Administration Office
503/645-6433
Fax 503/629-6301

Board of Directors Regular Meeting
Tuesday, June 16, 2020

5:30 pm Executive Session
6:30 pm Regular Meeting

AGENDA

1. Executive Session*
   A. Personnel
   B. Legal
2. Call Regular Meeting to Order
3. Action Resulting from Executive Session
4. Election of Officers for Fiscal Year 2020/21
5. Proclamation: Parks and Recreation Month (July)
6. Budget Hearing: Resolution Adopting the Fiscal Year 2020/21 Budget, Levying Taxes, and Making Appropriations
   A. Open Hearing
   B. Staff Report
   C. Public Comment**
   D. Board Discussion
   E. Close Hearing
   F. Board Action
7. Audience Time**
8. Board Time
   A. Committee Liaisons Update
9. Consent Agenda***
   A. Approve: Resolution Authorizing Application for a Transportation and Growth Management Grant for Planning and Design of Westside Trail Segment 14
   B. Approve: Resolution Authorizing Amendment to the Tualatin Hills Park & Recreation District Retirement Plan Fiduciary Responsibility Delegation Charter
10. New Business
    A. Approve: Intergovernmental Agreement with Clean Water Services for Easements at Tualatin Hills Nature Park
11. Adjourn

Due to the current State of Emergency as a result of the COVID-19 pandemic, the THPRD Board of Director's June 19, 2020 Regular Meeting will be conducted electronically. Live streaming of this meeting will be available at https://youtu.be/wQXyhQUsOeQ and also posted on the district's website at www.thprd.org

***Executive Session:** Executive Sessions are permitted under the authority of ORS 192.660. Copies of the statute are available at the offices of Tualatin Hills Park & Recreation District.

** **Audience Time / Public Comment:** Testimony is being accepted for this meeting by email only. If you wish to submit testimony, please do so by 5 pm on June 16, 2020 to boardofdirectors@thprd.org. Testimony received by the designated time will be read into the record during the applicable agenda item with a 3-minute time limit.

***Consent Agenda:** If you wish to speak on an agenda item on the Consent Agenda, you may be heard under Audience Time. Consent Agenda items will be approved without discussion unless there is a request to discuss a particular Consent Agenda item. The issue separately discussed will be voted on separately.

In compliance with the Americans with Disabilities Act (ADA), this material, in an alternate format, or special accommodations for the meeting, will be made available by calling 503-645-6433 at least 48 hours prior to the meeting.

MEMO

DATE: June 11, 2020
TO: Board of Directors
FROM: Doug Menke, General Manager

RE: **Information Regarding the June 16, 2020 Board of Directors Meeting**

Agenda Item #4 – Election of Officers for Fiscal Year 2020/21
Board President Felicita Monteblanco will lead the process in the election of officers for fiscal year 2020/21. The seats to be elected include president, secretary (currently held by Tya Ping), and secretary pro-tempore (currently held by Wendy Kroger).

Agenda Item #5 – Proclamation: Parks and Recreation Month
Attached please find a proclamation declaring July as Parks and Recreation Month.

Agenda Item #6 – Budget Hearing: Resolution Adopting the Fiscal Year 2020/21 Budget, Levying Taxes and Making Appropriations
Enclosed please find a memo outlining the process for the budget hearing to adopt the Fiscal Year 2020/21 Budget.

Action Requested: **Board of directors' approval of Resolution 2020-10 to adopt the 2020/21 budget, levy ad valorem taxes, and make appropriations.**

Agenda Item #9 – Consent Agenda
Attached please find consent agenda items #9A-B for your review and approval.

Action Requested: **Approve Consent Agenda Items #9A-B as submitted:**

A. **Approve: Resolution Authorizing Application for a Transportation and Growth Management Grant for Planning and Design of Westside Trail Segment 14**

B. **Approve: Resolution Authorizing Amendment to the Tualatin Hills Park & Recreation District Retirement Plan Fiduciary Responsibility Delegation Charter**

Agenda Item #10 – New Business

A. **Intergovernmental Agreement with Clean Water Services for Easements at Tualatin Hills Nature Park**

Attached please find a memo requesting board approval of an easement request from Clean Water Services at the Tualatin Hills Nature Park.

Action Requested: **Board of Director's approval of the easements, intergovernmental agreement, and associated documents with Clean Water Services and authorization for the general manager or his designee to execute the necessary documents to facilitate the project.**

TUALATIN HILLS PARK & RECREATION DISTRICT

PROCLAMATION

By the Board of Directors

WHEREAS, parks and recreation programs are an integral part of communities throughout this country, and voters felt so strongly about the importance of parks and recreation that they voted in 1955 to establish Tualatin Hills Park & Recreation District to provide dedicated parks and recreation services; and

WHEREAS, our parks and recreation are vitally important to our quality of life, ensuring our health and wellness, and contributing to our economic and environmental well-being; and

WHEREAS, parks and recreation programs build healthy, active communities that aid in the prevention of chronic disease, provide therapeutic recreation services for people experiencing disabilities, and improve our mental, emotional and physical health; and

WHEREAS, parks and recreation programs are fundamental to the environmental well-being of our community; and

WHEREAS, parks and recreation programs provide the opportunity to build community and bring our incredibly diverse population together to share experiences, learn from each other, and build cross-cultural connections that strengthen the fabric of our community; and

WHEREAS, parks and natural recreation areas improve water quality, protect our natural habitats, improve the quality of the air we breathe, provide vegetative buffers, and preserve the ecological beauty of these areas for children and adults to connect with nature and recreate outdoors; and

WHEREAS, the U.S. House of Representatives has designated July as Parks and Recreation Month;

NOW, THEREFORE, the Board of Directors of the Tualatin Hills Park & Recreation District does hereby declare the month of July 2020 as

Parks and Recreation Month

And do urge all those in the Tualatin Hills Park & Recreation District to support and promote this observance.

Signed this 16th day of June, 2020.

_____ _____

Felicita Monteblanco, President Tya Ping, Secretary

MEMO

DATE: June 3, 2020
TO: Doug Menke, General Manager
FROM: Keith Hobson, Director of Business & Facilities

RE: **Budget Hearing: Resolution Adopting the Fiscal Year 2020/21 Budget, Levying Taxes, and Making Appropriations**

In accordance with Oregon Local Budget Law, the THPRD Board of Directors must conduct a public budget hearing on the approved budget prior to adopting the budget for the 2020/21 fiscal year. Also in accordance with Oregon Local Budget Law, a notice of this hearing and a summary of the approved budget have been published.

After conducting a budget hearing, the board needs to adopt the budget and take certain other actions relative to the 2020/21 fiscal year. The attached resolution takes the following actions as required by Oregon Local Budget Law:

Adopt the Budget
The budget, as approved by THPRD's Budget Committee, must be adopted by resolution no later than June 30, and needs to state the total amount of all budget requirements. After closing the budget hearing, the board may make limited adjustments to the approved budget prior to adoption, if necessary.

Levy Ad Valorem Taxes
Local governments that use ad valorem property taxes to balance their budgets must declare the tax amount or tax rate by resolution. Property taxes are imposed for the tax year on the assessed value of all taxable property within the park district.

Make Appropriations
The resolution includes a schedule of appropriations, based on the approved budget, which provides THPRD with the legal spending authority for the fiscal year.

This resolution has been reviewed by THPRD's legal counsel.

Action Requested
Board of directors' approval of Resolution 2020-10 to adopt the 2020/21 budget, levy ad valorem taxes, and make appropriations.

RESOLUTION NO. 2020-10

TUALATIN HILLS PARK & RECREATION DISTRICT, OREGON

A RESOLUTION CONSISTENT WITH THE REQUIREMENTS OF ORS 294.456 APPROVING A BUDGET, MAKING APPROPRIATIONS, DETERMINING, MAKING, DECLARING, ITEMIZING AND CATEGORIZING THE AD VALOREM PROPERTY TAX AMOUNTS AND RATES TO BE CERTIFIED TO THE WASHINGTON COUNTY ASSESSOR FOR FISCAL YEAR 2020/21 FOR THE TUALATIN HILLS PARK & RECREATION DISTRICT

WHEREAS, the Tualatin Hills Park & Recreation District (THPRD) must, consistent with the requirements of the Oregon Local Budget Law (ORS 294.305 to 294.565) prepare and adopt an annual budget; and

WHEREAS, THPRD has complied with the procedures set out in Oregon's Local Budget Law for preparing the budget, involving the public, estimating revenues, expenditures and proposed ad valorem property taxes and outlining the programs and services provided by THPRD.

NOW THEREFORE, it is hereby resolved as follows:

Section 1. Budget Approved and Adopted. The THPRD Board of Directors hereby approves and adopts a budget for Fiscal Year 2020/21 in a total amount of $121,823,211. A copy of the budget will be kept on file in THPRD's Administration Office and is incorporated by reference herein.

Section 2. Levy of Taxes. The THPRD Board of Directors hereby make the appropriations described in Section #3 below and determine, make and declare the ad valorem property tax amount provided for in the budget at the rate of $1.3073 per $1,000 of assessed value (AV) and a property tax of $8,128,679 for bonded debt. Taxes are hereby imposed and categorized for Tax Year 2020/21 upon the assessed value of all taxable property within the boundaries of THPRD. The following allocations and categorization (subject to the limitations of OR. CONST. Article XI, Sec. 11b) make up the levy:

	Subject to the General Government Limitations	**Excluded from Limitations**
General Fund	$1.3073 / $1,000 AV	
Bonded Debt Fund		$8,128,679

Section 3. Fiscal Year 2020/21 Appropriations. The amounts for the fiscal year beginning July 1, 2020 and for the purposes shown below are hereby appropriated as follows:

General Fund

Board of Directors	$ 346,658
Administration	$ 3,088,592
Business & Facilities	$23,736,891
Park & Recreation Services	$24,995,844
Capital Outlay	$ 7,268,673
Capital Replacement Reserve	$ 1,500,000
Contingency	$ 2,500,000
TOTAL APPROPRIATIONS	**$63,436,658**

Bonded Debt Fund

Bond Principal Payments	$ 5,800,000
Bond Interest Payments	$ 2,410,306
Bonded Debt Fund Reserve	$ 100,000
TOTAL APPROPRIATIONS	**$ 8,310,306**

Systems Development Charge Fund

Materials and Services	$ 50,000
Capital Outlay	$35,446,278
TOTAL APPROPRIATIONS	**$35,496,278**

Maintenance Mitigation Fund

Materials and Services	$ 186,500
TOTAL APPROPRIATIONS	**$ 186,500**

Metro Bond Local Share Capital Fund

Capital Outlay	$ 8,628,870
TOTAL APPROPRIATIONS	**$ 8,628,870**

Bond Capital Projects Fund

Capital Outlay	$ 5,764,599
TOTAL APPROPRIATIONS	**$ 5,764,599**

Section 4. The Budget Officer, Keith D. Hobson, is hereby authorized consistent with

the terms of ORS 310.060 to certify to the Washington County Clerk and Washington County Assessor the tax levy made by this resolution and shall file with the State Treasurer and the Division of Audits of the Secretary of State a true copy of the Budget as finally adopted.

Section 5. This resolution takes effect on July 1, 2020.

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BOARD OF DIRECTORS APPROVAL: June 16, 2020

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Felicita Monteblanco
President/Director

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Tya Ping
Secretary/Director

Adoption and date attested by:

_____

Jessica Collins
Recording Secretary

[9A]

MEMO

DATE: May 28, 2020
TO: Doug Menke, General Manager
FROM: Keith Hobson, Director of Business & Facilities

RE: **Resolution Authorizing Application for a Transportation and Growth Management Grant for Planning and Design of Westside Trail Segment 14**

Introduction

Staff are seeking approval to submit a Transportation and Growth Management (TGM) grant application not to exceed $350,000 to fund both planning and design of Westside Trail Segment 14, which will span from Walker Road to the future landing of the Highway 26 pedestrian and bicycle bridge, and identifying and prioritizing network connections to the trail in partnership with Washington County. Staff requests board of directors' approval and signature on the attached resolution authorizing staff to apply for this grant.

Background

Transportation System Planning Grant applications are being accepted for the TGM Program. TGM is a joint program of the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Department of Transportation (ODOT). Transportation System Planning Grants, the category of TGM grant for which we will apply, require a 12% local match, which can be met with cash, direct project costs, or time and materials. The district intends to meet the local match requirement with staff time and is also seeking Major Streets Transportation Improvement Program (MSTIP) Opportunity Funds from Washington County.

The scope of work proposed for this project includes completing a sufficient design to generate reliable cost estimates for construction of the trail and identifying and prioritizing key bicycle and pedestrian network connections, including mid-block crossing, to the trail in partnership with Washington County, and engaging the public for feedback on final plans. THPRD will coordinate with both Washington County and the City of Beaverton on this effort.

Proposal Request

Staff are seeking approval to submit a TGM grant application not to exceed $350,000 to fund both planning and design of Westside Trail Segment 14, which will span from Walker Road to the future landing of the Highway 26 pedestrian and bicycle bridge, and identifying and prioritizing network connections to the trail in partnership with Washington County. Staff requests board of directors' approval and signature on the attached resolution authorizing staff to apply for this grant.

The attached resolution is consistent with the format previously approved by legal counsel in 2020.

Benefits of Proposal

A successful TGM grant application will allow THPRD to proceed with planning and design of Westside Trail Segment 14, leveraging district staff time and MSTIP Opportunity Funds to

maximize return for district residents. The planning work proposed will be used to apply for future grant applications to support construction of this trail segment.

Potential Downside of Proposal
Since the local match requirements will be met through the use of THPRD staff time and MSTIP Opportunity Funds, there is no apparent downside to the proposal.

Maintenance Impact
There is no maintenance impact of this proposal.

Action Requested
Board of directors' approval of Resolution 2020-11 authorizing application to the Transportation & Growth Management Program.

RESOLUTION NO. 2020-11

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE
TUALATIN HILLS PARK & RECREATION DISTRICT
AUTHORIZING APPLICATION TO THE TRANSPORTATION & GROWTH
MANAGEMENT PROGRAM

WHEREAS, the Transportation & Growth Management Program, a joint program of the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Department of Transportation (ODOT), is accepting applications for 2020 Transportation System Planning Grants; and

WHEREAS, the Tualatin Hills Park & Recreation District (THPRD) is a local government agency/special service district that is eligible to apply for those grant funds; and

WHEREAS, the THPRD Board of Directors have identified planning for the development of future regional trails and identification and prioritization of network connections to the future trail as a high priority in the district; and

WHEREAS, the proposed project will include planning and design work for Westside Trail Segment 14, as well as identification and prioritization of network connections to the trail in partnership with Washington County.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE TUALATIN HILLS PARK & RECREATION DISTRICT IN BEAVERTON, OREGON, AS FOLLOWS:

Section 1: The Board of Directors approves submittal of a grant application to the Transportation & Growth Management Program for planning and design of Westside Trail Segment 14 and identification and prioritization of network connections to the future trail.

Section 2: This resolution shall be effective following its adoption by the Board of Directors.

Approved by the Tualatin Hills Park & Recreation District Board of Directors on the 16th day of June 2020.

_____
Felicita Monteblanco, President

_____
Tya Ping, Secretary

ATTEST:

_____
Jessica Collins, Recording Secretary

MEMO

DATE: June 11, 2020
TO: Doug Menke, General Manager
FROM: Lori Baker, Chief Financial Officer

RE: **Resolution Authorizing Amendment to the Tualatin Hills Park & Recreation District Retirement Plan Fiduciary Responsibility Delegation Charter**

Introduction

Staff is requesting board approval of a resolution which authorizes the amendment to the Tualatin Hills Park & Recreation District Retirement Plan Fiduciary Responsibility Delegation Charter ("Charter"). This amendment provides for the addition of the Tualatin Hills Park & Recreation District Individual Account Program Retirement Plan ("IAP Plan") to the Charter and changes the committee members to update membership to include a member nominated by the labor association.

Background

As part of the district pension plan, the District has a fiduciary committee that oversees the administrative activities of the plan. The Board approved a resolution on June 9, 2020 that provided for the spinoff of the Individual Account Program for Tier 2 participants. This resulted in a separate plan document for the IAP Plan and will provide for a separately managed trust that accounts for each individuals IAP balances. This separate plan will have administrative requirements as addressed in the Charter.

Additionally, the district and OSEA have partnered to develop a plan to add an OSEA representative to the committee, in support of collaborative plan administration. The Charter is also being updated for position name changes and restructuring that is scheduled to occur in the upcoming fiscal year and to add that in the event any Committee members are conflicted with respect to a matter, the matter will be decided upon a majority vote of all non-conflicted Committee members.

Proposal Request

Staff is recommending that key administrative tasks necessary for the proper functioning of the IAP Plan be assigned to the Committee to execute including among others:

a) The development of rules and procedures for the IAP Plan's administration and their enforcement.

b) Determining employee eligibility for IAP Plan participation.

c) Communicating with the IAP Plan's beneficiaries about the IAP Plan itself, the nature and characteristic(s) of the various investment choices the IAP Plan offers as well as other information both required and useful so that the beneficiaries understand and take advantage of this significant employment benefit.

d) Developing investment objectives, guidelines and performance measurement standards.

e) Selecting investment funds for the IAP Plan and monitoring their performance and in the context of established standards of performance and taking action(s) to ensure said performance standards are met.

f) Monitoring the reasonableness of investment costs for IAP Plan participants.

g) Retaining record-keepers/administrators, investment advisors, attorneys, auditors and others to assist the Committee in their performance of the aforementioned responsibilities.

h) Executing IAP Plan documents and amendments so the IAP Plan remains compliant with applicable law and/or IAP Plan objectives.

The Charter has been reviewed and approved by district legal counsel.

Benefits of Proposal
Adding the IAP Plan to the Charter ensures that there is clear guidance on the governance and administration responsibilities with respect to the IAP Plan. The Charter sets out with an appropriate level of specificity the obligations and duties of the district and the Retirement Plan Committee.

Potential Downside of Proposal
There is no foreseeable downside to the requested action.

Action Requested.
Board of Directors' approval of Resolution 2020-12 amending the Retirement Plan Fiduciary Responsibility Delegation Charter.

RESOLUTION NO. 2020-12

TUALATIN HILLS PARK & RECREATION DISTRICT, OREGON

A RESOLUTION OF TUALATIN HILLS PARK & RECREATION DISTRICT BOARD OF DIRECTORS AUTHORIZING AMENDMENT TO THE RETIREMENT PLAN FIDUCIARY RESPONSIBILITY DELEGATION CHARTER

WHEREAS, the Tualatin Hills Park & Recreation District (District) sponsors and maintains, consistent with state law, the Tualatin Hills Park & Recreation District Retirement Plan, a governmental defined benefit plan and the Tualatin Hills Park & Recreation District Individual Account Program Retirement Plan, a governmental defined contribution plan (Plans).

WHEREAS, the District's Board of Directors, as the governing body for the District, IS CHARGED with obligations ensuring the Plans are prudently managed, operated and maintained for the exclusive benefit of the Plans' participants, contain a prudently diversified group of investment alternatives, and conform their operation to the Plan documents and applicable law.

WHEREAS, the Board believes the aforementioned general fiduciary charge would be best served by amending the written Retirement Plan Fiduciary Responsibility Delegation Charter to include the newly adopted Individual Account Program Retirement Plan.

WHEREAS, the District has provided an amended charter.

WHEREAS, the Board wishes to adopt said amended charter.

NOW THEREFORE, BE RESOLVED BY THE BOARD OF DIRECTORS OF THE TUALATIN HILLS PARK & RECREATION DISTRICT:

Section 1. The Board of the Tualatin Hills Park & Recreation District hereby adopts the Amended Fiduciary Responsibility Delegation Charter attached hereto as Exhibit 1.

Section 2. This resolution is and shall be effective from and after its adoption by the Board.

Signatures on next page

BOARD OF DIRECTORS APPROVAL: June 16, 2020

Felicita Monteblanco
President/Director

Tya Ping
Secretary/Director

Adoption and date attested by:

Jessica Collins
Recording Secretary

Original Adoption Date: May 2016
Amended: June 16, 2020

Tualatin Hills Park & Recreation District Retirement Plan
Fiduciary Responsibility Delegation Charter

I. Purpose and Objectives

This Fiduciary Responsibility Delegation Charter ("Charter") is to guide the Board of Directors of the **Tualatin Hills Park & Recreation District** ("Plan Sponsor") in executing its fiduciary responsibilities with respect to the following retirement plans ("Plans").

Plan Name	Type
Tualatin Hills Park & Recreation District Retirement Plan	Governmental Defined Benefit Plan
Tualatin Hills Park & Recreation District Individual Account Program Retirement Plan	Governmental Defined Contribution Plan

This Charter defines the Plan Sponsor's fiduciary responsibilities and sets out the scope of the delegation the Plan Sponsor has concerning its rights, powers and duties. Any delegation by the Plan Sponsor's Board of Directors ("Board") and/or the Plans' Retirement Plan Committee ("Committee") has to be done in writing. Plan Fiduciaries—both members of the Board and of the Committee—who fail to meet the responsibilities described herein may be personally liable for a breach of their fiduciary duty. However, the Plan Sponsor shall, consistent with Oregon law, indemnify, defend and hold harmless the fiduciary delegate(s) for alleged breach(es) of their fiduciary duty except in the event of a delegate's gross negligence or willful misconduct.

The Plan Sponsor's objectives as they relate to fiduciary responsibility include:

a) Maintaining the Plans for the exclusive benefit of participants while avoiding prohibited transactions and/or conflicts of interest;

b) Exercising prudence in all respects while executing its fiduciary responsibilities;

c) To the extent applicable, providing an appropriately diverse universe of investment alternatives for participants' use and choice under the Plans and/or investing the Plans' assets in a prudent manner; and

d) Ensuring the Plans' operations be fully compliant with applicable Plan document provisions and applicable law.

II. Fiduciary Authority and Responsibilities Under the Plans

The Plan Sponsor is permitted to assign/delegate certain of its specific fiduciary duties. Certain fiduciary duties belong to and remain with the Plan Sponsor's Board of Directors with other duties being delegated to persons pursuant to this Charter.

The Board retains decisional responsibility for any substantive change(s) to the Plans that may impact Plan costs including benefit eligibility and/or employer contributions.

Individuals acting as fiduciaries must acknowledge in writing that they understand and accept their fiduciary responsibilities.

III. Committee Membership

The Board delegates functional fiduciary responsibility to the Retirement Plan Committee. Subject to the limitations identified below, the Board selects Committee members who then must accept their appointments by signing the Committee Member Nomination and Acknowledgement Letter.

a) The Committee shall include Tualatin Hills Park & Recreation District ("THPRD") employees holding the identified positions, one (1) OSEA-nominated employee member and one (1) Board-designated Board member.
    1. General Manager
    2. Human Resource Manager
    3. Chief Financial Officer

b) The Committee shall select a Chair from among its members.

c) If an employee member of the Committee ceases to be a THPRD employee, their Committee membership automatically ends without need for action by the Board or notice to the individual.

d) Any person holding one of the positions identified in III(a)(1) through (3) above is automatically made a member of the Committee without further action by the Board.

IV. Committee Procedures

The Committee shall perform administrative responsibilities with respect to the Plans including:

a) Committee Chair. The Chair shall be responsible for preparation of the meeting agenda, meeting materials and the conduct of the meeting.

b) Majority Vote. Any action relating to the Committee's administrative responsibilities for the Plans shall be made by a simple majority vote of its members. In the determination of any matter with respect to which one or more of the Committee members have a conflict of interest such that they determine they must not vote on the matter, the matter shall be determined by a simple majority vote of the Committee members who do not have a conflict of interest.

c) Delegation to Act on Behalf of Committee. The Committee may delegate to one or more of its members the following duties:
    1. give written notice of actions taken by the Committee to affected participants; and
    2. contract for legal, recordkeeping, accounting, actuarial, clerical and other services.

    Any delegation must be done in writing. The Committee may appoint subcommittees, the members of which need not be Committee members.

d) Committee Rules. Subject to the limitations of the Plans, the Committee shall establish rules for the Committee's administration and transaction of business, including meetings time(s) and place and the content of notices with respect to such meetings.

e) Frequency of Meetings. Committee meetings shall be held at least semi-annually.

f) Reports to the Board. The Committee shall present a report to the Board not less than once a calendar year which shall at a minimum include a summary of the Committee's administrative and Plans' investment activities for the period covered by the report.

V. Plan Administrative Responsibilities

The Committee's Plan administrative responsibilities include:

a) Requiring the furnishing of relevant information to facilitate the Plans' operations and the provision of benefits to its participants as a condition to the receipt of Plan benefits;

b) Making and enforcing rules and procedures for efficient Plan administration;

c) Maintaining the Plans' administrative records;

d) Interpreting Plan documents;

e) Determining guidelines for benefit amounts and deciding on claims for Plan benefits;

f) Designating persons to carry out any fiduciary responsibilities of the Plan Administrator for the Plans;

g) Executing Plan amendments as required by changes in applicable law and/or regulation, changed Plan objectives after said amendments' approval by the Board;

h) Communication of the Plans' provisions, the nature and characteristic(s) of the various investment choices available and provide other information consistent with section 404(c) and 404(a)(5) of ERISA (29 USC §§1104(c) and 1104(a)(5)) as applicable;

i) Determining employee eligibility for Plan participation consistent with the Plans and their enrollment;

j) Ensuring timely deposit of participant salary deferrals to the participants' separate accounts under the Plans;

k) Preparing and reviewing the Plans' consolidated financial reporting including governmental reporting;

l) Reviewing the Plans' annual independent financial audit report and obtaining and maintaining all required fidelity bond(s);

m) Providing general oversight of the Plans' legal compliance;

n) Retaining actuaries, record-keepers/administrators, consultants, attorneys, auditors and other advisers for the Plans to assist the Committee's aforementioned responsibilities;

o) Monitoring and evaluating the actuaries, record-keeper/administrators, consultants, attorneys, auditors and other advisors hired to assist with or perform delegated responsibilities as to the reasonability of fees and the appropriate execution of delegated responsibilities; and

p) Establishing policies and procedures allocating expenses incurred by the Plans.

VI. Plan Investment Responsibilities

The Board delegates certain investment related responsibilities to the Committee. The Committee's investment related responsibilities include:

a) Investment Policies. Develop investment objectives, guidelines and performance measurement standards as provided for in the Investment Policy Statement for each Plan.

b) Selection of Investment Managers. Select a prudently appropriate universe of investment funds for the Plans and monitor their performance against appropriate benchmarks.

c) Monitoring Investments. Monitoring the Plans' investments in the context of established standards of performance and taking prudent and appropriate action(s) to ensure said performance standards are met.

d) Monitoring Fees and Expenses. Monitoring the reasonableness of investment costs for Plan participants.

e) Investment Adviser. Retain independent advisers and investment consultants to assist with the aforementioned responsibilities.

f) Other Responsibilities. The Committee may take such other and further actions with respect to the investments of the Plans as may be consistent with this Charter or as may be set out in Plan documents or which the Committee determines are in the best interests of the Plans and the participants.

VII. Construction

This Charter shall not be interpreted to limit the discretion of the Plan Sponsor. The Plan Sponsor, by its Board, reserves the discretion to make exceptions to this Charter as may be appropriate.

Nothing in this Charter is intended to expand the Plan Sponsor's and Committee's responsibilities beyond the requirements of applicable law.

As used herein, the term "participants" includes participants and their beneficiaries.

VIII. Charter Review and Amendment

This Charter shall be reviewed periodically by the Board and in no event less than once every five (5) years and shall be amended or adjusted to reflect relevant changes in the Plans' operations, philosophy and/or objectives as well as may be required by applicable law.

IX. Plan Document Coordination

In the event of any conflict between the provisions of this Charter any delegation of authority made pursuant to this Charter and the provisions of the Plan documents, the Plan documents control.

Original Adoption Date: May 2016
Amended: June 16, 2020

X. Fiduciary Responsibility

The Committee members, in the exercise of each and every power or discretion vested with them shall fulfill their collective and individual fiduciary responsibilities in compliance with applicable Oregon law and with the care, skill, prudence and diligence that under the circumstances then prevailing, a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims.

AS AUTHORIZED BY THE BOARD RESOLUTION DATED 16th DAY OF JUNE, 2020

EXECUTED FOR THE COMMITTEE:

BY:

_____ _____
Signature Date

_____
Printed Name

_____
Title

Original Adoption Date: May 2016
Amended: June 16, 2020

Tualatin Hills Park & Recreation District Retirement Plan
Fiduciary Responsibility Delegation Charter

I. Purpose and Objectives

This Fiduciary Responsibility Delegation Charter ("Charter") is to guide the Board of Directors of the **Tualatin Hills Park & Recreation District** ("Plan Sponsor") in executing its fiduciary responsibilities with respect to the following retirement plans ("Plans").

Plan Name	Type
Tualatin Hills Park & Recreation District Retirement Plan	Governmental Defined Benefit Plan
Tualatin Hills Park & Recreation District Individual Account Program Retirement Plan	Governmental Defined Contribution Plan

This Charter defines the Plan Sponsor's fiduciary ~~responsibility~~ responsibilities and sets out the scope of the delegation the Plan Sponsor has concerning its rights, powers and duties. Any delegation by the Plan Sponsor's Board of Directors ("Board") and/or the Plans ~~Sponsor's~~ Retirement Plan Committee ("Committee") has to be done in writing. Plan Fiduciaries—both members of the Board and of the Committee—~~failing~~ who fail to meet the responsibilities described herein may be personally liable for a breach of their fiduciary duty. However, the Plan Sponsor shall, consistent with Oregon law, indemnify, defend and hold harmless the fiduciary delegate(s) for alleged breach(es) of their fiduciary duty except in the event of a delegate's gross negligence or willful misconduct.

The Plan Sponsor's objectives as they relate to fiduciary responsibility include:

a) Maintaining the Plans for the exclusive benefit of participants while avoiding prohibited transactions and/or conflicts of interest;

b) Exercising prudence in all respects while executing its fiduciary responsibilities;

c) To the extent applicable, p~~P~~roviding an appropriately diverse universe of investment alternatives for participants' use and choice under the Plans ~~as well as~~and/or investing the Plan's' assets in a prudent manner; and

d) Ensuring the Plan's' operations be fully compliant with applicable Plan document provisions and applicable law.

II. Fiduciary Authority and Responsibilities Under the Plans

The Plan Sponsor is ~~responsible for~~permitted to assign~~ing~~/delegat~~eing~~ certain of its specific fiduciary duties. Certain fiduciary duties belong to and remain with the Plan Sponsor's Board of Directors with other duties being delegated to persons pursuant to this Charter.

The Board retains decisional responsibility for any substantive change(s) to the Plans that may impact Plan costs including benefit eligibility and/or employer contributions.

Original Adoption Date: May 2016
Amended: June 16, 2020

Individuals acting as fiduciaries must acknowledge in writing that they understand and accept their fiduciary responsibilities ~~in writing~~.

III. Committee Membership

The Board delegates functional fiduciary responsibility to the ~~Plan Sponsor's~~ Retirement Plan Committee. Subject to the limitations identified below, the Board selects Committee members who then must accept their appointments by signing the Committee Member Nomination and Acknowledgement Letter.

a) The Committee shall include Tualatin Hills Park & Recreation District ("THPRD") employees holding the identified positions, one (1) OSEA ~~nominated~~ employee member and one (1) Board-designated Board member.
   1. General Manager
   ~~2. Director of Business and Facilities~~
   ~~3.~~2. Human Resource Manager
   ~~4.~~3. Chief Financial Officer

b) The Committee shall select a Chair from among its members.

c) If an employee member of the Committee ceases to be a THPRD employee, their Committee membership automatically ends without need for action by the Board or notice to the individual.

d) Any person holding one of the positions identified in III(a)(1) through (3) above is automatically made a member of the Committee without further action by the Board.

IV. Committee Procedures

The Committee shall perform administrative responsibilities with respect to the Plans including:

a) Committee Chair. The Chair shall be responsible for preparation of the meeting agenda, meeting materials and the conduct of the meeting.

b) Majority Vote. Any action relating to the Committee's administrative responsibilities for the Plans shall be made by a simple majority vote of its members. In the determination of any matter with respect to which one or more of the Committee members have a conflict of interest such that they determine they must not vote on the matter, the matter shall be determined by a simple majority vote of the Committee members who do not have a conflict of interest.

c) Delegation to Act on Behalf of Committee. The Committee may delegatee ~~any or all of its administrative responsibility~~ to one or more of its members the following duties ~~to~~:
   1. give written notice of actions taken by the Committee to affected participants ~~.~~; and
   2. contract for legal, recordkeeping, accounting, actuarial, clerical and other services.

   Any delegation must be done in writing. The Committee may appoint subcommittees, the members of which need not be Committee members.

d) Committee Rules. Subject to the limitations of the Plans, the Committee shall establish rules for the Committee's administration and transaction of business, including meetings time(s) and place and the content of notices with respect to such meetings.

e) Frequency of Meetings. Committee meetings shall be held at least semi-annually.

f) Reports to the Board. The Committee shall present a report to the Board not less than once a calendar year which shall at a minimum include a summary of the Committee's administrative and Plans' investment activities for the period covered by the report.

V. Plan Administrative Responsibilities

The Committee's Plan administrative responsibilities include:

a) Requiring the furnishing of relevant information to facilitate the Plan's operations and the provision of benefits to its participants as a condition to the receipt of Plan benefits;

b) Making and enforcing rules and procedures for efficient Plan administration;

c) Maintaining the Plan's administrative records;

d) Interpreting Plan documents;

e) Determining guidelines for benefit amounts and deciding on claims for Plan benefits;

f) Designating persons to carry out any fiduciary responsibilities of the Plan Administrator for the Plans;

g) Executing Plan amendments ~~t~~ as required by changes in applicable law and/or regulation, changed Plan objectives after said amendments' approval by the Board;

h) Communication of the Plan's provisions, the nature and characteristic(s) of the various investment choices available and provide other information consistent with section 404(c) and 404(a)(5) of ERISA (29 USC §§1104(c) and 1104(a)(5)) as applicable;

i) Determining employee eligibility for Plan participation consistent with the Plans and their enrollment;

j) Ensuring timely deposit of participant salary deferrals to the participants' separate accounts under the Plans;

k) Preparing and reviewing the Plan's consolidated financial reporting including governmental reporting;

l) Reviewing the Plan's annual independent financial audit report and obtaining and maintaining all required fidelity bond(s);

m) Providing general oversight of the Plan's legal compliance;

n) Retaining actuaries, record-keepers/administrators, consultants, attorneys, auditors and other advisers for the Plans to assist the Committee's aforementioned responsibilities;

o) Monitoring and evaluating the actuaries, record-keeper/administrators, consultants, attorneys, auditors and other advisors hired to assist with or perform delegated responsibilities as to the reasonability of fees and the appropriate execution of delegated responsibilities; and

p) Establishing policies and procedures allocating expenses incurred by the Plans.

VI. Plan Investment Responsibilities

The Board delegates certain investment related responsibilities to the Committee. The Committee's investment related responsibilities include:

a) Investment Policiesy. Develop investment objectives, guidelines and performance measurement standards as provided for in the Investment Policy Statement for each Plan.

b) Selection of Investment Managers. Select a prudently appropriate universe of investment funds for the Plans and monitor their performance against appropriate benchmarks.

c) Monitoring Investments. Monitoring the Plan's' investments in the context of established standards of performance and taking prudent and appropriate action(s) to ensure said performance standards are met.

d) Monitoring Fees and Expenses. Monitoring the reasonableness of investment costs for Plan participants.

e) Investment Adviser. Retain independent advisers and investment consultants to assist with the aforementioned responsibilities.

f) Other Responsibilities. The Committee may take such other and further actions with respect to the investments of the Plans as may be consistent with this Charter or as may be set out in Plan documents or which the Committee determines are in the best interests of the Plans and the participants.

VII. Construction

This Charter shall not be interpreted to limit the discretion of the Plan Sponsor. The Plan Sponsor, by its Board, reserves the discretion to make exceptions to this Charter as may be appropriate.

Nothing in this Charter is intended to expand the Plan Sponsor's and Committee's responsibilities beyond the requirements of applicable law.

As used herein, the term "participants" includes participants and their beneficiaries.

VIII. Charter Review and Amendment

This Charter shall be reviewed periodically by the Board and in no event less than once every five (5) years and shall be amended or adjusted to reflect relevant changes in the Plan's' operations, philosophy and/or objectives as well as may be required by applicable law.

IX. Plan Document Coordination

Original Adoption Date: May 2016
Amended: June 16, 2020

In the event of any conflict between the provisions of this Charter any delegation of authority made pursuant to this Charter and the provisions of the Plan documents, the Plan documents controls.

X. Fiduciary Responsibility

The Committee members, in the exercise of each and every power or discretion vested with them shall fulfill their collective and individual fiduciary responsibilities in compliance with applicable Oregon law and with the care, skill, prudence and diligence that under the circumstances then prevailing, a prudent person acting in a like capacity and familiar with such matters would use in the conduct of an enterprise of a like character and with like aims.

AS AUTHORIZED BY THE BOARD RESOLUTION DATED ___ DAY OF ____, 2016.2020

EXECUTED FOR THE COMMITTEE:

BY:

_____ _____
Signature Date

_____
Printed Name

_____
Title

[10A]

MEMO

DATE: June 10, 2020
TO: Doug Menke, General Manager
FROM: Aisha Panas, Director of Park & Recreation Services

RE: **Intergovernmental Agreement with Clean Water Services for Easements at Tualatin Hills Nature Park**

Introduction

Clean Water Services (CWS) needs to expand the capacity of an existing sewer line that runs along Cedar Mill Creek through the Tualatin Hills Nature Park (see Maps 1 & 2). CWS has worked with THPRD staff to explore alternative alignments (such as along surface streets) to avoid the park, however the most feasible route involves adding a larger sewer pipe near the current one within the park.

Background

Staff have been working collaboratively with CWS to reduce impact and ensure visitor safety.

No formal commitment has been made, but the working understanding proposes a sewer route that requires open trench construction and a temporary gravel road from the north end of the park, concluding at an existing main sewer at Beaverton Creek on the west edge of the park. Construction will require access for large construction equipment along Cedar Mill Creek via SW 170th Ave. and SW Merlo Rd.

The project will disrupt patron use of the trail system and entail the removal of approximately 475 trees over six inches in diameter. Trees will be used for on-site ecological enhancements. Four significant wooden boardwalks are in the path of the construction and will need to be removed. Three will be closed the first year and one in the second year. One of those three, the Big Fir boardwalk, will be rebuilt and permanently repositioned early in the construction process to allow access to the western portion of the park.

Construction is proposed to start in summer 2021 and is expected to last for two construction seasons, concluding in fall 2022. The start date is a year later than originally expected. To avoid impacts to bird nesting, tree removal will start in December 2020.

Ecological restoration of the site will be accomplished through weed removal, replanting of trees and shrubs, and rerouting of stream side channels to help reduce erosion during storm events. CWS has successfully restored large disturbance areas in the past, including along Beaverton Creek in the Tualatin Hills Nature Park.

A CWS-led public meeting was held to discuss the project in July 2019. Members of the Friends of the Tualatin Hills Nature Park as well as THPRD's Nature & Trails Advisory Committee participated. Participants were disappointed about the disturbance the project will cause to patrons and wildlife, but understood the need. No significant concerns were voiced.

Proposal Request
To construct the sewer, CWS will need a temporary construction easement of 17.62 acres with about 11 acres of ground disturbance. They will also require a new permanent easement of approximately two acres.

Per management direction, staff negotiated an agreement with Clean Water Services for the following:

1. Each boardwalk that is impacted is rebuilt in its entirety to current THPRD standards, including the use of new pultruded plastic decking. CWS will cover all associated costs for reconstruction to THPRD's current standards.
2. Habitat restoration, replanting, monitoring, and maintenance is completed on impacted natural areas and maintained for a period of five years or until area meets performance standards, whichever is greater. Special attention will be made to limiting impacts on wildlife.
3. CWS is responsible for all permits, visitor safety measures, and public communications/detours.

The attached easement, intergovernmental agreement, and legal descriptions have been reviewed and approved as to form by the park district's legal counsel. A complete list of documents is in the table below.

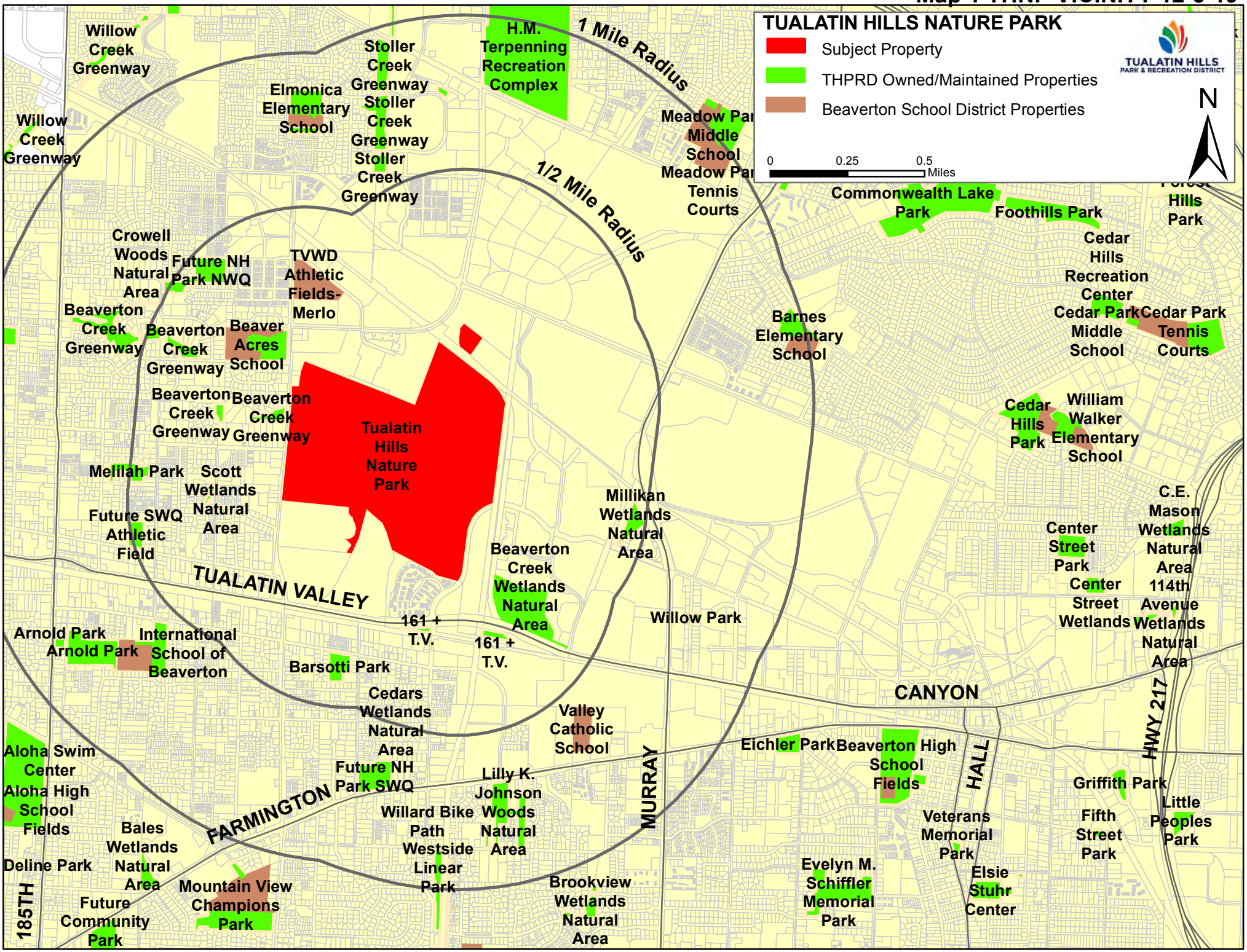
Exhibit #	Description
NA	Cover letter from CWS
NA	Intergovernmental agreement
A	Sewer route/access overview
B	THPRD Trail Functional Plan
C	Tree plan
D	Revegetation plan
E	Construction plan
F	Permanent easement
G	Temporary easement
H	Restoration easement
I	Tree protection guidelines
J	Access easement

Benefits of Proposal
The park district will receive upgraded boardwalks that increase access for people experiencing disabilities and provide a safer experience for all. Construction of the sewer provides for a critical community need.

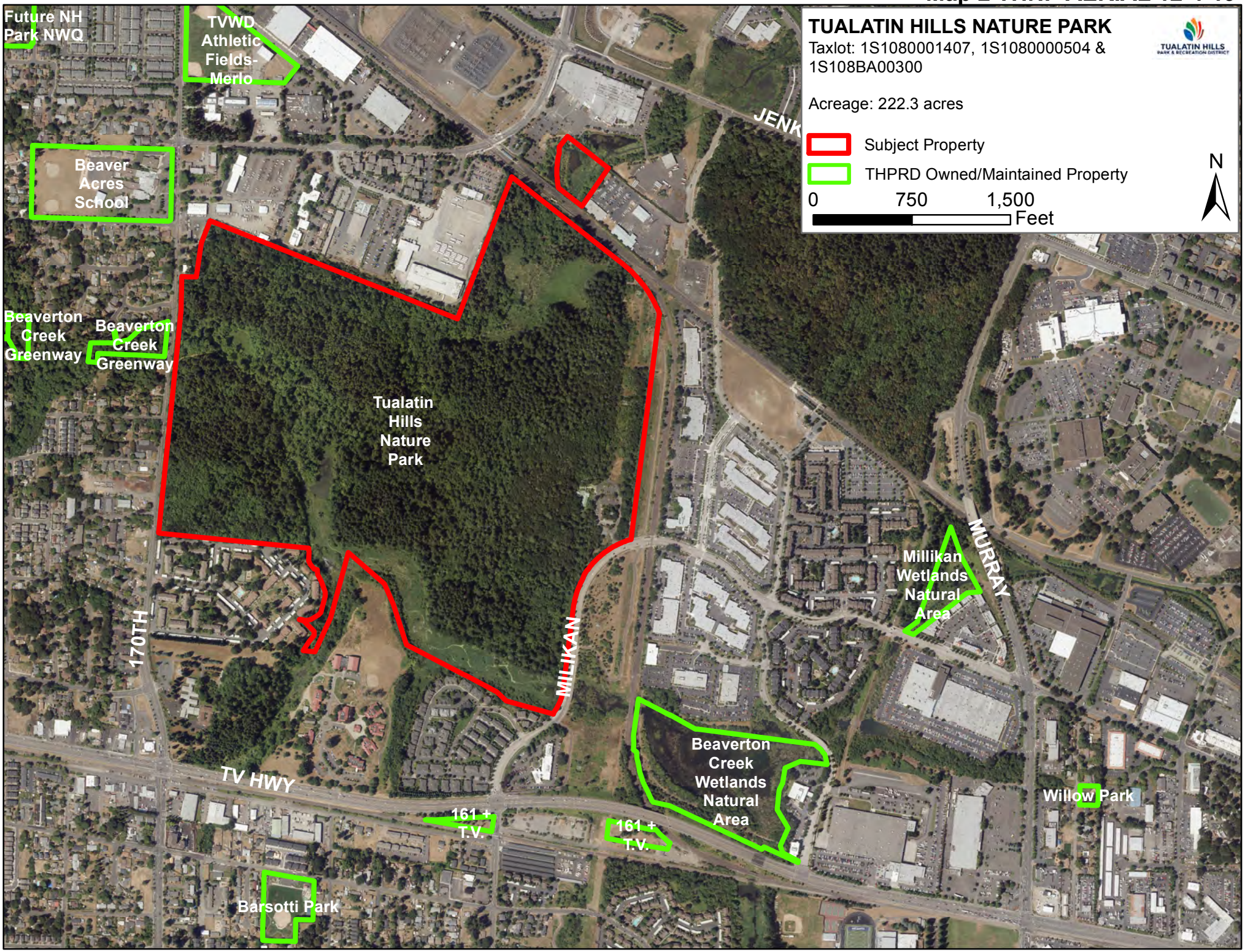
Potential Downside of Proposal
There will be two years of disruptions to park users and wildlife. Hundreds of trees will be cut down, though they will be used for habitat and stream enhancement where practical.

Action Requested
Board of Directors approval of the easements, intergovernmental agreement, and associated documents with Clean Water Services and authorization for the general manager or his designee to execute the necessary documents to facilitate the project.

Map 1 THNP VICINITY 12-5-19



Map 2 THNP AERIAL 12-4-19



Clean Water Services

DATE: May 18, 2020

TO: Doug Menke, THPRD General Manager

FROM: Meredith Armstrong, CWS Easement Acquisition Specialist

Introduction

Pursuant to THPRD's policy and procedures for considering requests for easements on THPRD property Clean Water Services (District) is seeking board of directors' approval to acquire a permanent sanitary sewer easement and a temporary construction easement on the grounds of the Tualatin Hill Nature Park (THNP).

Background

District owns and operates the existing Cedar Mill Interceptor (sanitary sewer trunk), a 36-inch diameter concrete gravity sewer that was constructed in 1975. The District is currently planning for the upgrade of approximately 4,900 feet of the existing sewer trunk and appurtenances through the Project Area. In addition, the District is planning an array of instream, floodplain, and riparian habitat enhancement actions within the vicinity of the sanitary sewer trunk to increase ecosystem resilience. Resilience is primarily achieved by adding side channels and woody debris that disperse high flows across the floodplain enhancing natural stream, wetland, and floodplain processes and conditions.

The Cedar Mill Creek Sanitary and Regional Stormwater Management Approach Project (Project) will replace the existing concrete sewer trunk with a 48-inch fiberglass reinforced polymer (FRP) pipe. The proposed sewer trunk closely follows the alignment of the existing sewer trunk and of Cedar Mill Creek (CMC) and traverses floodplain and wetland within THNP. The proposed Project will result in 11 acres and 19,730 cu.yd. of total ground disturbance for all associated work. The Project will not result in changes to impervious surface area.

The preferred alignment will be adjacent to the existing sewer trunk generally following within the previous construction area for the existing sanitary sewer trunk, reducing adverse effects to the environment, reducing impacts to private properties, providing opportunities to enhance degraded wetlands, and allowing for the existing sewer to remain in service until

final connections for the proposed sewer trunk are made. Portions of the proposed construction area were previously disturbed by the initial installation of the sewer trunk (vegetation clearing, trenching, and staging) in 1975. The proposed sewer trunk will reoccupy the previously disturbed construction corridor, which will reduce impacts to mature trees and other high value habitats. By locating side channels to align with trunk construction disturbance areas, impacts to resources were further reduced and the multiple flow paths over the buried pipe reduce the risk of stream incision.

Proposal Request

District will need a permanent easement and temporary construction easement in order to complete the work for the Project. To facilitate the granting of the easements District and THPRD are entering into an Intergovernmental Agreement (IGA) that specifies the easements to be granted and lays out the details of how and when the sewer construction will be completed within THNP.

The work will take place from winter 2020 – fall 2022. District will remove trees in the winter of 2020, prior to bird nesting season, the Project will be constructed during the in-water work window starting summer of 2021 and ending fall of 2022. District will coordinate with THPRD staff to minimize impacts to THPRD activities on site.

District will compensate THPRD for the easements through upgrades to the trail and boardwalks in THNP. District will reconstruct any boardwalks directly affected by the project, bringing them up to THPRD's current boardwalk standards. District will also relocate the Big Fir Trail away from the Project area, placing it closer to the Big Pond.

District will work with THPRD staff to ensure a safe environment for trail users during construction. Some temporary trails or detour routes will be in place while construction is taking place, other trails will be closed completely during construction. District will lead all outreach and public involvement, while coordinating closely with THPRD staff.

Benefits of Proposal

The agreement will allow for District to upgrade the sewer line to provide additional capacity needed to serve the community. THPRD will be compensated in form of enhancements to THNP Boardwalks and trails.

The District will work with THRPD to replace invasive vegetation with native vegetation. District will provide an array of instream, floodplain, and riparian habitat enhancement actions in THNP, within the vicinity of the sanitary sewer trunk, which will increase ecosystem resilience.

Potential Downside of Proposal

There will be temporary closures of trails. Construction activity will be noticeable to park users both visually and audibly. District will need to fall 478 trees that have a diameter at breast height (DBH) greater than 6" but less than 12", 206 trees that have a DBH greater than 12" but less than 18" and 132 trees that have a DBH greater than 18" to complete the construction work, while these will be used for enhancement work of the creek and floodplain, there will be visible tree loss.

Maintenance Impact

District will continue to need access to their trunk line to ensure it functions properly to prevent overflows and other maintenance problems. The maintenance requirements will remain the same as they have in past. Some of the impacted boardwalks will be reconstructed to provide additional loading, to allow Clean Water Services' maintenance crews to get access to the sewer pipe, without causing damage.

Action Requested

Board of directors' approval/authorization of the easement and IGA, and authorization for the general manager or his designee to execute the documents.

Kind Regards,

Meredith Armstrong
Easement Acquisition Specialist
503-681-4425
armstrongm@cleanwaterservices.org

INTERGOVERNMENTAL AGREEMENT
BETWEEN
CLEAN WATER SERVICES AND
TUALATIN HILLS PARK & RECREATION DISTRICT
FOR
CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH PROJECT

This Intergovernmental Agreement, ("Agreement") dated _____, 2020, is between **CLEAN WATER SERVICES** ("District") and the **TUALATIN HILLS PARK & RECREATION DISTRICT** ("THPRD").

A. RECITALS

1. ORS 190.003 - 190.110 encourages intergovernmental cooperation and authorizes local governments to delegate to each other authority to perform their respective functions as necessary.

2. The District is currently planning the Cedar Mill Creek Sanitary and Regional Stormwater Management Approach Project (Project) which includes replacing the existing sanitary sewer trunk and an array of natural enhancements through the area shown on the project map attached as Exhibit A (Project Area).

3. THPRD is the owner of Tax Lots 1S1080000504, Tualatin Hills Nature Park (THNP) and 1S108BA00300, where a majority of the Project is located.

4. THPRD operates and maintains numerous trails and boardwalks throughout the THNP along with the Tualatin Hills Nature Center where various educational programs are held. THPRD's Trail Plan calls for new or reconstructed boardwalks to meet current trail standards and realign the Big Fir Trail.

5. District requires permanent and temporary construction easements, temporary construction access, material storage, and trail closures through the Project Area to construct the Project.

6. District requires future planned access routes as shown on Exhibit A through THNP for operational and maintenance requirements. For purposes of this Agreement access routes that are combined with existing trails and boardwalks are referred to as "pedestrian/maintenance access trails", other existing trails and boardwalks impacted by the project are referred to as "impacted trails", and access routes that are not combined with existing trails or boardwalks are referred to as "post project maintenance access".

7. District and THPRD desire to enter into this Agreement to coordinate reconstruction of the trails and boardwalks, minimize impacts to park users, habitat mitigation and restoration, and construction of the Project to occur within the THNP.

NOW, THEREFORE, the parties agree as follows:

B. DESCRIPTION

The Project includes the following elements:

1. Replacing the existing sanitary sewer trunk including installing approximately 4,900 feet of a new 48-inch sanitary sewer pipe and apparatuses parallel to the existing 36-inch sanitary sewer pipe. Upon completing the new 48-inch pipe, the existing pipe will be abandoned in place. Any existing apparatuses related to the existing pipe will be removed.

2. Natural enhancements include an array of in-stream, floodplain, and riparian habitat enhancement actions meant to increase ecosystem resilience. Resilience is primarily achieved by adding side channels and woody debris that disperse high flows across the floodplain, enhancing natural stream, wetland, and floodplain processes and conditions.

3. Impacted trails will be reconstructed per THPRD's Trails Functional Plan (attached as Exhibit B), except they will be designed to support a vehicle live load of 5,000 pounds.

   - 0.05 miles of the Oak Trail in the northwest corner of the Nature Park where the Oak Trail connects to the Westside Regional Trail and 300 feet of the Vine Maple Boardwalk across the Cedar Mill Creek floodplain
   - 400 feet of the Oak Trail Boardwalk across the Cedar Mill Creek floodplain
   - 625 feet of the Chickadee Loop Boardwalk along Beaverton Creek
   - Big Fir realignment consists of abandoning and revegetating 630 feet of existing trail and boardwalk and installing 230 feet of new boardwalk near the Big Pond overlook.

4. Maintenance Access from SW 170th Ave. will consist of a cellular, interlocking, plastic grid, filled with top soil and planted with native herbaceous plants, totaling approximately 140 feet of permanent access between SW 170th and Chickadee Loop will be installed, as shown on Exhibit A. Access to the west end of the Oak boardwalk (approximately 950 feet) will be via paved trail. THPRD will grant District a permanent non-exclusive access easement over, on, upon, and across the area shown in Exhibit J for the purpose of vehicular and pedestrian ingress and egress to and from the permanent sewer easement located in the THNP .

5. Temporary Access will be required within the Project Area to move materials and equipment. The temporary access road will consist of a mix of coarse chips of bark and wood fiber commonly referred to as "hog fuel", wood matts, steel plates, or crushed aggregate. Crushed aggregate will only be used where site conditions make other materials insufficient to support construction activities. Any crushed aggregate, wood matts, or steel sheets used for temporary access will be removed at the conclusion of the Project. Any remaining hog fuel used during the Project will be spread out over the Project Area and be left in place. District will attempt to source weed free materials and establish BMPs to minimize transfer of invasive species due to construction activity.

6. Active Construction for the Project will occur from May 1, 2021 through October 31, 2021 and May 1, 2022 through October 31, 2022 (Active Construction). Idle Construction for the Project will occur from January 1, 2021 through April 30, 2021 and November 1, 2021 through April 30, 2022. (Idle Construction). Idle construction may include tree and brush removal, but no pipe installation will occur during this time.

7. Construction will cause some trails and boardwalks to be closed within THNP. District will lead outreach efforts, with THPRD support, to notify park users of construction activities and trail detours/closures.

C. DISTRICT OBLIGATIONS

District will provide the following services to THPRD using existing staff and contractors to complete the Project.

1. District and THPRD will collaborate on continued outreach to THNP users and the local community relating to all Project activities. Outreach may include installing Project signage with trail closure and detour route information, holding public meetings, communicating via social media, or distributing flyers.

2. District will remove trees within the Project Area as shown on the Tree Plan, attached as Exhibit C. District will fall trees outside the nesting season. All fallen trees will remain on-site and be used in restoration efforts to increase habitat and stream resiliency. During the Active Construction period, District will clear and grub the Project Area to facilitate installation of temporary access roads and construction of the Project.

3. District will make a reasonable effort to minimize impacts to wildlife and trees. This includes:
    a. Surveying the Project Area for raptor nests and if possible protect any trees where nests are found until any chicks have fledged the nest.
    b. Falling trees outside the nesting season.
    c. Removing some vegetation prior to the nesting season within the Project Area to deter nest creation.
    d. Actively monitoring the Project Area for nests prior to construction. Active nests will either be protected, relocated or removed from the Project Area on a case by case basis.
    e. Using erosion control barriers that wildlife are capable of crossing over and under.
    f. Clearly delineating the Project Area to contain construction activity. This will be achieved by a high-vis orange plastic fence installed approximately 12-inches off the ground. This will allow smaller wildlife to cross under the fence.
    g. Follow the tree protection guidelines as defined in THPRD's tree protection guidelines attached as Exhibit I.

4. District will close, remove, and re-construct boardwalks and trails throughout the course of the Project. District will sequence work to minimize closure of trails and boardwalks during Active Construction and work with THPRD to provide temporary trail surfaces during the Idle Construction Period. Any trail or boardwalk closures will be closely coordinated with THPRD staff four weeks in advance of any closure in order to plan and initiate any necessary outreach and signage. Disruption to the Westside Regional Trail will be limited to isolated temporary closures during active work only. Reconstruction of the Big Fir Trail will be prioritized to provide access to the west side of the park.

5. District will replant all areas disturbed by the Project with native vegetation in substantially the form shown on the Revegetation plan attached as Exhibit D. District will maintain and monitor the plantings for five years, or until all permit conditions are met, whichever is longer.

6. District will coordinate and implement the Project substantially in accordance with the plan attached as Exhibit E. The attached plan is in draft form, District will work with THPRD on development of the final plan. District will give THPRD 15 business days to review and approve the District's construction plans and specifications.

7. District will provide THPRD 15 business days to inspect the Project at the conclusion of construction and provide District a punch list with items THPRD wants District to remedy before accepting the

Project.

8. District will provide THPRD the opportunity to inspect the Project and provide a list of warranty items for the District's contractor to address 11 months after THPRD's acceptance of the Project.

9. District will participate in the replacement costs of Impacted Boardwalks referenced in Section B. 3. District will only be responsible for additional costs to increase the load capacity of the Shared Boardwalk to allow for a vehicle live load of 5,000 pounds. If either party causes damage to an element of the Impacted Boardwalk, that party shall be responsible for 100% of the cost of replacing all damaged elements of the Impacted Boardwalk caused by that party's actions.

10. To accomplish the preceding obligations, District will budget approximately $2,000,000 and enter into construction contracts to perform the work, subject to approval of District's Board of Directors.

11. District will complete the Project, including trail reconstruction and site restoration, within the times set forth in Section B.6. Except as provided in Section C.9 and B.5, the Project will be constructed by the District at District's sole cost and expense.

D. THPRD OBLIGATIONS

THPRD will:

1. Provide timely review and comments to District on Project related requests.

2. Grant District a permanent Easement for Sanitary Sewer and a Temporary Construction Easement in substantially the forms attached as Exhibits F and G.

3. Grant District a Permit of Entry over the Project Area, in substantially the form attached as Exhibit H, to adaptively manage Natural Enhancements, plant disturbed areas, monitor vegetation as required by District's permit conditions, replant as necessary and maintain invasive vegetation.

4. Accept the Project upon validating the completion of any punch list items provided to the District.

5. Following Project completion, THPRD will consult with District at such time as THPRD may desire or need to replace, improve, or relocate the impacted boardwalks referenced in Section B. 3 ("Future Boardwalk Improvements"). THPRD will be responsible for any design, permitting, bidding and administration of the construction contract for Future Boardwalk Improvements, except that District will participate in cost sharing as referenced in Section C. 9.

6. Invoice District for any replacement costs of impacted boardwalks.

7. Coordinate with District on any trail closures, outreach, and Project implementation.

E. GENERAL TERMS

1. Laws and Regulations. THPRD and District agree to abide by all applicable laws and regulations.

2. Term of this Agreement. This Agreement is effective from the date listed on page one and remains in effect until the respective obligations of THPRD and District have been fully performed or this Agreement is terminated as provided in Section G. 5. below.

3. Indemnification. Consistent with the terms of the Oregon Constitution and Oregon Tort Claims Act, THPRD and District agree to indemnify and defend each other, their officers, employees, and agents (collectively as appropriate either THPRD or District) from and against all claims, demands, penalties, and causes of action of any kind or character relating to or arising from this Agreement in favor of any person on account of personal injury, death, damage to property, or violation of law, which arises out of, or results from, the n fault of the indemnitor, its officers, employees, or agents.

4. Integration. This document constitutes the entire agreement between THRPD and District on the subject matter hereof and supersedes all prior or contemporaneous written or oral understandings, representations or communications of every kind on the subject. Acceptance or acquiescence in a course of performance rendered under this Agreement will not constitute a waiver by either party of any right under this Agreement and will not prejudice the waiving party's exercise of the right in the future.

5. Termination. This Agreement may be terminated immediately by mutual written agreement of the parties with the termination taking effect 30 days from the written agreement to terminate.

6. Resolution of Disputes. If any dispute arises out of this Agreement and cannot be resolved by the Project Managers, THPRD's General Manager and District's Chief Executive Officer (CEO) will attempt to resolve the issue. If THPRD's General Manager and District's CEO are not able to resolve the dispute, the parties will submit the matter to mediation, each party paying its own costs, including attorney fees, and sharing equally in common costs. If any dispute is not resolved by mediation, the parties agree to arbitrate any dispute in accordance with the then effective arbitration rules of (and by filing a claim with) Arbitration Service of Portland, Inc. and judgment upon the award rendered pursuant to the arbitration may be entered in any court having jurisdiction thereof.

7. Interpretation of Agreement.

   A. This Agreement will not be construed for or against any party by reason of the authorship or alleged authorship of any provision.

   B. The paragraph headings in this Agreement are for ease of reference only and will not be used in construing or interpreting this Agreement.

8. Severability/Survival. If any of the provisions in this Agreement are held illegal, invalid or unenforceable, the enforceability of the remaining provisions will not be impaired. All provisions concerning the limitation of liability, indemnity and conflicts of interest will survive the termination of this Agreement for any cause.

9. Approval Required. This Agreement and all amendments, modifications or waivers of any portion thereof will not be effective until approved by 1) District's CEO or the CEO's designee and when required by applicable District's rules, District's Board of Directors and 2) THPRD.

10. Choice of Law/Venue. This Agreement and all rights, obligations and disputes arising out of the Agreement will be governed by Oregon law. All disputes and litigation arising out of this Agreement will be decided by the state courts in Oregon. Venue for all disputes and litigation will be in Washington County, Oregon.

11. No Third Party Rights. District and THPRD are the only parties to this Agreement and the only parties entitled to enforce its terms. There are no intended beneficiaries and no rights granted to any third party.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed the day and year first written above.

CLEAN WATER SERVICES

By: _____
Chief Executive Officer or Designee

Date: _____

APPROVED AS TO FORM

_____
District Counsel

TUALATIN HILLS PARK AND RECREATION DISTRICT

By: _____
Doug Menke, General Manager

Date: _____

APPROVED AS TO FORM

_____
THPRD Counsel

Exhibit A

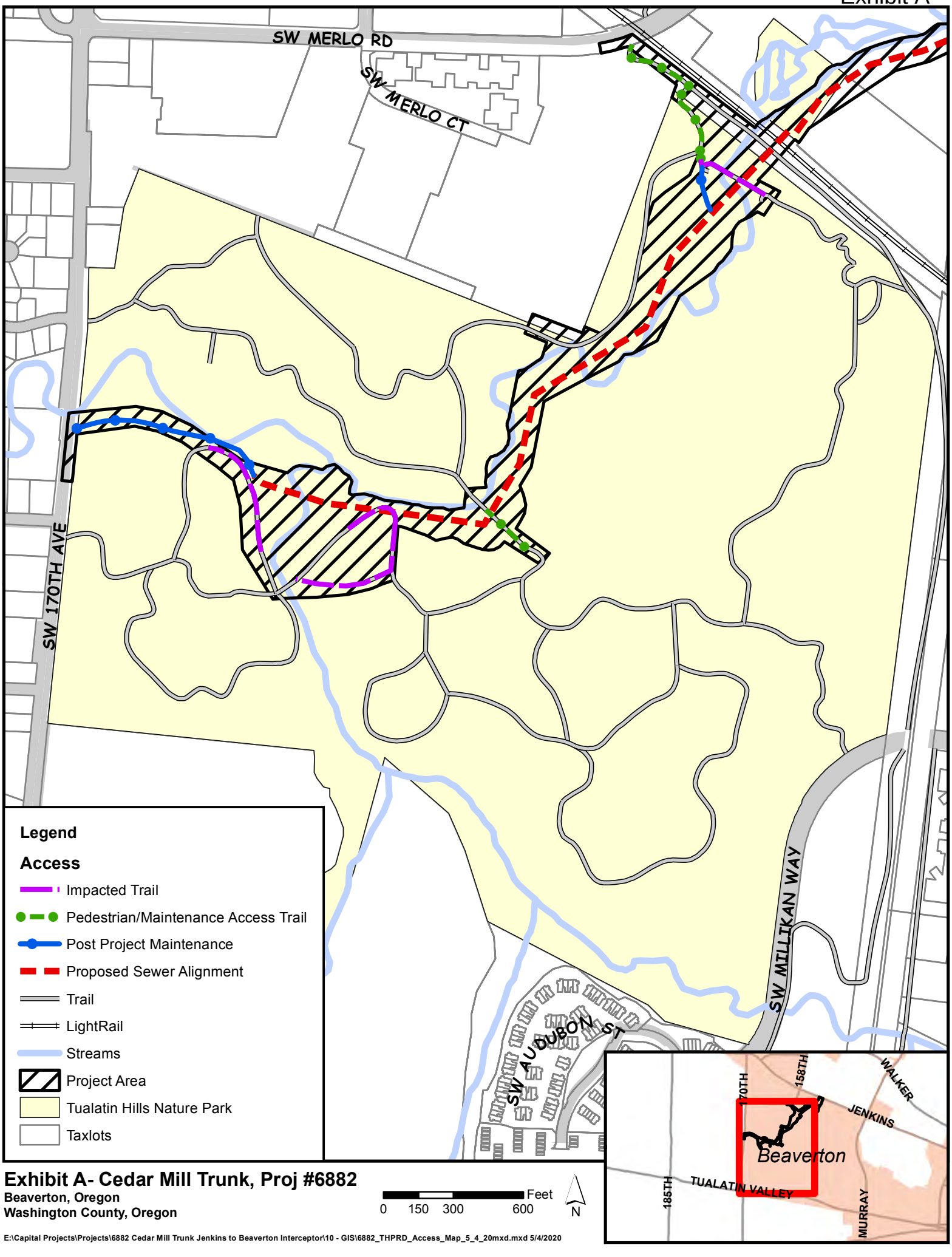


Exhibit A- Cedar Mill Trunk, Proj #6882
Beaverton, Oregon
Washington County, Oregon

E:\Capital Projects\Projects\6882 Cedar Mill Trunk Jenkins to Beaverton Interceptor\10 - GIS\6882_THPRD_Access_Map_5_4_20mxd.mxd 5/4/2020

Exhibit B

TUALATIN HILLS
PARK & RECREATION DISTRICT

TRAILS FUNCTIONAL PLAN

Approved February 2016

ACKNOWLEDGEMENTS

BOARD OF DIRECTORS

John Griffiths, Secretary Pro-Tempore

Jerry Jones Jr., Secretary

Ali Kavianian, Director

Larry Pelatt, President

Bob Scott, Director

THPRD MANAGEMENT OVERSIGHT

Doug Menke, General Manager

Keith Hobson, Director of Business & Facilities

Aisha Panas, Director of Park & Recreation Services

THPRD PROJECT TEAM

Bruce Barbarasch, Superintendent of Natural Resources & Trails Management

Tim Bonnin, Senior Park Planner

Mike Fontenot, Park Maintenance Coordinator

Steve Gulgren, Superintendent of Design & Development

Brad Hauschild, Urban Planner

Mark Hokkanen, Risk & Contract Manager

Mike Janin, Superintendent of Security Operations

Gery Keck, Facilities & Project Manager

Nicole Paulsen, Design & Development Coordinator

Jeannine Rustad, Superintendent of Planning

Keith Watson, Park Maintenance Supervisor

PLAN REVIEWERS

THPRD Advisory Committees (Parks, Natural Resources, Trails)

Metro Trails and Greenspaces Staff

Washington County Land Use & Transportation Staff

City of Beaverton Transportation Planning Staff

CONSULTANT

Katie Mangle, Alta Planning + Design

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EXECUTIVE SUMMARY

The purpose of the Trails Functional Plan (TFP) is to support implementation of the Tualatin Hills Park & Recreation District's (THPRD) 2013 Comprehensive Plan Update. This plan sets forth THPRD's approach to providing, developing and maintaining trails for its patrons. This TFP outlines how the district acquires land for trails and prioritizes new trail development and existing substandard trail enhancement.

This plan replaces the 2006 Trails Master Plan. It updates the district's existing trails inventory and makes new recommendations for the trail framework. The TFP will help THPRD maintain overall level of service (LOS), improve walkable access to trails, establish criteria for how land is acquired for trails and establish prioritization criteria for trail development and enhancement.

This plan consists of four primary sections:

- Existing Conditions
- Achieving Success
- Implementation & Development
- Success Monitoring

EXISTING CONDITIONS
Where We Are

This section of the TFP includes refinement to the district's rail classification system that further clarifies the intent of regional, community and neighborhood trails as well as other types of facilities (e.g., shared use pathways, sidewalks, etc.). It also establishes new design standards for regional (12 feet wide), community (10 feet wide) and neighborhood (6-8 feet wide) trails. Guidance is also provided on administering trail counts and provides locational criteria for counter placement as well as describing the types of mid-block crossing options available, and their design elements.

The TFP identifies a number of trail planning partners the district should actively engage with to further its trail system. This includes agencies such as the Oregon Parks & Recreation Department, the Oregon Department of Transportation, Metro, Washington County, the City of Beaverton and those cities neighboring the district's service area. The plan also identifies utility agencies, such as the Bonneville Power Administration, Portland General Electric and Clean Water Services, as being partners in trail design and development.

A major component of this section of the plan is the identification of the district's trail system and the individual segments that make up each individual trail. A number of tables highlight those segments completed and those segments remaining to be constructed. Additional tables highlight new trails that need to be planned, especially in new urbanizing areas of the district like South Cooper Mountain and Bonny Slope West.

ACHIEVING SUCCESS
What We Want To Be

The TFP establishes trail standards for the district's trail classifications (regional, community, neighborhood) as well as standards for trails occurring in unique situations (trails adjacent to roadways, trails combined with sidewalks, trails in greenways). This plan also includes a number of design standards and guidelines covering a variety of topics such as accessibility, utilities, surfacing, amenities (site furnishings, bollards, signage, etc.), bridges and boardwalks and safety and security. Additionally, guidance is provided for maintenance and operation of trail facilities.

IMPLEMENTATION & DEVELOPMENT
How We Get There

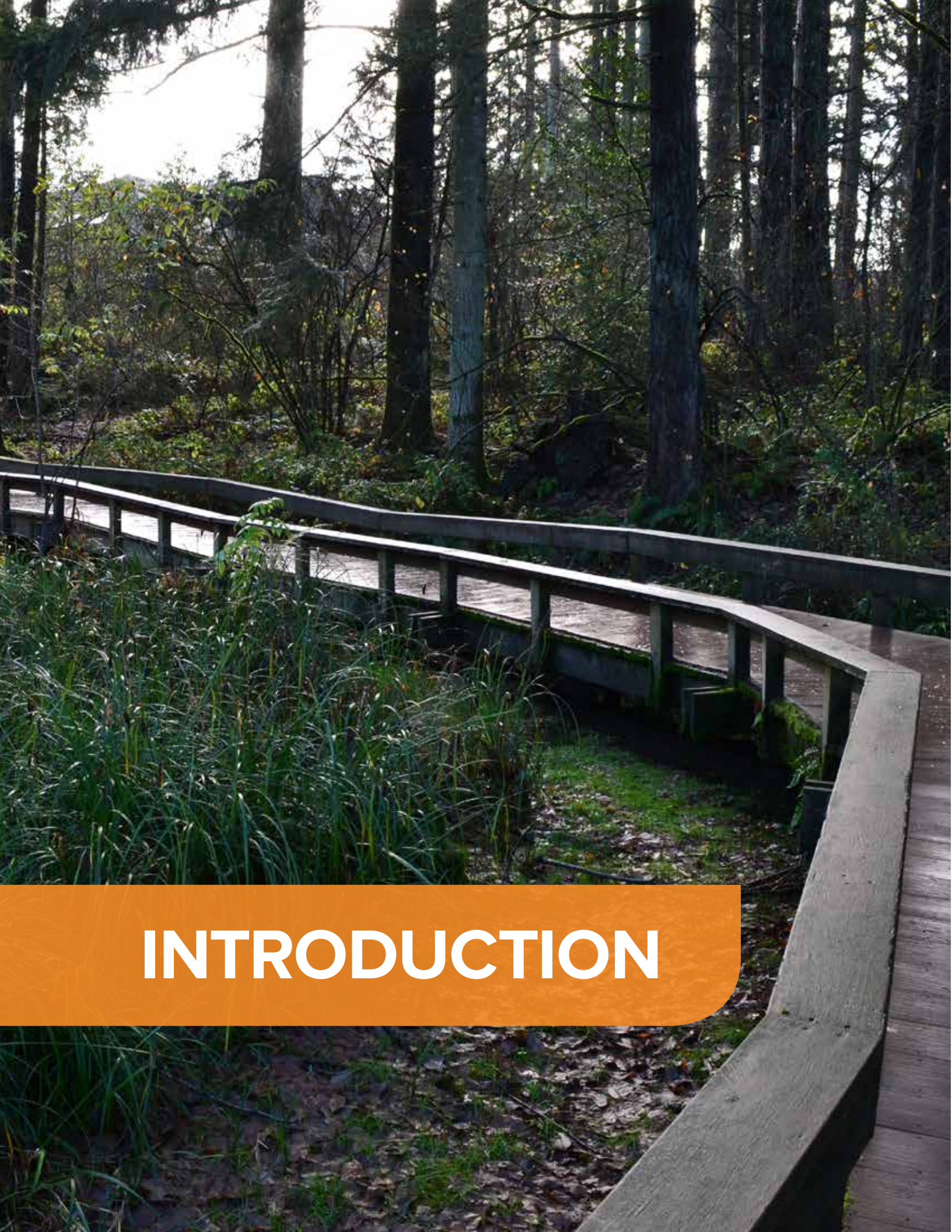
The TFP identifies criteria that will be used to prioritize trail enhancement and development. These include, but are not limited to: level of community support, project location in an underserved area and whether or not it overcomes barriers. As projects arise, they will be scored and placed in Tier I (high) or Tier II (medium) priority categories. These criteria will also be used for determining site suitability for land acquisition of new trail corridors.

In addition to the criteria identified in this plan, future trails to be located along creek corridors or other natural areas, such as the Beaverton Creek, Bronson Creek and Willow Creek Trails, will also be evaluated using site development suitability criteria identified in the district's Natural Resources Functional Plan (NRFP). These trails are identified as future study areas on the updated trail system map, incorporated within this TFP.

A number of funding sources are identified for trail development and enhancement projects, such as capital funds, system development charges (SDCs), grants, partnerships and general obligation bonds. Not all funding sources can be used for all types of trail improvements.

SUCCESS MONITORING
How Are We Doing

The TFP identifies a number of performance measures for trails, which are typically monitored annually and include, but are not limited to: miles of new trails completed, miles of existing trails enhanced and number of trail users counted. Trail user profiles, and access to target populations will be monitored to help ensure equitable access to trails throughout the district's service area.



INTRODUCTION

The district's 1998 Trails Master Plan, updated in 2006, recommended improvements to the existing trail system; completion of missing gaps; and connections to significant environmental features, schools, parks and recreation, public facilities, transit, local neighborhoods and business centers throughout the region.

The Trails Master Plan also listed eight goals:

- Providing recreation opportunities
- Trail development and regional connections
- Access
- Community linkages
- Amenities
- Maintenance and emergency access
- Preservation
- Funding

This TFP replaces the 2006 Trails Master Plan. It updates the district's trails inventory and incorporates the eight goals. This TFP also identifies new recommendations for the district's trail framework. While this TFP replaces the 2006 Trails Master Plan, which replaced the 1998 Trails Master Plan, it builds upon the progress made since these previous plans were adopted and sets a vision for future success.

The purpose of the TFP is to outlines how THPRD:

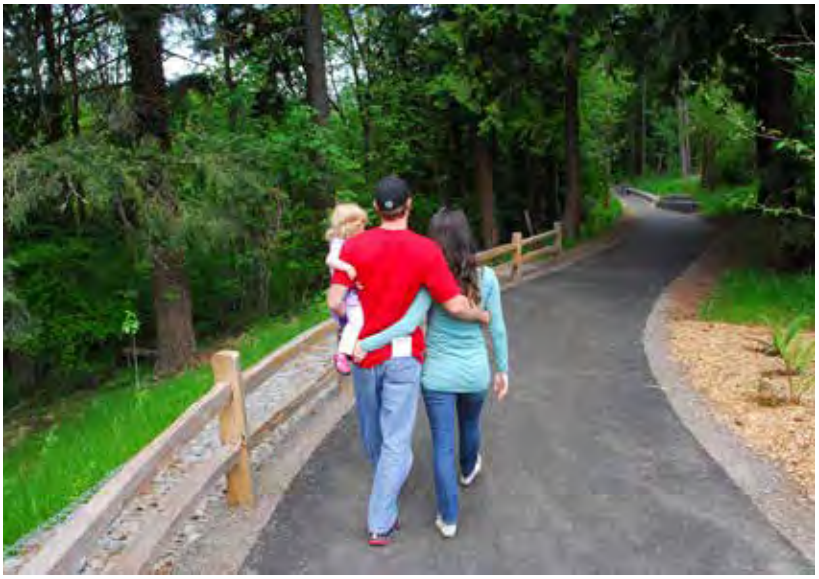
» Acquires land for trails

» Prioritizes new trail development

» Upgrades existing substandard trails

The following goal identified in the 2013 Comprehensive Plan Update relates to providing, developing and maintaining trails for its patrons:

» Goal 5 "Develop and maintain a core system of regional trails, complemented by an interconnected system of community and neighborhood trails, to provide a variety of recreational opportunities such as walking, biking and jogging."



In additional to providing recreational opportunities for district residents, it is recognized that trails also provide transportation opportunities to transit – both bus and light rail – for bicycle commuters.

An outcome of THPRD's Comprehensive Plan Update process and the 2013 Comprehensive Plan Update was a call for a review of the standards and guidelines used to ensure residents are provided with quality facilities, such as trails, parks and natural areas. This review included land acquisition procedures for trails, development or enhancement of trails and maintenance and operation of trails.

This plan will help the district:

» Maintain overall level of service (LOS) to the residents it serves

» Improve walkable access to trails and other district facilities

» Establish update criteria for how land is acquired for trails

» Establish prioritization criteria for new trail development and enhancement of existing substandard trails

EXISTING CONDITIONS

THPRD first adopted a trails master plan in 1998. In 2006, that plan was updated (as part of the comprehensive plan update) and identified a number of goals for trails; established a trail classification system; created standards for trails, land acquisition and maintenance; and provided strategies for achieving success. The 2006 Comprehensive Plan was updated in 2013, refining district goals and rethinking strategies on goal implementation, including the establishment of this TFP. This section of the TFP takes a look at where the district sits today and its progression since the 2006 update.

3.1 GENERAL DESCRIPTION / OVERVIEW

3.1.1 Bond Survey Results

As part of the district's 2008 bond initiative, a survey was conducted to determine what facilities are most important to residents. Development of new trails and completing gaps in the existing trail system were at the top of the list. Surveys completed in 2012, 2014, and 2015 as part of the 2013 Comprehensive Plan Update, Parks Functional Plan (PFP) and this TFP also confirmed that trails and access to trails rate high in importance to district residents for both recreational and commuting purposes.

3.1.2 Trail Descriptions and Classifications

The following trail descriptions are intended to provide a broader overview of the types of trails and linkages that can be found within THPRD's service area. Trails within the service area are varied and occur in many different types of environments and situations. This includes trails that are more urban, occupying roadways, sidewalks, other rights of way and trails that may switch from a designated paved, multiuse trail onto a shared sidewalk/trail, to weave through the surrounding urban infrastructure. Some trails may be more natural or remote or follow utility corridors or greenways.

3.1.2.a Regional Trail

A regional trail is defined by its length, multi-jurisdictional alignment and connection to regionally significant features. Regional trails connect residents within the district to adjacent communities like Hillsboro, Tigard, Portland, unincorporated Washington County and the greater Portland metropolitan region. These trails also connect to regionally significant features such as the Tualatin Hills Nature Park, the Jenkins Estate and the Howard M. Terpenning Recreation Complex. In addition to providing recreational opportunities, regional trails often serve as transportation corridors because of the regional connections they make to transit, civic places, employment and commercial centers, and residential neighborhoods. Typical characteristics of regional trails include:

- Accommodating two-way non-motorized bicycle and pedestrian traffic, typically being 12 feet wide
- Being located in its own right of way separated from roads and streets
- Being paved with gravel shoulders
- Accommodating smaller maintenance and emergency vehicles when possible

3.1.2.b Community Trail

Community trails link important destinations between neighborhoods and across the district to parks, natural areas, schools, trails, transit and shopping centers. They function as both recreation and transportation corridors for a variety of users. Typical characteristics of community trails include:

- Accommodating two-way non-motorized bicycle and pedestrian traffic, typically being 10 feet wide
- Being located in its own right of way separated from roads and streets
- Being paved with gravel shoulders
- Potentially being designed to function as a regional trail when high trail use is anticipated
- Accommodating smaller maintenance and emergency/security vehicles when possible

3.1.2.c Neighborhood Trail

Please note that the 2006 Trails Master Plan identified both urban and neighborhood natural trails in its trail classifications. With this TFP, natural neighborhood trails have been re-classified as soft "surface pathways." These types of trails are primarily site specific to parks or natural areas and do not extend beyond these areas. Information on design considerations for these types of pathways can be found in the district's PFP and the NRFP. With this TFP, urban neighborhood trails have been re-classified as neighborhood trails and are described below.

Neighborhood trails provide short distance connections to local features such as parks, natural areas, community centers, schools and other neighborhood attractions. Where they provide a direct connection, neighborhood trails will generally have their own right of way, separated from the street system. In other cases, they may consist of on-street segments with patrons using existing sidewalks for pedestrians and bike lanes or residential streets for bicyclists. These trails are often walking and hiking trails from regional or community trails and public right of ways, but many may also be located within parks or natural areas. Typical characteristics of neighborhood trails include:

- Not always accommodating two-way non-motorized bicycle and pedestrian traffic, typically being 6-8 feet wide
- Being located on- or off-street, with or without its own right of way and separated from roads or streets
- Being paved or unpaved, usually without gravel shoulders
- Not always being fully accessible because neighborhood trails can include staircases or be located on steep slopes due to site topography

3.1.2.d Additional Definitions

- Trail: a designated land corridor that provides a marked route with little interruption in travel
- Shared Use: shared by pedestrians (including dog walkers), bicyclists, skaters, joggers and other non-motorized users
- Unpaved/Natural Surface: a surface consisting of gravel, crushed rock, soil, or other semi-pervious material
- Sidewalk: a paved walkway along the side of a roadway separated from the roadway by a raised curb and/or planter strip; located within the public right of way
- Bike lane: a portion of the roadway, usually an arterial or collector, that has been designated by striping, signing and pavement markings for the preferential or exclusive use of bicyclists; located within the public right of way

3.1.3 Trail Counters

THPRD manages a trail user count program that relies on passive infrared counters at fixed locations, collecting hourly usage. The information is collected monthly for analysis in daily, weekly, monthly and annual reports. Based on district staff calibration, the trail counters are highly accurate. Several counters can be found along the same trail to determine heavier use areas. Also, multiple counters along the same trail can help to track changes over time, such as a before and after the addition of a new trail segment, installation of a mid-block crossing, or providing new directional signage. It should be noted that increases or decreases in trail use can vary depending on a whole host of variables, including weather and time of year.

3.1.3.a Trail Counts

The district uses a number of trail counters along many if its regional and community trails. Trail counters are also used along pathways or nature trails internal to park sites and natural areas. As described previously, the purpose of using trail counters is to gauge trail usage and track trail user trends. At the time of this TFP adoption, trail counters are located at the following regional and community trail locations (see Appendix 7.3 for counts collected from 2010-2015). Information collected does show a trend for increasing trail use each year, especially on those trails where gaps have been completed, such as on the Fanno Creek Trail and Westside Trail.

» Fanno Creek Regional Trail at Scholls Ferry Road

» Fanno Creek Regional Trail at Hall Boulevard

» Fanno Creek Regional Trail at 92nd Avenue

» Rock Creek Regional Trail

» Waterhouse Trail (North) at Walker Road

» Waterhouse Trail (South) at Walker Road

» Westside Regional Trail at Murrayhill

» Westside Regional Trail at Village Lane

3.1.3.b Trail Counter Location Criteria

As new trails are planned and completed, the location of trail counters is important to ensure appropriate trail usage data is collected. Locations selected for long- and short-duration data collection should focus primarily on those trail sections most representative of prevailing user patterns (not necessarily at landmarks or other areas that might skew data collection).

For fixed counters, which are what the district uses, the following considerations should be kept in mind:

- Locate on straight, level sections of trail, not on curves or on/near a steep grade
- Locate on smooth pavement or other compacted surface
- Locate at potential improvement areas, such as mid-block crossings, gaps, pinch points and locations that are operationally difficult for bicyclists and pedestrians to navigate, to gauge impacts of future improvements
- Avoid locating near water or in direct sunlight
- Avoid placement that directly faces roadways unless a vertical barrier exists
- Avoid locating near high-power utility lines that could disrupt or distort the detection capability

The Natural Resources & Trail Management department is responsible for locating trail counters and collecting trail count data. Prior to installation, coordination with the appropriate district staff is needed to determine a precise trail counter location.

3.1.4 Trail Planning Partners

The district is primarily concerned with the off-street trails network. On-street connections between trails, parks, natural areas, schools, transit and other community destinations are the primary responsibility of the City of Beaverton and Washington County. However, partnership and cooperation between the district, city and county is essential when providing or enhancing existing on-street connections to adequately serve users. This includes coordination between this plan and the transportation plans of each respective agency.

Within THPRD's service area, other jurisdictions are responsible for permitting development through the land use and development approval process. The land use ordinances of Beaverton and Washington County provide both jurisdictions the ability to require land dedication and on-site development of trails during the development review process. Trails included in each jurisdiction's Transportation System Plan (TSP) may be incorporated through the site planning and land division application review process.

In addition to working with the city and county, other agencies can offer guidance for trail planning and development. Table 3A provides an overview of these partner agencies.

TABLE 3A **TRAIL PLANNING PARTNERS**

Trail Partner	Description
Oregon Parks & Recreation Department (OPRD)	» Statewide recreational trails planning and development agency » Provides technical assistance for trail design and development » Provides funding for trail development and construction through state and federal grant programs » Supports bicycle and pedestrian tourism » Coordinates with ODOT to ensure compatibility between trails and transportation
Oregon Department of Transportation (ODOT)	» Statewide transportation planning and development agency » Provides technical assistance for trail design and development whenever located within a state right of way or on federally funded trail projects » Provides funding for trail design and development through state and federal grants and funding programs » Coordinates with OPRD to ensure compatibility between trails and transportation
Metro	» Regional trails and transportation planning agency, including the regional trails and greenspaces the plan, regional transportation plan and the regional active transportation plan » Provides technical assistance for trail design and development » Provides funding for trail planning, design and development through regional and federal grants and funding programs » Coordinates with state and local agencies to ensure compatibility between trails and transportation » Administers a number of data collection, analysis and distribution programs on the regional trail system, including land acquisition, planning, implementation, monitoring and maintenance
Clean Water Services (CWS)	» Local environmental agency for water quality protection and enhancement » Provides regulatory guidance/standards for trail design and development located within vegetated corridors adjacent to creeks, stream and wetlands » Provides mitigation/enhancement requirements for impacts to vegetated corridors as a result of trail development

TABLE 3A **TRAIL PLANNING PARTNERS** (CONTINUED)

Trail Partner	Description
Washington County	» THPRD's ultimate service area includes portions of urbanized, unincorporated Washington County, such as Aloha, Bethany, Bonny Slope, Cedar Hills and Cedar Mill » Local transportation planning agency, including bicycle and pedestrian systems (identified in the county's transportation plan) » Provides regulatory guidance/standards for trail design and development when located in the public right of way and as part of the development review process » Provides funding and/or other assistance for trail design and development through county funding programs and/or capital improvement projects, such as bike lanes or widened sidewalks » Coordinates with THPRD and other local agencies to ensure compatibility between trails and transportation
City of Beaverton	» Located entirely within THPRD's ultimate service area » Local transportation planning agency, including bicycle and pedestrian systems (identified in the city's transportation plan) » Provides regulatory guidance/standards for trail design and development when located in the public right of way and as part of the development review process » Provides funding and/or other assistance for trail design and development through local funding programs and/or capital improvement projects, such as bike lanes or widened sidewalks » Coordinates with THPRD to ensure compatibility between trails and transportation
City of Hillsboro	» Located on the west side of THPRD's ultimate service area » Local trails and transportation planning agency » Coordinates with THPRD to ensure compatibility with regional and community trail connections between service areas
City of Portland Parks & Recreation Bureau	» Located on the east side of THPRD's ultimate service area » Local trails planning agency » Coordinates with THPRD to ensure compatibility with regional and community trail connections between service areas
City of Tigard	» Located on the south side of THPRD's ultimate service area » Local trails and transportation planning agency » Coordinates with THPRD to ensure compatibility with regional and community trail connections between service areas

3.2 TRAIL SEGMENTS

The district's trails system, illustrated in Figure 3C, includes nine regional trails and 16 community trails encompassing over 60 miles. Of the nine regional trails, six are previously identified in the 2006 Trails Master Plan and three are new, based on the development of this TFP. Eleven of the community trails come from the 2006 Trails Master Plan and five are new additions. Also illustrated on the 2015 Trail System Map are key neighborhood trails that provide connections from regional or community trails to significant points of interest, such as parks, natural areas, transit, schools or other areas of interest. Please note that while neighborhood trails are illustrated on the map, they are not designated by name in the same manner as regional and community trails are designated.

3.2.1 Current Trails

3.2.1.a Current Regional Trails

The district has six regional trails identified within its service area (based on the 2006 Trails Master Plan), traversing over 36 miles. Of these, two are nearly complete with only small segments remaining (Fanno Creek and Rock Creek Trails) and one is halfway complete (Westside Trail). The three remaining trails (Beaverton Creek, McKernan Creek (formerly named Cooper Mountain) and Tualatin Valley) have minimal, if any, segments completed. The following table illustrates the district's regional trail network. These trails are illustrated in Figure 3C.

Trail segments that are constructed are considered "complete" in the status column in the following tables. Segments not constructed are deemed "incomplete" and segments that have portions constructed are considered "partial," These status classifications apply to both regional and community trails. Please note, that although some trail segments are complete, they may be considered substandard. The following tables (3B – 3E) are intended to highlight trail system connectivity throughout the district. Please note that "Trail Status" marked with a "+" indicates a trail segment completed to a substandard condition to be enhanced in the future.

TABLE 3B **CURRENT REGIONAL TRAIL DESCRIPTIONS**

Segment	Description	Status	Length (miles)
R1: Rock Creek Trail			
1	Sunset Highway – Crescent Park Trail	Incomplete	0.69
2	Crescent Park Trail – 185th Avenue	Complete+	0.32
3	185th Avenue – West Union Road	Complete+	0.26
4	West Union Road – Waterhouse Trail	Complete+	1.00
5	Waterhouse Trail – Kaiser Road	Complete+	0.77
6	Kaiser Road – Westside Trail	Complete+	0.88
R3: Westside Trail			
1	Barrows Road – Scholls Ferry Road	Complete+	0.39
2	Scholls Ferry Road – Weir Road	Complete+	1.00
3	Weir Road – Galena Way	Complete+	0.26
4	Galena Way – Rigert Road	Complete+	0.64
5	Rigert Road – Hart Road	Complete+	0.38
6	Hart Road – Burntwood Way	Complete+	0.26
7	Burntwood Way – Davis Road	Complete+	0.39
8	Davis Road – Division Street	Complete+	0.42
9	Division Street – Farmington Road	Complete+	0.22
10	Farmington Road – TV Highway	Complete+	0.57
11	TV Highway – Merlo Light Rail Station	Partial+	0.76
12	Merlo Light Rail Station – Jenkins Road	Incomplete	0.29
13	Jenkins Road – Walker Road	Partial+	0.61
14	Walker Road – Sunset Highway	Incomplete	0.93
15	Sunset Highway – Cornell Road	Incomplete	0.31
16	Cornell Road – Oak Hills Drive	Incomplete	0.36
17	Oak Hills Drive – West Union Road	Partial+	0.43
18	West Union Road – Rock Creek Trail	Incomplete	1.81
19	Rock Creek Trail – THPRD Boundary	Incomplete	0.72

TABLE 3B **CURRENT REGIONAL TRAIL DESCRIPTIONS** (CONTINUED)

Segment	Description	Status	Length (miles)
R4: Beaverton Creek Trail			
1	THPRD Boundary – 185th Avenue	Incomplete	0.79
2	185th Avenue – 170th Avenue	Incomplete	0.91
3	170th Avenue – Murray Boulevard	Partial+	1.56
4	Murray Boulevard – Cedar Hills Boulevard	Incomplete	1.13
5	Cedar Hills Boulevard – Lombard Avenue	Incomplete	0.52
6	Lombard Avenue – Allen Boulevard	Partial+	1.21
7	Allen Boulevard – Denney Road	Partial+	0.51
8	Denney Road – Fanno Creek Trail	Partial+	0.49
R5: Tualatin Valley Trail			
1	Reedville Trail – 185th Avenue	Incomplete	0.53
2	185th Avenue – Westside Trail	Incomplete	1.38
3	Westside Trail – Murray Boulevard	Incomplete	0.63
4	Murray Boulevard – Erickson Street	Incomplete	1.42
5	Erickson Street – Beaverton Creek Trail	Incomplete	1.04
R7: Fanno Creek Trail			
1	Scholls Ferry Road – Hall Boulevard	Complete+	1.17
2	Hall Boulevard – Denney Road	Complete+	0.70
3	Denney Road – BSD Maintenance Shop	Partial+	0.74
4	BSD Maintenance Shop – Scholls Ferry Road	Complete+	0.68
5	Scholls Ferry Road – 92nd Avenue	Incomplete	0.11
6	92nd Avenue – Oleson Road	Complete+	1.15
R7: McKernan Creek Trail (formerly the Cooper Mountain Trail)			
1	South Cooper Loop Trail – 175th Avenue	Incomplete	2.14
2	175th Avenue – Summercrest Park	Incomplete	0.79
3	Summercrest Park – Westside Trail	Complete+	0.47

3.2.1.b Current Community Trails

The district has 11 community trails identified within its service area (based on the 2006 Trails Master Plan), traversing over 30 miles. Of these trails, only the Waterhouse Trail has been nearly completed (only a fifth mile gap remains unconstructed of the 5 mile trail). The remainder of the district's community trails has only partially completed segments or has not yet been constructed. The following table outlines the district's community trail network. These trails are illustrated in Figure 3C. Please note that "Trail Status" marked with a "+" indicates a trail segment completed to a substandard condition to be enhanced in the future.

TABLE 3C **CURRENT COMMUNITY TRAIL DESCRIPTIONS**

Segment	Description	Status	Length (miles)
C1.1: North Bethany Trail			
1	Rock Creek Trail – Reindeer Drive	Complete+	0.13
2	Reindeer Drive – Springville Road	Incomplete	0.26
3	PCC Rock Creek Recreation Facility	Complete	0.85
4	PCC Rock Creek Recreation Facility – Bethany Creek Trail #1	Incomplete	1.46
C1.2: Bethany Creek Trail #1			
1	North Bethany Trail – Kaiser Road	Incomplete	0.46
2	Kaiser Road – Bethany Creek Trail #2	Incomplete	0.76
C1.3: Bethany Creek Trail #2			
1	Waterhouse Trail – Kaiser Road	Incomplete	0.64
2	Kaiser Road – Springville Road	Incomplete	0.76
3	Springville Road – Westside Trail	Incomplete	0.44
C1.4: Bethany Creek Trail #3			
1	Waterhouse Trail – Kaiser Road	Incomplete	0.46
2	Kaiser Road – North Bethany Trail	Incomplete	0.51

TABLE 3C **CURRENT COMMUNITY TRAIL DESCRIPTIONS** (CONTINUED)

Segment	Description	Status	Length (miles)
C1.4: Bethany Creek Trail #3			
1	Waterhouse Trail – Kaiser Road	Incomplete	0.46
2	Kaiser Road – North Bethany Trail	Incomplete	0.51
C2: Bronson Creek Trail			
1	Cornell Road – Sunset Highway	Complete+	0.18
2	Sunset Highway – 174th Avenue	Incomplete	0.09
3	174th Avenue – West Union Road	Incomplete	0.99
4	West Union Road – Westside Trail	Incomplete	0.60
5	Westside Trail – Laidlaw Road	Incomplete	1.05
6	Laidlaw Road – Westside Trail	Partial+	0.63
C4: Cedar Mill Creek Trail			
1	Lost Springs Drive – Bonny Slope West Trail	Complete+	0.57
2	Bonny Slope West Trail – Foege Park/Cedar Hills Boulevard	Complete+	0.47
3	Foege Park/Cedar Hills Boulevard – North Johnson Creek Trail	Partial+	0.61
4	North Johnson Creek Trail – Barnes Road	Partial+	0.30
5	Barnes Road – Lost Springs Drive	Complete+	0.30
C5: Willow Creek Trail			
1	Willow Drive – MAX Line	Incomplete	0.34
2	MAX Line – Heritage Parkway	Incomplete	0.45
3	Heritage Parkway – Walker Road	Incomplete	0.47
4	Walker Road – 173rd Avenue	Incomplete	0.33
5	173rd Avenue – Waterhouse Avenue	Complete+	0.62
C5: Willow Creek Trail			
6	Waterhouse Avenue – 153rd Avenue	Incomplete	0.47

TABLE 3C **CURRENT COMMUNITY TRAIL DESCRIPTIONS** (CONTINUED)

Segment	Description	Status	Length (miles)
C6: Waterhouse Trail			
1	Merlo Road – Baseline Road	Complete	0.59
2	Baseline Road – Walker Road	Complete+	0.49
3	Walker Road – Willow Creek Greenway	Complete+	0.71
4	Willow Creek Greenway – Sunset Highway	Partial+	0.18
5	Sunset Highway – Jocelyn Street	Complete	0.82
6	Jocelyn Street – Stoller Creek Greenway	Complete+	0.89
7	Stoller Creek Greenway – Waterhouse Linear Park	Complete+	0.16
8	Waterhouse Linear Park – Springville Road	Complete+	0.66
9	Springville Road – THPRD Boundary	Incomplete	0.87
C7: North Johnson Creek Trail			
1	Cedar Mill Creek Trail – Valeria View Drive	Incomplete	0.83
2	Valeria View Drive – Sunset Transit Center	Incomplete	0.36
3	North Johnson Creek Trail – Miller Road	Incomplete	1.51
4	Miller Road – Cornell Road	Incomplete	0.97
C8 – Beaverton Wetlands Trail			
1	TV Trail – Westside Trail	Complete+	0.66
C9 – South Johnson Creek Trail			
1	TV Highway – Farmington Road	Incomplete	0.48
2	Farmington Road – Division Street	Incomplete	0.36
3	Division Street – Village Lane	Incomplete	0.31
4	Village Lane – Davis Road	Incomplete	0.24
5	Davis Road – Hart Road	Partial+	0.85
6	Hart Road – Sexton Mountain Drive	Partial+	0.55
7	Sexton Mountain Drive – Beard Road	Incomplete	0.54
8	Beard Road – Murray Boulevard	Incomplete	0.73
9	Murray Boulevard – Scholls Ferry Road	Incomplete	0.59

3.2.2 New Trails

As the district's service area continues to urbanize within its outer fringe, new trails will be needed to serve residents and further expand the district's existing and planned trail system. This includes the areas of Aloha-Reedville in the west, Bonny Slope West in the northeast and South Cooper Mountain in the southwest. The trails identified in the tables below are a result of planning efforts undertaken by Washington County (Aloha-Reedville, Bonny Slope West) and Beaverton (South Cooper Mountain). Although already urbanized and developed, the area east of Highway 217 is also in need of trails that would connect residents north towards US26 and west towards the Beaverton Creek and Tualatin Valley Trails.

3.2.2.a New Regional Trails

The following table highlights three new regional trails the district needs to plan for as the areas described above begin to urbanize and develop. This includes the north-south Reedville Trail, which will connect the South Cooper Loop Trail to the Tualatin Valley and Beaverton Creek trails; and the South Cooper Loop Trail, which runs east-west connecting the Westside Trail to the Reedville Trail in the district's southwest quadrant. The Crescent Park Trail also runs east-west and will connect to the Rock Creek Trail from the City of Hillsboro (based on Hillsboro's updated 2015 trails master plan) in the district's northwest quadrant. These trails are illustrated in Figure 3C.

TABLE 3D **NEW REGIONAL TRAILS**

Segment	Description	Status	Length (miles)
R2: Crescent Park Trail			
1	THPRD Boundary – Rock Creek West Soccer Fields	Incomplete	0.28
2	Rock Creek West Soccer Fields – Rock Creek Trail	Complete	1.32
R6: Reedville Trail			
1	THPRD Boundary – South Cooper Loop Trail	Incomplete	0.93
2	South Cooper Loop Trail – THPRD Boundary	Incomplete	0.57
6	Jocelyn Street – Stoller Creek Greenway	Complete+	0.89
7	Stoller Creek Greenway – Waterhouse Linear Park	Complete+	0.16
8	Waterhouse Linear Park – Springville Road	Complete+	0.66
9	Springville Road – THPRD Boundary	Incomplete	0.87
R9: South Cooper Loop Trail			
1	Reedville Trail – Farmington Road	Incomplete	0.36
2	Farmington Road – Grabhorn Road	Incomplete	1.44
3	Grabhorn Road – McKernan Creek Trail	Incomplete	0.74
4	McKernan Creek Trail – Scholls Ferry Road	Incomplete	1.01
5	Scholls Ferry Road – Roy Rogers Road	Incomplete	0.90
6	Roy Rogers Road – Barrows Road	Incomplete	0.42
7	Barrows Road – Barrows Park	Incomplete	0.51
8	Barrows Park – Westside Trail	Complete	0.49

TABLE 3E **NEW COMMUNITY TRAILS**

Segment	Description	Status	Length (miles)
C3: Bonny Slope West Trail			
1	Cedar Mill Creek Trail – Thompson Road	Incomplete	1.63
2	Thompson Road – Bronson Creek Trail	Incomplete	1.36
C10.1: South Cooper Mountain Trail #1			
1	McKernan Creek Trail – South Cooper Loop Trail	Incomplete	1.35
C10.2 – South Cooper Mountain Trail #2			
1	McKernan Creek Trail – South Cooper Loop Trail	Incomplete	1.14
C10.3 – South Cooper Mountain Trail #3			
1	South Cooper Loop Trail – South Cooper Mountain Trail #9.1	Incomplete	1.11
C11 – North Cooper Mountain Trail			
1	South Cooper Loop Trail – 190th Avenue	Incomplete	0.93
2	190th Avenue – Cooper Mountain Nature Area	Incomplete	0.38
3	Cooper Mountain Nature Area – McKernan Creek Trail	Incomplete	0.81

3.2.2.b New Community Trails

The following table highlights the five new community trails the district needs to plan for as the areas described above begin to urbanize and develop. This includes the Bonny Slope Area in the northeast and the Cooper Mountain area in the southwest. These trails are illustrated in Figure 3C.

3.2.3 Trail Corridor Study Areas

It should be noted that much of the district's remaining (to be constructed) regional and community trail systems are located within creek corridors and other environmentally sensitive areas. These trail corridors have been identified on the 2016 Trail System Map (Figure 3C) as study areas, which mean these areas do not have a defined trail alignment at this time.

These study areas will undergo a feasibility analysis incorporating both this TFPs Trail Prioritization Criteria Matrix (Table 5A) and the district's Natural Resource Functional Plan's (NRFP) Site Development Suitability Criteria (Table 5A in the NRFP) to determine an appropriate trail alignment. Although this analysis could result in the recommendation that a trail, or portion of a trail, be located outside of the resource area (possibly as an on-street connection), require additional natural area mitigation along the trail corridor or not be constructed at all, it is the desire of the district to provide off-street trails and connectivity whenever reasonable. Where

the TFP trail prioritization criteria indicates a high priority for trail development and the NRFP site suitability criteria indicates a high priority for natural resource function, it shall be up to the district's management team and/or board of directors to determine which priority takes precedence.

For those trail corridors located within creek corridors or other environmentally sensitive areas but not identified on the trail system map in a study area, this same feasibility analysis will take place in order to determine the most appropriate trail alignment.

3.2.4 Maps

3.2.4.a 2006 Trail System

Figure 3A illustrates the district's trail system at the time of the 2006 Trails Master Plan. This map provides a historical look at the trail system prior to the passage of the 2008 bond measure and the completion of a number of trail segments throughout the district.

3.2.4.b Trailshed Analysis

Figure 3B illustrates walkable access for district residents to district facilities from constructed district trails. This analysis was completed as part of the 2013 Comprehensive Plan Update, which calls for an emphasis on walkable access to district facilities such as trails, parks, natural areas and recreation/aquatic centers. This map also illustrates walkable access to the district's trail system; represented by the shaded areas (each color represents one trailshed). This map is for reference only (more detailed information can be found in the 2013 Comprehensive Plan Update).

3.2.4.c 2015 Trail System

Figure 3C illustrates the existing and planned trail system in THPRD's service area. It also shows the context of existing and planned trails of other jurisdictions. It should be noted that some of the future trails are depicted as study areas, indicating these trail corridors are located in natural areas and require an additional level of analysis with site suitability criteria identified in the district's NRFP to ensure trail and resource area compatibility. A large scale map can be found in the appendix for better legibility.

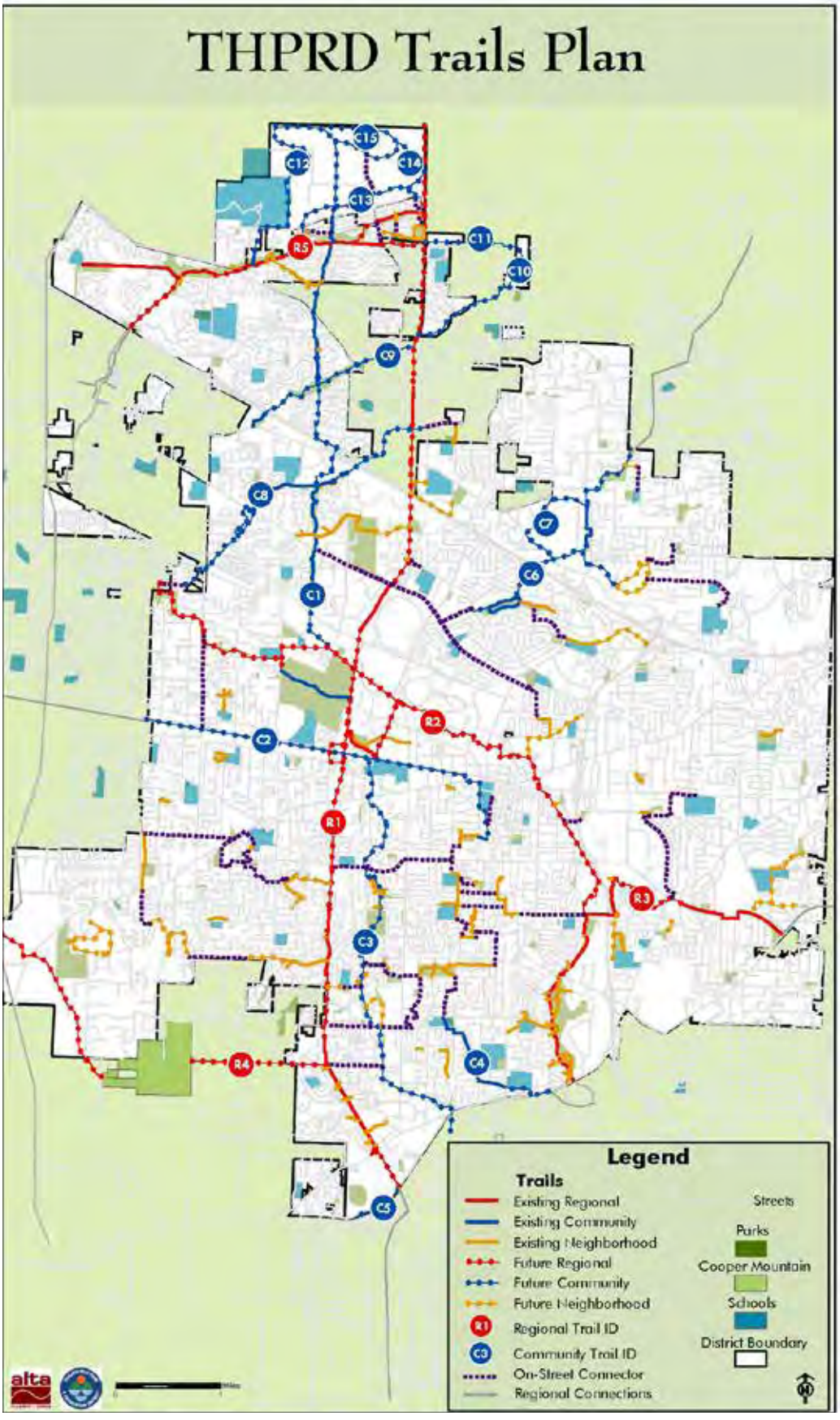


FIGURE 3A **2006 TRAIL SYSTEM**

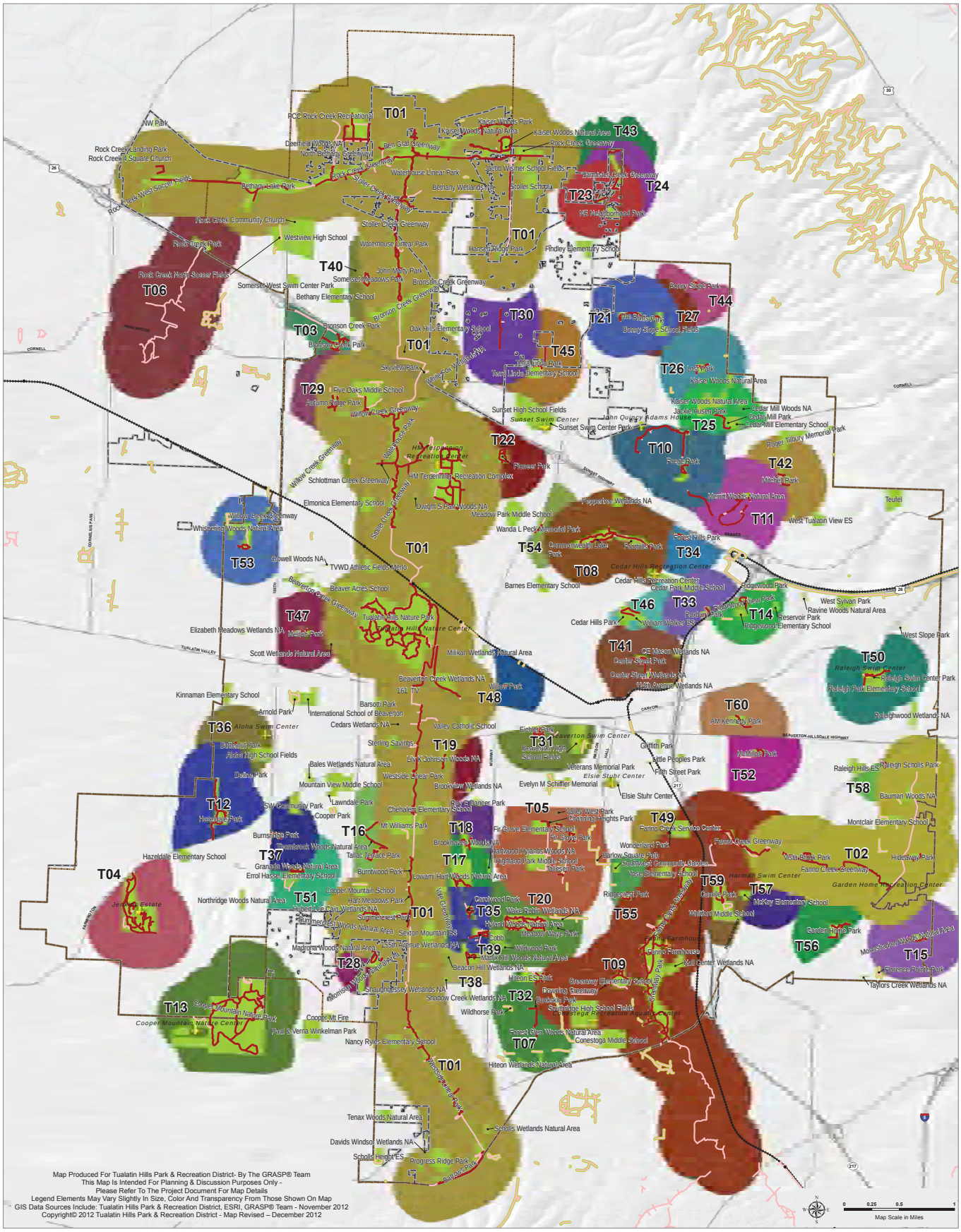


FIGURE 3B **TRAILSHED ANALYSIS**

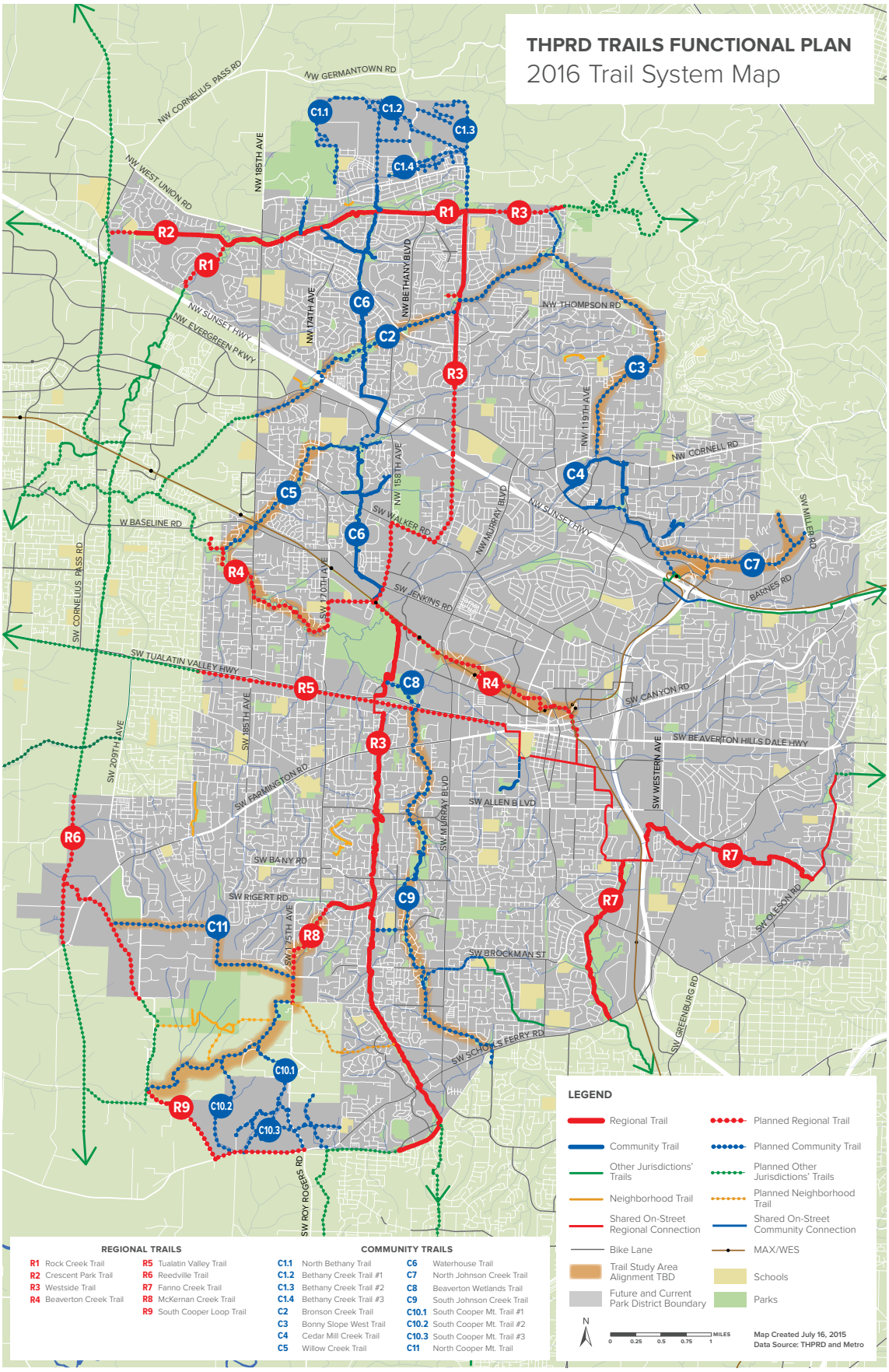


FIGURE 3C **2016 TRAIL SYSTEM**

ACHIEVING SUCCESS

To facilitate the district's desire to provide, maintain and operate a quality trail system, a number of guidelines have been established. A number of elements need to be considered, including, but not limited to, trail classifications, accessibility, amenities, surfacing, bridges and boardwalks and mid-block crossings. This section of the TFP provides the guidance necessary to ensure district trails meet user expectations.

4.1 TRAIL DESIGN STANDARDS BY CLASSIFICATION

A complete trail network provides a variety of experiences within a range of settings. THPRD's system includes routes that provide recreational opportunities as well as alignments that present viable transportation alternatives for bicycle commuters. The system includes three main functional classes of trails:

» Regional Trail

» Community Trail

» Neighborhood Trail

See Section 3.1.2 above for definitions of the trail classifications. Table 4A below provides guidance on trail design based on classification and Figures 4A through 4C illustrate a typical trail cross-section for each trail classification.

FIGURE 4A
Regional trail typical section

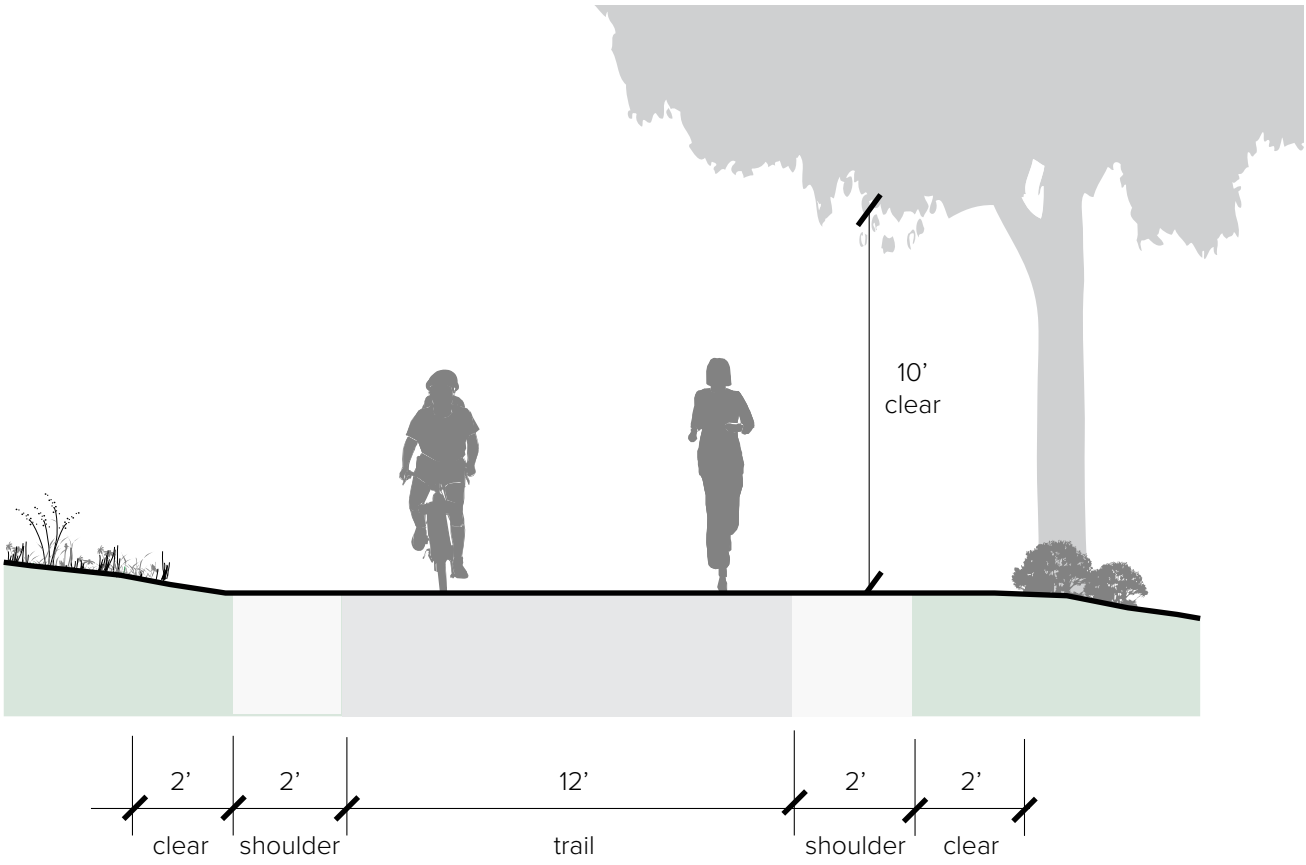


FIGURE 4B
Community trail typical section

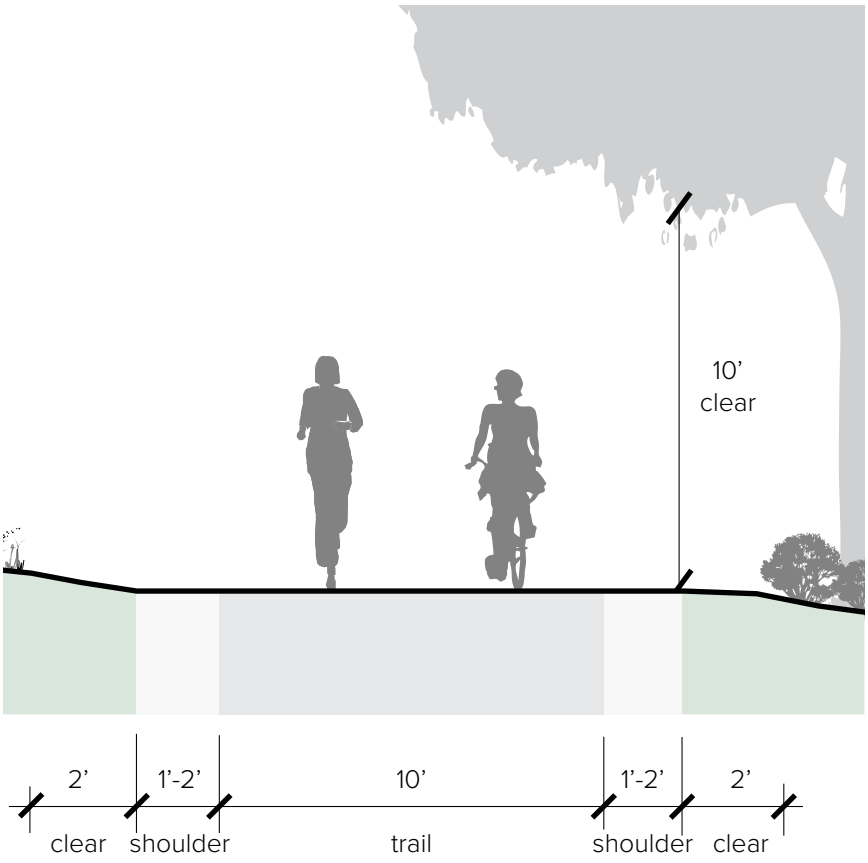


FIGURE 4C
Neighborhood trail typical section

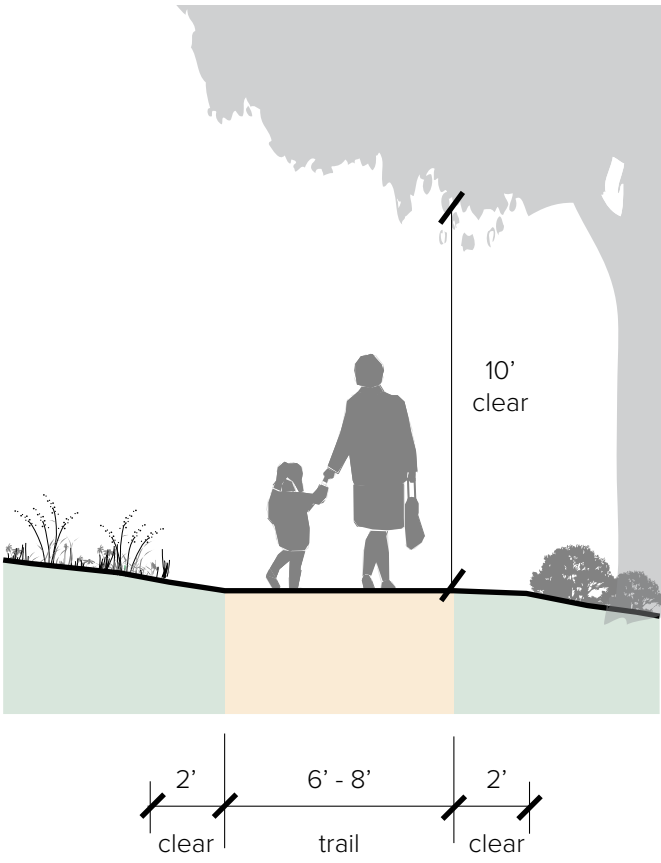


TABLE 4A **TRAIL CLASSIFICATION DESIGN MATRIX**

Classification	Function	Materials	Width	Vertical Clearance*	Horizontal Clearance**
Regional	Provides transportation and recreational connectivity at a regional scale	Paved (asphalt or concrete); may be pervious	12 feet with 2 foot gravel shoulder	10 feet (from top of trail)	2 feet (from edge of shoulder)
Community	Provides recreational and transportation connectivity at a community scale	Paved (asphalt or concrete; may be pervious)	10 feet with 1-2 foot gravel shoulder	10 feet (from top of trail)	2 feet (from edge of shoulder)
Neighborhood (Urban)	Provides access or a parallel route to higher level trail facilities	Paved	6-8 feet, with or without gravel shoulder	10 feet (from top of trail)	2 feet (from edge of shoulder or trail w/o shoulder)
Neighborhood (Natural)	Linear natural spaces typically following riparian corridors	Varies depending on site conditions	6-8 feet, no gravel shoulder	10 feet (from top of trail)	2 feet (from edge of trail)

**Area above the trail free from obstructions such as tree limbs or branches*
***Area on both sides of trail free from obstructions such as shrubs and trees*

TABLE 4B **ADDITIONAL TRAIL TYPE DESIGN MATRIX**

Classification	Function	Materials	Width	Vertical Clearance*	Horizontal Clearance**
Combined Trail and Sidewalk	Provides route options for both bicyclists and pedestrians outside of existing roadway corridors	Paved (asphalt or concrete)	12 feet (sidewalk and trail)	10 feet (from top of trail)	2 feet (from edge of trail)
Trail Adjacent to a Road or Sidewalk	Separated route within a transportation corridor	Paved	Regional Trail: 12 feet; Community: 10 feet	Vertical curb between trail and roadway; 10 feet (from top of trail)	4 feet landscape buffer between trail and roadway/ sidewalk; 4 feet (from edge of trail) - non-landscape buffer side)
Trail in a Greenway	Provides route for both pedestrians and bicyclists using riparian corridors and/or wetland areas	Paved or unpaved	6-8 feet; should include a vegetated buffer zone from adjacent water bodies	10 feet (from top of trail)	2 feet (from edge of trail)

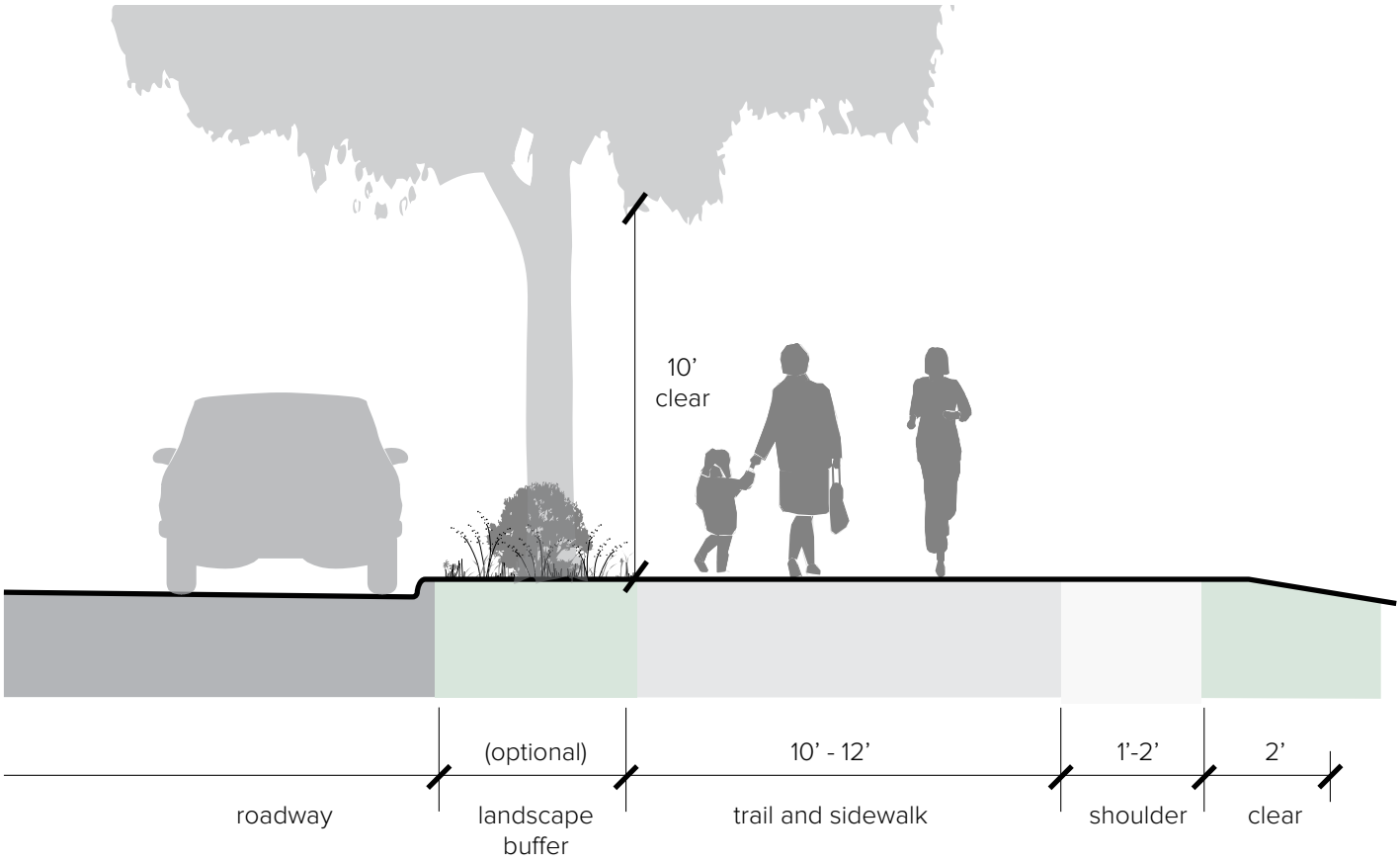
**Area above the trail free from obstructions such as tree limbs or branches*
***Area on both sides of trail free from obstructions such as shrubs and trees*

4.2 ADDITIONAL TRAIL TYPE DESIGN STANDARDS

Trails of each classification traverse many types of environments and contexts. The standards in Table 4B provide guidance for some common trail types, based on site context.

Any new or improved sidewalks should adhere to the requirements of the City of Beaverton or Washington County, as appropriate. The district should partner with both agencies as road improvements are being planned along trail corridors to help ensure bicycle and pedestrian needs are adequately met.

FIGURE 4D
Combined trail and sidewalk typical section

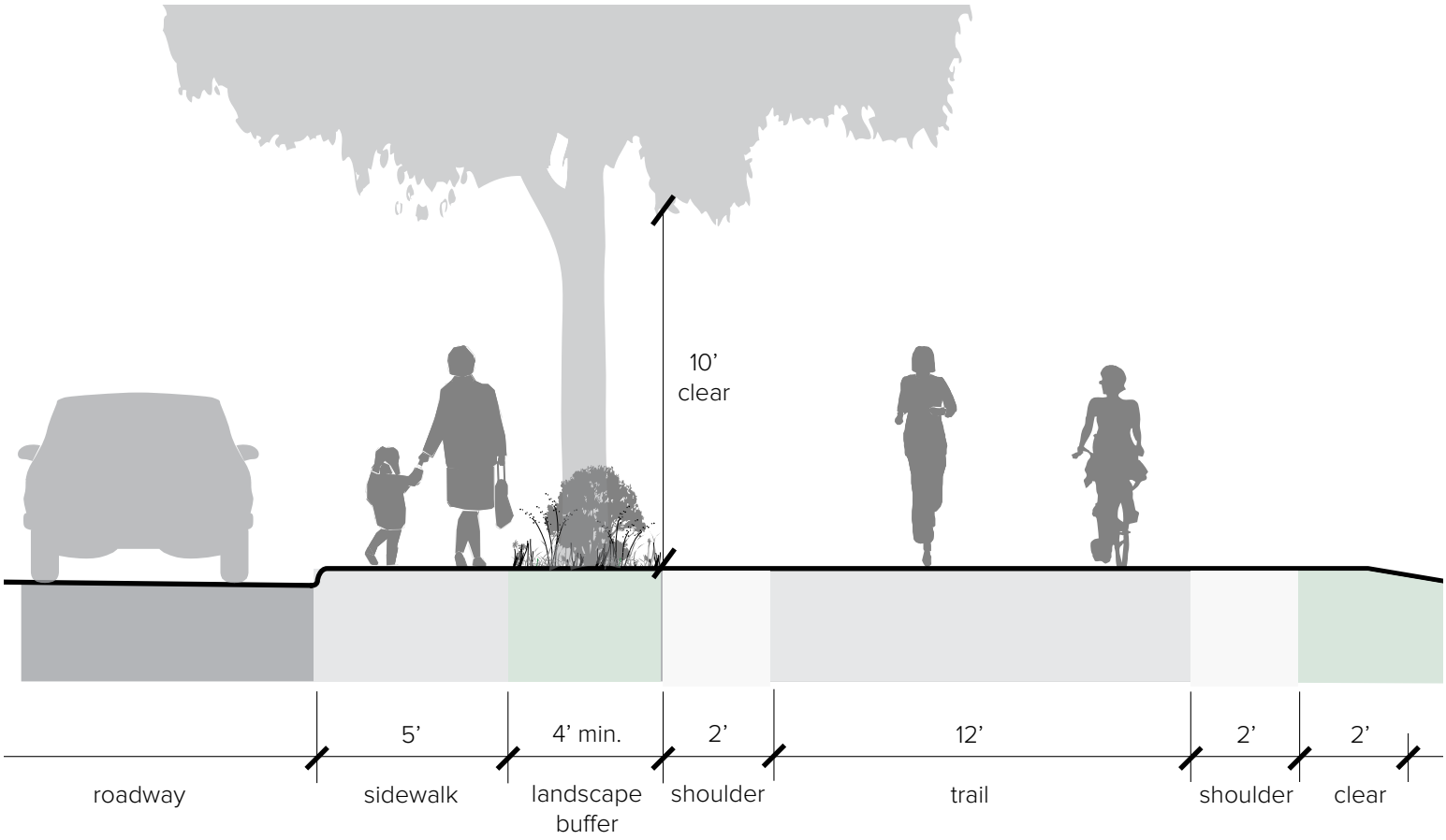


4.2.1 Combined Trail and Sidewalk

Shared use paths are completely separated from motorized vehicular traffic and are constructed in the public right of way, within a green space area, public utility corridor or other public access area. Combined sidewalks and trails are generally located adjacent to roadways within the public right of way. They may be separated from the curb by a landscape buffer or they may be "curb-tight," connected to the curb.

Trail design standards for these types of facilities are described in the table above. Additional consideration should also be given to enhancing the user experience and safety for both bicycles and pedestrians, including the use of striping, landscaping, clear sight lines and other design considerations described later in this section. Figures 4D and 4E illustrate typical cross-sections for these two trail types.

FIGURE 4E
Trail adjacent to a roadway, trail typical section



4.2.2 Trails within Greenways

Due to much of the district's service area being urbanized, limited opportunities are available to develop new off-street trails. Much of the district's remaining (to be constructed) regional and community trail system is located within environmentally sensitive areas, such as creek corridors and greenways. Greenways are defined as follows:

Greenways are linear natural spaces that follow creeks and streams. Some greenways provide public access with environmentally compatible trails, viewpoints, or watercraft launch sites. Other greenways prioritize wildlife habitat protection and do not allow any public access. (Metro, Regional Trails and Greenways Plan)

Greenways offer substantial recreational and green space preservation opportunities. When planning for a trail along or in a greenway, a balance must be provided between the protection of natural resources and the public's desire for access to natural resource areas. Trails within greenways should be studied to identify impacts to natural resource areas, stormwater, flora and fauna, and flood levels as well as recreational and transportation benefits for district residents.

As mentioned previously in this TFP, the trail system map (Figure 3C) highlights study areas where trails are planned to be located along or within creek corridors. This includes trails such as Beaverton Creek, Bronson Creek, Willow Creek and others. Section 3.2.3 outlines the process of how these study areas will be evaluated using both trail prioritization criteria outlined in this plan and the site development suitability criteria outlined in the district's NRFP.

The following principles provide some general environmental considerations for trail development within greenways:

» Consider

- Alignments to minimize the number of stream crossings
- Circulation and/or migration of local fauna
- Impact of on-site vs. off-site mitigation
- Opportunities for the restoration of poor water quality, habitat areas and/or stream edges
- Interpretive or educational elements to highlight local features, flora and fauna
- Use of concrete as a surface treatment option for trails in greenway due to its durability and lower maintenance requirements
- Natural dispersed infiltration systems such as vegetated swales or infiltration strips to manage stormwater
- Construction materials with little to no toxicity (see http://www.pharosproject.net)

» Avoid

- Fragmentation of small habitats
- Wetlands whenever possible, but if necessary span at the narrowest point
- Constructing trails that may be more prone to erosion and maintenance upkeep over time
- Use of pervious paving in floodplain areas or areas without proper drainage due to sedimentation and higher maintenance requirements

» Maintain buffer zones (vegetated corridors) from creeks, streams and sensitive bodies of water per Clean Water Services standards

4.3 DESIGN EXCEPTIONS

The design standards and guidelines outlined in this section are the district's best practices and basis for design of all planned trails. However, trail development requires consideration of the local context, project site conditions, the environment and jurisdictional requirements.

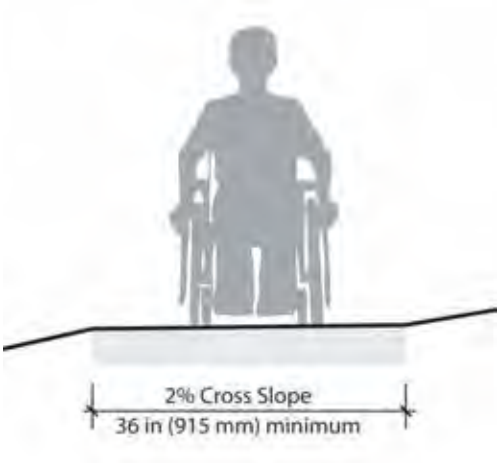
During the master planning and design development process, the district will consider alternatives to the standard width dimensions, turning radii, surface treatments and other elements when justification is provided to address the following factors:

- User safety
- Avoidance of and/or minimizing environmental impact
- Consideration of topography
- Demand and anticipated level of use
- Cost
- Regional or local jurisdictional guidance, such as Metro's Active Transportation Plan

Generally, trail widths less than the standard are only to be used over short distances, such as around utility poles, bridge abutments, significant trees or in sensitive natural resource areas. Trail widths greater than the standard width may also be considered in high use areas, such as near commercial centers, transit, schools and recreation facilities. Design exceptions may require approval by the district's management team.

4.4 ACCESSIBILITY

4.4.1 ADA



The Americans with Disabilities Act (ADA) was established to prohibit discrimination on the basis of disability by public accommodations and requires places of public accommodation and commercial facilities to be designed, constructed and altered in compliance with the accessibility standards established by the ADA. As new trails are developed and existing trails are enhanced, the district will work on meeting ADA requirements to ensure access for all.

4.4.2 ADAAG

The United States Access Board has approved the Americans with Disabilities Act Accessibility Guidelines (ADAAG) for trails and outdoor recreational access routes. However, some trails may have limitations that make meeting ADAAG guidelines difficult or prohibitive. Prohibitive impacts include harm to significant cultural or natural resources, requirements of construction methods that are against federal, state or local regulations, or terrain characteristics that prevent compliance.

Some key ADAAG guidance considerations include:

- Use of firm and stable surfaces, such as asphalt, concrete, wood, recycled plastic lumber or compacted gravel, wherever universal accessibility is a consideration
- Provide clear tread width a minimum of 3 feet
- Provide a 5 foot wide passing space at a minimum of every 1,000 feet when the trail width is less than 5 feet wide
- Avoid surface obstacles more than one-half inch high, or 2 inches high when the surface is other than asphalt, concrete wood or recycled plastic lumber
- Avoid a cross slope more than 2%, or 5% where the surface is not asphalt, concrete, wood or recycled plastic lumber when necessary for drainage
- Longitudinal slope must meet one or more of the following conditions shown in Table 4C
- Provide detectable surface changes at curb ramp approaches from roadways or parking areas
- Provide one accessible parking space per every 25 vehicle spaces at trailheads
- No more than 30% of the total trail length may exceed a running slope of 8.33%

TABLE 4C **MAXIMUM RUNNING SLOPE AND LENGTH**

Running slope		Maximum Length of Segment
Steeper than	But no more steep than	
1 : 0 (0%)	1 : 20 (5%)	No Limit
1 : 20 (5%)	1 : 12 (8.33%)	200 feet
1 : 12 (8.33%)	1 : 10 (10%)	30 feet
1 : 10 (10%)	1 : 8 (12%)	10 feet

ADA Accessibility Guidelines (ADAAG), ADA Standards, https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/background/adaag

4.5 REGULATORY

4.5.1 Oregon Department of Transportation (ODOT)

ODOT has adopted the American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities for trail design standards. The AASHTO guide should be consulted for geometric design standards such as horizontal and vertical curves, and sight-distance. This is especially important for those trails serving a transportation function, such as regional trails. Any trail projects receiving federal funding assistance will be required to meet ODOT standards in its design and development.

4.5.2 American Association of State Highway and Transportation Officials (AASHTO)

The AASHTO Guide for the Development of Bicycle Facilities generally recommends against the development of trails along roadways. These facilities create a situation where a portion of the bicycle traffic rides against the normal flow of motor vehicle traffic and can result in wrong-way riding when either entering or exiting the trail. As mentioned above, AASHTO provides guidance for the geometric design of trail design and construction. These standards should be considered for all trail projects and are required to be met for all federally funded trail projects.

4.5.3 Manual of Uniform Traffic Control Devices (MUTCD)

The MUTCD regulates the design and use of all traffic control devices including signs and pavement markings. A summary of the MUTCD guidance for trails and bicycles includes the following:

- Use of a solid yellow line when passing is discouraged
- Use of a dashed yellow line when passing is permitted due to adequate conditions
- Use of striping in areas of restricted sight-distance, substandard trail width, high traffic areas, intersection approaches and/or where night time riding is expected with limited lighting
- Avoid over-striping trails in order to maintain effectiveness for trail user safety purposes
- Any transportation related signage (regulatory, caution, directional, etc.) visible from roadways or other public right of way must meet MUTCD standards

Please note that the district's Trails Management Program contains more detailed information related to MUTCD guidance and how the district puts this guidance into practice along the trails system.

4.5.4 Utilities

Many types of utilities, such as water, gas, electric and others offer good opportunities for trail co-location. Recreational and utility co-use has some complications, including the unique needs of the utility company or public agency. However, with strategic maintenance and land agreements, utilities can have a minimal effect on trail users. Additionally, utility companies usually benefit by having an uninterrupted and easily accessible route to their utility service.

Each utility has specific requirements regarding trail routing, alignment, setbacks, loading, landscaping and other factors. For each project all utilities should be coordinated with to ensure current requirements are being used as well as to better understand utility maintenance schedules and servicing needs, including frequency and vehicle/equipment requirements. Limitations may be placed on trail surfacing materials and location of structures, such as bridges and boardwalks, depending on utility type and location.

The district works with the following utility providers on many of its trail projects:

» Bonneville Power Administration (BPA)

» Portland General Electric Company (PGE)

» Northwest Natural Gas (NWN)

» Tualatin Valley Water District (TVWD)

» Clean Water Services (CWS)

» City of Beaverton

» City of Portland

4.5.5 Railroad / TriMet

As with utilities, some of the district's trails are, or will be, located in right of way owned by Union Pacific Railroad and operated by Portland & Western Railroad or owned and operated by TriMet. As such, coordination with each of these agencies is needed to ensure their respective requirements are being met. Because most of these are live railroad right of ways, additional safe guards must be considered when design and constructing trails. This includes consideration of the following:

» Use of fencing and/or other separation techniques should be part of the trail design when adjacent to railroad tracks

» Maximize the setback between the trail and the railroad tracks to the greatest extent possible; subject to railroad, federal, state and regional guidelines

4.6 SURFACING

When determining surface type for THPRD trails, consider topography, landscape context, underlying soils, trail type and classification. Asphalt is the preferred standard for all regional and community trail surfacing, but alternative trail surfacing may be allowed with a design exception. All surfaces have advantages and disadvantages, and each must be analyzed to determine which surface is most appropriate in any given location.

4.6.1 Impervious

Traditionally, asphalt and concrete are the most commonly used materials for trails because they last the longest, meet ADA and ADAAG requirements and meet the needs of most users. Other possible trail surfacing options include:

» Commercial soil stabilizers

» Geotextile confinement systems

» Crusher fines

» Limestone treated surfaces

» Recycled plastic or wood decking

Surfacing options for bridges and boardwalks are identified in Section 4.8.3.

In arriving at a recommended trail surface, the following should be considered:

» Initial capital cost and funding

» Long-term maintenance costs

» Surfacing durability and longevity

» Existing soil and environmental conditions

» Availability of materials

» Anticipated trail use/functionality

» Aesthetics

ADA and ADAAG-compliant trails require paved surfaces, in most instances, for access and ease of use. In limited cases, packed gravel fines can be used, where there is little to no topography. However, packed surfaces require much more maintenance effort and cost over time, and may not be desirable in the long term.

Asphalt

Asphalt trails offer substantial durability for the cost of installation and maintenance. Asphalt is popular with users for its smooth, continuous surface and has the benefit of lower cost, but requires more upkeep in comparison to concrete. As a flexible pavement, asphalt can also be considered for installing as a paved trail in a greenway or with grades steeper than three percent. If constructed properly on suitable sub-grade, asphalt has a life span of ten to 15 years. The use of asphalt for trails is the district's preferred standard.

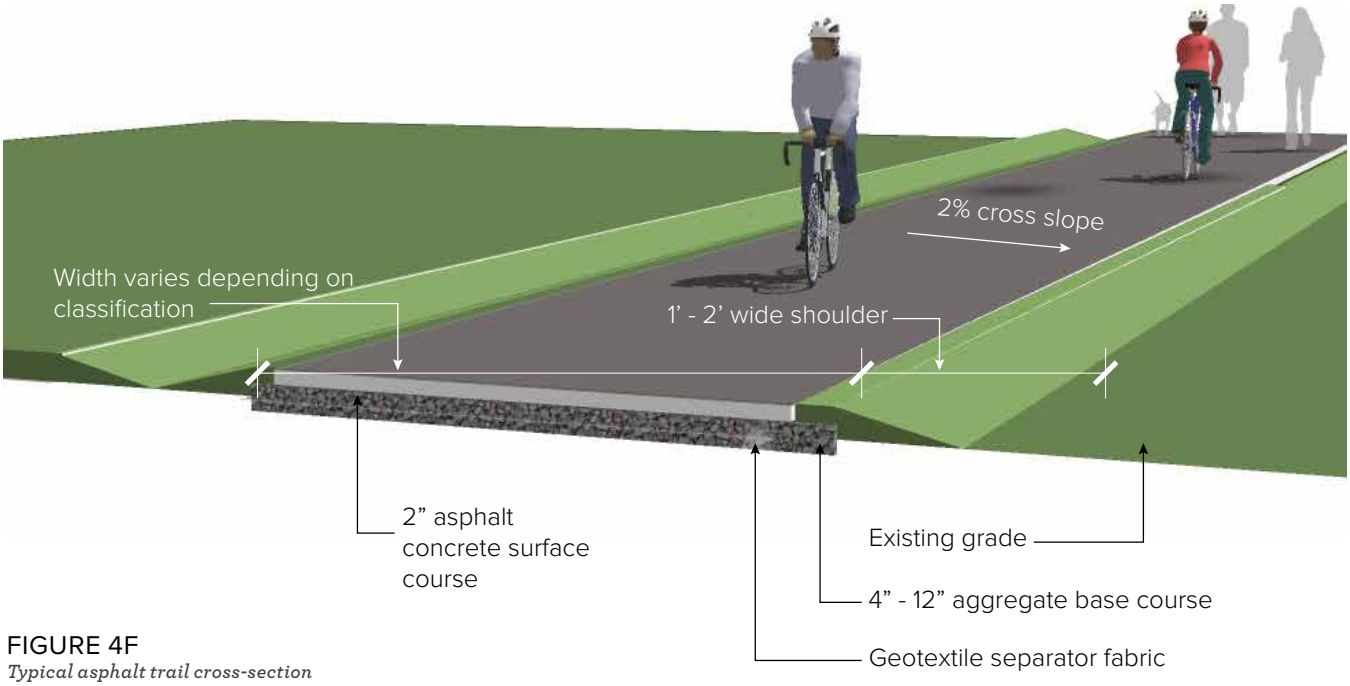


FIGURE 4F
Typical asphalt trail cross-section

Concrete

When cost allows, concrete is recommended because of its durability, longevity and lower maintenance requirements. Concrete is especially good in areas prone to frequent flooding, such as greenways. However, the hardness and jarring effect of this surface is not preferred by runners or cyclists. Concrete joints that are saw-cut rather than tooled tend to improve trail user experience. If constructed properly on suitable sub-grade, concrete has a life span of approximately 25 to 30 years.

4.6.2 Pervious / Permeable

The use of permeable paving when feasible supports the district's sustainability policy and has a number of positive environmental impacts, include lower storm water runoff and greater water infiltration rates. However, permeable paving is generally twice the cost of impervious materials to install and is recommended when site conditions are conducive to its use. As permeable paving continues to evolve and improve, the district will continue to evaluate its potential use in the trail system. The following should be considered for its use:

- Conduct a feasibility study to determine site conditions and soil type
- Environmental factors, such as the proximity to tree canopies or soil debris
- Establishment of a regular and routine maintenance schedule to retain permeability, access for vacuuming debris and cleaning equipment, especially after storm events
- Areas with proper drainage (not suitable in floodplain or areas with ponding or sedimentation)

4.6.3 Soft Surface

For purposes of this plan, natural surface trails are limited to bare earth (soil), gravel or crushed rock. Additional information about soft surface trails can be found in the district's PFP. When using crushed rock or gravel, trails in greenways benefit from screenings that contain about 4% fines by weight to compact and stabilize the trail's surfacing over time. However, an alternative surface should be considered when designing in flood-prone areas or steep terrain. When using soft surface trails:

- Provide constant positive drainage to avoid ponding
- Bench cut trail into slope without extensive removal of existing vegetation; build grade reversals and out-sloped elevations to encourage sheet flow across the trail
- Design small-scale stormwater facilities along the trail to minimize erosion
- Provide a longitudinal slope of 5% and a cross slope of 2%
- Keep the trail available for year round use

4.7 AMENITIES

Amenities help distinguish district trails from others and help to enhance the trail user experience. This includes features such as site furnishings, bollards, signage, striping and fencing. It should be noted, however, that these amenities will not always be found along all district trails due to site constraints, trail classification, anticipated trail use and other factors. The following design guidelines for typical district trail amenities are intended as a tool for decision-making purposes related to new trail design or the enhancement of existing substandard trails.

4.7.1 Site Furnishings

Although district trails are regularly maintained and monitored, it is advisable to use vandal resistant construction and materials whenever possible. Site furnishings typical to district trails are highlighted as follows:

» **Seating**

- May include benches, seat walls, boulders, logs or other built features
- Typically located at trailheads, mid-block crossings, wildlife or natural area viewing locations and other areas of interest
- Provide adequate space for strollers and wheelchairs in a manner that does not impede trail use
- Seat walls shall include skate deterrents as appropriate

» **Trash receptacles**

- Preferably located at trailheads and mid-block crossings; may be considered near wildlife/natural area viewing locations if high use is anticipated
- Should not be located directly adjacent to benches and seating areas
- Should be located for ease of maintenance service and access

» Bike racks

- Typically located at parks along trail corridors, trailheads and where restrooms are located
- Should be located in a manner that does not impede trail use

» Drinking fountains and port-a-potties

- Preferably located at trailheads and parks along trail corridors; may also be considered near mid-block crossings if other locations are too far away
- New drinking foundations should include pet bowl and jug filler options
- Consider locations for ease of maintenance service and access

» Doggie bag dispensers

- Typically located at trailheads, mid-block crossings and near trash receptacles
- Mount on post with rules sign or on other surface as appropriate

» Kiosks

- Typically located at major trailheads or trail intersections
- Design adjacent to the trail near other site furnishings, such as a bench or trash receptacle

» Artwork

- Should be considered in the overall design of a trail project, as appropriate, and can be incorporated as part of the site furnishings (benches, bike racks, kiosks, etc.); as trail elements (bridge, boardwalk, walls, etc.); as stand-alone features (sculpture, mural, etc.); or as educational features (interpretive elements, environmental features, etc.)
- Consider using local artists to provide works that make the trail network uniquely distinct and representative of the district's character

4.7.2 Bollards

The use of bollards along district trails is intended to discourage motorized modes from using them. They are also used to distinguish district trails from trails provided by other public agencies (like school districts or cities) and private groups (like homeowner associations or golf/athletic clubs). The types of bollards used by the district and their unique characteristics are highlighted as follows:

» May include permanent, removable, collapsible or other site elements, such as boulders or logs

» Typically located at trailheads, mid-block crossings, maintenance access points and any other access point where vehicles may access the trail

» **Bollards are generally installed in groups of:**

- Two with removable or collapsible bollards
- Three with two permanent bollards and one removable or collapsible bollard

» Bollards are typically yellow in color and should consider the use of reflective tape

» **Permanent**

- Typically used on regional and community trails
- Locate in the gravel shoulder; where no shoulder exists, should be located 1-2 feet from edge of trail

» **Removable / Collapsible**

- Typically used on regional, community and neighborhood trails
- Located at trail centerline when used with permanent bollards on regional and community trails
- Locate at trail centerline when natural features create side barriers for neighborhood trails

» **Boulders / Logs**

- Typically located along street frontages at mid-block crossings, trailheads with parking areas and other potential unauthorized vehicle access points
- Often used in combination with bollards, especially if boulders are available on site or from another project
- Space uniformly to discourage vehicle entry but still allow for mowing and smaller sized maintenance equipment

4.7.3 Signage

All signage proposed along trails shall adhere to the district's approved Signage Master Plan. All signs visible from the public right of way must conform to MUTCD standards and guidelines, especially those signs that are directional and regulatory in nature. The district is also a partner in Metro's Intertwine Regional Trails Program, which provides guidance for identification and wayfinding signage for the interconnectedness of regionally significant trails, parks, natural areas and green spaces of the greater metropolitan area. The following list represents signage most commonly found throughout the district's trail system. Table 4D provides guidance for locating these typical sign types found along trails.

» Site Identification – Type A Sign Family

» Trailhead Identification – Type D Sign Family

» Regulatory – Type R Sign Family

» Directional and Safety – Type T Sign Family

» **Identification**

- Signs may include the Intertwine designation per Metro's Intertwine Regional Trails Signage Guidelines

» **Regulatory**

- Typically includes the R1 sign type at all trail sites, although other regulatory signs may be applicable
- R1 signs are typically located at all trailheads, mid-block crossings and all other trail entries and can be combined with A3 signs and doggie bag dispensers as appropriate
- Any other regulatory sign types are to be located at the appropriate location(s) within a trail corridor
- Follow AASHTO and MUTCD guidelines for signs at mid-block crossings and trail intersections

» **Directional and Safety**

- Follow Metros Intertwine Regional Trails Signage Guidelines

» **Educational**

- Typically includes interpretive signage, although other signage may be applicable
- Interpretive signs are typically used when unique site features or educational characteristics exist; any such signage must adhere to the district's interpretive signage program as administered by its Natural Resources & Trail Management department.

TABLE 4D **TRAIL SIGNAGE LOCATIONAL GUIDELINES**

Level of Visibility (High to Low)	Sign Type	Type of Location	Site Placement	Comments
	Large ID Sign: A2	Oriented towards automobile driver	Main entrance OR prominent road location	Arterial street
	Standard ID Sign: A1	Oriented towards automobile driver	Main entrance OR prominent road location	Minor collector OR neighborhood street
	Trail ID Sign w/ map: D2	Major pedestrian entry point/trailhead/ existing park (ex: light rail station, parking lot)	On right side of trail	Requires orientation map
	Trail ID Sign: D1	Regular pedestrian entrance off arterial street	On right side of trail at a minimum of 10 feet inside trail OR at the apex of the "T" intersection if appropriate	Include directional strips with distance to prominent feature or trail connection
	Small ID/Rules Sign: A3/R1	At minor entry points, including street crossings	On right side of trail	Rules must be displayed at all entry points
	Trail Connection: T3	Where patron must exit trail and use on-street/sidewalk routes to close a gap in trail	On right side of exiting trail.	Requires connection map
	Pedestrian Directional: T5	Major directional at an internal trail intersection OR split	Placed at the apex of the "T" or "V" intersection	
	Trail Directional: T1	Minor directional at an internal trail intersection OR split	Placed at the apex of the "T" or "V" intersection	Visible/useful for users coming from different directions
	Trail Crossing: T4	Where trail makes direct connection across the street	On right side of trail where patrons cross	Must meet MUTCD standards

4.7.4 Striping

The use of striping is based on the district's Trails Management Program. However, trail projects that are federally funded will be required to follow AASHTO and MUTCD guidelines. The intent of the district's striping protocol of trails is to promote trail user safety by mitigating substandard trail conditions such as trail narrowing, limited sight-distance or sharp curves. It is not THPRD's intent to stripe all the trails throughout the district.

4.7.5 Fencing / Railing

Fences or railings along trails may be needed to prevent access to/from high-speed roadways or to provide protection along steep side slopes and waterways. Fences should only be used where they are needed for safety reasons. They should be placed as far away from the trail as possible; with a minimum offset of two feet. Many of these principles apply to cut-sections of trail where retaining walls are required: minimum two feet offset, with a rub-rail whenever possible. Whenever fencing or railing is used in a trail corridor, the following fencing types should be considered:

» **General considerations**

- The district does not install fencing for property owners; in instances where it is required, the district shall place such fencing on the property owner side of the property line and the property owner is responsible for fencing after installation
- The district does not install fencing to delineate natural area boundaries unless deemed necessary by the Natural Resources & Trail Management department
- Fencing should be located within a mow strip as deemed necessary by the Maintenance Operations department regardless of fencing type

» **Split-rail**

- Preferably used for site boundaries, natural areas and safety; it is the district's preferred fencing type in most situations where delineation between activities or uses is needed
- When used for site boundaries, fencing should be placed on district side of the property line for ease of maintenance
- Generally 3-4 feet tall, having two rails; fences having three rails are considered "heavy duty"
- Consider along trails having steep downhill slopes or at top of retaining walls
- Locate within a bark mulch mow strip as appropriate

» **Chain-link**

- May used for site boundaries and safety
- Generally 3-6 feet tall depending on situation
- May be galvanized or vinyl-coated depending on location; where vinyl-coating is needed, it should be black
- Consider use of privacy slats as appropriate

» **Welded wire or field fencing**

- Typically used for natural areas
- Generally 2-5 feet tall
- Consider along natural areas where access by park users are not desired, such as mitigation or restoration areas
- Generally used on a temporary basis

» **Ornamental / Decorative**

- Ornamental or decorative fencing may be considered in those instances where a higher level of design is desired, such as main trailheads located at parks or other district facilities

» **Safety railing**

- Typically used along boardwalks, top of retaining walls and steep slopes where the trail surface is 30 inches or more above ground surface
- Minimum height of 42 inches
- Openings in the railing must not exceed 4 inches in width
- Where a cyclist's handlebar may come into contact with a fence or barrier, a smooth, 12 inch wide rub-rail should be installed at a height of three feet

4.7.6 Landscaping

Generally THPRD does not design or install landscaping as part of a trail project unless it relates to mitigation. However, in some situations trail projects and residential developments are combined that require aesthetic landscaping. Use of native and drought tolerant species should be considered whenever possible, especially in locations where irrigation is not provided.

» Locations

- Typically located at trailheads and where separation is needed between the trail and other uses, such as roadways, sidewalks and pathways
- Shall include native and drought tolerant plant species as appropriate, but may include ornamental plant species where irrigation is available
- Trees to be planted no closer than 10 feet from the edge of trail surfacing
- Shrubs to be planted no closer than 5 feet from the edge of trail surfacing
- Groundcovers and grasses to be planted no closer than 3 feet from the edge of trail surfacing
- Existing landscaping and trees must be protected and incorporated into trail development/enhancement whenever possible

» Ornamental grasses

- Generally require minimal maintenance once established and are typically used in landscape buffers separating the trail from roadways and sidewalks

» Groundcovers

- Generally require minimal maintenance once established and are typically used in landscape buffers separating the trail from roadways and sidewalks.
- Typically used in areas where turf grass is not appropriate, such as on steep slopes, and landscape buffers separating the trail from roadways, or sidewalks.

» Shrubs

- Consider native plant species along park boundaries, natural areas and other locations where buffers are needed

» Trees

- Avoid the use of trees having excessive litter and debris
- Consider a tree's ultimate size and growth habit to ensure proper placement for trail designs
- Consider using root barrier in areas where existing trees are located closer than 10 feet to the edge of trail and/or when a large number of trees will be planted
- Refer to the local jurisdiction street tree guidelines for trees to be planted along trails, sidewalks or rights of way

» **Low maintenance guidelines**

- Avoid the use of plant species that produce excessive litter and debris, such as fruit, pods or cones
- Avoid the use of plant species susceptible to wood rot, disease or limb breakage ("weak wooded") in areas of high trail use
- Avoid siting plant species that overhang trails or have root systems that could impact trail surfaces

4.8 BRIDGES AND BOARDWALKS

Bridges and boardwalks are structures that span over sensitive natural areas or inundated waterways to limit potential environmental impact. They are typically used when crossing small creeks and wetlands. Boardwalks range in length and can span as little as 10 feet or stretch for longer distances depending on site conditions. Bridges are used where greater lengths are required to span sensitive areas or when the objective is to reduce impacts to the floodplain.

FIGURE 4G
Typical bridge/boardwalk cross-section.

Bridges and boardwalks are commonly constructed of wood, steel or concrete with recycled plastic components. Wood is the most cost effective, versatile and relatively easy to install. Special consideration must be taken when using pressure treated lumber over waterways. While steel is a more expensive option, it can be purchased as a prefabricated kit, and can expand extensive lengths where other materials cannot. Modular concrete boardwalk systems are gaining popularity due to their low-impact installation methods and durability within wet areas. Recycled plastic is popular for its material durability, but is typically limited to non-bearing uses such as decking and handrails. Bridge and boardwalk designs must consider the intended use and be built from materials that is aesthetically and structurally appropriate.

4.8.1 Boardwalks

General considerations for the use of boardwalks include:

- Clear span width must be a minimum of 14 feet for regional trails and 12 feet for community trails. Wider widths are preferred in areas with higher anticipated use and whenever railings are used
- Use of a 6 inch curb rail is recommended. A 42 inch guardrail is required at locations where there is a 30 inch or greater elevation difference in the boardwalk surface and the ground/water surface below
- Design to structurally support 5 tons of capacity depending on emergency vehicle access and maintenance requirements
- Evaluate footing types to include uplift as well as loading consideration for flood events.
- Consult a structural engineer for member sizing, headwall and post footing design
- Give careful consideration to selection of decking material to minimize slippery conditions (see Table 4E)
- Follow all local, state and federal permitting requirements where boardwalks are located within wetlands; construction in wetlands is subject to jurisdictional regulations

4.8.2 Bridges

Bridges are most often used to provide user access over natural features such as streams, creeks and wetlands, where a boardwalk is not an option. The type and size of bridges can vary widely depending on the trail location, site conditions and jurisdictional requirements.

The biggest factor in determining the width and load capacity for trail bridges, as well as boardwalks, is the project requirements and the maintenance program , including emergency/ security access. A developed site and maintenance access determines trail widths and bridge/boardwalk capacity. The funding source is also a determining factor, since federally-funded trails must adhere to the most stringent design standards.

Below is a list of general guidelines for the design of bridges for future trail projects. Many of these considerations are also applicable to design of boardwalks.

» **When constructing a federally funded project, design criteria for the width of bridges are established by AASHTO**

- Standard width: 14 feet, unless a design exception is granted
- Standard for a 'live load' for pedestrian and bicycle bridges: 85 psf (pound per square foot), plus any additional vehicle loading when used by maintenance or emergency/security vehicles
- For bridges greater than 10 feet wide, the vehicular design load is for an HS10 truck
- Bridges must also be designed to resist lateral forces from wind and earthquake as described by AAHSTO

» **Projects funded from other sources:**

- Bridge width for regional and community trails: 2 feet wider than the paved trail approaching the structure
- In special situations, a design exception is required in order to allow the width of a bridge to match the width of the trail connecting to it. Refer to Section 4.3 above for additional information about design exceptions

- Vehicle-rated bridges will only be specified when they are justified for maintenance, emergency or security access. The justification will be dependent on the site and maintenance program. If determined to be used for vehicle access, a bridge should generally be able to support the weight of a light duty emergency vehicle
- A goal of the district is to reduce, restrict and limit the need for maintenance vehicle access over bridges by placing trash receptacles and other 'high maintenance' site amenities close to the main access points
- If maintenance or emergency/security staff need access to a site's interior, make sure the trail intersections have wide radii and gentle turning movements; i.e., no 90 degree turns or 'T' intersections
- Provide a minimum of one 8 foot wide trail to one end of a bridge or boardwalk for routine maintenance
- If site amenities or structures are in a site's interior and will require vehicle access for routine maintenance (e.g., play equipment, shelter, bridge/boardwalk, sport court, etc.) then a trail with adequate width and proper load capacity must be provided
- Adjust maintenance service delivery measures and design the site to reduce vehicle trips or access into the site's interior
- Some sites may have reduced trail widths or surfacing modifications to meet the intent of the NRFP, which calls on staff to: "Plan, provide and manage appropriate maintenance access routes, where required, that minimize impacts to natural resource areas by designing them with minimal impervious surfaces and widths."

4.8.3 Materials

The district has traditionally used natural wood for its bridges and boardwalks. Over the past several years, the use of recycled plastic lumber has been used in an effort to be more sustainable. Other materials may also prove to be useful, depending on site conditions, costs and other factors. The following matrix in Table 4E can be used to determine an appropriate surfacing treatment based on a variety of site characteristics. Please note that the following should also be used when determining surfacing materials for stairs or overlooks.

As new and/or improved surfacing options become available, they should be evaluated in the same manner described in Table 4E. Consult the district's sustainability policy prior to making decisions about surfacing materials.

TABLE 4E
BRIDGE / BOARDWALK SURFACING MATRIX

		Trail Conditions (3 = Better Suited / 1 = Lesser Suited)								
		Shaded Conditions	Sun Conditions	Vehicle Access	Active Use (jog/ bike)	ADA	Cost	Ease of Maintenance	Wetlands/ Water	Durability/ Sustainability
Trail Surfacing	Ipe	1	3	TBD	1	3	1	3	3	3
	Treated Wood	2	2	2	2	3	3	2	1	2
	American Plastic Lumber	2	2	1	3	3	2	2	3	2
	Fiberglass Grating	3	2	1	2	2	1	3	3	2
	Metal Grating	3	3	1	2	2	1	3	3	2
	Concrete Slab	TBD								

4.9 MID-BLOCK CROSSINGS

The following provides design guidance for roadway intersection treatments. The guidelines presented in this plan represent conceptual recommendations. Specific roadway intersection treatments will be based on further engineering analysis conducted by a registered engineer and review by the respective jurisdictional agency (City of Beaverton or Washington County).

The approach to designing crossings at mid-block locations depends on an evaluation of vehicular traffic, line of sight, trail traffic, use patterns, vehicle speed, road type, road width and other safety issues such as proximity to major attractions. When space is available, use of a median refuge island can improve user safety by providing pedestrians and bicyclists the space to perform a safe crossing.

Regardless of whether a mid-block crossing is non-signalized or signalized, the crossing should do the following:

- Be a safe distance (based on travel speeds and sight lines) from adjacent intersections and not interfere (or be interfered) with vehicle traffic flow
- Be located on flat topography to increase motorist visibility of the trail crossing
- Be as close to perpendicular (90 degrees) to the roadway as possible
- Use signage and striping to warn trail users of the upcoming roadway is strongly recommended
- Maintain clear sight lines between trail users and motorists by clearing or trimming vegetation obstructions
- Provide a center median refuge if the crossing is more than 75 feet from curb to curb or as directed by the agency with jurisdiction

When a proposed trail mid-block crossing is within approximately 300 feet of an existing signalized pedestrian crosswalk, the trail should be routed to it. This will avoid potential traffic signal operation problems and reduce motorist confusion. For this alignment to be effective, barriers, signage or offset trail alignments may be needed to direct trail users to the signalized crossing. If no pedestrian crossing exists at the signal, modifications may be required to accommodate a safe crossing.

4.9.1 Non-Signalized Crossings

Non-signalized crossings are most likely to occur at local/ neighborhood roadways and some collector roadways. Non-signalized crossings may be appropriate when maximum traffic volumes are less than 9,000-12,000 ADT (average daily traffic) vehicles and maximum travel speed is 35 MPH (miles per hour). Non-signalized crossings may be appropriate with traffic volumes up to 15,000 ADT on two-lane roads and up to 12,000 ADT on four-lane roads, if a median refuge island is provided in both scenarios.

FIGURE 4H
Mid-block non-signalized trail crossing of a local/residential street.

Typical treatments at these crossings include:

- Continental striping, if allowed by the agency with road jurisdiction
- Signage
- Sidewalk improvements, such as ADA transitional ramps
- Vehicle bollards at trail access points
- Street lighting
- Median refuge islands if appropriate
- Speed hump or raised crosswalk on roadways with low to moderate traffic volumes (under 12,000 ADT) and a need to control traffic speeds

Trail design features that may be used to warn trail users of an upcoming roadway crossing may include the following:

- Curves in the trail to help slow trail users and raise awareness of oncoming vehicles
- Detectable warning strips help visually impaired pedestrians identify the edge of the street
- Signage

4.9.2 Signalized Intersections

Signalized crossings are most likely to occur at arterial roadways and some collector roadways. There are different scales of signalization, depending on traffic capacity, speed and trail user volume.

A signalized intersection should include all of the same treatments as a non-signalized crossing, plus the addition of a traffic control device. The addition of a traffic control device, such as a traffic signal or flashing beacon, provides increased protection for trail users.

Typical traffic control devices used by the district, as approved by the City of Beaverton or Washington County, include the following:

- Rectangular Rapid Flashing Beacons (RRFB) act as lit warning devices to supplement the trail crossing warning signs at uncontrolled approaches.

» Pedestrian Activated Hybrid Beacons (also known as HAWK signals) alert motorists to stop when trail users are crossing mid-block. When not activated, the signal is dark. When activated, the overhead signal begins flashing yellow, followed by solid yellow, advising motorists to prepare to stop. The signal then displays two solid reds allowing bicyclists and pedestrians to safely cross. Finally, an alternating flashing red signal indicates that motorists may proceed when safe, after coming to a full stop.

» Full Traffic Signal is a typical traffic signal with a green light always shown. When activated by a bicyclist or pedestrian, the light changes to yellow, then red; allowing the user to safely cross with a "Walk" indicator. Full traffic signal installations must meet MUTCD pedestrian standards for schools or modified warrants, which include: being located where a shared use path intersects with a high volume, high speed roadway, with traffic volumes exceeding 15,000 ADT and vehicle speeds exceeding 40 MPH.

Unlike non-signalized crossings of local or residential street, each signalized crossing (regardless of traffic speed or volume) requires additional review by a registered engineer and the agency having jurisdiction of the roadway to identify sight lines, potential impacts on traffic progression, timing with adjacent signals, capacity and safety.

4.9.3 Grade-Separated Crossings

Grade-separated crossings may be appropriate where a path intersects with a high volume, high speed roadway, with traffic volumes exceeding 25,000 ADT and vehicle speeds exceeding 45 MPH. Due to considerable cost and complexity of design, grade separated crossings are limited to unique situations and usually in partnership with a local jurisdiction. Typical grade-separated crossings include:

» Undercrossing

» Overcrossing

Safety and ADA accessibility is a foremost concern with both types of crossings. In undercrossing situations, the trail user may be temporarily out of sight from public view or experience and environment with poor visibility. To ensure safety and security concerns are met, both types of crossings must be spacious, well-lit and visible to public view. Flooding and/or standing water may also pose a problem for undercrossings requiring the need for periodic cleaning and/or draining (especially after storm events for those undercrossings that may be located within greenways).

4.10 RISK, SAFETY AND SECURITY

4.10.1 Crime Prevention Through Environmental Design (CPTED)

Along with the desire of creating well-designed trails for its residents, the district is also intent on ensuring the safety and security of its trails and facilities. To help make this possible, the following fundamental CPTED principles should be considered.

» **Access**

- Establishment of clearly defined trail entries and facilities for trail users to easily access and move about
- Establishment of clearly defined trail boundaries to differentiate between public and private spaces

» **Visibility**

- Maintain open sight lines throughout a trail corridor in order to promote natural surveillance and the “see and be seen” concept

4.10.2 Scan Analyze Response Assess (SARA)

SARA is a four-step process to quickly address situations that occur in the field, and is described as follows:

» **Scan:** observe what the situation is, to determine what possible factors are the cause

» **Analyze:** determine what possible solutions could be implemented to correct

» **Response:** implement solution

» **Assess**: evaluate if the solution corrected the situation or if additional measures need to be taken

4.10.3 Sight Distance

Maintaining adequate sight distance for trail users is key in providing a safe trail system. This includes ensuring visibility for (and of) trail users at mid-block crossing locations, steep slopes and switchbacks, tight curves, wooded areas and any other situation where sight lines could be impaired due to site conditions.

4.11 MAINTENANCE & OPERATIONS

Maintenance operations of district trails fall into one of two categories: park maintenance or natural resources maintenance.

» Park maintenance is responsible for hard surface trails in order to provide safe and open access opportunities for people to recreate, travel, play and enjoy the outdoors

» Natural resources maintenance is responsible for soft surface trails in order to lessen human impacts and allow natural processes to continue, while providing safe passage for people where appropriate

Please refer to the district's PFP for additional information relating to park maintenance and the NRFP for additional information relating to natural resources maintenance. Trail maintenance operations fall into both categories and consist of the following:

4.11.1 Trail Management Program

THPRD's Natural Resources & Trails Management department administers the district's approved Trails Management Program. The goal of the Trails Management Program is to provide high quality trail systems that safely and sustainably connect people and communities. When the program is successful, these conditions will be met:

» Trails will meet safety standards

» Trail stakeholders, such as district departments and volunteers, will know their role

» Trail information will be available to the public

Trails management is a team effort, requiring the cooperation of multiple departments. The Natural Resources & Trail Management department has the lead role to coordinate the strengths of trained volunteers and the Maintenance Operations, Design & Development, Risk Management, and Security Operations departments to recognize and recommend physical and service improvements to our district's trail system. Please refer the program document for more detailed information about trails management.

4.11.2 Safety Inspection Training Program

As part of the Trails Management Program, the district uses a Safety Inspection Training Program. This program trains district staff to be aware and able to identify potential hazards along the trail system, such as overhanging tree limbs, deteriorating trail surfaces or substandard trail sections. These inspections are conducted annually and are prioritized accordingly. Those hazards posing immediate safety concerns to trail users are moved to the top of the list and addressed immediately. All other potential hazards are rated using a risk assessment matrix for future inclusion in the district's capital maintenance replacement program. The Trails Analysis Form is included in the Appendix for reference.

4.11.3 Maintenance Standards Manual

In addition to the district's Trails Management Program, additional standards and guidelines for trail maintenance can be found in THPRD's Maintenance Standards Manual. Please refer to this manual for district standards and guidelines related to trail maintenance practices. This manual is intended to work in tandem with the Trails Management Program and helps implement many of trail management principles.

4.11.4 Maintenance Vehicle Access Guidelines

In general, regional and community trails should be designed with maintenance and emergency vehicle access in mind. This includes not only the paved trail, but also any bridges or boardwalks along a trail corridor. However, not all bridges and boardwalks need to be vehicle rated if adequate access can be provided from either end of a bridge or boardwalk. Additional guidance can be found in Section 4.8 above.

IMPLEMENTATION & DEVELOPMENT

5.1 PRIORITIZATION CRITERIA FOR TRAIL DEVELOPMENT

The 2006 Trails Master Plan established eight goals for the district's trail system:

- Providing recreation opportunities
- Trail development and regional connections
- Access
- Community linkages
- Amenities
- Maintenance and emergency access
- Preservation
- Funding

These eight goals provided the framework in the establishment of the prioritization criteria discussed in the next paragraph.

With the help of the Trails Advisory Committee and staff, selection criteria were developed to establish the framework for the trail prioritization criteria matrix, Table 5A below. The criteria were used to establish priority recommendations for new trails and upgrades to existing substandard trails. These priorities will be implemented by the district's board of directors through the annual budgeting process. Priorities will largely be set based on the funds that are available and applicable for each category (i.e. capital funding to be used for replacement projects on existing trails, site development changes used for new trail improvements).

The spring 2015 survey indicated that respondents believed the district should allocate its resources in the following order: 1) constructing new trails and 2) upgrading existing substandard trails. Although not specifically asked, it can be inferred that land acquisition for new trails should be a priority of the district because of the desire by survey respondents to see new trails constructed.

As such, there may be extenuating circumstances when land acquisition will take precedence to new trail development or enhancement. Land acquisition is often driven by market conditions, a property owner's willingness to sell, public or private partnerships and other factors. The district will continue to actively pursue land for trails in those areas where no service currently exist, including current and future service areas. In areas currently served, the district will be most interested in acquiring land that will fill gaps in or extend the existing trail network.

Table 5A represents thirteen prioritization criteria that will be used to determine how the district will use its resources for trail development, whether it is the enhancement of existing substandard trails or the development of new trails. In order to better prioritize trail projects throughout the district, each criterion is weighted based on district policies and desired outcomes. As projects arise, they will be scored and placed in one of two priority areas. Projects scoring 30 or higher will be considered Tier I projects, or high priority projects; projects scoring 29 or lower will be considered Tier II projects, or medium priority.

TABLE 5A **TRAIL PRIORITIZATION CRITERIA MATRIX**

Criteria	Point Scale (3=High / 1=Low)		
	3	2	1
Citizen-Initiated Project Support	Generally Supported by Residents Adjacent to Trail	Generally Supported by the Community At-Large	Neutral or Generally Not Supported
Located in Environmental Justice Area* or CDBG Designated Area	Within a Significantly Above Average Area	Within an Above Average Area	Within an Average or Below Average Area
Located in an Underserved Area	No Trail Access		
(within 1-mile)	Limited Trail Access		
(within 1-mile)	Adequate Trail Access (within 1-mile)		
Locational Proximity to Residents Served	Surrounded by In-District Residents	Partially Surrounded by In-District Residents	Surrounded by Out-of-District Residents
Number of Residents Served	More than 1,000	500 to 1,000	Less than 500
Overcomes Barriers	Major Improvement		
(off-street)	Moderate Improvement	Minor or No Improvement	
(on-street)			
Potential for Access to Scenic / Natural Areas	More than 75% of the Trail Corridor	30% to 75% of the Trail Corridor	Less than 30% of the Trail Corridor
Property Ownership	District Owned (fee-simple or easement)	District Owned & Public Right of Way	Public Right of Way (on-street)
Proximity to Major Destinations / User Generators (parks, schools, transit, commercial centers, etc.)	Less than ½-Mile	½-Mile to 1-Mile	More than 1-Mile
Regional Benefits	Improves Access to Regional Areas of Interest	Improves Access to Local/ Community Areas of Interest	Improves Access to Neighborhood Areas of Interest
Trail Connectivity	Fills a Gap in the Trail System	Improves a Substandard Portion in the Trail System	Does Not Fill a Gap or Improve a Substandard Segment in the Trail System
Trail Ease of Implementation	Minor Site Work	Moderate Site Work	Major Site Work
Staff Judgment	Does this project make sense in this location? Does this project fill a specific need or service? How long has this area had an unmet need?		

**Based on information produced by Metro*

It should be noted that much of the district's future regional and community trail system is located within environmentally sensitive areas, such as creek corridors. These trail corridors have been identified on the 2015 Trail System Map (Figure 3C) as study areas, which mean they do not have a defined trail alignment at this time.

Instead, these study areas will be analyzed using both the Trail Prioritization Criteria Matrix above (Table 5A) and the district's NRFPs Site Development Suitability Criteria (Table 5A of that plan) to determine an appropriate trail alignment. This could result in the recommendation that a trail, or portion of a trail, be located outside of the resource area (possibly as an on-street connection). Where the TFP trail prioritization criteria indicates a high priority for trail development and the NRFP site suitability criteria indicates a high priority for natural resource function, it shall be up to the district's management team and/or board of directors to determine which priority takes precedence.

For those trail corridors located within an environmentally sensitive area but not identified on the trail system map in a study area, this same feasibility analysis will take place in order to determine the most appropriate trail alignment.

5.1.1 New Trail Construction

Prioritization of new trail development projects is based on the trail prioritization criteria identified in Table 5A. Prioritization also takes into consideration the district's existing trail network as shown in Figure 3C. Tables 5B and 5C identify development priorities for future trails.

5.1.2 Existing Trail Enhancements[1]

Prioritization of enhancement trail projects is based on the trail prioritization criteria found in Table 5A. Prioritization also takes into consideration the district's existing trail network as shown in Figure 3C. In many cases, these represent trails that are narrower than district recommendations or have bridges or boardwalks that are narrower than the trail approaches. In either case, these scenarios cause pinch points along the trail system, increasing safety concerns and decreasing trail functionality for trail users. Tables 5D and 5E highlight enhancement priorities for existing trails.

1 Existing substandard trail improvement projects that increase capacity and functionality – such as increased widths and curb cuts – are not SDC eligible. Funding for these types of projects is generally associated with grants, bonds or other funding sources. In limited circumstances, these projects may be associated with a maintenance project – such as a trail overlay – and funded through the General Fund.

TABLE 5B **TIER I (HIGH) PRIORITY PROJECTS**

Trail Name / Segment Number	Description
Beaverton Creek Trail #1	THPRD Boundary to 185th Avenue
Beaverton Creek Trail #2	185th Avenue to 170th Avenue
Beaverton Creek Trail #3 & #4	Westside Trail to Hocken Avenue
Waterhouse Trail #4	Willow Creek Greenway to Cornell Road

TABLE 5C **TIER II (MEDIUM) PRIORITY PROJECTS**

Trail Name / Segment Number	Description
Beaverton Creek Trail #3	170th Avenue to Westside Trail
Cedar Mill Creek Trail #4	114th Avenue to Foege Park
Fanno Creek Trail #5	Scholls Ferry Road to 92nd Avenue
South Johnson Creek Trail #5	Lowami Hart Woods to Brookhaven Park
Westside Trail #12 – #14	Merlo Light Rail Station to Sunset Highway
Westside Trail #15 – #19	Sunset Highway to THPRD Boundary
Westside Trail	Sunset Highway Crossing
Remaining trail segments to be determined	

TABLE 5D **TIER I (HIGH) PRIORITY PROJECTS**

Trail Name / Segment Number	Description
Trail Name / Segment Number	Description
Waterhouse Trail #6	Jocelyn Drive to West Union Road

TABLE 5E **TIER II (MEDIUM) PRIORITY PROJECTS**

Trail Name / Segment Number	Description
Westside Trail #2 – #4	Scholls Ferry to Nora Road
Westside Trail #5	Rigert Road to Hart Road
Westside Trail #6	Hart Road to Burntwood Way
Remaining trail segments to be determined	

5.2 LAND ACQUISITION / RIGHT OF WAY

THPRD's Planning and Design & Development departments use its Acquisition Parameters Guide, which outlines how the district acquires properties. This includes land acquired as fee simple, easements and donations. As part of its due diligence, the district uses an extensive process of inventorying potential properties for acquisition. This process is highlighted in the following illustration (Figure 5A) and helps to determine site suitability for trail development. This process, initially created and used as part of the 2008 bond measure land acquisition strategy, has been updated to include the trail prioritization criteria outlined in the above.

In addition to the flow chart, a number of questions are also asked when determining acquisition and prioritization of potential trail sites. These include the following:

- Does it make sense to develop a trail at this location?
- Does this site fill a specific need or service?
- Is this a unique opportunity?
- Can the site fulfill its intended purpose?
- What are potential costs for future trail development (utilities & infrastructure, trail constructability, etc.)?
- Does it serve a multipurpose opportunity for a trail, park, natural area and/or athletic facility, or is it just a trail?
- Is it a key piece to expand an existing trail?

As opportunities arise, properties will be scored and placed in "high", "medium," or "low" suitability trail sites.

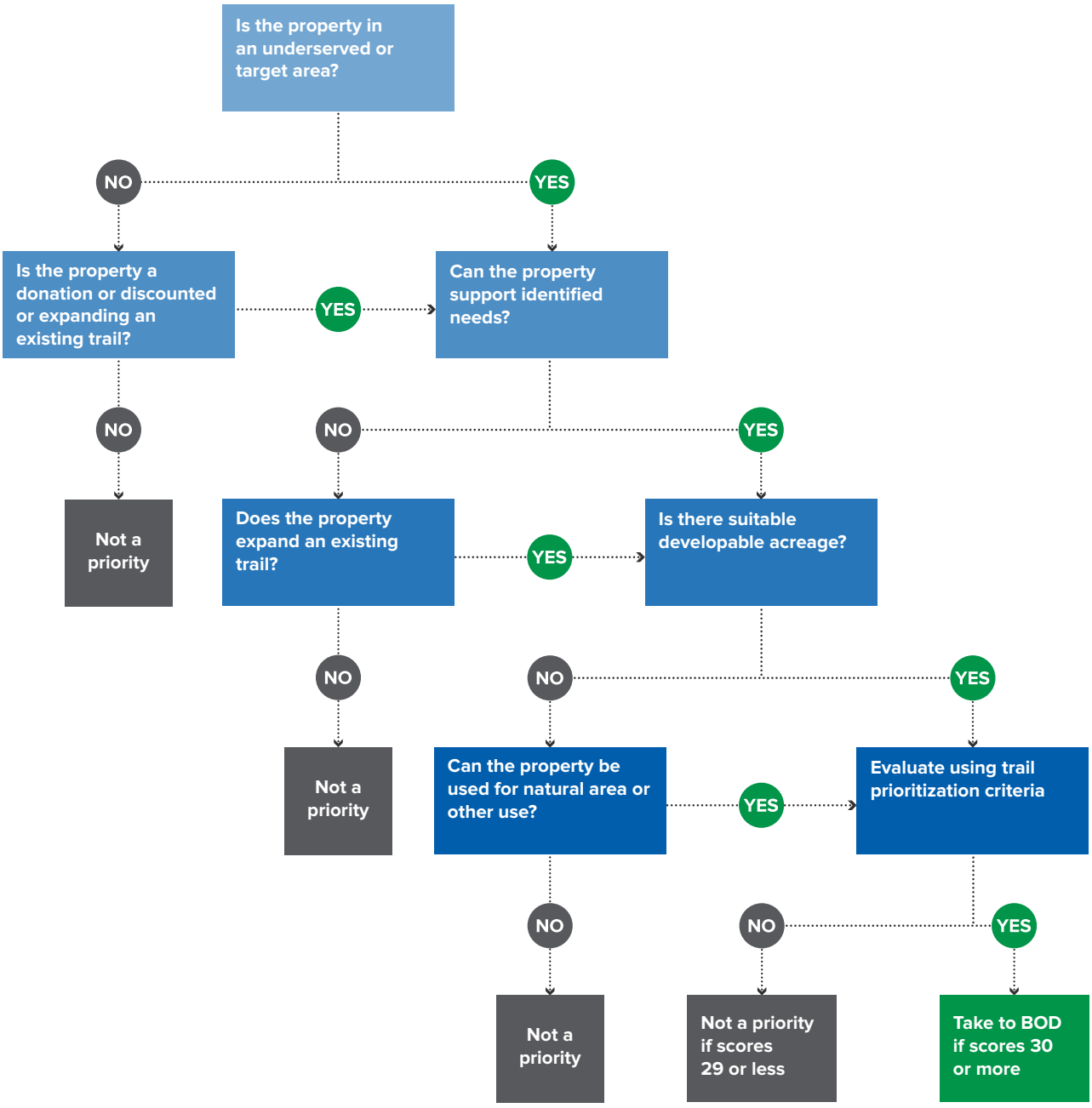


FIGURE 5A
Land Acquisition Site Suitability Flow Chart.

5.3 FUNDING STRATEGIES

5.3.1 Capital Improvement Program (CIP)

The district's capital improvement program (CIP) is a combination of deferred maintenance capital projects and SDC development projects. Additionally, the CIP takes into account the project priorities outlined above. Projects in the CIP are then funded through the district's budgeting process with either general funds or SDC funds. Grants, partnerships, donations and volunteers may also be solicited to help fund projects identified in the CIP in an effort to maximize district resources.

5.3.1.a Property Tax / General Fund

The district's primary funding source is property tax revenue. This revenue goes into the district's general fund and is then allocated for capital projects and maintenance operations on an annual basis. This fund is typically prioritized toward capital replacements.

5.3.1.b System Development Charges / SDC Fund[2]

The district's main source of funding for new trail improvements comes from its system development charges (SDC) fund. Since 1997 the district has collected fees on new residential and commercial development occurring within its service area. These fees can only be used for new trail development or improvements to existing trails that expand capacity necessitated by new development. SDC funds cannot be used for capital replacement or maintenance purposes.

5.3.2 Developer SDC Credit Projects

In lieu of paying SDC fees at the time of development, developers may enter into a memorandum of understanding (MOU) to construct trail improvements for the amount of estimated SDC fees that would normally be charged. The MOU outlines specific trail improvements to be constructed for which credit will be issued. The MOU also includes language to ensure that such trail improvements meet district design standards and guidelines.

2 Existing substandard trail improvement projects that increase capacity and functionality – such as increased widths and curb cuts – are not SDC eligible. Funding for these types of projects is generally associated with grants, bonds or other funding sources. In limited circumstances, these projects may be associated with a maintenance project – such as a trail overlay – and funded through the General Fund.

5.3.3 Grants

Grant sources include private foundations, public agencies, such as the Oregon Parks and Recreation Department, the Oregon Department of Transportation, Metro, and other agencies. Grants can be used to acquire land, fund an entire trail development and/or just a portion of a trail, such as a bridge, signage or trailhead amenities. Grants can also be used for new trail development or enhancement of existing trails and facilities. The district will typically use SDC funds as a local match in order to leverage grant funds.

5.3.4 Donation / Volunteer / Partnership

In certain instances, trail improvements are donated to the district or provided to the district. This could include land, materials, products and/or labor for the construction or maintenance of trail improvements. In most instances, this occurs in conjunction with improvement projects of other public agencies, such as Metro, Washington County, Clean Water Services or the City of Beaverton. In some instances, trail improvements can come from private development or community groups seeking improvements of trail facilities in their neighborhoods.

5.3.5 Bond Funding

The district may pursue the issuance of bonds if approved by voters during a general or special election. Bond funds can be used for a variety of projects based on how the bond is crafted, including land acquisition, new trail development, redevelopment of existing trails, capital replacements or a combination of these items. Bond funds can be short-term or long-term, and can be used for specific projects or many different projects.

SUCCESS MONITORING

6.1 PERFORMANCE MEASURES

Perhaps the simplest measures for gauging district progress are tracking:

- Number of master plans completed
- Miles of new trails constructed
- Number of capital replacement projects completed
- Miles of substandard trails enhanced

While the district will monitor these items, they cannot be stand-alone measurements as many factors can influence targeted outcomes. Budget constraints, shifts in priorities, environmental considerations and other such factors can impact the length of time to complete projects or acquire land.

Additional performance measures that can be used by the district include:

» Trail system completion

» Trail system connectivity

» Access and proximity to population

» Trail maintenance

» Trail user satisfaction

» Trail user profile

» Trail user counts

6.2 MONITORING PROCEDURES

The district will use a variety of methods to monitor its successes, or shortfalls, in achieving its expectations. Monitoring of expectations will occur on an annual basis or a multi-year basis depending on outcomes being monitored. The following table identifies specific monitoring procedures to collect data on those performance measures listed above.

Any successful monitoring process includes effective communication of outcomes. As part of the district's effort, it will provide periodic updates or reports to the management team and board of directors on key elements in the monitoring process, including miles of trails completed, identification of most heavily used trail segments (based on trail counts) and where critical gaps in the trail system exist.

Communication with the public is also important and may include updates on initiation of trail master planning, new trail construction and completion of trail development projects. Project updates and highlights of specific trails may be included on the district's website, in its activities guide and/or in its monthly e-newsletter and quarterly newsletter. Any communication intended for the public needs to be coordinated with the district's Communications & Outreach Division.

TABLE 6A **PERFORMANCE MEASURES AND MONITORING PROCEDURES**

Performance Measure	Monitoring Procedure(s)	Additional Notes
System Completion	GIS evaluation	Maintain GIS database of trails to include attributes such as trail surface, trail width and date of construction
Trail System Connectivity	GIS-based model	Use GIS model developed through Rails to Trails Conservancy Trail Modeling and Assessment Program (T-MAP) to inventory and analyze the district's trail system in relation to regional and nationwide trail networks
Access and proximity to population	GIS evaluation	Determine locations of access, quality of access using GIS to determine percentage of households or percentage of population within a half mile of accesses
Trail Maintenance	Routine operations	Conduct systematic risk assessment (inspections of railings, bridges, surfaces, signage, etc.; evaluation and removal of debris; emergency response protocol; tracking of incidences and safety issues; vegetation control)
Trail Maintenance	Remedial operations	Correct significant defects (resurfacing, repainting, repairing, etc.)
User Profile/ Satisfaction	Survey	Gather data on type of use, amount of use, distance traveled, amount of money spent, where money is spent. Information can feed into an economic and health impact assessment. Multiple examples of these analyses can be found around the country and the T-MAP program is also developing these national tools that can be used here
Counts	Field counts	Automated or manual calculation of ADT

6.2.1 Short Term Monitoring

One of the easiest ways for the district to gauge whether it is improving its trail system is through its annual maintenance inspection process. Each year all district assets, including trails, are evaluated and placed into the deferred maintenance database. This database is used to help prioritize capital replacement projects during the budgeting process. As replacement projects occur, including updates to trail facilities and amenities, these items can be tracked against the trail inventory completed in spring 2015.

Trail user surveys are another way the district can monitor whether or not expectations are being met or if access to trails is improving. Although these types of surveys are not scientific or statistically valid, they do provide a method of getting immediate feedback from the people on the trails. Analysis of trail counts is another method for tracking trail usage and can often reinforce information gathered from user surveys and inspections.

6.2.2 Long Term Monitoring

Because projects such as master plans, new trail development, and existing trail enhancement often take more than one year to complete, it is more effective to monitor for success on a 3-5 year basis. Tracking projects identified in the district's annual budget is one of the easiest ways to track progress, comparing projects completed on time versus those that get delayed or eliminated.

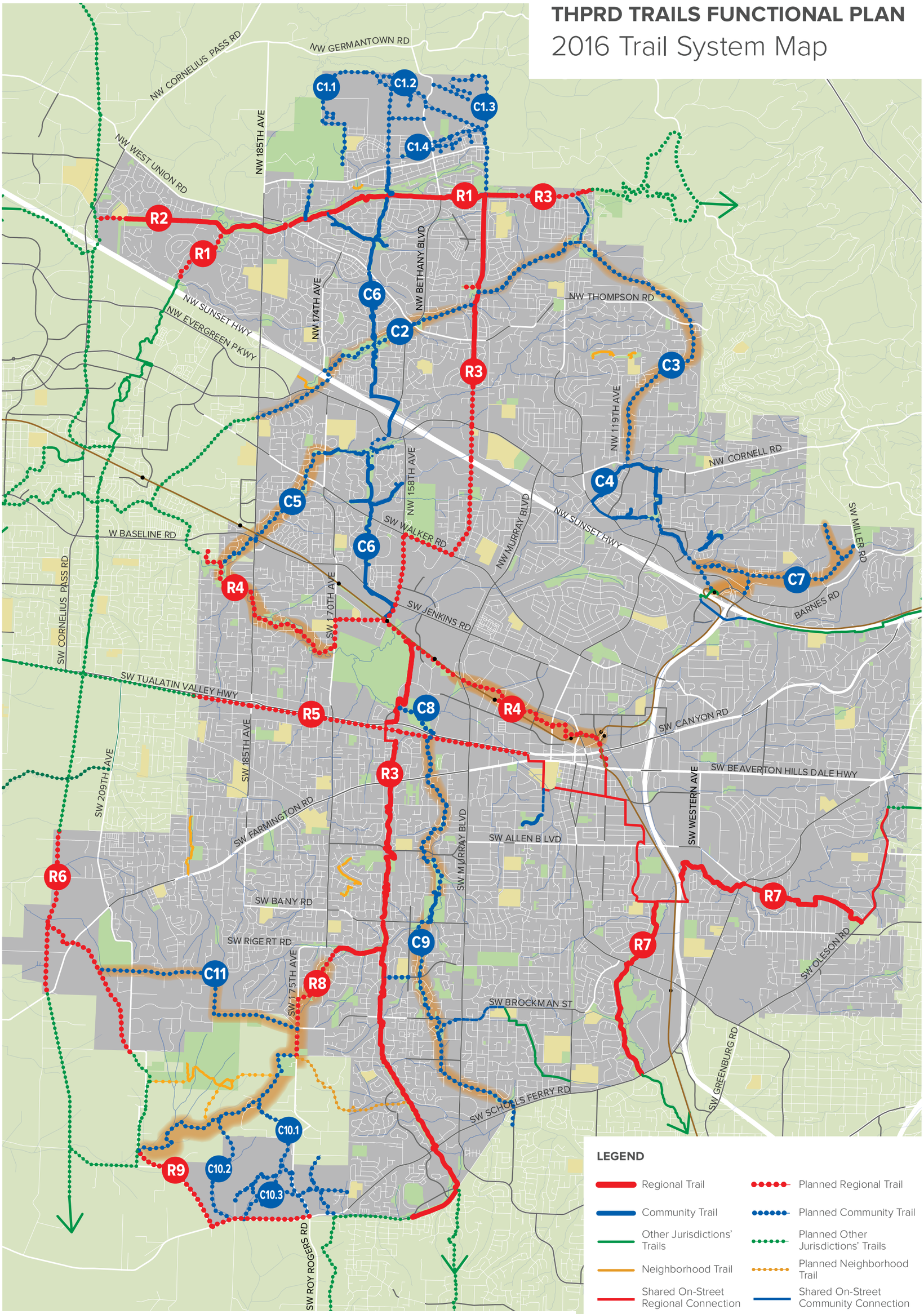
Trail user profiles, and access to user populations, and other demographic information are also better gauged on a long-term basis. These types of analysis tend to be more useful in ensuring all residents have access to the trail system as well as reinforcing the positive benefits trails provide to the community.

APPENDIX

FIGURE 7.1
2016 Trail System Map

THPRD TRAILS FUNCTIONAL PLAN

2016 Trail System Map



REGIONAL TRAILS

- **R1** Rock Creek Trail
- **R2** Crescent Park Trail
- **R3** Westside Trail
- **R4** Beaverton Creek Trail
- **R5** Tualatin Valley Trail
- **R6** Reedville Trail
- **R7** Fanno Creek Trail
- **R8** McKernan Creek Trail
- **R9** South Cooper Loop Trail

COMMUNITY TRAILS

- **C1.1** North Bethany Trail
- **C1.2** Bethany Creek Trail #1
- **C1.3** Bethany Creek Trail #2
- **C1.4** Bethany Creek Trail #3
- **C2** Bronson Creek Trail
- **C3** Bonny Slope West Trail
- **C4** Cedar Mill Creek Trail
- **C6** Waterhouse Trail
- **C7** North Johnson Creek Trail
- **C8** Beaverton Wetlands Trail
- **C9** South Johnson Creek Trail
- **C10.1** South Cooper Mt. Trail #1
- **C10.2** South Cooper Mt. Trail #2
- **C10.3** South Cooper Mt. Trail #3

LEGEND

- Regional Trail
- Planned Regional Trail
- Community Trail
- Planned Community Trail
- Other Jurisdictions' Trails
- Planned Other Jurisdictions' Trails
- Neighborhood Trail
- Planned Neighborhood Trail
- Shared On-Street Regional Connection
- Shared On-Street Community Connection
- Bike Lane
- MAX/WES
- Trail Study Area Alignment TBD
- Schools
- Future and Current Park District Boundary
- Parks

N

MILES

Map Created July 16, 2015

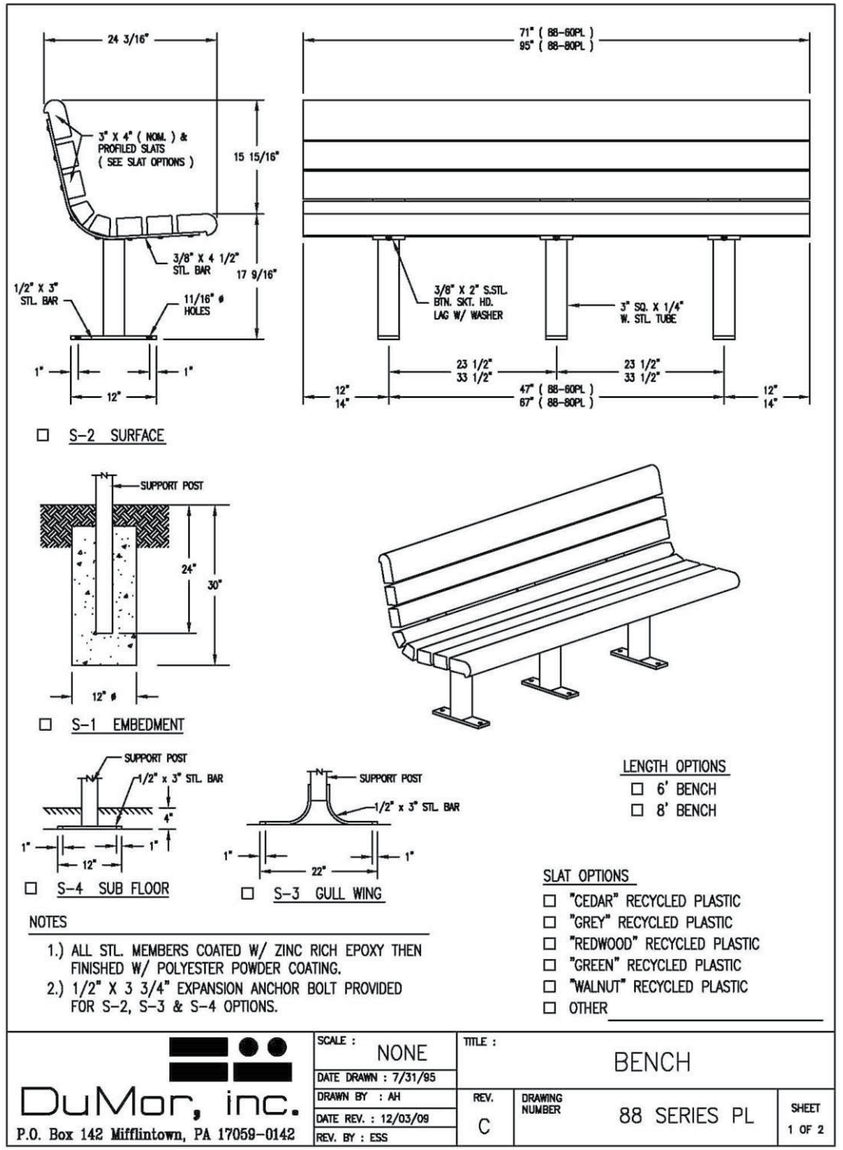


FIGURE 7.2.1A **SITE FURNISHINGS**
Bench – Dumor 88-PL Series

7.2 TRAIL DETAILS

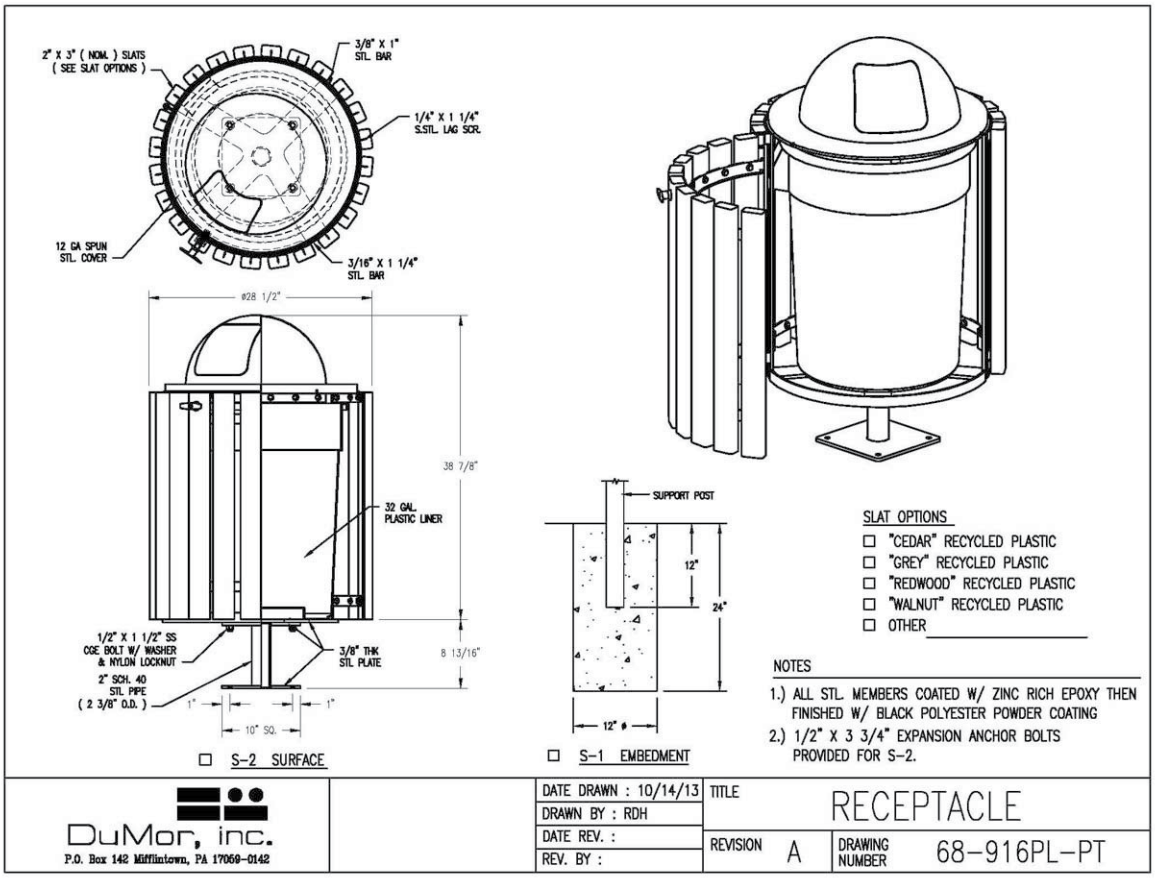


FIGURE 7.2.1B **SITE FURNISHINGS**
Trash Receptacle – Dumor 68-916PL-PT Series

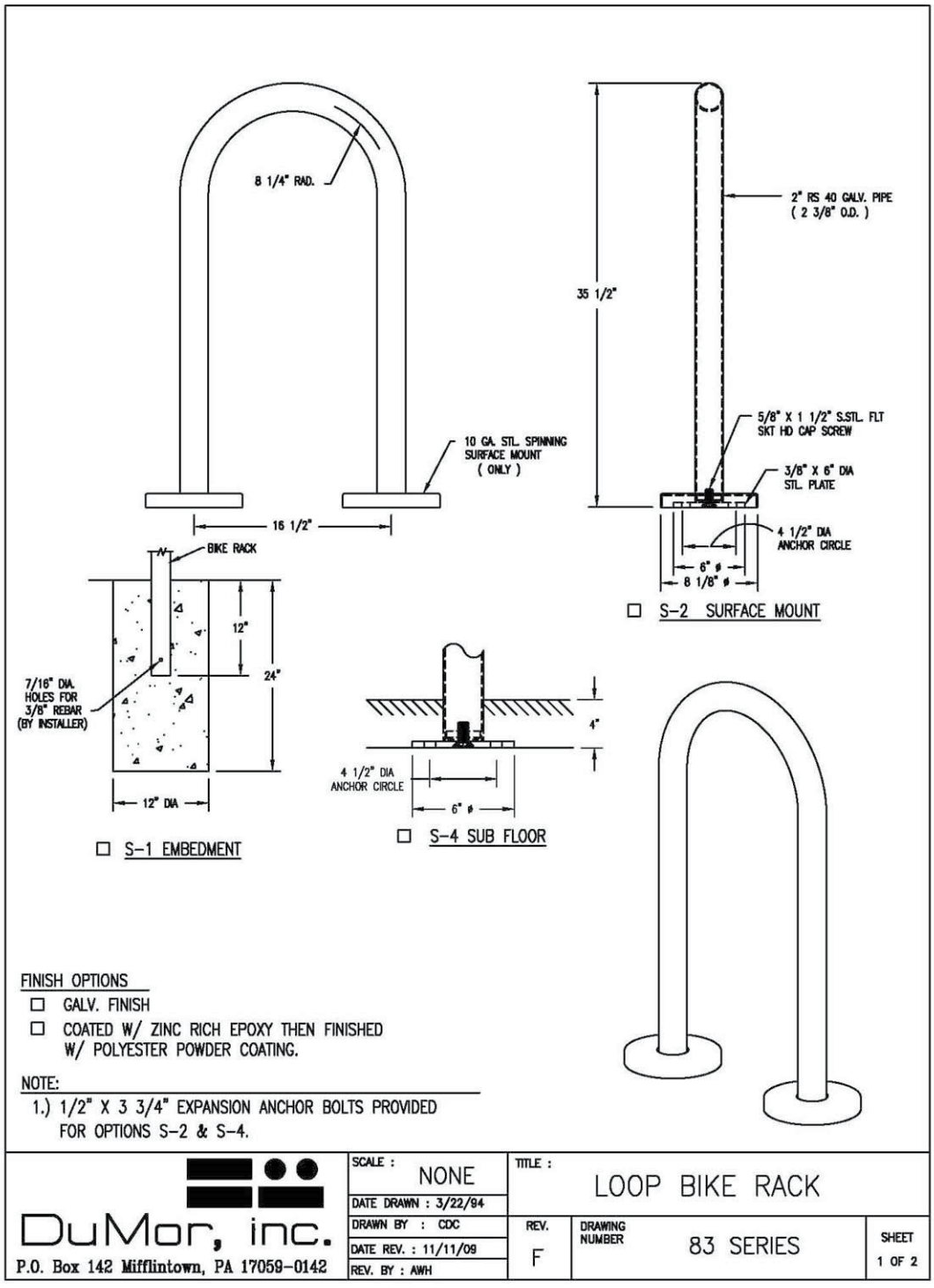


FIGURE 7.2.1C **SITE FURNISHINGS**
Bike Rack – Dumor 83 Series

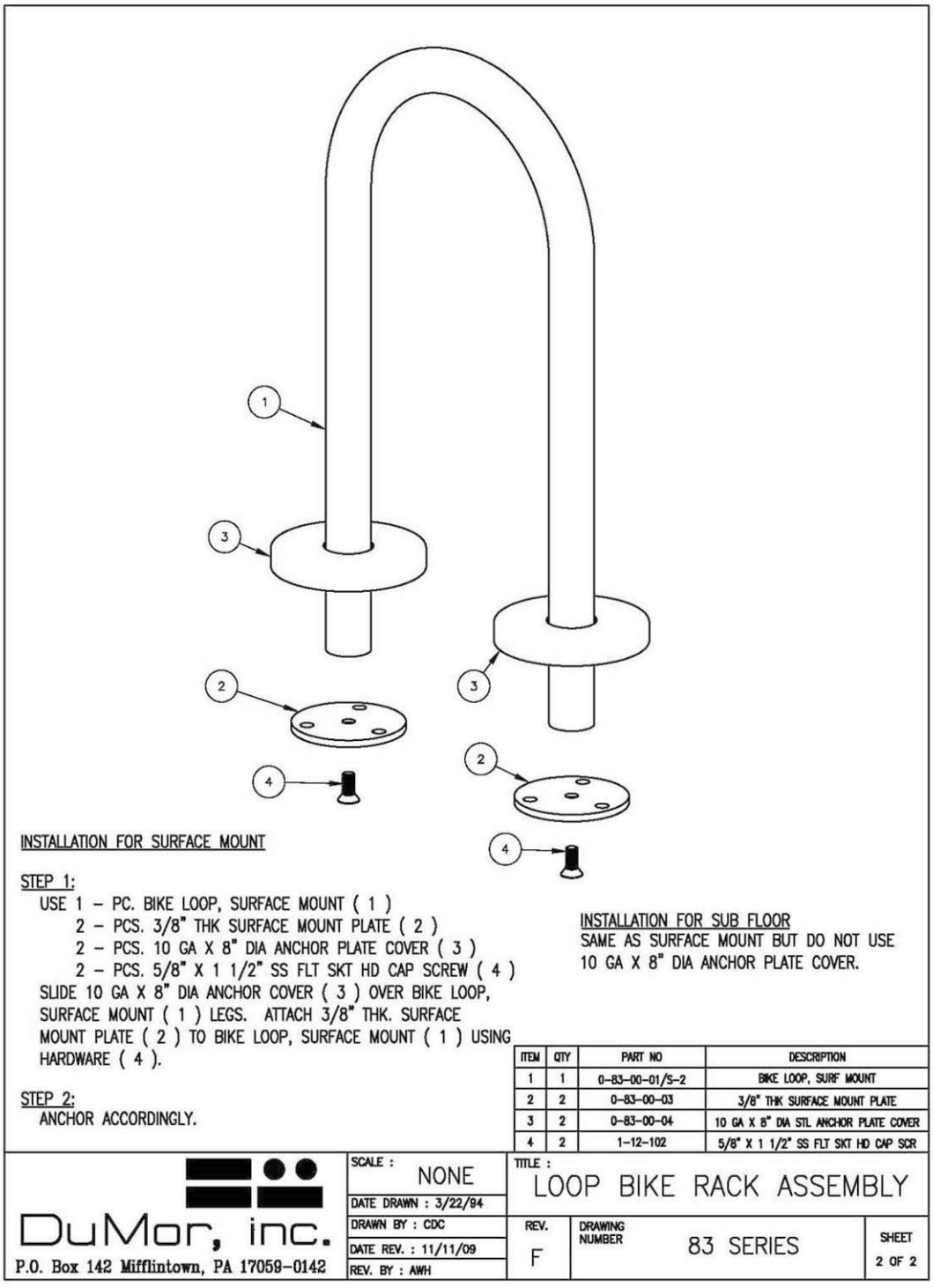


FIGURE 7.2.1D **SITE FURNISHINGS**
Bike Rack – Dumor 83 Series (continued)

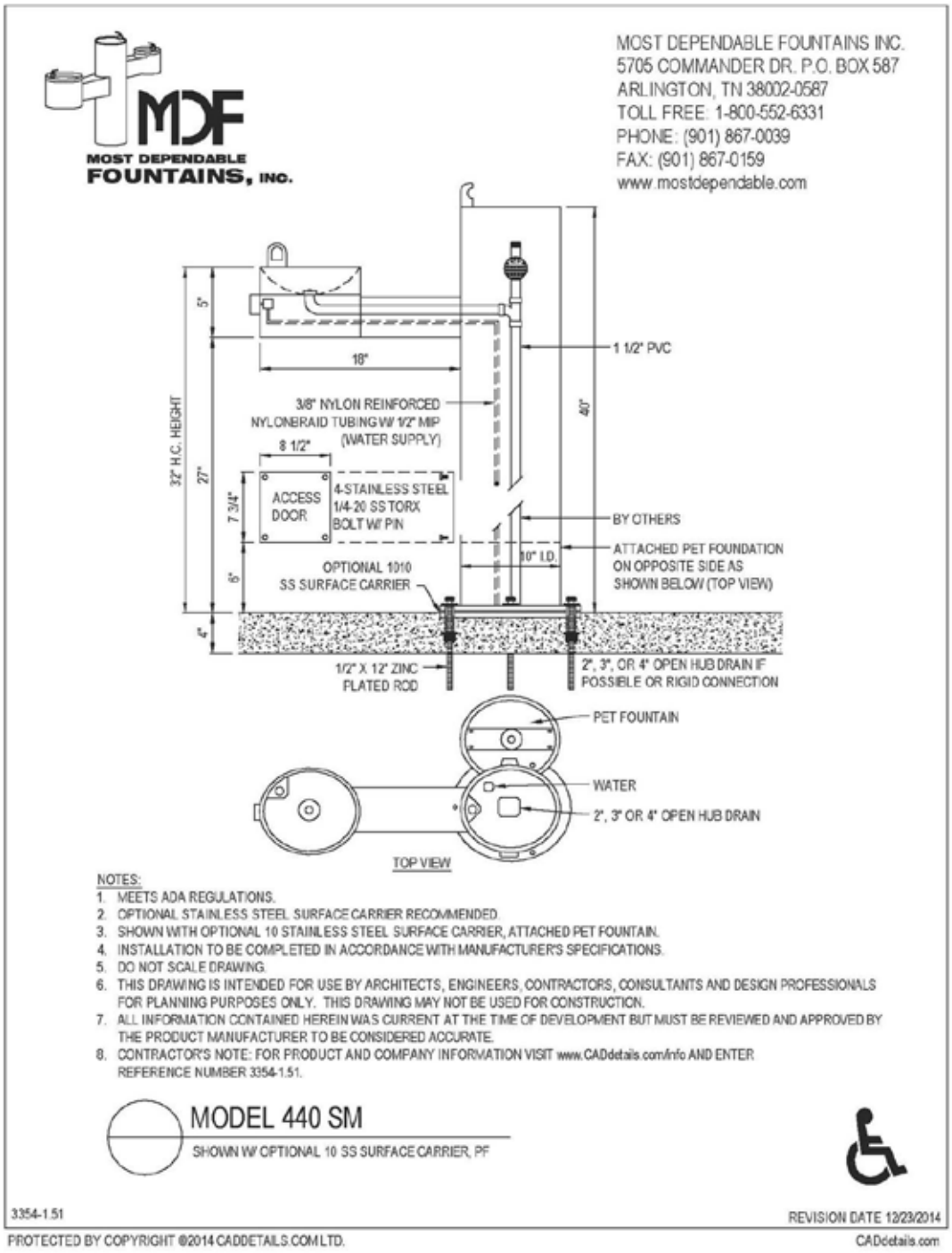


FIGURE 7.2.1E **SITE FURNISHINGS**
Drinking Fountain – Most Dependable Fountain 440 SM

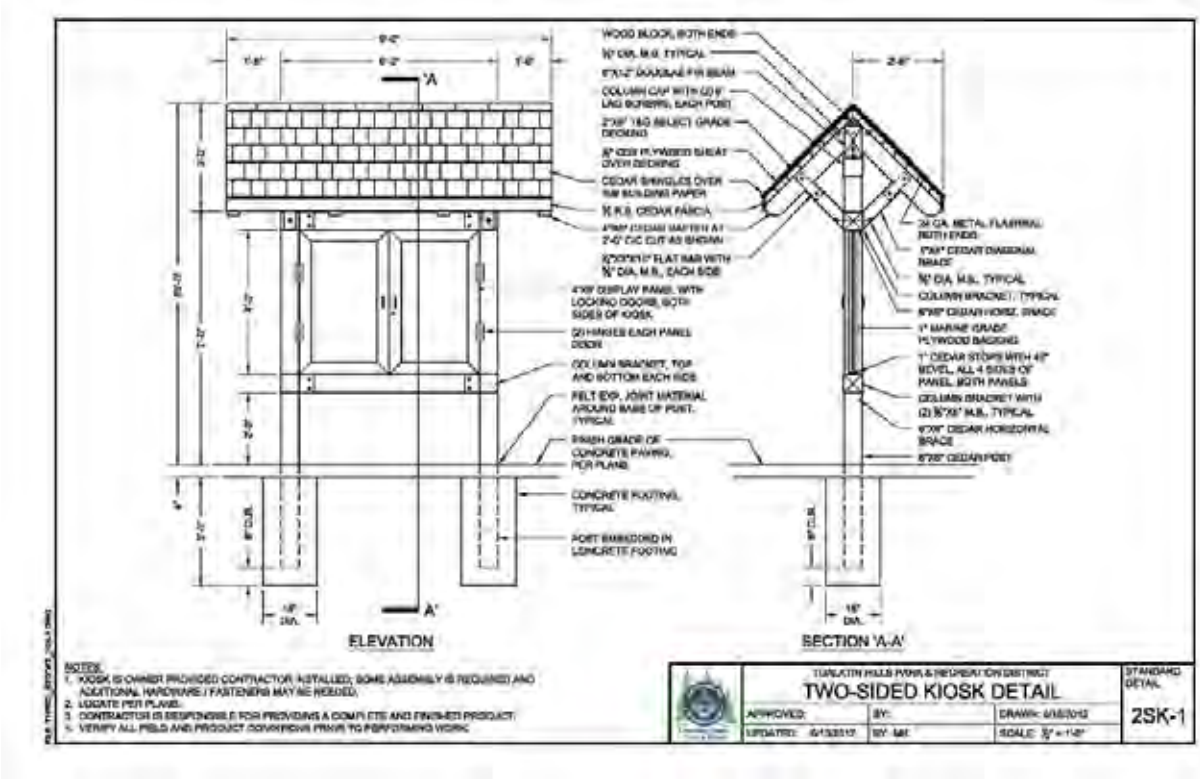


FIGURE 7.2.1F **SITE FURNISHINGS**
Kiosk – THPRD standard

7.2.2 Bollards

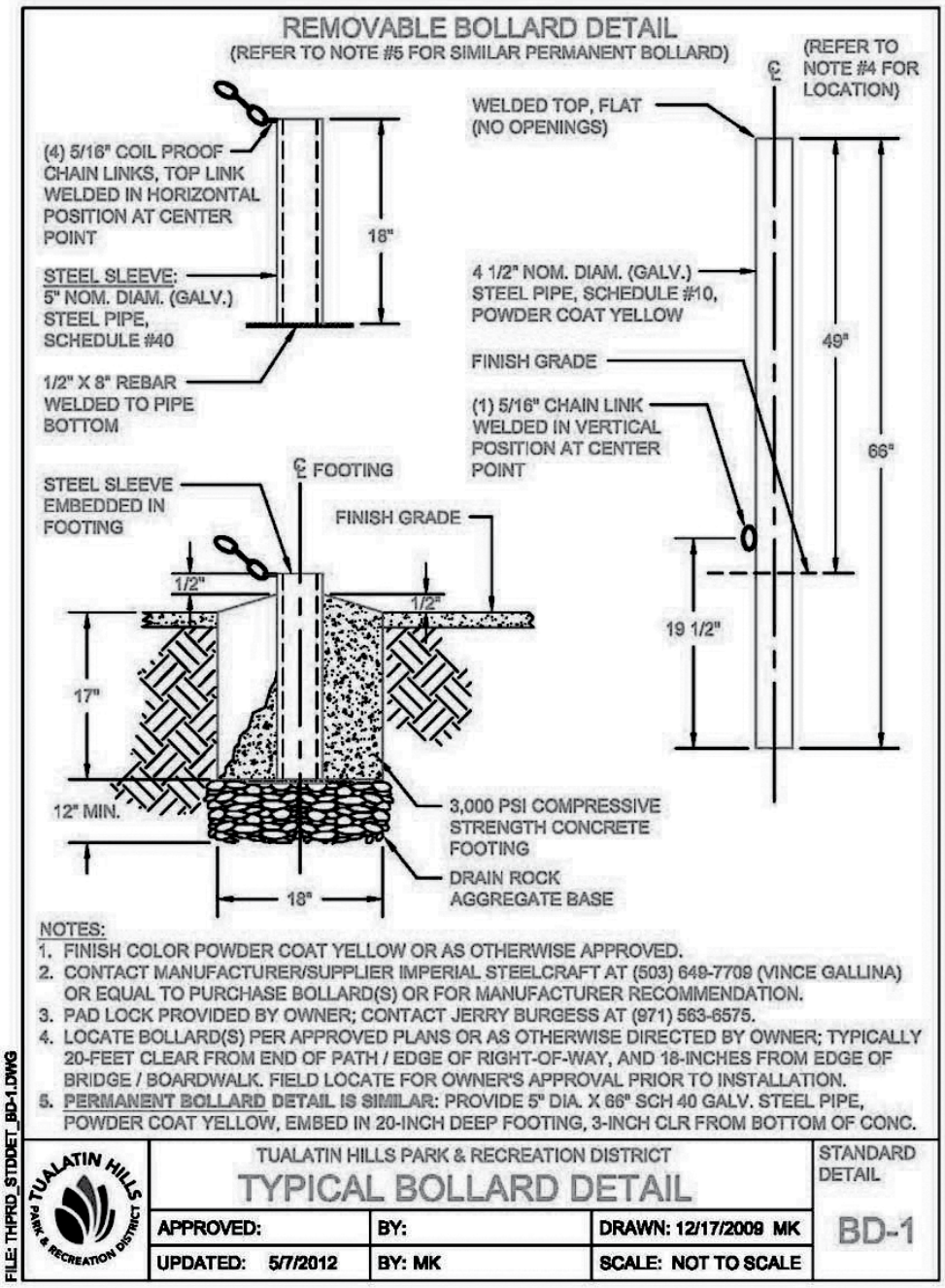


FIGURE 7.2.2 **BOLLARDS**
Permanent and Removable Bollard – THPRD standard

7.2.3 Signage

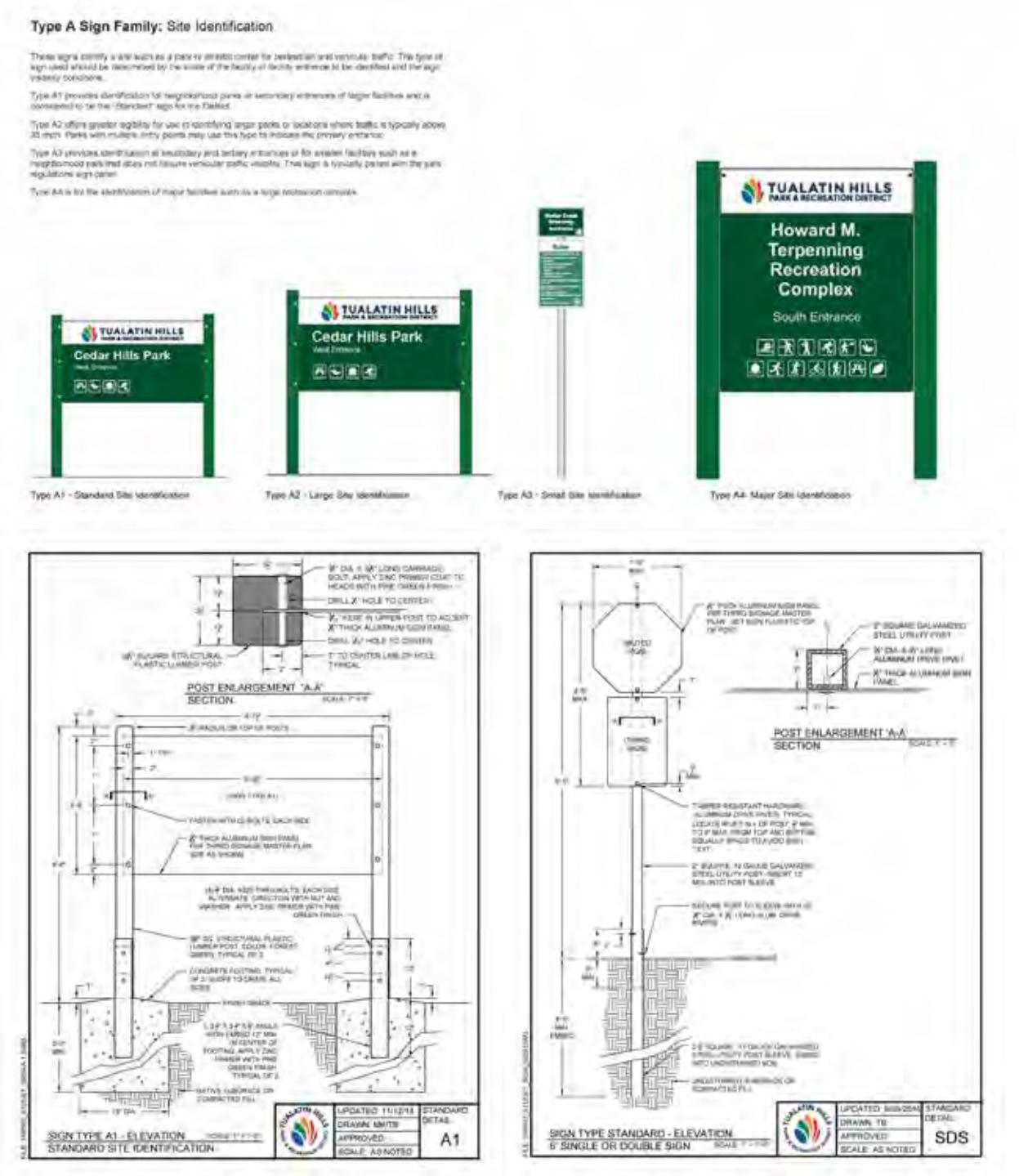


FIGURE 7.2.3A **SIGNAGE**
Type A Sign Family – Site Identification

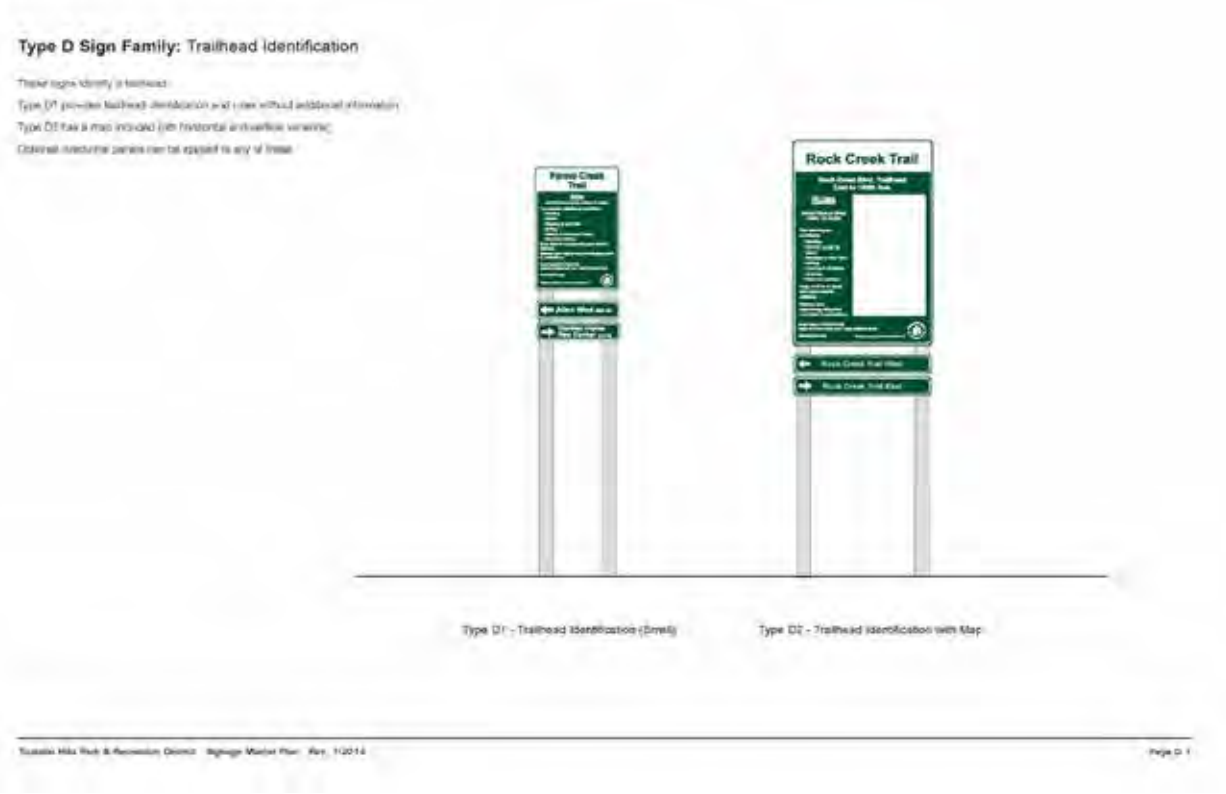
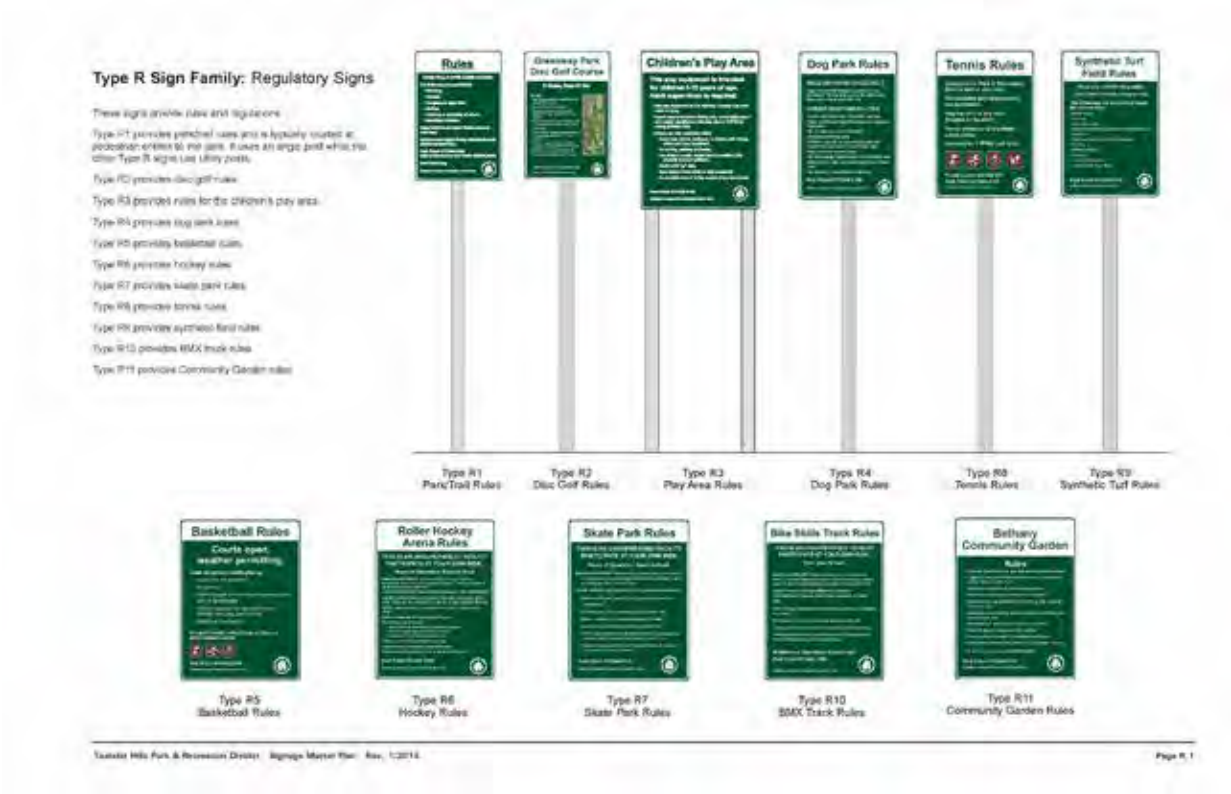


FIGURE 7.2.3D **SIGNAGE**
Type D Sign Family – Trailhead Identification



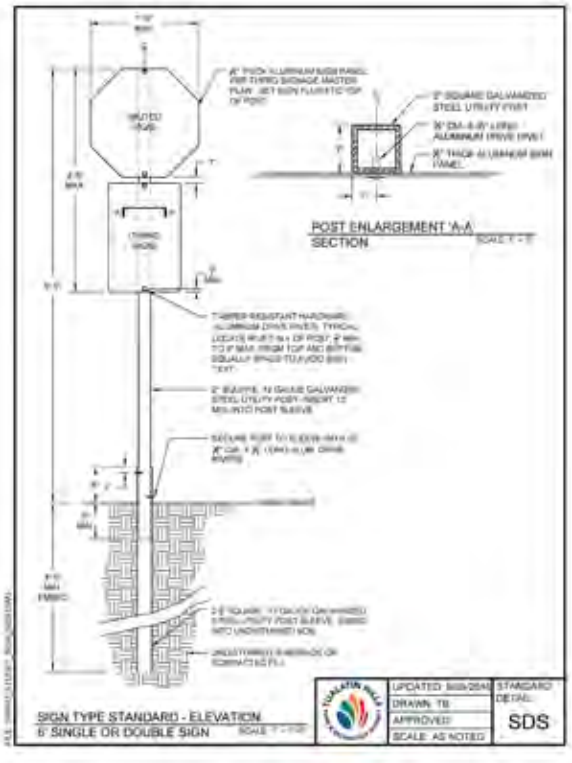
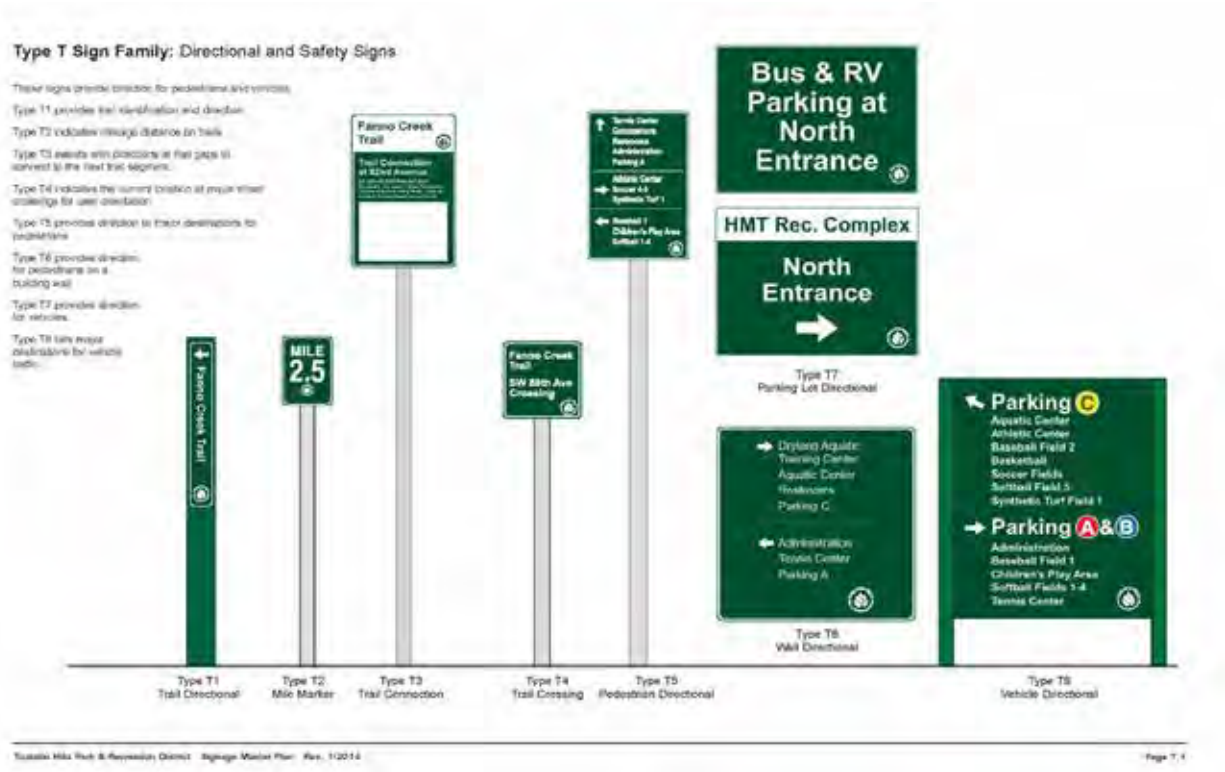


FIGURE 7.2.3R **SIGNAGE**
Type R Sign Family – Regulatory



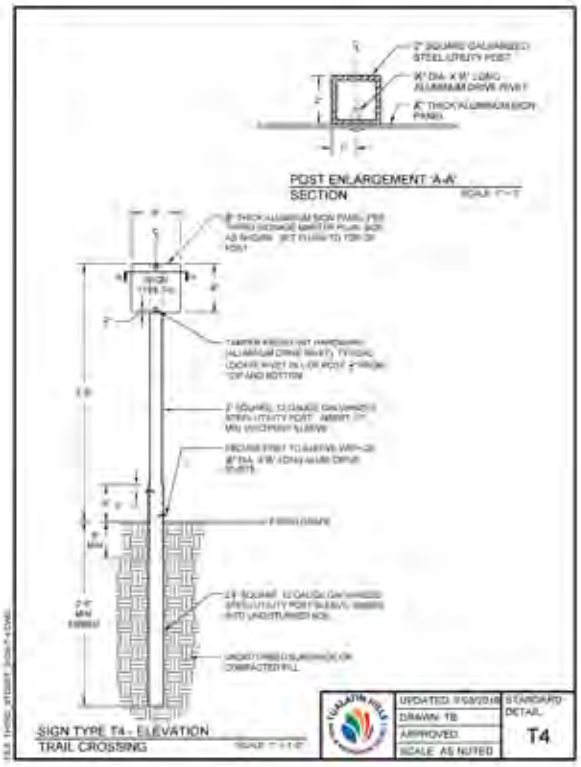


FIGURE 7.2.3T **SIGNAGE**
Type T Sign Family – Directional and Safety

7.2.4 FENCING

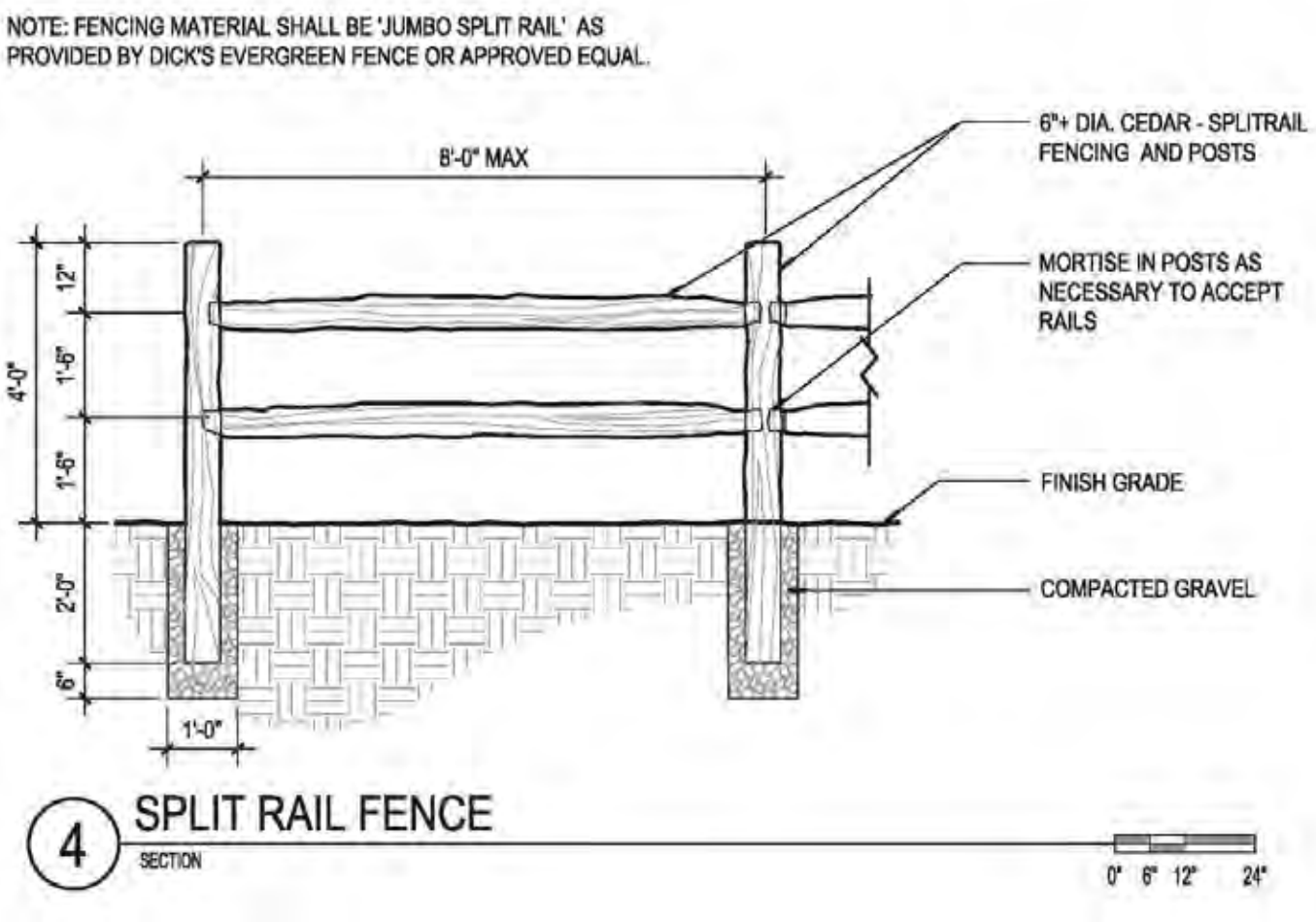


FIGURE 7.2.4 **FENCING**
Split-rail fence

7.3 TRAIL COUNTS 2010–2015

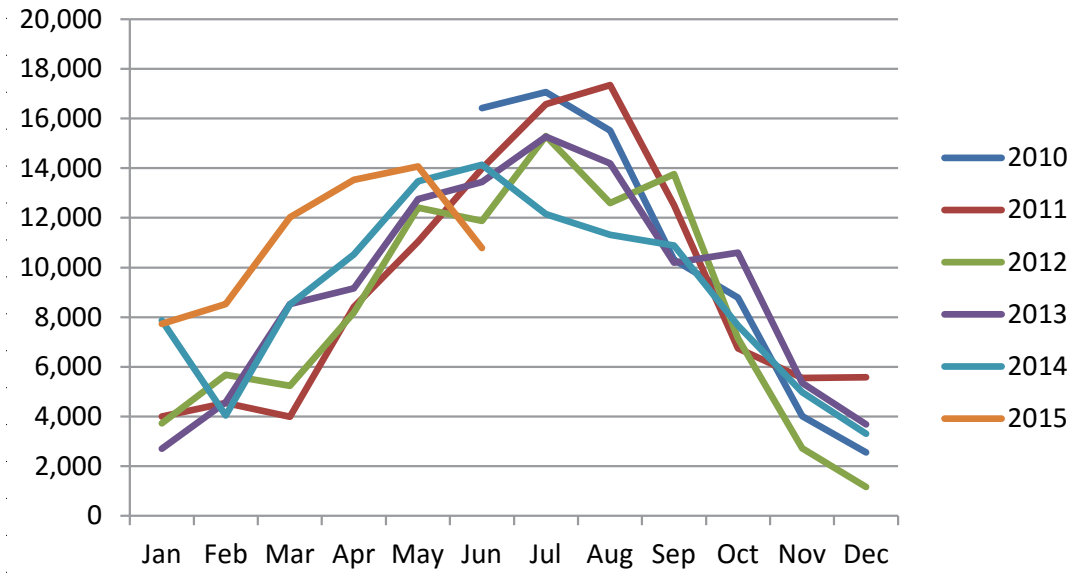


FIGURE 7.3.1A **TRAIL COUNTS 2010-2015**
Fanno Creek Regional Trail at SW Scholls Ferry Road

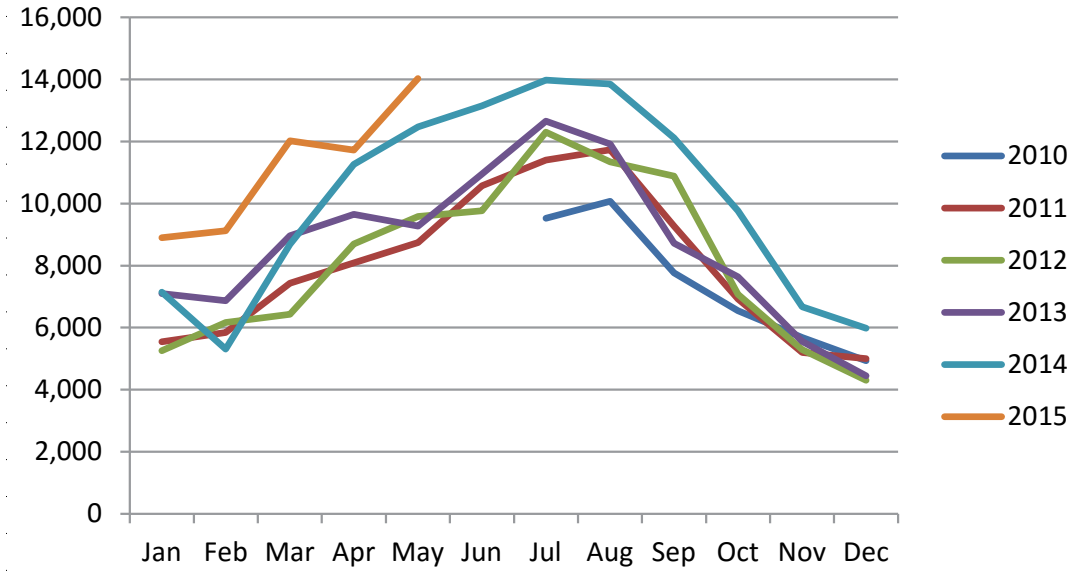


FIGURE 7.3.1B **TRAIL COUNTS 2010-2015**
Fanno Creek Regional Trail at SW Hall Boulevard

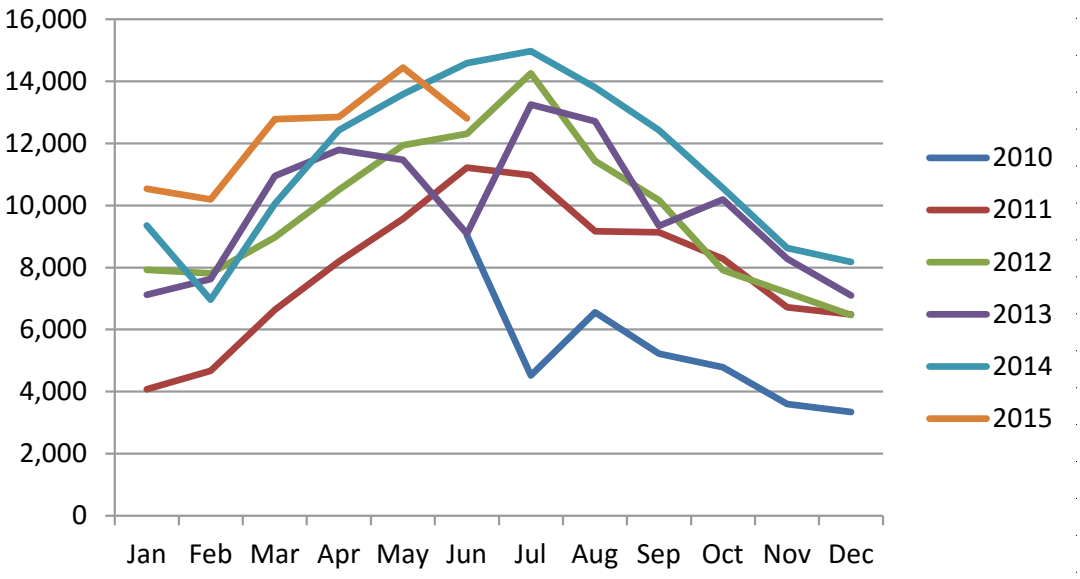


FIGURE 7.3.1C **TRAIL COUNTS 2010-2015**
Fanno Creek Regional Trail at SW 92nd Avenue

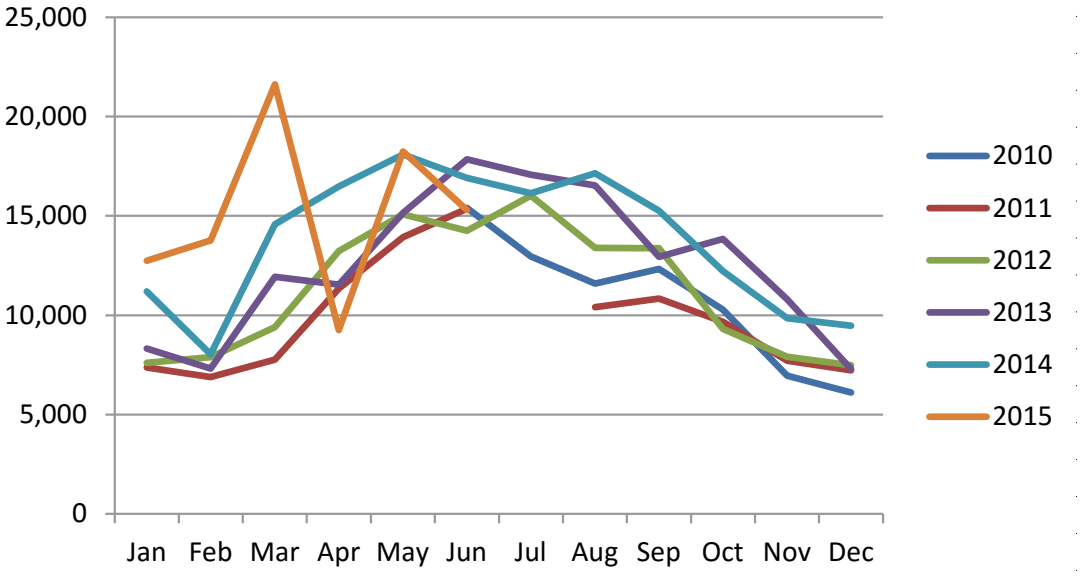


FIGURE 7.3.2 **TRAIL COUNTS 2010-2015**
Rock Creek Regional Trail at Pirate Park/Waterhouse Trail

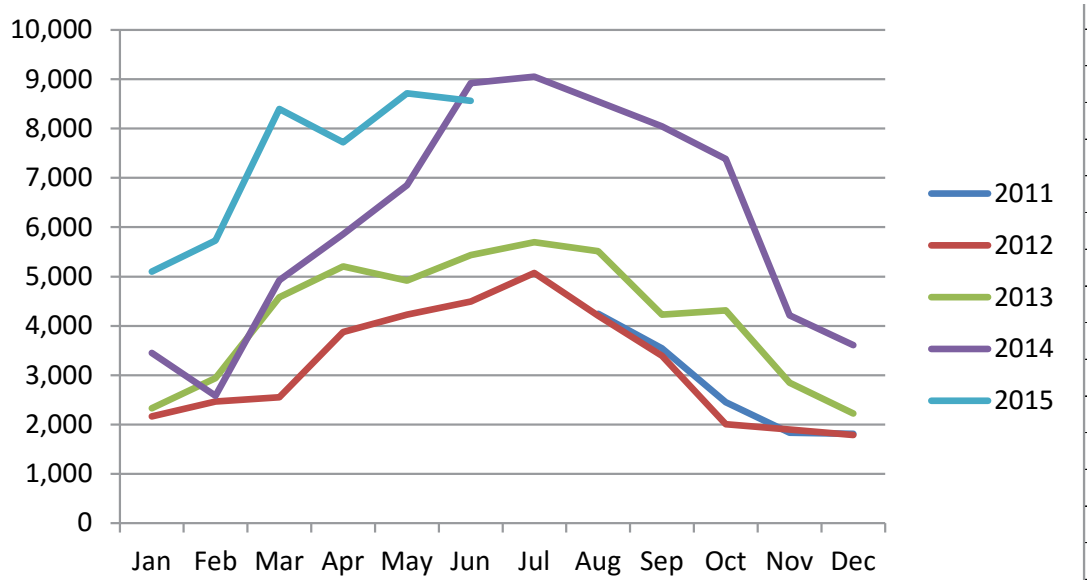


FIGURE 7.3.3A **TRAIL COUNTS 2010-2015**
Waterhouse Community Trail at SW Walker Road (north side)

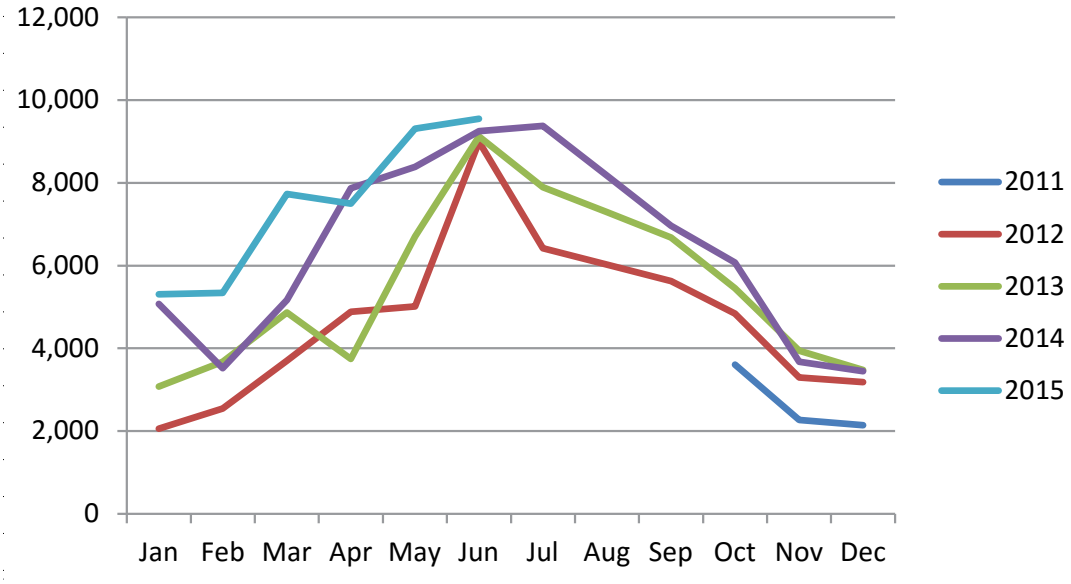


FIGURE 7.3.3B **TRAIL COUNTS 2010-2015**
Waterhouse Community Trail at SW Walker Road (south side)

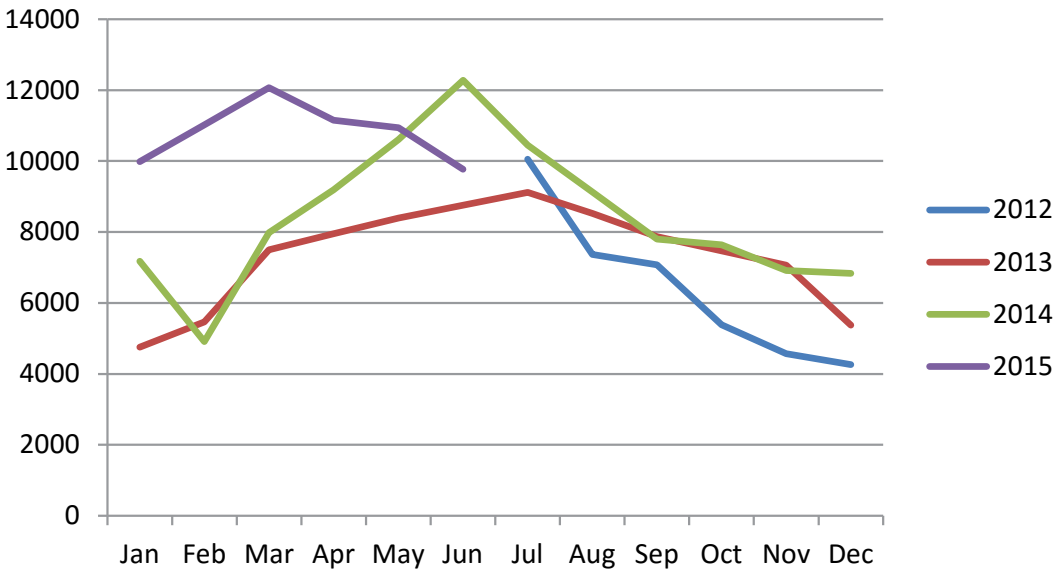


FIGURE 7.3.4A **TRAIL COUNTS 2010-2015**
Westside Regional Trail at SW Village Lane

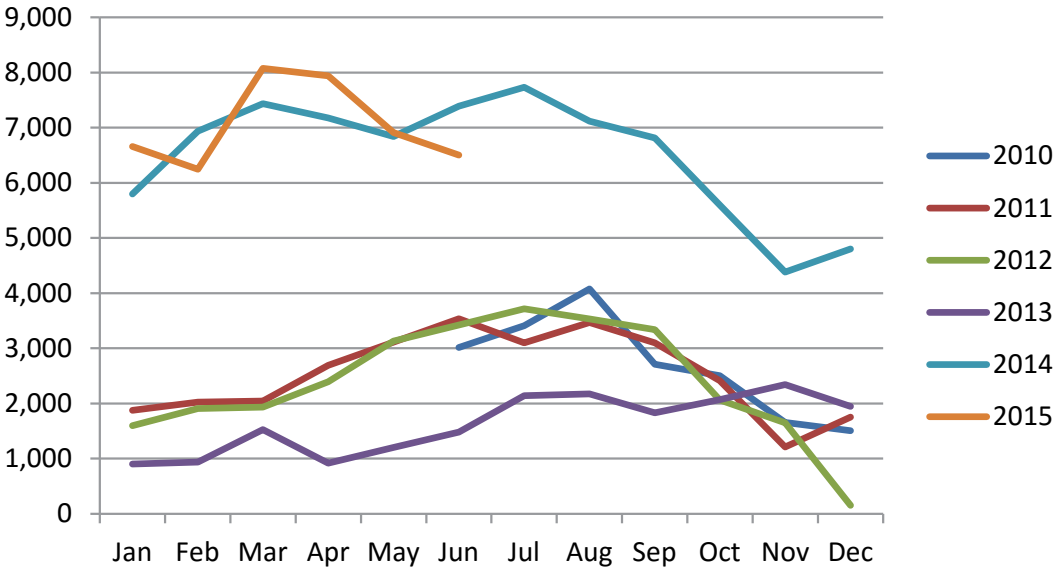
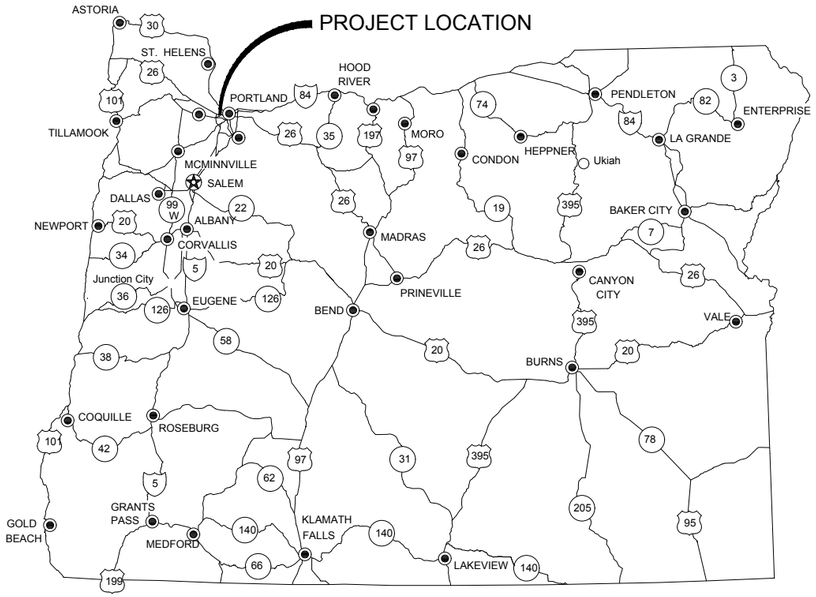


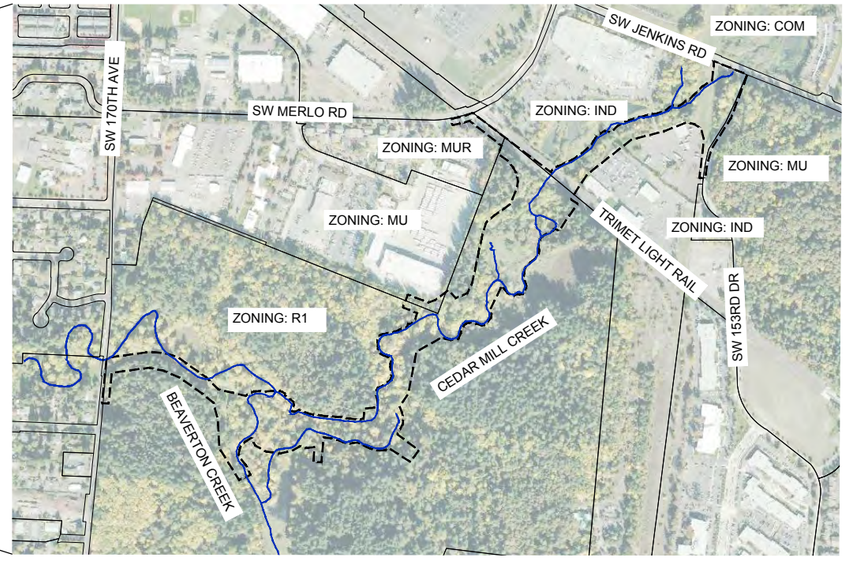
FIGURE 7.3.4B **TRAIL COUNTS 2010-2015**
Westside Regional Trail at Murrayhill Park

Exhibit C

CEDAR MILL AND REGIONAL STORMWATER MANAGEMENT APPROACH

BEAVERTON, OR





REV 60% DESIGN

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION

JANUARY 2020

WOLF WATER RESOURCES

NO.	REVISION	BY	DATE

Clean Water Services
Our commitment is clear.
2550 SW Hillsboro Hwy
Hillsboro, OR 97123
(503) 681-3600
www.cleanwaterservices.org

VICINITY MAP

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	
DRAFTER: BS, AD	
DESIGNER: MW, AD	
CHECKED: MW	
APPROVED: MW	

PROJECT 6882

SHEET L1 OF X

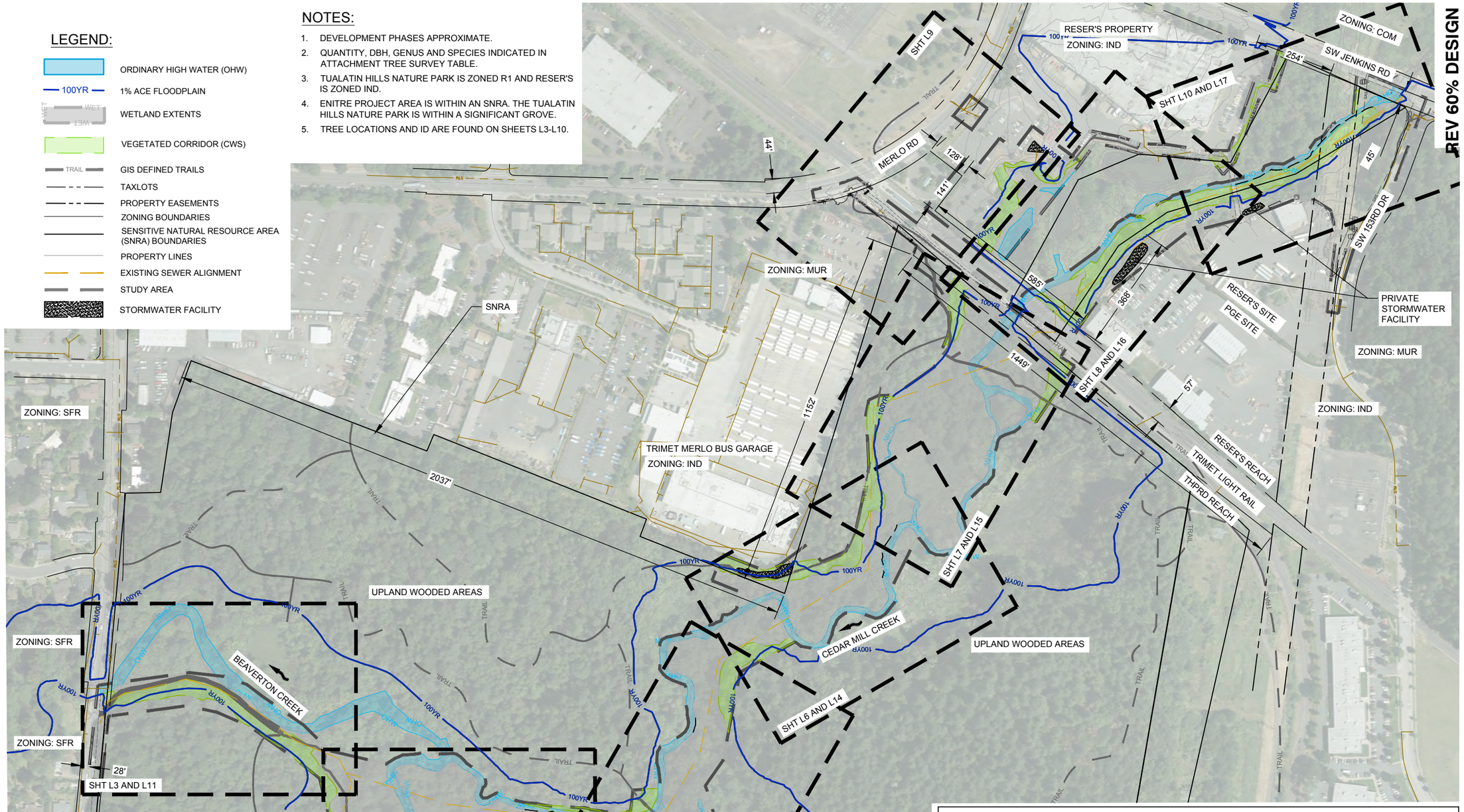
L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\Permitting\Tree\VICINITY MAP.dwg Sheet 1/9/2020 5:58 PM BSCHONER 23.1s (LMS Tech)

LEGEND:

- ORDINARY HIGH WATER (OHW)
- 100YR — 1% ACE FLOODPLAIN
- WETLAND EXTENTS
- VEGETATED CORRIDOR (CWS)
- TRAIL — GIS DEFINED TRAILS
- TAXLOTS
- PROPERTY EASEMENTS
- ZONING BOUNDARIES
- SENSITIVE NATURAL RESOURCE AREA (SNRA) BOUNDARIES
- PROPERTY LINES
- EXISTING SEWER ALIGNMENT
- STUDY AREA
- STORMWATER FACILITY

NOTES:

1. DEVELOPMENT PHASES APPROXIMATE.
2. QUANTITY, DBH, GENUS AND SPECIES INDICATED IN ATTACHMENT TREE SURVEY TABLE.
3. TUALATIN HILLS NATURE PARK IS ZONED R1 AND RESER'S IS ZONED IND.
4. ENITRE PROJECT AREA IS WITHIN AN SNRA. THE TUALATIN HILLS NATURE PARK IS WITHIN A SIGNIFICANT GROVE.
5. TREE LOCATIONS AND ID ARE FOUND ON SHEETS L3-L10.



SCALE
160 0 80 160 320
SCALE FEET

N

PLAN

MITIGATION TABLE

	DECIDUOUS	CONIFEROUS	TOTAL
DBH OF SURVEYED TREES	11788	6920	18708
DBH REMOVAL MAXIMUM ALLOWED	10020	5882	15902
DBH PROPOSED FOR REMOVAL	4774	1427	6201
MITIGATION THRESHOLD	5894	3460	9354

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JANUARY 2020
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OVERVIEW

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L2 OF X

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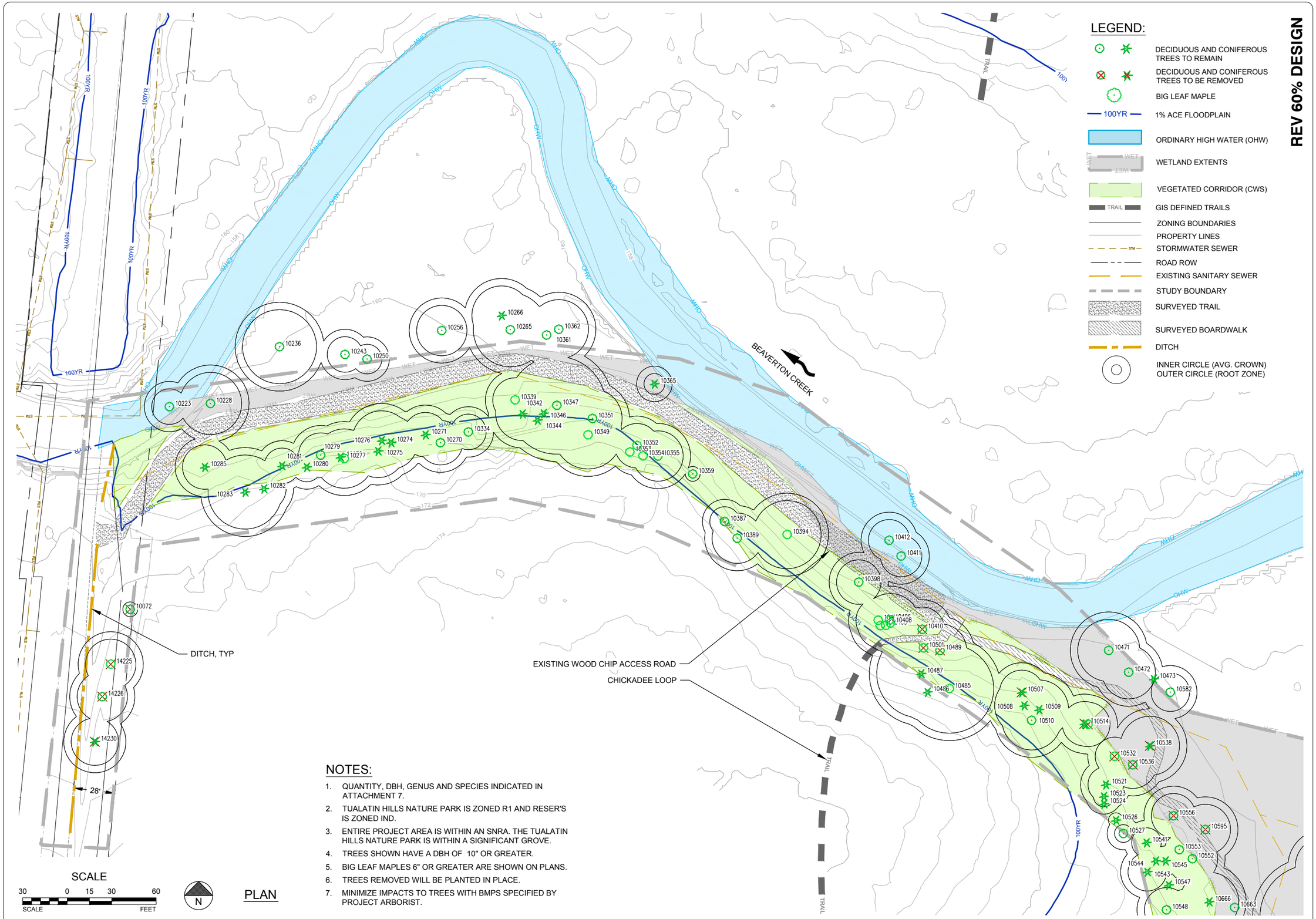

NOTES:

1. QUANTITY, DBH, GENUS AND SPECIES INDICATED IN ATTACHMENT 7.
2. TUALATIN HILLS NATURE PARK IS ZONED R1 AND RESER'S IS ZONED IND.
3. ENTIRE PROJECT AREA IS WITHIN AN SNRA. THE TUALATIN HILLS NATURE PARK IS WITHIN A SIGNIFICANT GROVE.
4. TREES SHOWN HAVE A DBH OF 10" OR GREATER.
5. BIG LEAF MAPLES 6" OR GREATER ARE SHOWN ON PLANS.
6. TREES REMOVED WILL BE PLANTED IN PLACE.
7. MINIMIZE IMPACTS TO TREES WITH BMPS SPECIFIED BY PROJECT ARBORIST.

REV 60% DESIGN

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION

JANUARY 2020

WOLF WATER RESOURCES

NO.	REVISION	BY	DATE

Clean Water Services
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Hillsboro, OR 97123
(503) 681-3600
www.cleanwaterservices.org

EXISTING CONDITIONS PLAN 1

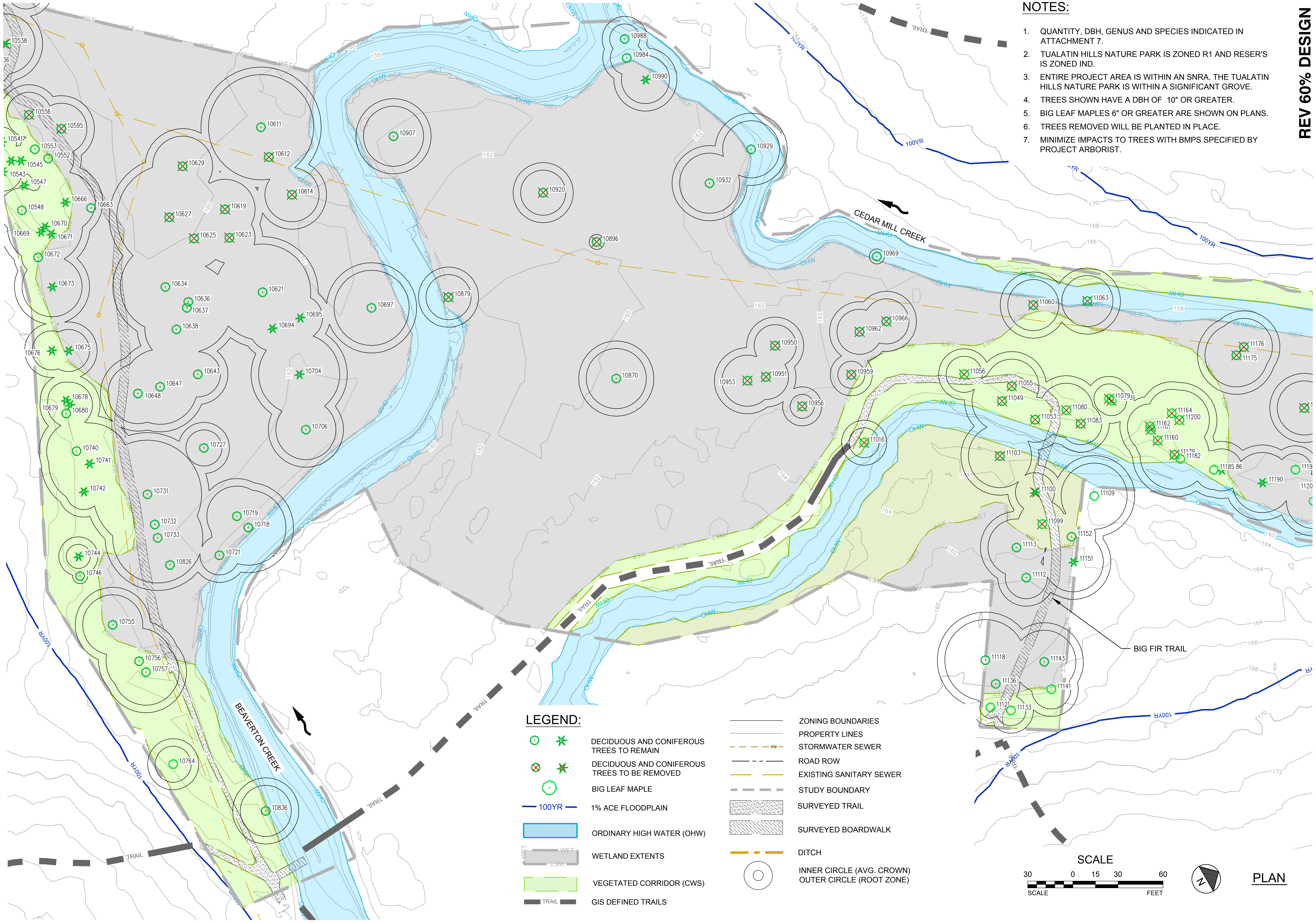
CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	
DRAFTER: BS, AD	
DESIGNER: MW, AD	
CHECKED: MW	
APPROVED: MW	

PROJECT 6882
SHEET L3 OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\Permitting\Tree\TREE_EXCOND.dwg TREE1 1/14/2020 11:26 AM BSCHONER 23.1s (LMS Tech)

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\Permitting\Tree\TREE_EXCOND.dwg TREE2 1/14/2020 11:26 AM BSCHONER 23.1s (LMS Tech)



NOTES:

1. QUANTITY, DBH, GENUS AND SPECIES INDICATED IN ATTACHMENT 7.
2. TUALATIN HILLS NATURE PARK IS ZONED R1 AND RESER'S IS ZONED IND.
3. ENTIRE PROJECT AREA IS WITHIN AN SNRA. THE TUALATIN HILLS NATURE PARK IS WITHIN A SIGNIFICANT GROVE.
4. TREES SHOWN HAVE A DBH OF 10" OR GREATER.
5. BIG LEAF MAPLES 6" OR GREATER ARE SHOWN ON PLANS.
6. TREES REMOVED WILL BE PLANTED IN PLACE.
7. MINIMIZE IMPACTS TO TREES WITH BMPS SPECIFIED BY PROJECT ARBORIST.

LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
- BIG LEAF MAPLE
- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
- WETLAND EXTENTS
- VEGETATED CORRIDOR (CWS)
- TRAIL — GIS DEFINED TRAILS
- ZONING BOUNDARIES
- PROPERTY LINES
- STORMWATER SEWER
- ROAD ROW
- EXISTING SANITARY SEWER
- STUDY BOUNDARY
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- DITCH
- INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)

SCALE

30 0 15 30 60

SCALE FEET

PLAN

REV 60% DESIGN

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION
JANUARY 2020
WOLF WATER RESOURCES

NO.	REVISION	BY	DATE

Clean Water Services
Our commitment is clear.
2550 SW Hillsboro Hwy
Hillsboro, OR 97123
(503) 681-3600
www.cleanwaterservices.org

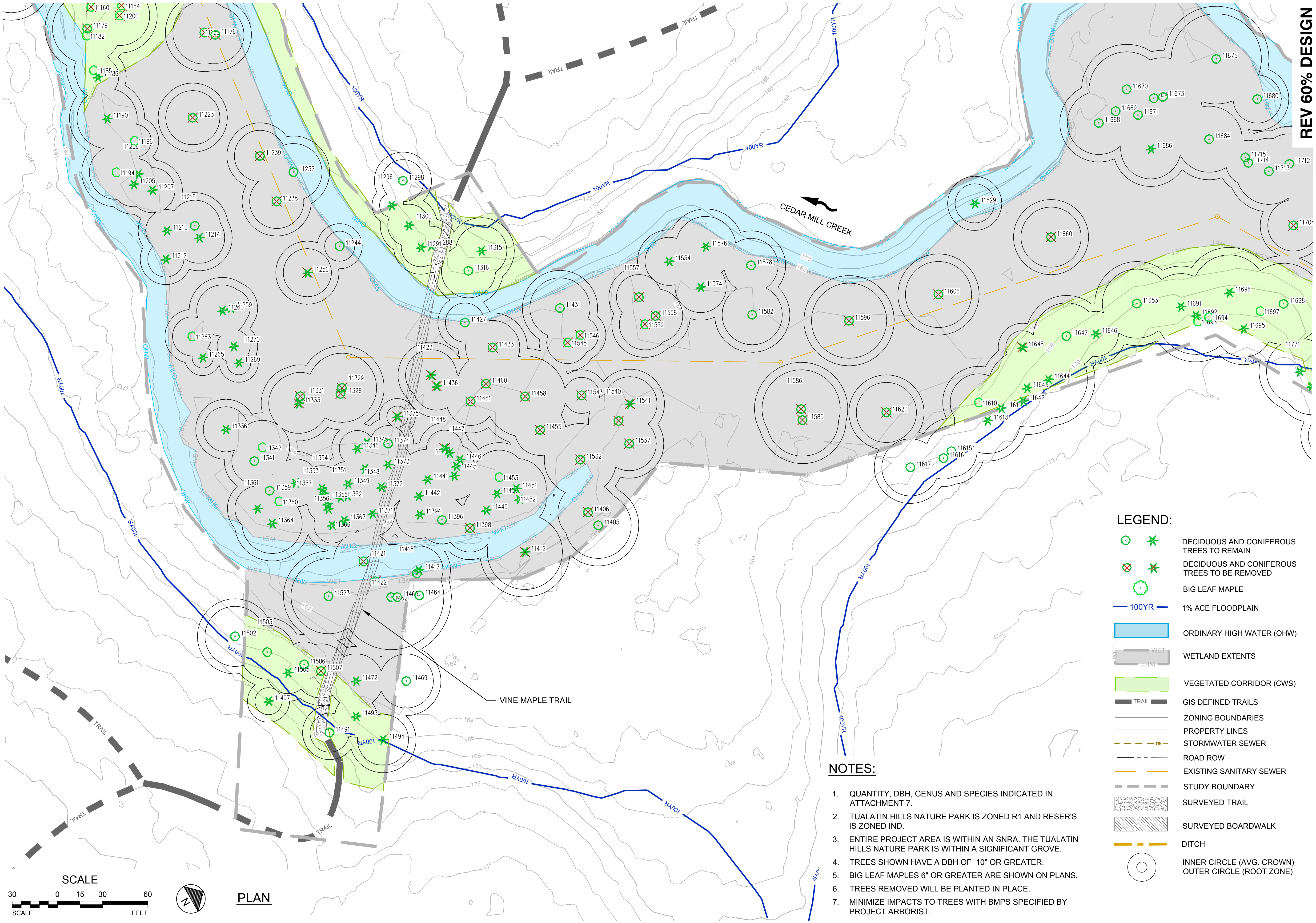
EXISTING CONDITIONS PLAN 2

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION
DRAFTER: BS, AD
DESIGNER: MW, AD
CHECKED: MW
APPROVED: MW

PROJECT 6882
SHEET L4 OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\Permitting\Tree\TREE_EXCOND.dwg TREE3 1/14/2020 11:26 AM BSCHONER 23.1s (LMS Tech)



LEGEND:

	DECIDUOUS AND CONIFEROUS TREES TO REMAIN
	DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
	BIG LEAF MAPLE
100YR	1% ACE FLOODPLAIN
	ORDINARY HIGH WATER (OHW)
WET	WETLAND EXTENTS
	VEGETATED CORRIDOR (CWS)
TRAIL	GIS DEFINED TRAILS
	ZONING BOUNDARIES
	PROPERTY LINES
	STORMWATER SEWER
	ROAD ROW
	EXISTING SANITARY SEWER
	STUDY BOUNDARY
	SURVEYED TRAIL
	SURVEYED BOARDWALK
	DITCH
	INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)

NOTES:

1. QUANTITY, DBH, GENUS AND SPECIES INDICATED IN ATTACHMENT 7.
2. TUALATIN HILLS NATURE PARK IS ZONED R1 AND RESER'S IS ZONED IND.
3. ENTIRE PROJECT AREA IS WITHIN AN SNRA. THE TUALATIN HILLS NATURE PARK IS WITHIN A SIGNIFICANT GROVE.
4. TREES SHOWN HAVE A DBH OF 10" OR GREATER.
5. BIG LEAF MAPLES 6" OR GREATER ARE SHOWN ON PLANS.
6. TREES REMOVED WILL BE PLANTED IN PLACE.
7. MINIMIZE IMPACTS TO TREES WITH BMPS SPECIFIED BY PROJECT ARBORIST.

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JANUARY 2020
WOLF WATER RESOURCES

NO.	REVISION	BY	DATE

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EXISTING CONDITIONS PLAN 3

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION
DRAFTER: BS, AD
DESIGNER: MW, AD
CHECKED: MW
APPROVED: MW

PROJECT 6882
SHEET L5 OF X

TRIMET MERLO BUS GARAGE
ZONING: IND

STORMWATER OUTFALL

DITCH, TYP

CEDAR MILL CREEK

NOTES:

1. QUANTITY, DBH, GENUS AND SPECIES INDICATED IN ATTACHMENT 7.
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LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
- BIG LEAF MAPLE
- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
- WETLAND EXTENTS
- VEGETATED CORRIDOR (CWS)
- TRAIL — GIS DEFINED TRAILS
- ZONING BOUNDARIES
- PROPERTY LINES
- STM — STORMWATER SEWER
- ROAD ROW
- EXISTING SANITARY SEWER
- STUDY BOUNDARY
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- STORMWATER FACILITY
- DITCH
- INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)

SCALE
30 0 15 30 60
SCALE FEET

PLAN

REV 60% DESIGN

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WOLF WATER RESOURCES

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EXISTING CONDITIONS PLAN 4

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882 | SHEET L6 | OF X

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LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
- BIG LEAF MAPLE
- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
- WETLAND EXTENTS
- VEGETATED CORRIDOR (CWS)
- TRAIL — GIS DEFINED TRAILS
- ZONING BOUNDARIES
- PROPERTY LINES
- STM — STORMWATER SEWER
- ROAD ROW
- EXISTING SANITARY SEWER
- STUDY BOUNDARY
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)

NOTES:

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6. TREES REMOVED WILL BE PLANTED IN PLACE.
7. MINIMIZE IMPACTS TO TREES WITH BMPS SPECIFIED BY PROJECT ARBORIST.

ZONING: IND

ZONING: MUR

OAK TRAIL

CEDAR MILL CREEK

SCALE

30 0 15 30 60

SCALE FEET

PLAN

REV 60% DESIGN

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION

JANUARY 2020

WOLF WATER RESOURCES

NO.	REVISION	BY	DATE

Clean Water Services
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EXISTING CONDITIONS PLAN 5

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882

SHEET L7 OF X

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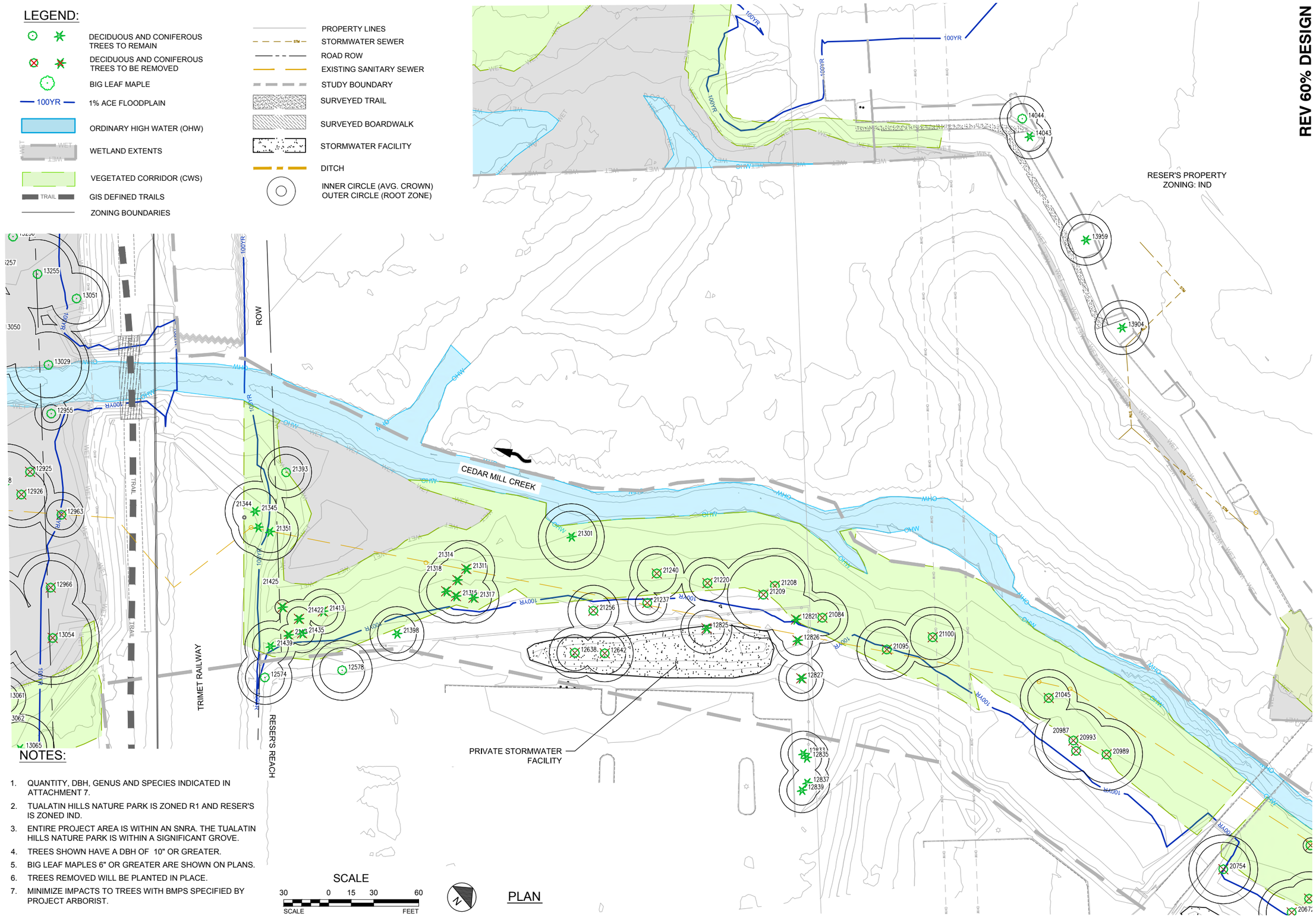
LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
- BIG LEAF MAPLE
- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
- WETLAND EXTENTS
- VEGETATED CORRIDOR (CWS)
- TRAIL — GIS DEFINED TRAILS
- ZONING BOUNDARIES
- PROPERTY LINES
- STORMWATER SEWER
- ROAD ROW
- EXISTING SANITARY SEWER
- STUDY BOUNDARY
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- STORMWATER FACILITY
- DITCH
- INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)



NOTES:

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SCALE
30 0 15 30 60
SCALE FEET

PLAN

REV 60% DESIGN

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WOLF WATER RESOURCES

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EXISTING CONDITIONS PLAN 6

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L8 OF X

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NOTES:

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LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
- BIG LEAF MAPLE
- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
- WETLAND EXTENTS
- VEGETATED CORRIDOR (CWS)
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- ZONING BOUNDARIES
- PROPERTY LINES
- STM — STORMWATER SEWER
- ROAD ROW
- EXISTING SANITARY SEWER
- STUDY BOUNDARY
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- STORMWATER FACILITY
- DITCH
- INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)

MERLO RD

ZONING: IND

SCALE
30 0 15 30 60
SCALE FEET

PLAN

REV 60% DESIGN

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WOLF WATER RESOURCES

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EXISTING CONDITIONS PLAN 7

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	
DRAFTER: BS, AD	
DESIGNER: MW, AD	
CHECKED: MW	
APPROVED: MW	

PROJECT 6882
SHEET L9 OF X

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LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
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- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
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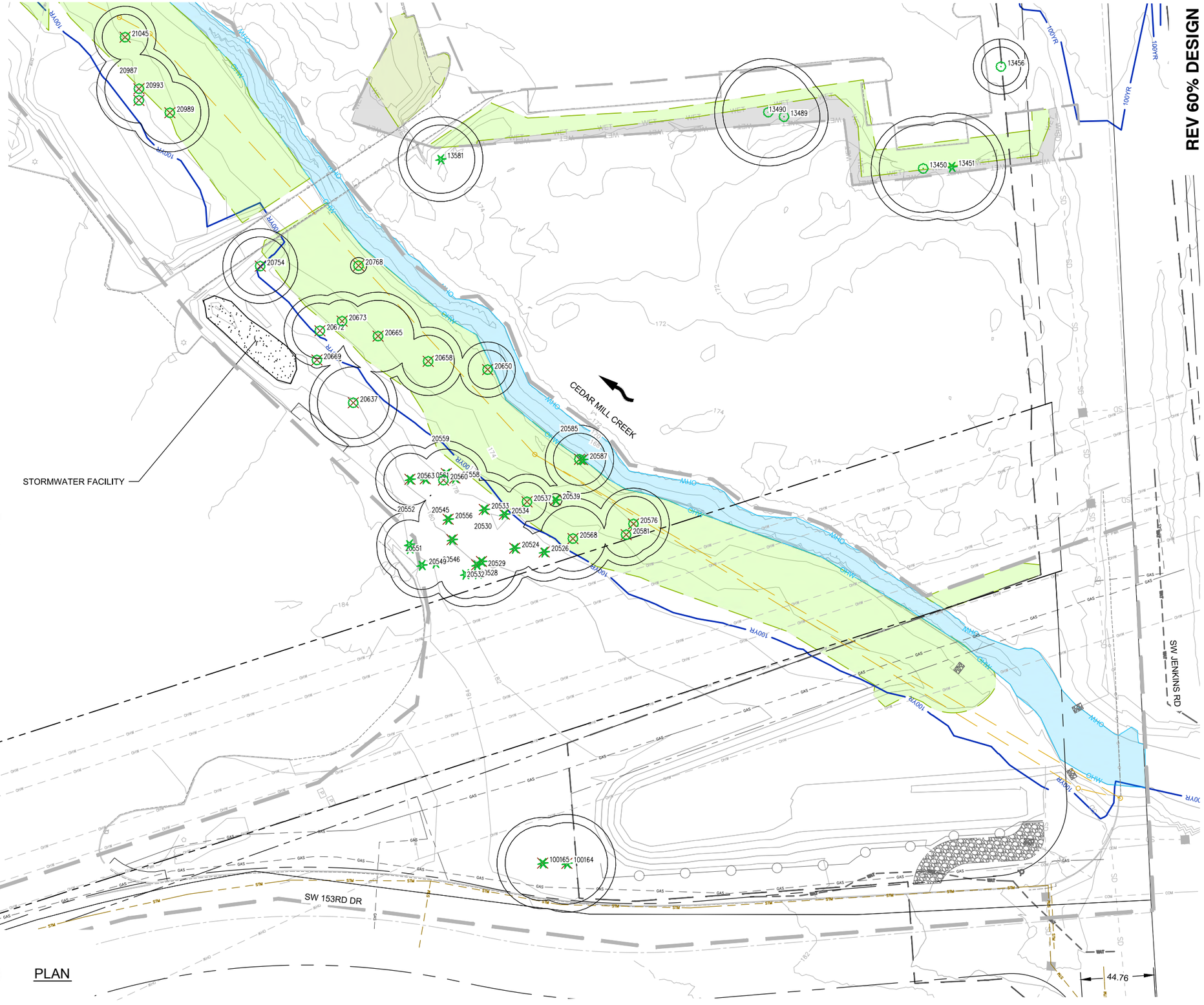
6. TREES REMOVED WILL BE PLANTED IN PLACE.
7. MINIMIZE IMPACTS TO TREES WITH BMPS SPECIFIED BY PROJECT ARBORIST.



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JANUARY 2020

WOLF WATER RESOURCES

NO.	REVISION	BY	DATE

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EXISTING CONDITIONS PLAN 8

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882 | SHEET L10 | OF X

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REV 60% DESIGN

LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
- BIG LEAF MAPLE
- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
- WETLAND EXTENTS
- VEGETATED CORRIDOR (CWS)
- TRAIL — GIS DEFINED TRAILS
- ZONING BOUNDARIES
- PROPERTY LINES
- STM — STORMWATER SEWER
- ROAD ROW
- EXISTING SANITARY SEWER
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- DITCH
- INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)

BEAVERTON CREEK

SITE ACCESS ENTRANCE

TEMP CONSTRUCTION PULL OFF

EX DITCH, TYP
TO BE RELOCATED EAST OF PULL OFF

CHICKADEE LOOP,
REMOVE BOARDWALK

PROPOSED BOARDWALK

SITE ACCESS

SCALE

30 0 15 30 60

SCALE FEET

N

PLAN

NOTES:

1. QUANTITY, DBH, GENUS AND SPECIES INDICATED ON ATTACHMENT 7.
2. TREES SHOWN ON PLAN ARE 10" OR GREATER.
3. BIG LEAF MAPLES 6" OR GREATER SHOWN ON PLAN.
4. EROSION CONTROL MEASURES INCLUDE STRAW WATTLE AND SILT FENCES AS APPROPRIATE IN GRADING AREAS.
5. SIDE CHANNELS SHALL BE FIELD FIT TO AVOID TREES.
6. CONSTRUCTION TO BEGIN 2020 AT SW 170TH AND CONTINUE THROUGH 2021. ADDITIONAL PLANTING MAY OCCUR IN 2022.

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION

JANUARY 2020

WOLF WATER RESOURCES

NO.	REVISION	BY	DATE

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DIMESIONED SITE PLAN 1

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882

SHEET L11 OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\Permitting\Tree\TREE_DIM-PLAN.dwg TREE2 1/14/2020 12:37 PM BSCHONER 23.1s (LMS Tech)

NOTES:

1. QUANTITY, DBH, GENUS AND SPECIES INDICATED ON ATTACHMENT 7.
2. TREES SHOWN ON PLAN ARE 10" OR GREATER.
3. BIG LEAF MAPLES 6" OR GREATER SHOWN ON PLAN.
4. EROSION CONTROL MEASURES INCLUDE STRAW WATTLE AND SILT FENCES AS APPROPRIATE IN GRADING AREAS.
5. SIDE CHANNELS SHALL BE FIELD FIT TO AVOID TREES.
6. CONSTRUCTION TO BEGIN 2020 AT SW 170TH AND CONTINUE THROUGH 2021. ADDITIONAL PLANTING MAY OCCUR IN 2022.

REV 60% DESIGN

GRADING LIMITS

SIDE CHANNEL DIVERSION 1

CONSTRUCT TEMPORARY BERM FOR WATER MANAGEMENT

SIDE CHANNEL 1, LEAVE PLUG TO ALLOW FOR WORK IN DRY

SIDE CHANNEL 2, LEAVE PLUG TO ALLOW FOR WORK IN DRY

CEDAR MILL CREEK

BEAVERTON CREEK

BIG FIR TRAIL, REMOVE BOARDWALK

PROPOSED BOARDWALK, 166 LF

488.0'

509.8'

80'

102+62

LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
- BIG LEAF MAPLE
- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
- WETLAND EXTENTS
- VEGETATED CORRIDOR (CWS)
- TRAIL — GIS DEFINED TRAILS
- ZONING BOUNDARIES
- PROPERTY LINES
- STORMWATER SEWER
- ROAD ROW
- EXISTING SANITARY SEWER
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)

SCALE

30 0 15 30 60

SCALE FEET

N

PLAN

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DIMENSIONED SITE PLAN 2

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882

SHEET L12 OF X

REV 60% DESIGN

LEAVE PLUG TO allow FOR WORK IN THE DRY

PROPOSED SANITARY LINE

CEDAR MILL CREEK

287.8'

308.1'

EXISTING SANITARY LINE

GRADING LIMITS

SIDE CHANNEL 3, CONNECTION LENGTH SUBJECT TO CHANGE BASED ON EXISTING CHANNEL MORPHOLOGY

VINE MAPLE TRAIL, REMOVE BOARDWALK

PROPOSED BOARDWALK, 250 LF

SCALE

30 0 15 30 60

SCALE FEET

PLAN

LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
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3. BIG LEAF MAPLES 6" OR GREATER SHOWN ON PLAN.
4. EROSION CONTROL MEASURES INCLUDE STRAW WATTLE AND SILT FENCES AS APPROPRIATE IN GRADING AREAS.
5. SIDE CHANNELS SHALL BE FIELD FIT TO AVOID TREES.
6. CONSTRUCTION TO BEGIN 2020 AT SW 170TH AND CONTINUE THROUGH 2021. ADDITIONAL PLANTING MAY OCCUR IN 2022.

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JANUARY 2020

WOLF WATER RESOURCES

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DIMESNIONED SITE PLAN 3

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882

SHEET L12 OF X

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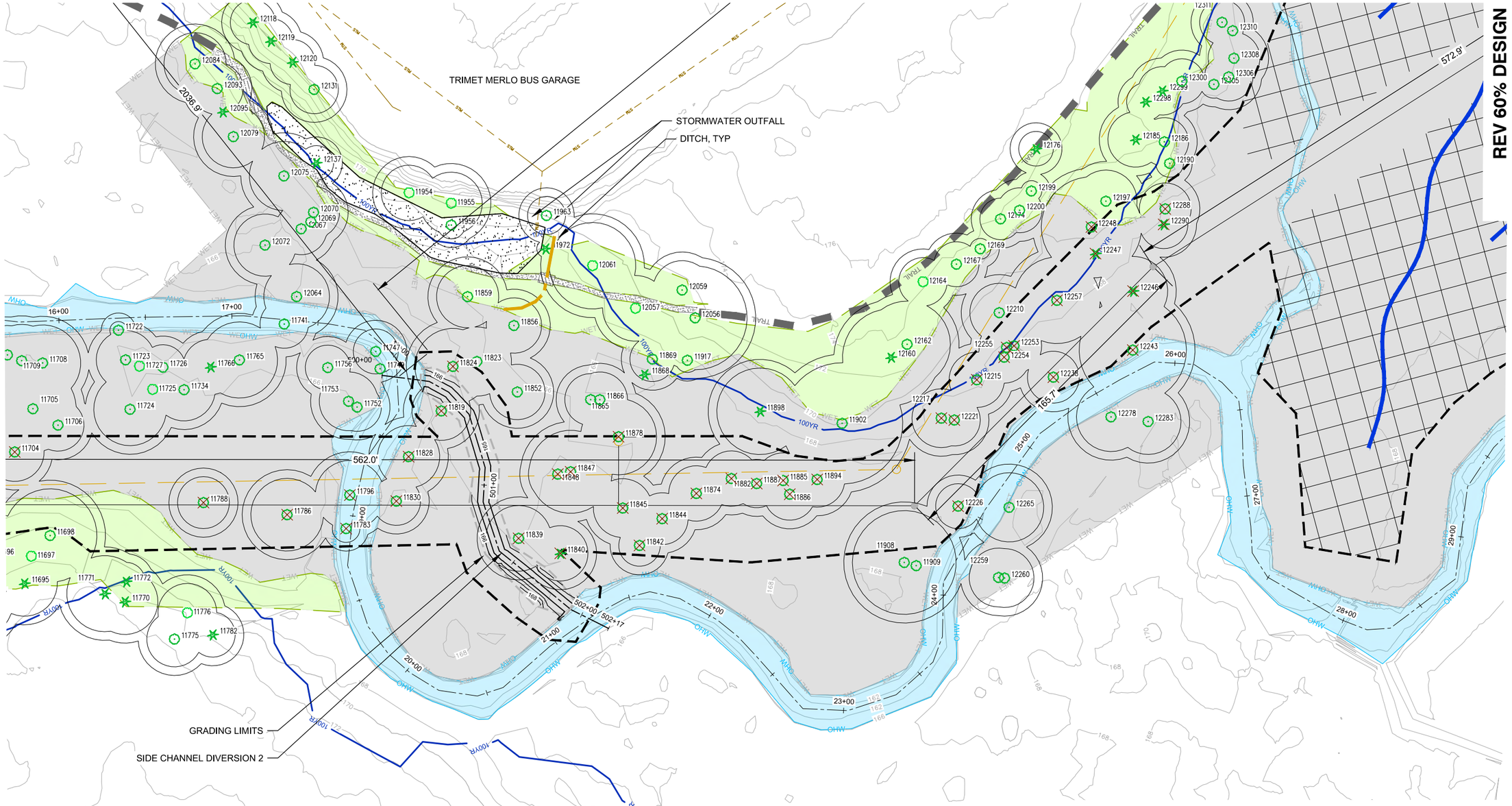

REV 60% DESIGN

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DIMENSIONED SITE PLAN 4

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

NOTES:

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LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
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- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
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- ZONING BOUNDARIES
- PROPERTY LINES
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- SURVEYED TRAIL
- SURVEYED BOARDWALK
- STORMWATER FACILITY
- STAGING AREA
- DITCH
- INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)

SCALE
30 0 15 30 60
SCALE FEET

PLAN

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L14 OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\Permitting\Tree\TREE_DIM-PLAN.dwg TREE4 1/14/2020 12:37 PM BSCHONER 23.1s (LMS Tech)

LEGEND:

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- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
- BIG LEAF MAPLE
- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
- WETLAND EXTENTS
- VEGETATED CORRIDOR (CWS)
- TRAIL — GIS DEFINED TRAILS
- ZONING BOUNDARIES
- PROPERTY LINES
- STORMWATER SEWER
- ROAD ROW
- EXISTING SANITARY SEWER
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- STORMWATER FACILITY
- STAGING AREA
- DITCH
- INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)

NOTES:

1. QUANTITY, DBH, GENUS AND SPECIES INDICATED ON ATTACHMENT 7.
2. TREES SHOWN ON PLAN ARE 10" OR GREATER.
3. BIG LEAF MAPLES 6" OR GREATER SHOWN ON PLAN.
4. EROSION CONTROL MEASURES INCLUDE STRAW WATTLE AND SILT FENCES AS APPROPRIATE IN GRADING AREAS.
5. SIDE CHANNELS SHALL BE FIELD FIT TO AVOID TREES.
6. CONSTRUCTION TO BEGIN 2020 AT SW 170TH AND CONTINUE THROUGH 2021. ADDITIONAL PLANTING MAY OCCUR IN 2022.

EXISTING SEWER ALIGNMENT
SITE ACCESS
OAK TRAIL, REMOVE BOARDWALK
SIDE CHANNEL 4
LEAVE PLUG TO ALLOW FOR WORK IN THE DRY

PROPOSED BOARDWALK, 329 LF

SIDE CHANNEL DIVERSION 3

572.9'

1120.2'

274.01'

FLOODPLAIN SWALES

PROPOSED BOARDWALK WILL REOCCUPY EXISTING FOOTPRINT

BORING PIT FOR TRENCHLESS CROSSING OF TRIMET ROW

SCALE
30 0 15 30 60
SCALE FEET

PLAN

REV 60% DESIGN

PRELIMINARY ONLY
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JANUARY 2020
WOLF WATER RESOURCES

NO.	REVISION	BY	DATE

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DIMENSIONED SITE PLAN 5

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L15 OF X

L:\SharedW2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\Permitting\Tree\TREE_DIM-PLAN.dwg TREE5 1/14/2020 12:37 PM BSCHONER 23.1s (LMS Tech)

LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
- BIG LEAF MAPLE
- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
- WETLAND EXTENTS
- VEGETATED CORRIDOR (CWS)
- TRAIL — GIS DEFINED TRAILS
- ZONING BOUNDARIES
- PROPERTY LINES
- STW — STORMWATER SEWER
- ROAD ROW
- EXISTING SANITARY SEWER
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- STORMWATER FACILITY
- STAGING AREA
- DITCH
- INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)

LANDSCAPED

RESER'S PROPERTY

POND

CONSTRUCTION VEHICLE TURNAROUND

BORING PIT FOR TRENCHLESS CROSSING OF TRIMET ROW

STORMWATER OUTFALL

POND

PRIVATE STORMWATER FACILITY

306.8'

436.5'

367.5'

231.5'

120.2'

RESERS BRIDGE

NOTES:

1. QUANTITY, DBH, GENUS AND SPECIES INDICATED ON ATTACHMENT 7.
2. TREES SHOWN ON PLAN ARE 10" OR GREATER.
3. BIG LEAF MAPLES 6" OR GREATER SHOWN ON PLAN.
4. EROSION CONTROL MEASURES INCLUDE STRAW WATTLE AND SILT FENCES AS APPROPRIATE IN GRADING AREAS.
5. SIDE CHANNELS SHALL BE FIELD FIT TO AVOID TREES.
6. CONSTRUCTION TO BEGIN 2020 AT SW 170TH AND CONTINUE THROUGH 2021. ADDITIONAL PLANTING MAY OCCUR IN 2022.

SCALE

30 0 15 30 60

SCALE FEET

PLAN

REV 60% DESIGN

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JANUARY 2020

WOLF WATER RESOURCES

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DIMENSIONED SITE PLAN 6

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882

SHEET L16 OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\Permitting\Tree\TREE_DIM-PLAN.dwg TREE6 1/14/2020 12:37 PM BSCHONER 23.1s (LMS Tech)

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\Permitting\Tree\TREE_DIM-PLAN.dwg TREE7 1/14/2020 12:37 PM BSCHONER 23.1s (LMS Tech)

LEGEND:

- DECIDUOUS AND CONIFEROUS TREES TO REMAIN
- DECIDUOUS AND CONIFEROUS TREES TO BE REMOVED
- BIG LEAF MAPLE
- 100YR — 1% ACE FLOODPLAIN
- ORDINARY HIGH WATER (OHW)
- WETLAND EXTENTS
- VEGETATED CORRIDOR (CWS)
- TRAIL — GIS DEFINED TRAILS
- ZONING BOUNDARIES
- PROPERTY LINES
- STM — STORMWATER SEWER
- ROAD ROW
- EXISTING SANITARY SEWER
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- STORMWATER FACILITY
- STAGING AREA
- DITCH
- INNER CIRCLE (AVG. CROWN) OUTER CIRCLE (ROOT ZONE)

NOTES:

1. QUANTITY, DBH, GENUS AND SPECIES INDICATED ON ATTACHMENT 7.
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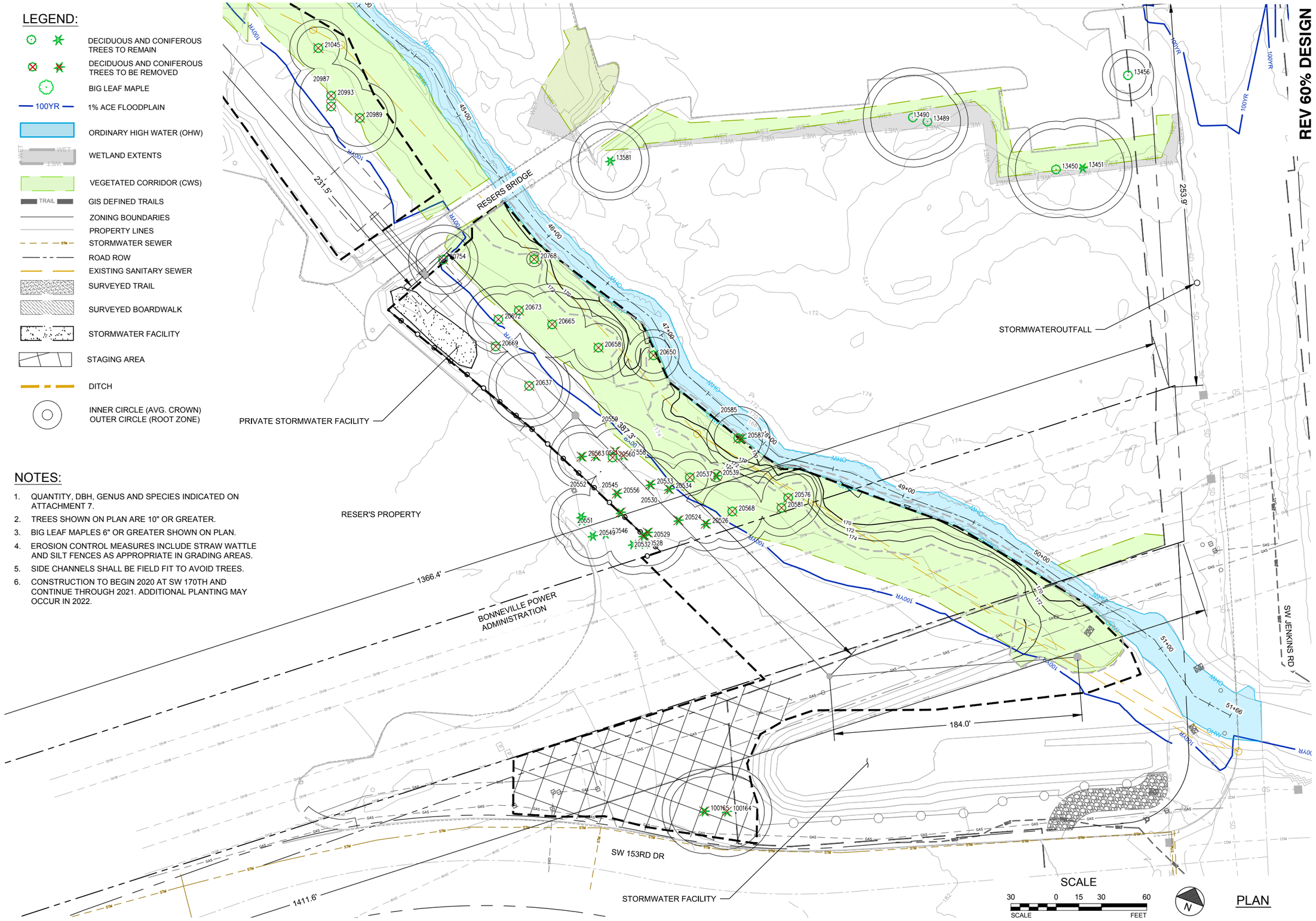
5. SIDE CHANNELS SHALL BE FIELD FIT TO AVOID TREES.
6. CONSTRUCTION TO BEGIN 2020 AT SW 170TH AND CONTINUE THROUGH 2021. ADDITIONAL PLANTING MAY OCCUR IN 2022.



REV 60% DESIGN

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DIMENSIONED SITE PLAN 7

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L17 OF X

Exhibit D

LEGEND:

- RIAPRIAN FOREST
- UPLAND VEGETATED CORRIDOR
- SCRUB SHRUB

RESER'S PROPERTY

RESER'S PARKING LOT

MERLO RD

STAGING AREA

TRIMET LIGHT RAIL

SW JENKINS RD

SW 153RD DR

SIDE CHANNEL DIVERSION 3

PERMANENT MAINTENANCE ACCESS, GEOCELL SEEDED WITH HERBACEOUS WETLAND SPECIES

SIDE CHANNEL 4

RESER'S REACH

THPRD REACH

BONNEVILLE POWER ADMINISTRATION

SIDE CHANNEL DIVERSION 2

PERMANENT MAINTENANCE ACCESS, GEOCELL SEEDED WITH HERBACEOUS SPECIES

SIDE CHANNEL 3

SIDE CHANNEL 2

SIDE CHANNEL 1

SIDE CHANNEL DIVERSION 1

170TH ST

BEAVERTON CREEK

CEDAR MILL CREEK

STUDY AREA BOUNDARY

N

SCALE

160 0 80 160 320

SCALE FEET

PLAN

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REVEGETATION PLAN

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882

SHEET L13 OF X

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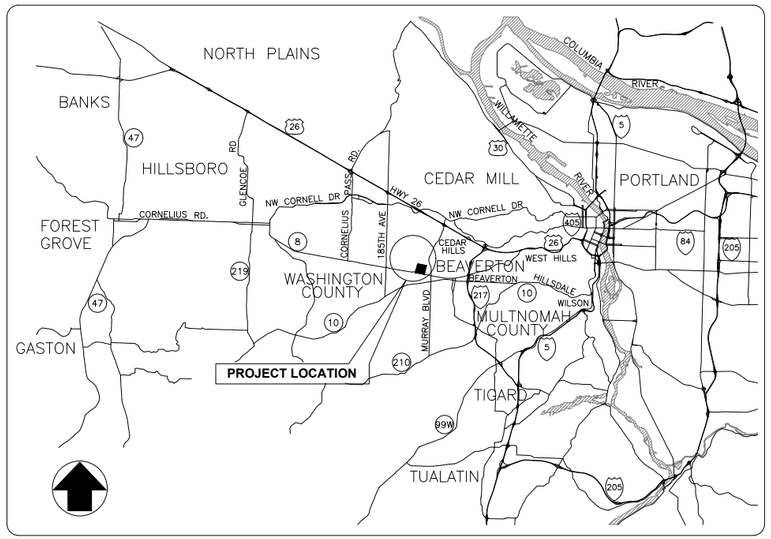
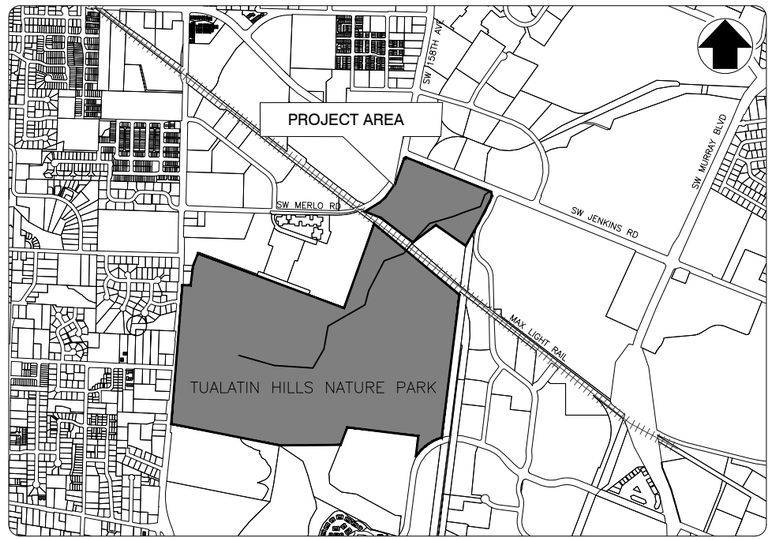
Exhibit E

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

60% DESIGN



VICINITY MAP
NTS



SITE MAP
NTS

UTILITY LOCATES (800) 322-2344

48 BUSINESS HOUR NOTICE PRIOR TO EXCAVATION

OREGON LAW REQUIRES CONTRACTOR TO COMPLY WITH RULES ADOPTED BY OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH 952-001-0090. COPIES OF RULES MAY BE OBTAINED BY CONTACTING THE UTILITY LOCATE CENTER AT (503) 232-1987.

ELECTRIC:	PORTLAND GENERAL ELECTRIC	(800) 544-1793
	BPA	(503) 230-3000
GAS:	NORTHWEST NATURAL GAS	(503) 226-4211
	KINDER-MORGAN - DON NONIS	(604) 985-3177
TELEPHONE:	QWEST	(800) 833-0825
	FRONTIER	(800) 483-4000
TELEVISION:	COMCAST	(866) 873-9735
	LEVEL 3 COMMUNICATIONS	(877) 366-8344
STREETS:	WASHINGTON COUNTY	(503) 846-7037
	CITY OF BEAVERTON	(503) 526-4084
WATER:	TUALATIN VALLEY WATER DIST.	(503) 642-1511
SANITARY SEWER:	CLEAN WATER SERVICES	(503) 547-8100
STORM SEWER:	CLEAN WATER SERVICES	(503) 547-8100

CLEAN WATER SERVICES

CONTACT INFORMATION

CAPITAL PROGRAM MGR.:	ANDREW J. BRAUN P.E.	(503) 681-3615
PROJECT CHAMPION:	JADENE STENSLAND P.E.	(503) 681-3662
WATER RESOURCES PROGRAM MGR:	CAROL MURDOCK	(503) 681-4472
SANITARY PROJECT MANAGER:	BRAD CREMENT P.E.	(503) 681-4426
WATER RESOURCE ENGINEER:	ABBEY RHODE P.E.	(503) 681-4427
RESTORATION LEAD:	KELLYN BAEZ	(503) 681-4459
PERMIT LEAD:	BRIAN COOK	(503) 681-3673
PROPERTY COORDINATOR	CHRISTINE WHITE	(503) 681-3669
PUBLIC INVOLVEMENT COORDINATOR:	MERIDETH ARMSTRONG	(503) 681-3669

CLEAN WATER SERVICES PROJECT NO. 6882

SHEET INDEX

HORIZONTAL DATUM:

A LOCAL DATUM PLANE DERIVED FROM STATE PLANE OREGON NORTH 3601 NAD83(2011) EPOCH: 2010.0000 BY MULTIPLYING BY A PROJECT MEAN GROUND COMBINED SCALE FACTOR OF 1.0000931773 AT A CENTRAL POINT WITH INTERNATIONAL FOOT STATE PLANE GRID COORDINATES N678251.684, E7601601.135 AND A MEDIAN CONVERGENCE ANGEL OF -1°39'41". STATE PLANE COORDINATES WERE DERIVED FROM GPS OBSERVATIONS USING THE TRIMBLE VRS NOW NETWORK. DISTANCE SHOWN ARE INTERNATIONAL FOOT GROUND VALUES.

VERTICAL DATUM:

ELEVATIONS ARE BASED ON WASHINGTON COUNTY BENCHMARK NO. 148. LOCATED IN THE CURB ON THE NORTHWEST CORNER OF THE INTERSECTION OF SW JAY STREET AND SW JENKINS ROAD. ELEVATION = 182.89 FEET (NGVD 29).

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COVER SHEET

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION 1S1W08NW	DRAFTER: CAD	DESIGNER: JTB	CHECKED: BVO	APPROVED: XXX

PROJECT 6882 | SHEET G1 | OF X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-G.dwg G1 12/30/2019 2:47 PM MATT.ESTEP 23.0s (LMS Tech)

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-G.dwg G2 12/30/2019 2:47 PM MATT.ESTEP 23.0s (LMS Tech)

PLAN
SCALE: NTS

60% DESIGN

PROJECT	6882
SHEET	G2
OF	X

1/4 SECTION	1S1W08NW
DRAFTER:	CAD
DESIGNER:	JTB
CHECKED:	BVO
APPROVED:	XXXX

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

PROJECT MAP

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GENERAL NOTES

1. CONTRACTOR SHALL NOTIFY CLEAN WATER SERVICES PROJECT MANAGER (503-681-3636) AND INSPECTION DEPARTMENT (503-681-4444) 48 BUSINESS HOURS PRIOR TO START OF CONSTRUCTION AND COMPLY WITH ALL OTHER REQUIREMENTS OF ORS 757.541 TO 757.571.

2. CONTRACTOR SHALL PROVIDE 24 HOUR NOTICE OF WORK RESUMPTION AFTER ANY SHUTDOWN EXCEEDING ONE DAY DURATION EXCEPT FOLLOWING WEEKENDS OR HOLIDAYS.

3. ALL CONSTRUCTION AND TESTING OF COMPLETED SANITARY SYSTEMS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF CLEAN WATER SERVICES GENERAL CONDITIONS AND STANDARD SPECIFICATIONS AS SET FORTH BY RESOLUTION & ORDER (R&O 07-20).

4. ALL EROSION CONTROL INSTALLATION AND MAINTENANCE SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF CLEAN WATER SERVICES EROSION PREVENTION & SEDIMENT CONTROL TECHNICAL GUIDANCE HANDBOOK.

5. ALL TRAFFIC CONTROL SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AS MODIFIED BY THE OREGON SUPPLEMENTS. COST ASSOCIATED WITH IMPLEMENTATION OF TRAFFIC CONTROL, SIGNAGE, OR DEVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

6. CONTRACTOR SHALL SUBMIT AND RECEIVE APPROVAL OF TRAFFIC CONTROL PLAN FROM WASHINGTON COUNTY PRIOR TO START OF CONSTRUCTION. FEES ASSOCIATED WITH ANY ROAD CLOSURE REQUEST SHALL BE THE RESPONSIBILITY OF CONTRACTOR.

7. CONTRACTOR SHALL CONFINE CONSTRUCTION OPERATIONS WITHIN PERMANENT EASEMENTS, TEMPORARY CONSTRUCTION EASEMENTS, OR PUBLIC RIGHT-OF-WAY ONLY. IF AREAS OR FEATURES OUTSIDE DESIGNATED CONSTRUCTION ZONES SUSTAIN IMPACT FROM CONTRACTORS ACTIVITIES, CONTRACTOR SHALL RESTORE TO PRE-CONSTRUCTION CONDITION AT NO COST TO CLEAN WATER SERVICES.

8. ALL EXISTING UTILITY LOCATIONS AND DESCRIPTIONS SHOWN ON PLANS HAVE BEEN COMPILED FROM AVAILABLE RECORDS AND/OR FIELD SURVEY. CLEAN WATER SERVICES CANNOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THIS INFORMATION. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF LOCATION AND DEPTH (POTHOLE) OF ALL EXISTING UTILITIES WITHIN CONSTRUCTION ZONE PRIOR TO BEGINNING CONSTRUCTION. CONTRACTOR SHALL PROMPTLY NOTIFY CLEAN WATER SERVICES OF POTENTIAL CONFLICTS. UNDER THESE TERMS CLEAN WATER SERVICES SHALL BE RESPONSIBLE FOR COST OF REQUIRED RELOCATIONS. IF CONTRACTOR FAILS TO LOCATE ANY KNOWN UTILITY WITHIN CONSTRUCTION ZONE THAT CONFLICTS WITH WORK, CONTRACTOR SHALL CORRECT CONFLICT AT OWN COST. ANY COSTS TO THE CONTRACTOR ARISING FROM COORDINATION WITH UTILITY COMPANY TO RELOCATE UTILITIES SHALL BE CONSIDERED INCIDENTAL TO COST OF PROJECT AND NO ADDITIONAL COMPENSATION SHALL BE DUE CONTRACTOR.

9. CONTRACTOR SHALL PROTECT ALL EXISTING SURVEY MONUMENTS AND CONSTRUCTION STAKING. CONTRACTOR SHALL NOTIFY CLEAN WATER SERVICES PRIOR TO DISTURBANCE OR REMOVAL OF ANY PERMANENT MONUMENTS TO ALLOW REFERENCING FOR FUTURE REPLACEMENT.

10. CONTRACTOR SHALL RESTORE ALL STREET FEATURES IMPACTED BY CONSTRUCTION. FEATURES SHALL INCLUDE , BUT NOT BE LIMITED TO, PAVEMENT, CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS, STREET STRIPING, SIGNAGE, MAILBOXES, AND UTILITIES.

11. CONTRACTOR SHALL RESTORE ALL PROJECT-RELATED EASEMENT AREAS AS STIPULATED IN EASEMENT AND CONTRACT DOCUMENTS. CLEAN WATER SERVICES SHALL PROVIDE CONTRACTOR WITH REFERENCE COPY OF ALL EASEMENT AGREEMENT CONDITIONS.

12. CONTRACTOR TO PROTECT AND MAINTAIN ALL STORMWATER FACILITIES AND STRUCTURES INCLUDING OUTFALLS, PIPES, RIPRAP, AND INLETS UNLESS OTHERWISE SHOWN ON DRAWINGS. ANY DAMAGE TO STORMWATER FACILITIES SHALL BE REPLACED AT CONTRACTOR'S EXPENSE.

13. CONTRACTOR TO COORDINATE WITH PORTLAND GENERAL ELECTRIC (PGE) FOR ANY CONSTRUCTION ACTIVITY WITHIN 25 FEET OF EXISTING FACILITIES. PGE SAFETY MONITOR MAY BE REQUIRED, CHECK PERMIT REQUIREMENTS.

14. CONTRACTOR TO COORDINATE WITH BONNEVILLE POWER ADMINISTRATION (BPA) FOR ANY CONSTRUCTION ACTIVITY WITHIN 25 FEET OF EXISTING FACILITIES. BPA SAFETY MONITOR MAY BE REQUIRED, CHECK PERMIT REQUIREMENTS.

15. CONTRACTOR TO COORDINATE WITH TRIMET FOR ANY CONSTRUCTION ACTIVITY WITHIN 25 FEET OF EXISTING FACILITIES. TRIMET SAFETY MONITOR MAY BE REQUIRED, CHECK PERMIT REQUIREMENTS.

16. CONTRACTOR TO COORDINATE WITH OREGON DEPARTMENT OF TRANSPORTATION (ODOT) FOR ANY CONSTRUCTION ACTIVITY WITHIN 25 FEET OF EXISTING FACILITIES. ODOT SAFETY MONITOR MAY BE REQUIRED, CHECK PERMIT REQUIREMENTS.

GENERAL NOTES - ENHANCEMENT

1. DRIVING DIRECTIONS: STARTING IN PORTLAND HEADING WESTBOUND ON HIGHWAY 26, TAKE EXIT 67. FOLLOW NW MURRAY BOULEVARD, THEN TAKE A RIGHT ONTO SW MILLIKAN WAY TO THE SITE.

2. GENERAL SITE TOPOGRAPHY IS APPROXIMATE AND DERIVED FROM TOPOBATHYMETRIC LIDAR SUPPLEMENTED BY SURVEY FROM W2R TAKEN SUMMER 2017 AND AKS SURVEY TAKEN JUNE 2019.

3. HORIZONTAL DATUM IS NAD83 OREGON STATE PLANE NORTH, INTERNATIONAL FEET.

4. VERTICAL DATUM IS NGVD29, FEET.

5. ALL SCALES SHOWN ARE FOR 22"X34" SHEETS.

6. ALL EQUIPMENT SHALL BE WASHED PRIOR TO MOBILIZATION TO THE SITE TO MINIMIZE THE INTRODUCTION OF FOREIGN MATERIALS AND FLUIDS TO THE PROJECT SITE. ALL EQUIPMENT SHALL BE FREE OF OIL, HYDRAULIC FLUID, AND DIESEL FUEL LEAKS. TO PREVENT INVASION OF NOXIOUS WEEDS OR THE SPREAD OF WHIRLING DISEASE SPORES, ALL EQUIPMENT SHALL BE POWER WASHED OR CLEANED TO REMOVE MUD AND SOIL PRIOR TO MOBILIZATION INTO THE PROJECT AREA. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ADEQUATE MEASURES HAVE BEEN TAKEN.

7. CONTRACTOR SITE ACCESS IS SHOWN ON SHEET L1.

8. CONTRACTOR SHALL RESTORE EXISTING ACCESS ROAD AND REMOVE NEW ACCESS ROADS AS SPECIFIED BEFORE COMPLETION OF CONSTRUCTION.

9. THE CONTRACTOR SHALL ATTEND A MANDATORY PRE-BID MEETING ON SITE.

10. ALL WORK SHALL CONFORM TO THE CURRENT EDITIONS OF ODOT STANDARD PLANS & SPECIFICATIONS UNLESS INDICATED OTHERWISE BY CONTRACT DOCUMENTS.

11. CONTRACTOR SHALL ALLOW FOR EXPANSION OF EXCAVATED MATERIAL AND COMPACTION OF PLACED MATERIAL AT NO ADDITIONAL COST.

12. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF CULVERT OFF SITE.

13. SEEDING SHALL TAKE PLACE FOLLOWING DISTURBANCE.

14. WORK WITHIN ORDINARY HIGH WATER SHALL BE LIMITED TO JUNE 1ST THROUGH SEPTEMBER 30TH.

15. SEEDING SHALL TAKE PLACE FOLLOWING DISTURBANCE.

16. THE CONTRACTOR SHALL BE SOLELY RESPONSBILE FOR HAVING UTILITIES LOCATED PRIOR TO CONSTRUCTION ACTIVITIES.

17. THE CONTRACTOR SHALL CALL 800-322-2344 FOR UTILITY LOCATES PRIOR TO CONSTRUCTION.

18. THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE AFFECTED UTILITY SERVICE TO REPORT ANY DAMAGED OR DESTROYED UTILITIES.

19. THE CONTRACTOR SHALL PROVIDE EQUIPMENT AND LABOR TO AID THE EFFECTED UTILITY SERVICE IN REPAIRING DAMAGED OR DESTROYED UTILITIES AT NO ADDITIONAL COST.

60% DESIGN

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GENERAL NOTES

CEDAR MILL CREEK
SANITARY AND
REGIONAL
STORMWATER
MANAGEMENT
APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT	SHEET	OF
6882	G3	X

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@	AT
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS
AB	ANCHOR BOLT
ABAN(D)	ABANDON(ED)
ABS	ACRYLONITRILE BUTADIENE STYRENE
ABV	ABOVE / ALCOHOL BY VOLUME
AC	ASPHALTIC CONCRETE
ACP	ASPHALTIC CONCRETE PAVING
ADJ	ADJUSTABLE
ADJC	ADJACENT
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHR	ANCHOR
AL	ALUMINUM
ALT	ALTERNATE
AMP	AMPERE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATE
APPVD	APPROVED
APW A	AMERICAN PUBLIC WORKS ASSOCIATION
ARCH	ARCHITECTURAL
ARV	AIR RELEASE VALVE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASSN	ASSOCIATION
ASSY	ASSEMBLY
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
ATM	ATMOSPHERE
AUTO	AUTOMATIC
AUX	AUXILIARY
AVE	AVENUE
AVG	AVERAGE
AWWA	AMERICAN WATER WORKS ASSOCIATION
B&S	BELL & SPIGOT
BC	BOLT CIRCLE
BD	BOARD
BETW	BETWEEN
BF	BOTH FACE
BFD	BACKFLOW PREVENTION DEVICE
BFILL	BACKFILL
BFV	BUTTERFLY VALVE
BHP	BRAKE HORSEPOWER
BKGD	BACKGROUND
BLDG	BUILDING
BLK	BLOCK
BLVD	BOULEVARD
BM	BENCHMARK / BEAM
BMP	BEST MANAGEMENT PRACTICES
BO	BLOW-OFF
BOC	BACK OF CURB
BS	BOTH SIDES
BSMT	BASEMENT
BTF	BOTTOM FACE
BTU	BRITISH THERMAL UNIT
BV	BALL VALVE
BW	BOTH WAYS
C	CELSIUS
C TO C	CENTER TO CENTER
CARV	COMBINATION AIR RELEASE VALVE
CATV	CABLE TELEVISION
CB	CATCH BASIN
CCP	CONCRETE CYLINDER PIPE
CCW	COUNTER CLOCKWISE
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CHAN	CHANNEL
CHEM	CHEMICAL
CHFR	CHAMFER
CHKV	CHECK VALVE
CI	CAST IRON
CIP	CAST IRON PIPE
CIPC	CAST IN PLACE CONCRETE
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT
CL OR C/L	CENTER LINE
CL2	CHLORINE
CLG	CEILING
CLJ	CONTROL JOINT
CLR	CLEAR
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CND	CONDUIT
CO	CLEANOUT
COL	COLUMN
COMB	COMBINATION
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS / CONTINUATION
CONTR	CONTRACT(OR)
COORD	COORDINATE
COP	COPPER
CORP	CORPORATION
CORR	CORRUGATED
CP	CONTROL POINT
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CR	CRUSHED ROCK
CS	COMBINED SEWER
CSP	CONCRETE SEWER PIPE
CT	COURT
CTR	CENTER
CU	CUBIC
CULV	CULVERT
CV	CONTROL VALVE
CW	CLOCKWISE / COLD WATER
CY	CUBIC YARDS
CYL	CYLINDER LOCK
D	DRAIN
DC	DIRECT CURRENT
DEFL	DEFLECTION
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DIM	DIMENSION
DIR	DIRECTION
DIST	DISTANCE
DN	DOWN
DR	DRIVE
DS	DOWNSPOUT
DWG	DRAWING
DWL	DOWEL
DWV	DRAIN WASTE AND VENT
DWY	DRIVEWAY
E OR ELEC	ELECTRICAL
EA	EACH
ECC	ECCENTRIC
EF	EACH FACE
EL	ELEVATION
ELB	ELBOW
ENCL	ENCLOSURE
EOP	EDGE OF PAVEMENT
EQ	EQUAL
EQL SP	EQUALLY SPACED
EQUIP	EQUIPMENT
ESMT	EASEMENT
EW	EACH WAY
EXC	EXCAVATE
EXIST	EXISTING
EXP	EXPANSION
EXP BT	EXPANSION BOLT
EXP JT	EXPANSION JOINT
EXT	EXTERIOR
F	FAHRENHEIT
F TO F	FACE TO FACE
FAB	FABRICATE
FB	FLAT BAR
FCA	FLANGED COUPLING ADAPTER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FDN	FOUNDATION
FEXT	FIRE EXTINGUISHER
FF	FAR FACE
FGL	FIBERGLASS
FH	FIRE HYDRANT
FIN	FINISH(ED)
FIPT	FEMALE IRON PIPE THREAD
FITG	FITTING
FL	FLOOR LINE
FLEX	FLEXIBLE
FLG	FLANGE
FLL	FLOW LINE
FLR	FLOOR
FM	FORCE MAIN
FO	FIBER OPTIC
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUDS
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET / FOOT
FTG	FOOTING
FUT	FUTURE
FXTR	FIXTURE
G	GAS
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GROOVED COUPLING
GFA	GROOVED FLANGE ADAPTER
GI	GALVANIZED IRON
GIP	GALVANIZED IRON PIPE
GJ	GRIP JOINT
GL	GLASS
GLV	GLOBE VALVE
GND	GROUND
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPS	GALLONS PER SECOND
GR	GRADE
GR LN	GRADE LINE
GRTG	GRATING
GV	GATE VALVE
GRVL	GRAVEL
GYP	GYPSUM
HB	HOSE BIBB
HC	HOLLOW CORE
HDPE	HIGH DENSITY POLYETHYLENE
HDR	HEADER
HDWE	HARDWARE
HGR	HANGER
HGT	HEIGHT
HH	HANDHOLD
HM	HOLLOW METAL
HMAC	HOT MIX ASPHALT CONCRETE
HNDRL	HANDRAIL
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORIZ	HORIZONTAL
HP	HIGH PRESSURE / HORSEPOWER
HPG	HIGH PRESSURE GAS
HPT	HIGH POINT
HR	HOUR
HSB	HIGH STRENGTH BOLT
HV	HOSE VALVE
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HWL	HIGH WATER LINE
HWY	HIGHWAY
HYD	HYDRANT
HYDR	HYDRAULIC
I&C	INSTRUMENTATION & CONTROL
IAW	IN ACCORDANCE WITH
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IF	INSIDE FACE
IMPVT	IMPROVEMENT
IN	INCH
INCC	INCLUDE(D)(ING)
INFL	INFLUENT
INJ	INJECTION
INSTL	INSTALLATION / INSTALL
INSUL	INSULATION
INTER	INTERCEPTOR
INTR	INTERIOR
INV	INVERT
IP	IRON PIPE
IPT	IRON PIPE THREAD
IR	IRON ROD
IRRIG	IRRIGATION
JT	JOINT
JUNC	JUNCTION
KPL	KICK PLATE
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWY	KEYWAY
L	LENGTH
LAB	LABORATORY
LAV	LAVATORY
LB	POUND
LF	LINEAR FOOT
LIN	LINEAL
LN	LANE
LOC	LOCATION
LONG	LONGITUDINAL
LP	LOW PRESSURE
LPT	LOW POINT
LRG	LARGE
LS	LONG SLEEVE / LUMP SUM
LT	LEFT
LVL	LEVEL
LWL	LOW WATER LINE
MAN	MANUAL
MAT	MATERIAL
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MCP	MASTER CONTROL PANEL
MECH	MECHANICAL
MET	METAL
MFR	MANUFACTURER
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MIN	MINIMUM
MIPT	MALE IRON PIPE THREAD
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MON	MONUMENT / MONOLITHIC
MOT	MOTOR
MP	MILEPOST
MSL	MEAN SEAL LEVEL
MTD	MOUNTED
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NF	NEAR FACE
NIC	NOT IN CONTRACT
NO / NO.	NORMALLY OPEN / NUMBER
NOM	NOMINAL
NORM	NORMAL
NRS	NON-RISING STEM
NTS	NOT TO SCALE
O TO O	OUT TO OUT
OC	ON CENTER
OD	OUTSIDE DIAMETER
ODOT	OREGON DEPARTMENT OF TRANSPORTATION
OF	OVERFLOW / OUTSIDE FACE
OPNG	OPENING
OPP	OPPOSITE
ORIG	ORIGINAL
OVHD	OVERHEAD
P&ID	PROCESS & INSTRUMENTATION DIAGRAM
PC	POINT OF CURVE
PCC	POINT OF COMPOUND CURVE
PCVC	POINT OF CURVATURE ON VERTICAL CURVE
PE	PLAIN END
PERF	PERFORATED
PERM	PERMANENT
PERP	PERPENDICULAR
PG	PRESSURE GAUGE
PH	PIPE HANGER
PI	POINT OF INTERSECTION
PIVC	POINT OF INTERSECTION ON VERTICAL CURVE
PL OR P/L	PROPERTY LINE / PLATE / PLASTIC
PLBG	PLUMBING
PNL	PANEL
POC	POINT OF CURVATURE
POLY	POLYETHYLENE
PP	POWER POLE
PRC	POINT OF REVERSE CURVATURE
PRCST	PRECAST
PREP	PREPARATION
PRESS	PRESSURE
PRKG	PARKING
PROP	PROPERTY
PRV	PRESSURE REDUCING VALVE
PS	PUMP STATION
PSIG	POUNDS PER SQUARE INCH GAUGE
PSL	PIPE SLEEVE
PSPT	PIPE SUPPORT
PT	POINT OF TANGENCY
PTVC	POINT OF TANGENCY ON VERTICAL CURVE
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PWR	POWER
QTY	QUANTITY
RAD	RADIUS
RC	REINFORCED CONCRETE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD / ROOF DRAIN
RDCR	REDUCER
REF	REFERENCE
REINF	REINFORCE(D)(ING)(MENT)
REQ'D	REQUIRED
RESTR	RESTRAINED
RFCA	RESTRAINED FLANGE COUPLING ADAPTER
RM	ROOM
RND	ROUND
RO	ROUGH OPENING
R/W	RIGHT-OF-WAY
RPBPD	REDUCED PRESSURE BACKFLOW PREVENTION DEVICE
RPM	REVOLUTIONS PER MINUTE
RR	RAILROAD
RST	REINFORCED STEEL
RT	RIGHT
SALV	SALVAGE
SAN	SANITARY
SC	SOLID CORE
SCHED	SCHEDULE
SD	STORM DRAIN
SDL	SADDLE
SDR	STANDARD DIMENSION RATIO
SECT	SECTION
SHLDR	SHOULDER
SHT	SHEET
SIM	SIMILAR
SLP	SLOPE
SLV	SLEEVE
SOLN	SOLUTION
SP	SOIL PIPE / SEWER PIPE
SPCL	SPECIAL
SPEC(S)	SPECIFICATION(S)
SPG	SPACING
SPL	SPOOL
SPRT	SUPPORT
SQ	SQUARE
SQ FT	SQUARE FOOT
SQ IN	SQUARE INCH
SQ YD	SQUARE YARD
SS	SANITARY SEWER
SST	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STOR	STORAGE
STR	STRAIGHT
STRUCT	STRUCTURE / STRUCTURAL
SUBMG	SUBMERGED
SUCT	SUCTION
SV	SOLENOID VALVE
S/W	SIDEWALK
SWD	SIDEWATER DEPTH
SWGR	SWITCH GEAR
SYMM	SYMMETRICAL
SYS	SYSTEM
T OR TEL	TELEPHONE
T&B	TOP & BOTTOM
TAN	TANGENCY
TB	THRUST BLOCK
TBM	TEMPORARY BENCHMARK
TC	TOP OF CONCRETE / TOP OF CURB
TCE	TEMPORARY CONSTRUCTION EASEMENT
TDH	TOTAL DYNAMIC HEAD
TEMP	TEMPERATURE / TEMPORARY
THPRD	TUALATIN HILLS PARKS & RECREATION DEPARTMENT
T&G	TONGUE & GROOVE
THK	THICK / THICKNESS
THRD	THREAD (ED)
THRU	THROUGH
TP	TEST PIT / TOP OF PAVEMENT / TURNING POINT
TRANS	TRANSITION
TSP	TRI-SODIUM PHOSPHATE
TST	TOP OF STEEL
TW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UN	UNION
UON	UNLESS OTHERWISE NOTED
USGS	UNITED STATES GEOLOGIC SURVEY
V	VENT / VOLT
VAC	VACUUM
VB	VACUUM BREAKER
VBOX	VALVE BOX
VC	VERTICAL CURVE
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
VCP	VITRIFIED CLAY PIPE
VTR	VENT THROUGH ROOF
W	WATER
W/	WITH
W/IN	WITHIN
W/O	WITHOUT
W/W	WALL TO WALL
WD	WOOD
WF	WIDE FLANGE
WH	WATER HEATER
WHS	WOOD HABITAT STRUCTURE
WI	WROUGHT IRON
WM	WATER METER
WP	WORKING POINT / WATERPROOFING
WS	WATER SERVICE
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
WSE	WATER SURFACE ELEVATION
WT	WEIGHT
WTP	WATER TREATMENT PLANT
WTRT	WATERTIGHT
WWF	WELDED WIRE FABRIC
WWTF	WASTEWATER TREATMENT FACILITY
WWTP	WASTEWATER TREATMENT PLANT
X SECT	CROSS SECTION
XFMR	TRANSFORMER
YD	YARD DRAIN / YARD
YH	YARD HYDRANT
YR	YEAR
ZN	ZINC

60% DESIGN

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION

DECEMBER 2019

Murraysmith
www.murraysmith.us

NO.	REVISION	BY	DATE

Clean Water Services
Our watersheds & more.
2550 SW Hillsboro Hwy
Hillsboro, OR 97123
503.681.3600
www.cleanwaterservices.org

murraysmith

ABBREVIATIONS

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION 1S1W08NW	DRAFTER: CAD	DESIGNER: JTB	CHECKED: BVO	APPROVED: XXXX

PROJECT	6882
SHEET	G4
OF	X

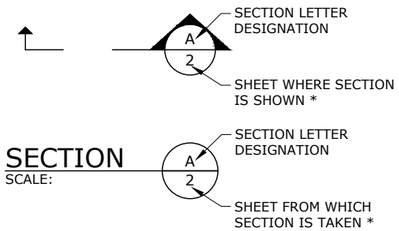
G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-G.dwg G4 12/30/2019 2:47 PM MATT.ESTEP 23.0s (LMS Tech)

TOPOGRAPHIC LEGEND

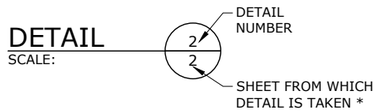
	EXISTING	PROPOSED
SANITARY SEWER LINE	8"SS	8"SS
SANITARY SEWER FORCE MAIN	6"FM	
STORM DRAIN	8"SD	8"SD
CULVERT		18"D
ABANDON PIPE		
DRAINAGE DITCH		
BARBWIRE FENCE		
NO WORK FENCE / CHAIN LINK FENCE / SITE FENCE		
GUARDRAIL		
ROCK WALL		
TREE/BUSH LINE		
CENTERLINE		
EASEMENT/PROPERTY LINE		
RIGHT-OF-WAY		
EDGE OF PAVEMENT/AC		
EDGE OF GRAVEL		
CURB		
SIDEWALK	S/W	
STRUCTURE OR FACILITY		
WETLAND	WET WET	
ORDINARY HIGH WATER	OHW	
CREEK CENTERLINE		
CONTOUR MINOR		
CONTOUR MAJOR	200	200
GRADE BREAK		
MANHOLE		
CLEAN-OUT		
BENCHMARK		
TREE DECIDUOUS		
TREE CONIFEROUS		
TREE TO BE PROTECTED		
TREE TO BE REMOVED		
SURFACE ELEVATION	+ 176.63	+ 176.63
BOARDWALK		
TRAIL		
ACCESS ROADS		
STAGING AREAS		
DEMOLITION AREA		
VEGETATIVE CORRIDOR	VEG	

SECTION AND DETAIL DESIGNATIONS

SECTION DESIGNATIONS



DETAIL DESIGNATIONS



* NOTE: IF PLAN AND SECTION FOR DETAIL CALL-OUT AND DETAIL ARE SHOWN ON THE SAME DRAWING, DRAWING NUMBER IS REPLACED WITH A DASH.

MISCELLANEOUS PIPING SYMBOLS

M	METER BOX
SP	SLIP-ON JOINT PIPE

60% DESIGN

PRELIMINARY ONLY
DO NOT USE FOR CONSTRUCTION

DECEMBER 2019

Murraysmith
www.murraysmith.us

NO.	REVISION	BY	DATE

Clean Water Services
Our commitment to Water.
2550 SW Hillsboro Hwy
Hillsboro, OR 97123
(503) 681-3600
www.cleanwaterservices.org

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SYMBOLS AND LEGEND

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

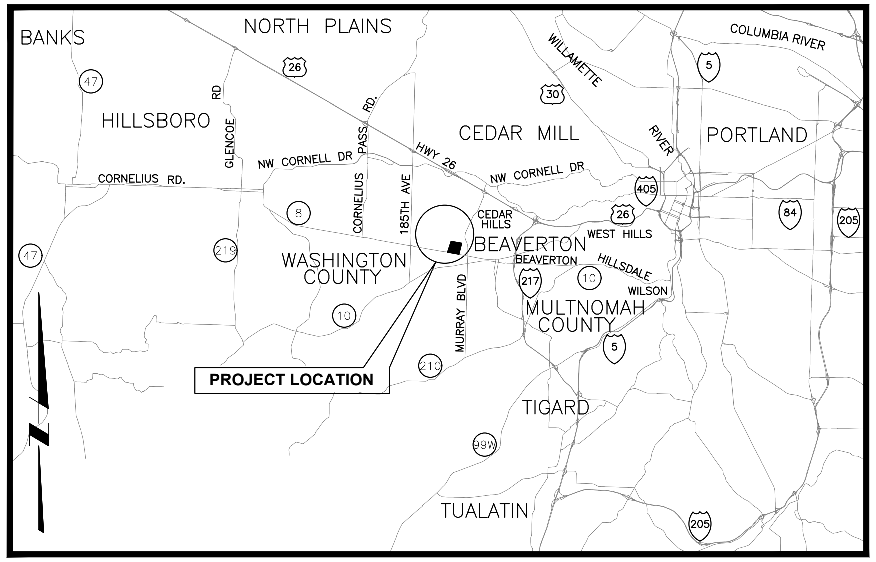
1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882

SHEET G5 OF X

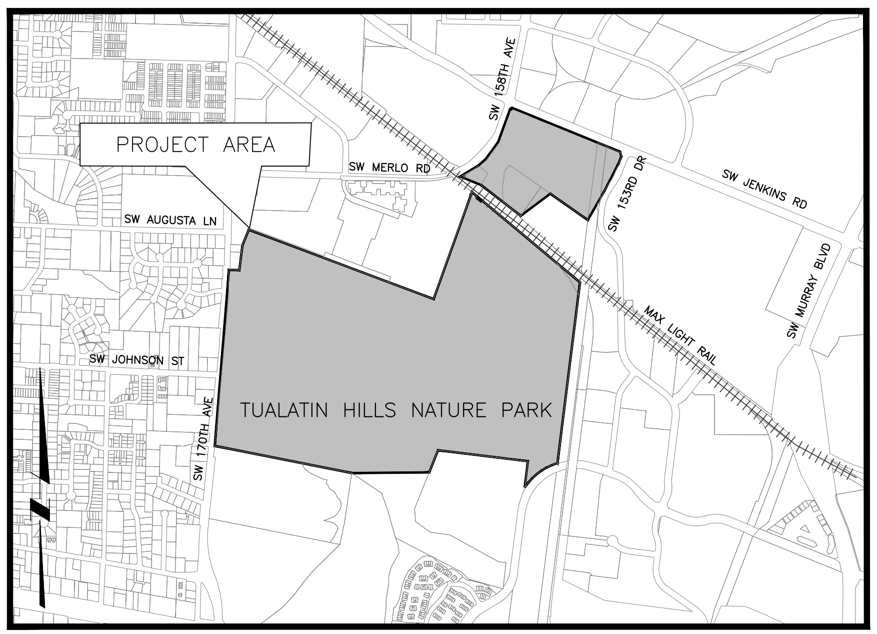
G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-G.dwg G5 12/30/2019 2:47 PM MATT.ESTEP 23.0s (LMS Tech)

EROSION AND SEDIMENT CONTROL PLANS



VICINITY MAP

SCALE: NTS



SITE MAP

SCALE: 1"=1/4 MI'

PROPERTY DESCRIPTIONS:

SW 170TH AVE AND SW JENKINS RD, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, WASHINGTON COUNTY, OREGON

ASSOCIATED PERMITS

N/A

PROJECT LOCATIONS:

SOUTH LIMITS APPROXIMATELY 2,000 FEET NORTH FROM SW TUALATIN VALLEY HWY AND SW 170TH AVE., BEAVERTON, WASHINGTON COUNTY, OR
LATITUDE = N45.488,
LONGITUDE = W122.848

LAND USE CASE FILE

N/A

DEVELOPER NAME

DEVELOPER: CLEAN WATER SERVICES
CONTACT: BRAD CREMENT
ADDRESS: 2550 SW HILLSBORO HWY
CITY/STATE: HILLSBORO, OR 97123
PHONE/FAX: 503-681-4426

PLANNING / ENGINEERING / SURVEYING FIRM

MURRAYSMITH, INC
CONTACT: BRENDAN O'SULLIVAN, P.E.
888 SW 5TH AVE., SUITE 1170
PORTLAND, OR 97204-2012
PHONE: (503) 225-9010 FAX: (866) 274-9807

NARRATIVE DESCRIPTIONS

EXISTING SITE CONDITIONS

UNDEVELOPED FLOODPLAIN & RIPARIAN AREA

DEVELOPED CONDITIONS

NATIVE RESTORATION FOLLOWING CONSTRUCTION OF NEW 48" DIAMETER SEWER AND ASSOCIATED APPURTENANCES

NATURE OF CONSTRUCTION ACTIVITY AND ESTIMATED TIME TABLE

* CLEARING (JUNE 2020)
* MASS GRADING (NOT APPLICABLE)
* UTILITY INSTALLATION (JULY 2020 - NOV 2021)
* STREET CONSTRUCTION (NOT APPLICABLE)
* FINAL STABILIZATION (NOT APPLICABLE)

TOTAL SITE AREA:

13.0 ACRES (565,500 SQ.FT.)

TOTAL DISTURBED AREA:

13.0 ACRES (565,500 SQ.FT.)

IMPERVIOUS SURFACE AREA:

EXISTING IMPERVIOUS AREA = 23,000 SF
PROPOSED IMPERVIOUS AREA = 0 SF

SOIL CLASSIFICATION:

SILT, LEAN CLAY, FAT CLAY

RECEIVING WATER BODIES:

CEDAR MILL CREEK
BEAVERTON CREEK

ATTENTION EXCAVATORS:

OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 503-232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER AT LEAST TWO BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 503-246-6699.

INSPECTION FREQUENCY

SITE CONDITION	MINIMUM FREQUENCY
1. ACTIVE PERIOD	DAILY WHEN STORMWATER RUNOFF, INCLUDING RUNOFF FROM SNOWMELT, IS OCCURRING. AT LEAST ONCE EVERY FOURTEEN (14) CALENDAR DAYS, REGARDLESS OF WHETHER OR NOT STORMWATER RUNOFF IS OCCURRING.
2. PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OF SITE INACCESSIBILITY.	ONCE TO ENSURE THAT EROSION AND SEDIMENT CONTROL MEASURES ARE IN WORKING ORDER. ANY NECESSARY MAINTENANCE AND REPAIR MUST BE MADE PRIOR TO LEAVING THE SITE.
3. INACTIVE PERIODS GREATER THAN FOURTEEN (14) CONSECUTIVE CALENDAR DAYS.	ONCE EVERY MONTH
4. PERIODS DURING WHICH THE SITE IS INACCESSIBLE DUE TO INCLEMENT WEATHER.	IF PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION.
5. PERIODS DURING WHICH DISCHARGE IS UNLIKELY DUE TO FROZEN CONDITIONS.	MONTHLY. RESUME MONITORING IMMEDIATELY UPON MELT, OR WHEN WEATHER CONDITIONS MAKE DISCHARGES LIKELY.

* HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS.
* ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS.
* INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS.
* RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY. DURING INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS, RETAIN THE ESCP AT THE CONSTRUCTION SITE OR AT ANOTHER LOCATION.

STANDARD EROSION AND SEDIMENT CONTROL PLAN DRAWING NOTES:

1. HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS. (SCHEDULE A.8.C.I.(3))
2. ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200-C PERMIT REQUIREMENTS. (SCHEDULE A.12.B AND SCHEDULE B.1)
3. INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200-C PERMIT REQUIREMENTS. (SCHEDULE A.1.C AND B.2)
4. RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY. DURING INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS, THE ABOVE RECORDS MUST BE RETAINED BY THE PERMIT REGISTRANT BUT DO NOT NEED TO BE AT THE CONSTRUCTION SITE. (SCHEDULE B.2.C)
5. ALL PERMIT REGISTRANTS MUST IMPLEMENT THE ESCP. FAILURE TO IMPLEMENT ANY OF THE CONTROL MEASURES OR PRACTICES DESCRIBED IN THE ESCP IS A VIOLATION OF THE PERMIT. (SCHEDULE A 8.A)
6. THE ESCP MUST BE ACCURATE AND REFLECT SITE CONDITIONS. (SCHEDULE A.12.C.I)
7. SUBMISSION OF ALL ESCP REVISIONS IS NOT REQUIRED. SUBMITTAL OF THE ESCP REVISIONS IS ONLY UNDER SPECIFIC CONDITIONS. SUBMIT ALL NECESSARY REVISION TO DEQ OR AGENT WITHIN 10 DAYS. (SCHEDULE A.12.C.IV. AND V)
8. PHASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OR EROSION. (SCHEDULE A.7.A.III)
9. IDENTIFY, MARK, AND PROTECT (BY CONSTRUCTION FENCING OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS. (SCHEDULE A.8.C.I.(1) AND (2))
10. PRESERVE EXISTING VEGETATION WHEN PRACTICAL AND RE-VEGETATE OPEN AREAS. RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED. (SCHEDULE A.7.A.V)
11. MAINTAIN AND DELINEATE ANY EXISTING NATURAL BUFFER WITHIN THE 50-FEET OF WATERS OF THE STATE. (SCHEDULE A.7.B.I. AND (2(A)(B))
12. INSTALL PERIMETER SEDIMENT CONTROL, INCLUDING STORM DRAIN INLET PROTECTION AS WELL AS ALL SEDIMENT BASINS, TRAPS, AND BARRIERS PRIOR TO LAND DISTURBANCE. (SCHEDULE A.8.C.I.(5))
13. CONTROL BOTH PEAK FLOW RATES AND TOTAL STORMWATER VOLUME, TO MINIMIZE EROSION AT OUTLETS AND DOWNSTREAM CHANNELS AND STREAMBANKS. (SCHEDULE A.7.C)
14. CONTROL SEDIMENT AS NEEDED ALONG THE SITE PERIMETER AND AT ALL OPERATIONAL INTERNAL STORM DRAIN INLETS AT ALL TIMES DURING CONSTRUCTION, BOTH INTERNALLY AND AT THE SITE BOUNDARY. (SCHEDULE A.7.D.I)
15. ESTABLISH CONCRETE TRUCK AND OTHER CONCRETE EQUIPMENT WASHOUT AREAS BEFORE BEGINNING CONCRETE WORK. (SCHEDULE A.8.C.I.(6))
16. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES. TEMPORARY OR PERMANENT STABILIZATIONS MEASURES ARE NOT REQUIRED FOR AREAS THAT ARE INTENDED TO BE LEFT UNVEGETATED, SUCH AS DIRT ACCESS ROADS OR UTILITY POLE PADS. (SCHEDULE A.8.C.II.(3))
17. ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS. (SCHEDULE A.8.C.I.(7))
18. PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BMPS SUCH AS: CONSTRUCTION ENTRANCE, GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ONSITE, OR USE AN EXIT TIRE WASH. THESE BMPS MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES. (SCHEDULE A 7.D.II AND A.8.C.I(4))
19. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE. (SCHEDULE A.7.D.II.(5))
20. CONTROL PROHIBITED DISCHARGES FROM LEAVING THE CONSTRUCTION SITE, I.E., CONCRETE WASH-OUT, WASTEWATER FROM CLEAN OUT OF STUCCO, PAINT AND CURING COMPOUNDS. (SCHEDULE A.6)
21. USE BMPS TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS; VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES; AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, FERTILIZER, PESTICIDES AND HERBICIDES, PAINTS, SOLVENTS, CURING COMPOUNDS AND ADHESIVES FROM CONSTRUCTION OPERATIONS. (SCHEDULE A.7.E.I.(2))
22. IMPLEMENT THE FOLLOWING BMPS WHEN APPLICABLE: WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURES, EMPLOYEE TRAINING ON SPILL PREVENTION AND PROPER DISPOSAL PROCEDURES, SPILL KITS IN ALL VEHICLES, REGULAR MAINTENANCE SCHEDULE FOR VEHICLES AND MACHINERY, MATERIAL DELIVERY AND STORAGE CONTROLS, TRAINING AND SIGNAGE, AND COVERED STORAGE AREAS FOR WASTE AND SUPPLIES. (SCHEDULE A.7.E.III.)
23. USE WATER, SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUE AS NEEDED TO AVOID WIND-BLOWN SOIL. (SCHEDULE A 7.A.IV)
24. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. EXERCISE CAUTION WHEN USING TIME-RELEASE FERTILIZERS WITHIN ANY WATERWAY RIPARIAN ZONE. (SCHEDULE A.9.B.III)
25. IF AN ACTIVE TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN PLAN APPROVAL BEFORE OPERATING THE SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS. (SCHEDULE A.9.D)
26. TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE REGISTRANT IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR. (SCHEDULE A 7.B)
27. AS NEEDED BASED ON WEATHER CONDITIONS, AT THE END OF EACH WORKDAY SOIL STOCKPILES MUST BE STABILIZED OR COVERED, OR OTHER BMPS MUST BE IMPLEMENTED TO PREVENT DISCHARGES TO SURFACE WATERS OR CONVEYANCE SYSTEMS LEADING TO SURFACE WATERS. (SCHEDULE A 7.E.II.(2))
28. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND BARE GROUND ACTIVITIES DURING WET WEATHER. (SCHEDULE A7.A.I)
29. SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ON THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL. (SCHEDULE A.9.C.I)
30. OTHER SEDIMENT BARRIERS (SUCH AS BIOBAGS): REMOVE SEDIMENT BEFORE IT REACHES TWO INCHES DEPTH ABOVE GROUND HEIGHT AND BEFORE BMP REMOVAL. (SCHEDULE A.9.C.I)
31. CATCH BASINS: CLEAN BEFORE RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT. SEDIMENT BASINS AND SEDIMENT TRAPS: REMOVE TRAPPED SEDIMENTS BEFORE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT AND AT COMPLETION OF PROJECT. (SCHEDULE A.9.C.III&IV)
32. WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE, MUST BE REMEDIATED. INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN-UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIMFRAME. (SCHEDULE A.9.B.I)
33. THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS OR DRAINAGE WAYS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASED SEDIMENTS (SCHEDULE A.9.B.II)
34. THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, TEMPORARY SEEDING, OR OTHER METHOD SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR 30 DAYS OR MORE. (SCHEDULE A.7.F.I)
35. PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE. (SCHEDULE A.7.F.II)
36. DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED. ONCE CONSTRUCTION IS COMPLETE AND THE SITE IS STABILIZED, ALL TEMPORARY EROSION CONTROLS AND RETAINED SOILS MUST BE REMOVED AND DISPOSED OF PROPERLY, UNLESS DOING SO CONFLICTS WITH LOCAL REQUIREMENTS. (SCHEDULE A.8.C.III(1) AND D.3.C.II AND III)

PERMITTEE'S SITE INSPECTOR: ____________

COMPANY/AGENCY: ____________
PHONE: ____________
FAX: N/A
E-MAIL: ____________
DESCRIPTION OF EXPERIENCE: ____________

RATIONALE STATEMENT

A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQ's GUIDANCE MANUAL HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE ABOVE LISTED BMP's WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THIS PROJECT BASED ON SPECIFIC SITE CONDITIONS, INCLUDING SOIL CONDITIONS TOPOGRAPHIC CONSTRAINTS, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS, AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESC PLAN, AN ACTION PLAN WILL BE SUBMITTED.

INITIAL ____________

THE PERMITTEE IS REQUIRED TO MEET ALL THE CONDITIONS OF THE 1200-C PERMIT. THIS ESCP AND GENERAL CONDITIONS HAVE BEEN DEVELOPED TO FACILITATE COMPLIANCE WITH THE 1200-C PERMIT REQUIREMENTS. IN CASES OF DISCREPANCIES OR OMISSIONS, THE 1200-C PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS OF THIS PLAN.

BMP MATRIX FOR CONSTRUCTION PHASES

REFER TO DEQ GUIDANCE MANUAL FOR A COMPREHENSIVE LIST OF AVAILABLE BMP'S.

	CLEARING	MASS GRADING	UTILITY INSTALLATION	STREET CONSTRUCTION	FINAL STABILIZATION	WET WEATHER (OCT. 1 - MAY 31ST)
EROSION PREVENTION						
PRESERVE NATURAL VEGETATION	** X	X	X	X	X	X
GROUND COVER			X		X	X
HYDRAULIC APPLICATIONS					X	
PLASTIC SHEETING						
MATTING						
DUST CONTROL	X	X	X	X	X	X
TEMPORARY/ PERMANENT SEEDING					X	X
BUFFER ZONE	** X	X	X	X	X	X
OTHER:						
SEDIMENT CONTROL						
SEDIMENT FENCE (PERIMETER)	** X	** X	X	X	X	X
SEDIMENT FENCE (INTERIOR)	** X	** X	X	X	X	X
STRAW WATTLES					X	X
FILTER BERM			X			
INLET PROTECTION	** X	** X	X	X	X	X
DEWATERING			X	X		X
SEDIMENT TRAP						
NATURAL BUFFER ENCROACHMENT	*X	*X	*X	*X	*X	*X
COMPOST SOCK	**X	**X	X	X	X	X
OTHER:						
RUN OFF CONTROL						
CONSTRUCTION ENTRANCE	** X	X	X	X	X	X
PIPE SLOPE DRAIN						
OUTLET PROTECTION						
SURFACE ROUGHENING					X	
CHECK DAMS			X	X		
OTHER:						
POLLUTION PREVENTION						
PROPER SIGNAGE	X	X	X	X	X	X
HAZ WASTE MGMT	X	X	X	X		
SPILL KIT ON-SITE	X	X	X	X	X	X
CONCRETE WASHOUT AREA			X			
OTHER:						

* SIGNIFIES ADDITIONAL BMP'S REQUIRED FOR WORK WITHIN 50' OF WATER OF THE STATE.
** SIGNIFIES BMP THAT WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBING ACTIVITY.

LOCAL AGENCY-SPECIFIC EROSION CONTROL NOTES

1. IF VEGETATIVE SEED MIXES ARE SPECIFIED, SEEDING MUST TAKE PLACE NO LATER THAT SEPTEMBER 1; THE TYPE AND PERCENTAGES OF SEED IN THE MIX IS ON SHEET EC0.2(A).
2. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE DISCHARGED OVER AN UNDISTURBED, PREFERABLY VEGETATED AREA, AND THROUGH A SEDIMENT CONTROL BMP I.E. (FILTER BAG).
3. ALL EXPOSED SOILS MUST BE COVERED DURING THE WET WEATHER PERIOD, OCTOBER 01 - MAY 31.

SHEET INDEX

EROSION AND SEDIMENT CONTROL PLANS

60% DESIGN

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DECEMBER 2019
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Hillsboro, OR 97123
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EROSION CONTROL COVER SHEET/ 1200C PERMIT

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION 1S1W08NW | DRAFTER: CAD | DESIGNER: DSN | CHECKED: CHK | APPROVED: APV

PROJECT 6882 | SHEET EC1 OF X

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LOCAL AGENCY-SPECIFIC EROSION CONTROL NOTES

1. WHEN RAINFALL AND RUNOFF OCCURS DAILY INSPECTIONS OF THE EROSION AND SEDIMENT CONTROLS AND DISCHARGE OUTFALLS MUST BE PROVIDED BY SOME ONE KNOWLEDGEABLE AND EXPERIENCED IN THE PRINCIPLES, PRACTICES, INSTALLATION, AND MAINTENANCE OF EROSION AND SEDIMENT CONTROLS WHO WORKS FOR THE PERMITTEE.

2. DURING WET WEATHER PERIOD, TEMPORARY STABILIZATION OF THE SITE MUST OCCUR AT THE END OF EACH WORK DAY.

3. ALL ACTIVE INLETS MUST HAVE SEDIMENT CONTROLS INSTALLED AND MAINTAINED AT ALL TIMES DURING CONSTRUCTION. UNLESS OTHERWISE APPROVED, A SURFACE MOUNTED AND ATTACHABLE, U-SHAPED FILTER BAG IS REQUIRED FOR ALL CURB INLET CATCH BASINS.

4. SIGNIFICANT AMOUNTS OF SEDIMENT WHICH LEAVES THE SITE MUST BE CLEANED UP WITHIN 24 HOURS AND PLACED BACK ON THE SITE AND STABILIZED OR PROPERLY DISPOSED. THE CAUSE OF THE SEDIMENT RELEASE MUST BE FOUND AND PREVENTED FROM CAUSING A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN UP OF SEDIMENT SHALL BE PREFORMED ACCORDING TO THE OREGON DEPARTMENT OF STATE LANDS REQUIRED TIME FRAME.

5. SEDIMENT MUST BE REMOVED FROM BEHIND ALL SEDIMENT CONTROL MEASURES WHEN IT HAS REACHED A HEIGHT OF 1/3 THE BARRIER HEIGHT, AND PRIOR TO THE CONTROL MEASURES REMOVAL.

6. CLEANING OF ALL STRUCTURES WITH SUMPS MUST OCCUR WHEN THE SEDIMENT RETENTION CAPACITY HAS BEEN REDUCED BY 50% AND AT COMPLETION OF PROJECT.

7. ANY USE OF TOXIC OR OTHER HAZARDOUS MATERIALS MUST INCLUDE PROPER STORAGE, APPLICATION, AND DISPOSAL.

8. THE PERMITTEE MUST PROPERLY MANAGE HAZARDOUS WASTES, USED OILS, CONTAMINATED SOILS, CONCRETE WASTE, SANITARY WASTE, LIQUID WASTE, OR OTHER TOXIC SUBSTANCES DISCOVERED OR GENERATED DURING CONSTRUCTION.

9. OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH CURRENT CLEAN WATER SERVICES STANDARDS AND STATE, AND FEDERAL REGULATIONS.

10. PRIOR TO ANY LAND DISTURBING ACTIVITIES, THE BOUNDARIES OF THE CLEARING LIMITS, VEGETATED BUFFERS, AND ANY SENSITIVE AREAS SHOWN ON THIS PLAN SHALL BE CLEARLY DELINEATED IN THE FIELD. UNLESS OTHERWISE APPROVED, NO DISTURBANCE IS PERMITTED BEYOND THE CLEARING LIMITS. THE OWNER/PERMITTEE MUST MAINTAIN THE DELINEATION FOR THE DURATION OF THE PROJECT. NOTE: VEGETATED CORRIDORS TO BE DELINEATED WITH ORANGE CONSTRUCTION FENCE, CHAIN LINK FENCE OR APPROVED EQUAL.

11. PRIOR TO ANY LAND DISTURBING ACTIVITIES, THE BMPS THAT MUST BE INSTALLED ARE A GRAVEL CONSTRUCTION ENTRANCE, PERIMETER SEDIMENT CONTROL, AND INLET PROTECTION. THESE BMPS MUST BE MAINTAINED FOR THE DURATION OF THE PROJECT.

12. IF VEGETATIVE SEED MIXES ARE SPECIFIED, SEEDING MUST TAKE PLACE NO LATER THAN SEPTEMBER 1ST; THE TYPE AND PERCENTAGES OF SEED IN THE MIX ARE AS IDENTIFIED ON THE PLANS OR AS SPECIFIED BY THE DESIGN ENGINEER.

13. WATERTIGHT TRUCKS MUST BE USED TO TRANSPORT SATURATED SOILS FROM THE CONSTRUCTION SITE. AN APPROVED EQUIVALENT IS TO DRAIN THE SOIL ON SITE AT A DESIGNATED LOCATION USING APPROPRIATE BMP'S; SOIL MUST BE DRAINED SUFFICIENTLY FOR MINIMAL SPILLAGE OF SEDIMENT & SEDIMENT-LADEN WATER.

14. THE ESC PLAN MUST BE KEPT ONSITE. ALL MEASURES SHOWN ON THE PLAN MUST BE INSTALLED PROPERLY TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER A SURFACE WATER SYSTEM, ROADWAY, OR OTHER PROPERTIES.

15. WRITTEN ESC LOGS ARE SUGGESTED TO BE MAINTAINED ONSITE AND AVAILABLE TO DISTRICT INSPECTORS UPON REQUEST.

16. IN AREAS SUBJECT TO WIND EROSION, APPROPRIATE BMP'S MUST BE USED WHICH MAY INCLUDE THE APPLICATION OF FINE WATER SPRAYING, PLASTIC SHEETING, MULCHING, OR OTHER APPROVED MEASURES.

17. SITE DEWATERING SHALL COMPLY WITH DEQ PERMIT STANDARDS, SEE SPECIFICATIONS FOR REQUIREMENTS.

PRE-CONSTRUCTION EROSION AND SEDIMENTATION CONTROL NOTES

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES. THESE MUST BE MAINTAINED FOR THE DURATION OF THE PROJECT.

2. SEDIMENT BARRIERS APPROVED FOR USE INCLUDE SEDIMENT FENCE, BERMS CONSTRUCTED OUT OF MULCH, CHIPPINGS, OR OTHER SUITABLE MATERIAL, STRAW WATTLES, OR OTHER APPROVED MATERIALS.

3. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, STREET SWEEPING, AND VACUUMING, MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT. TRUCKS ENTERING PAVEMENT FROM UNPAVED AREA SHALL BE FREE OF MUD & DEBRIS. SEE REQUIREMENT OF 1200-C PERMIT.

4. RUN-ON AND RUN-OFF CONTROLS SHALL BE IN PLACE AND FUNCTIONING PRIOR TO BEGINNING SUBSTANTIAL CONSTRUCTION ACTIVITIES. RUN-ON AND RUN-OFF CONTROL MEASURES INCLUDE: SLOPE DRAINS (WITH OUTLET PROTECTION), CHECK DAMS, SURFACE ROUGHENING, AND BANK STABILIZATION.

5. LIMIT SPEED OF VEHICLES ON SITE AND MOISTEN HAUL ROADS AS NECESSARY TO CONTROL DUST.

GRADING, STREET AND UTILITY EROSION AND SEDIMENT CONSTRUCTION NOTES

1. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL BE COMPOSED OF ONE OF THE FOLLOWING MIXTURES, COORDINATE WITH CWS FOR SEED MIX TO BE USED:
   - A. VEGETATED CORRIDOR AREAS REQUIRE NATIVE SEED MIXES. SEE RESTORATION PLAN FOR APPROPRIATE SEED MIX.
   - B. DWARF GRASS MIX (MINIMUM 100 LB/ACRE)
     1. DWARF PERENNIAL RYEGRASS (80% BY WEIGHT)
     2. CREEPING RED FESCUE (20% BY WEIGHT)
   - C. STANDARD HEIGHT GRASS MIX (MINIMUM 100 LB/ACRE)
     1. ANNUAL RYEGRASS (40% BY WEIGHT)
     2. TURF-TYPE FESCUE (60% BY WEIGHT)

2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.

3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE.

4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.

5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. DURING "WET WEATHER" PERIODS, STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.

6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES EXCEEDING 25% MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.

7. ACTIVE INLETS TO STORMWATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.

8. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORMWATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY. SUITABLE CONCRETE WASH-OUT AREAS WILL BE IDENTIFIED BY CONTRACTOR AND APPROVED BY EROSION CONTROL INSPECTOR.

9. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORMWATER SYSTEM. SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.

10. AVOID PAVING IN WET WEATHER WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORMWATER SYSTEM.

11. USE BMPs SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.

12. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORMWATER SYSTEM.

13. INLET PROTECTION SHALL BE IN-PLACE IMMEDIATELY FOLLOWING PAVING ACTIVITIES.

EROSION CONTROL NOTES

1. APPROVAL OF THIS EROSION SEDIMENTATION CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G.: SIZE AND LOCATION OF ROADS, PIPES, RESTRICTIONS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.).

2. THE IMPLEMENTATION OF THESE EROSION/SEDIMENTATION CONTROL (ESC) PLANS AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.

3. THE ESC FACILITIES SHOWN ON THESE PLANS MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.

4. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONALITY.

5. DURING INACTIVE PERIODS ON THE SITE OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS, INSPECTIONS SHALL BE REQUIRED ONCE EVERY TWO (2) WEEKS.

6. FOR EACH CATCH BASIN PROTECTION, CLEANING MUST OCCUR WHEN DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWN STREAM SYSTEM.

7. CONTRACTOR SHALL PROVIDE DUST CONTROL AS REQUIRED, SEE SPECIFICATIONS AND PERMIT REQUIREMENTS.

8. PAVEMENT SURFACES AND VEGETATION ARE TO BE PLACED AS RAPIDLY AS POSSIBLE.

9. SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1 FOR EACH PHASE OF CONSTRUCTION.

EROSION CONTROL NOTES (CONT)

10. IF THERE ARE EXPOSED SOILS OR SOILS NOT FULLY STABILIZED FROM OCTOBER 1 THROUGH MAY 31, THE WET WEATHER EROSION CONTROL MEASURES WILL BE IN EFFECT ACCORDING TO WES/CWS EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (REV. DECEMBER 2008).

11. ESC MEASURES SHALL BE REMOVED BY THE CONTRACTOR WHEN VEGETATION IS FULLY ESTABLISHED, AS APPROVED BY THE ENGINEER.

12. NOTIFY ENGINEER 24 HOURS PRIOR TO ANY WORK ON SITE.

SEDIMENT FENCE NOTES

13. STANDARD OR HEAVY-DUTY SEDIMENT FENCE FILTER FABRIC SHALL HAVE MANUFACTURED STITCHED LOOPS WITH 2"X2"X4' POSTS. STITCHED LOOPS SHALL BE INSTALLED ON THE UPHILL SIDE OF THE SLOPED AREA.

14. THE FILTER FABRIC FENCE SHALL BE INSTALLED TO FOLLOW THE CONTOURS WHERE FEASIBLE. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 12 INCHES.

15. SEDIMENT FENCES SHOULD BE INSTALLED A MINIMUM OF 3 FEET FROM TOE OF SLOPE IN ORDER TO MAXIMIZE STORAGE.

16. A TRENCH SHOULD BE EXCAVATED 6 INCHES DEEP ALONG THE LINE OF POSTS. TRENCH SHOULD BE BACKFILLED AND THE SOIL COMPACTED ON BOTH SIDES OF THE SEDIMENT FENCE.

17. SEDIMENT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.

18. WHEN JOINING TWO OR MORE SEDIMENT FENCES TOGETHER, JOIN THE TWO END STAKES BY WRAPPING THE TWO ENDS AT LEAST ONE AND ONE HALF TURNS AND DRIVING THE JOINED STAKES INTO THE GROUND TOGETHER.

19. WHEN SEDIMENT FENCE APPROACHES ITS TERMINATION POINT, TURN FENCE UPHILL AND EXTEND ON FULL PANEL (6 FEET). HEIGHT OF A SEDIMENT FENCE SHOULD NOT EXCEED 3 FEET. STORAGE HEIGHT AND PONDING HEIGHT SHOULD NEVER EXCEED 1.5 FEET.

BIO-FILTER BAG NOTES

20. BIO-FILTER BAGS SHOULD BE CLEAN 100% RECYCLED WOOD PRODUCT WASTE.

21. BIO-FILTER BAGS SHALL BE STANDARD SIZE 10" x 8" x 30", WEIGHING APPROXIMATELY 45 POUNDS WITH ½" PLASTIC NETTING.

22. USE 2 - 1" x 2" STAKES PER BAG, DRIVEN 12-INCHES INTO GROUND.

23. OVERLAP ENDS OF ADJACENT BAGS 6-INCHES TO PREVENT PIPING BETWEEN JOINTS.

24. ROUTINELY INSPECT BAGS. CHECK THAT STAKES ARE SECURE, ENDS OF BAGS ARE OVERLAPPED AND PLASTIC MESH BAGS HAVE NO TEARS.

25. REMOVE SEDIMENT WHEN IT HAS ACCUMULATED TO ⅓ HEIGHT OF BAG.

TURBIDITY BARRIER NOTES

1. TURBIDITY CURTAIN SHALL BE TYPE 1 DOT PERMEABLE STYLE BARRIER.
2. CURTAINS SHALL BE PLACED ACCORDING TO MANUFACTURER SPECIFICATIONS, ENSURING THAT PROPER ANCHORING TECHNIQUES ARE USED TO ENSURE CURTAIN REMAINS VERTICAL IN WATER COLUMN.
3. TURBIDITY CURTAIN SHALL BE INSPECTED BY CONTRACTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING ANY PROLONGED RAINFALL ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
4. TURBIDITY CURTAINS SHALL BE REMOVED AS DIRECTED WHEN THEY HAVE SERVED THEIR PURPOSED. BUT NOT BEFORE PERMANENT EROSION CONTROL MATTING HAS BEEN INSTALLED ON THE UPSLOPE AREA.

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EROSION CONTROL NOTES

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	NEM	JTB	BVO	BVO

PROJECT 6882

SHEET EC2 OF X

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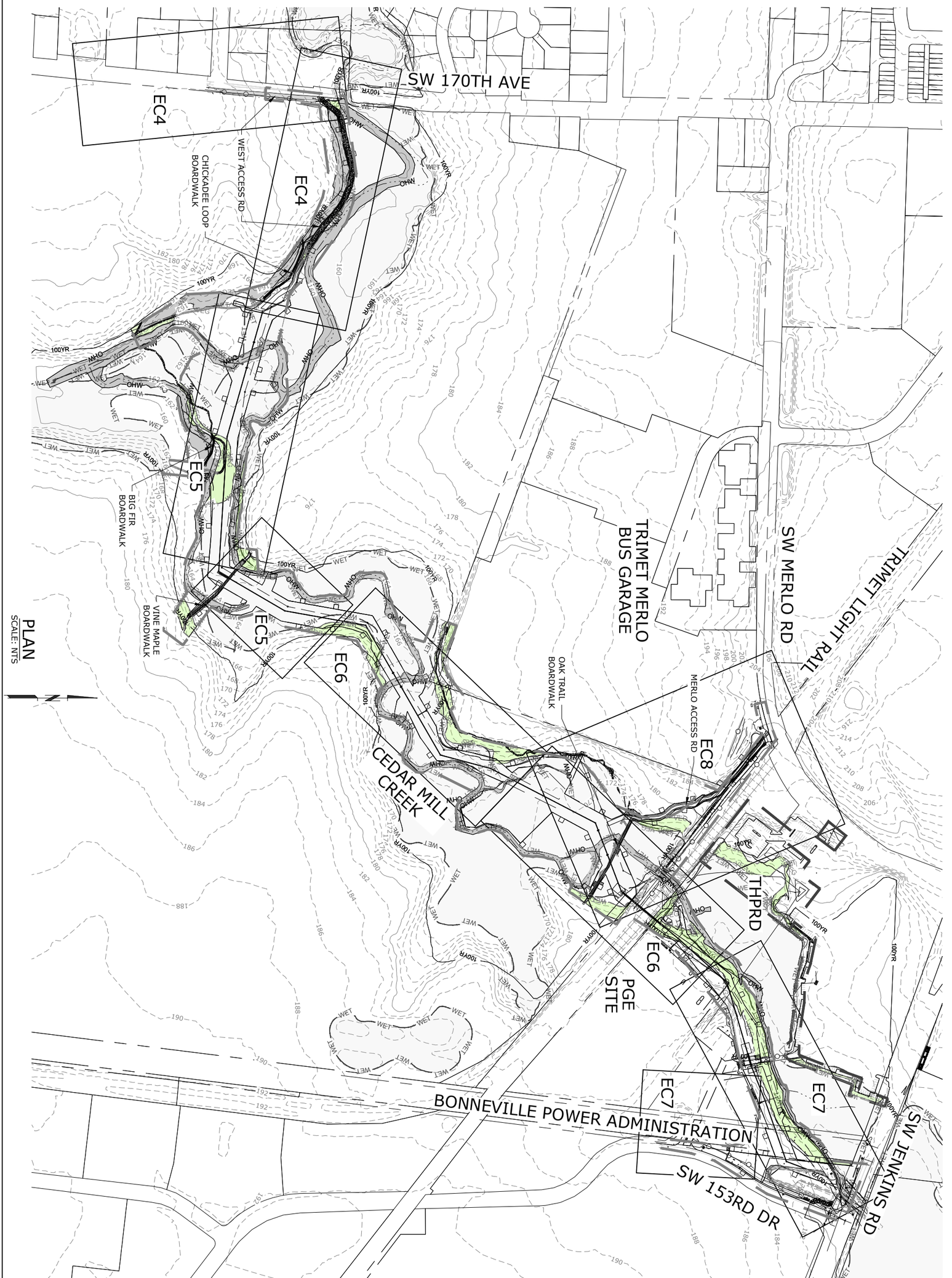

60% DESIGN

PROJECT	1/4 SECTION	CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH	EROSION CONTROL KEY MAP
6882	1S1W08NW		
SHEET EC3 OF X	DRAFTER: CAD DESIGNER: JTB CHECKED: BVO APPROVED: XXXX		

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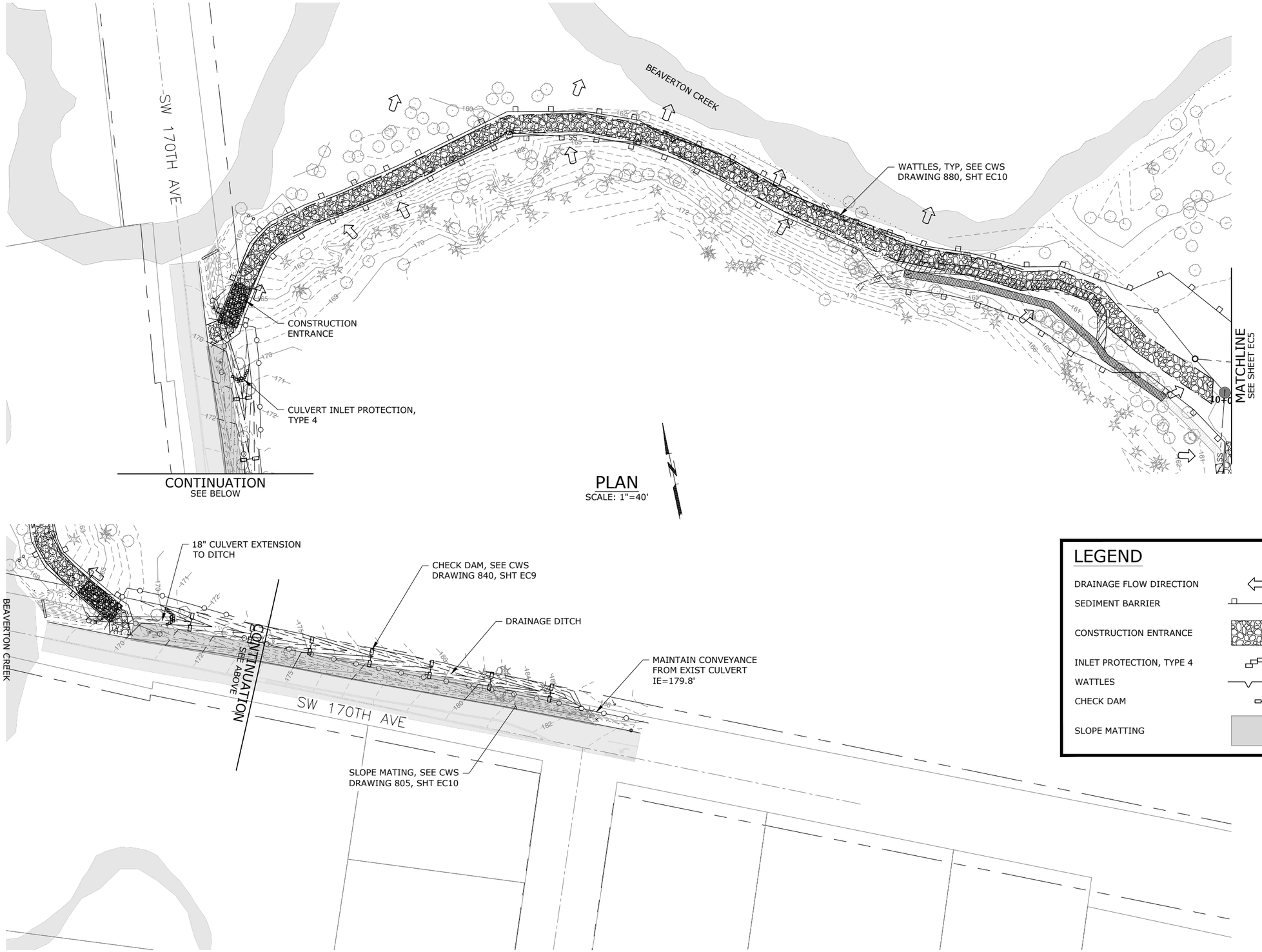

SHEET NOTES:

1. SEDIMENT FENCE SHALL BE A MIN OF 5' OFF TOP OF CREEK SLOPE IN ALL LOCATIONS.

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EROSION CONTROL PLAN - WEST ACCESS

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	DSN	CHK	APV

PROJECT 6882

SHEET EC4 OF X

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SHEET NOTES:

1. CONTRACTOR TO COORDINATE WITH ENGINEER ON STAGING AREA PLACEMENT AND PROTECTION
2. SEDIMENT FENCE SHALL BE A MIN OF 5' OFF TOP OF CREEK SLOPE IN ALL LOCATIONS.

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EROSION CONTROL PLAN
STA 10+00 TO STA 25+20

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	DSN	CHK	APV

PROJECT 6882
SHEET EC5 OF X

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PLAN
SCALE: 1"=40'

MATCHLINE STA 35+20
SEE SHEET EC5

MATCHLINE STA 35+00
SEE BELOW LEFT

WATTLES, TYP, SEE CWS DRAWING 880, SHT EC10

TYPE I DOT TURBIDITY CURTAIN, TYP

CEDAR MILL CREEK

26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35

LEGEND

- DRAINAGE FLOW DIRECTION
- SEDIMENT BARRIER
- WATTLES
- TURBIDITY CURTAIN

POTENTIAL STAGING AREA

MATCHLINE STA 35+00
SEE ABOVE RIGHT

36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45

MATCHLINE STA 45+00
SEE SHEET EC7

CEDAR MILL CREEK

PLAN
SCALE: 1"=40'

SHEET NOTES:

1. SEDIMENT FENCE SHALL BE A MIN OF 5' OFF TOP OF CREEK SLOPE IN ALL LOCATIONS.

40 20 0 40 80
SCALE IN FEET

EROSION CONTROL PLAN STA 25+20 TO STA 45+00

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	DSN	CHK	APV

PROJECT 6882

SHEET EC6 OF X

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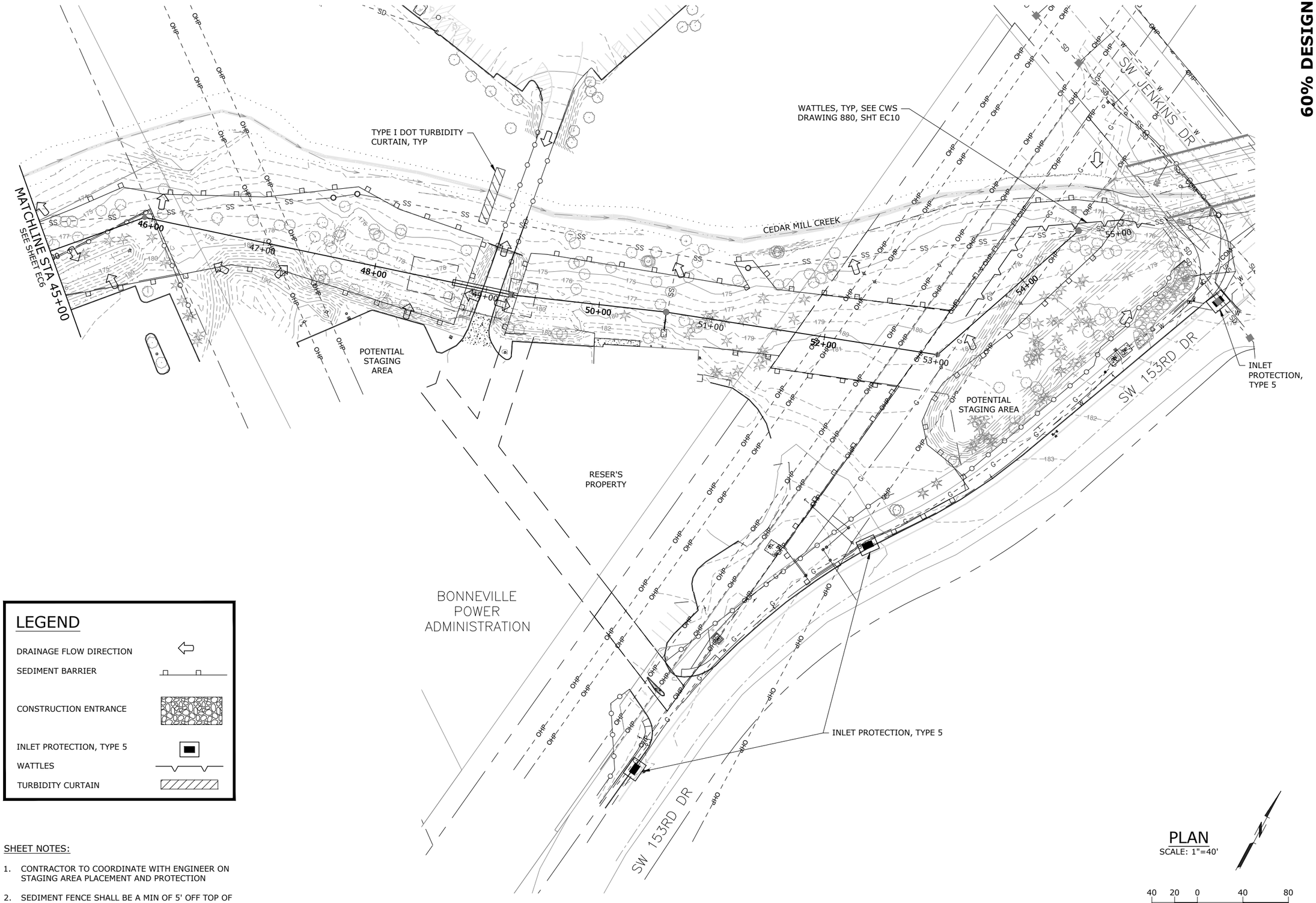
60% DESIGN



LEGEND

- DRAINAGE FLOW DIRECTION
- SEDIMENT BARRIER
- CONSTRUCTION ENTRANCE
- INLET PROTECTION, TYPE 5
- WATTLES
- TURBIDITY CURTAIN

SHEET NOTES:

1. CONTRACTOR TO COORDINATE WITH ENGINEER ON STAGING AREA PLACEMENT AND PROTECTION
2. SEDIMENT FENCE SHALL BE A MIN OF 5' OFF TOP OF CREEK SLOPE IN ALL LOCATIONS.

PLAN
SCALE: 1"=40'

40 20 0 40 80
SCALE IN FEET

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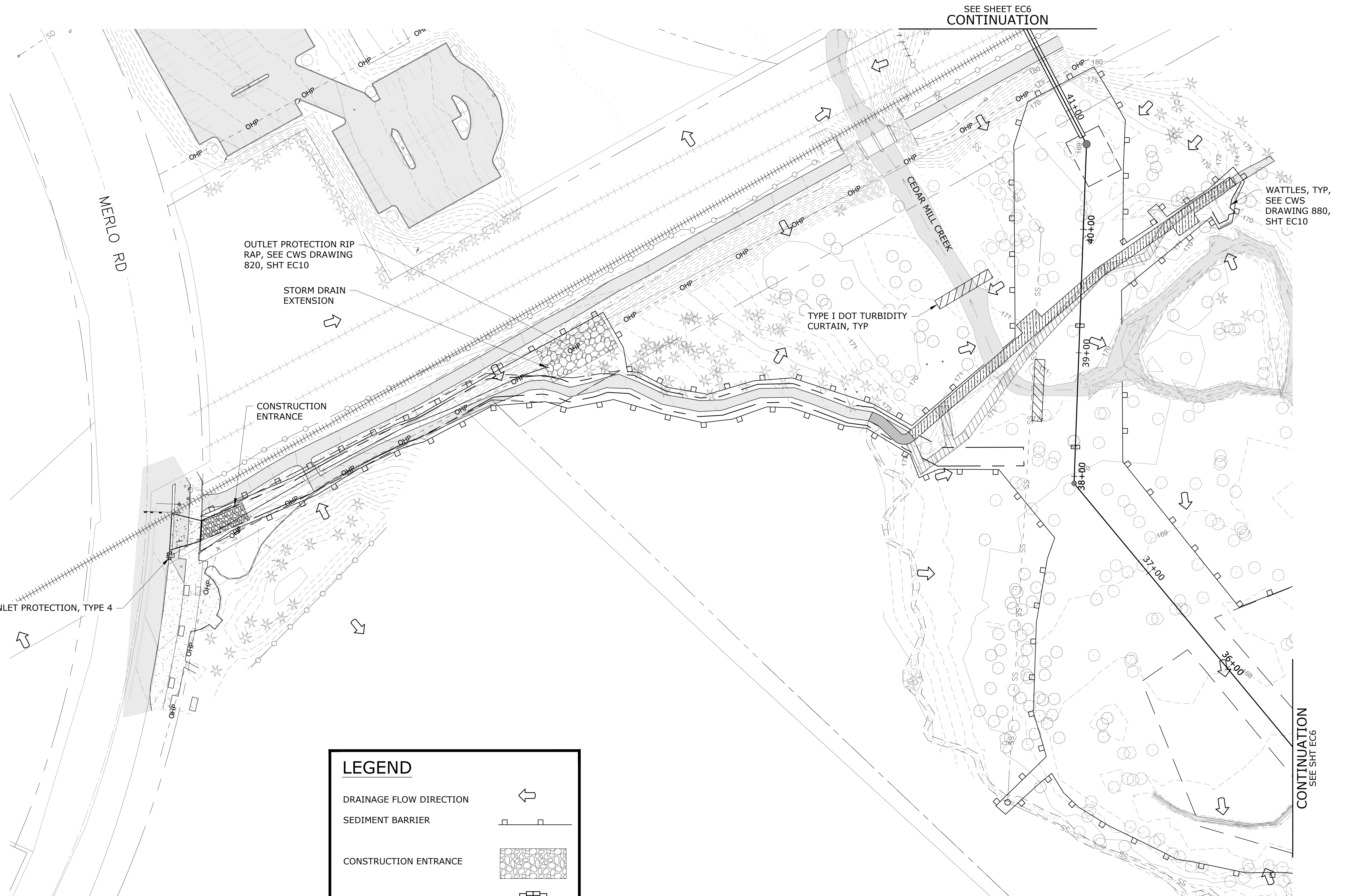
EROSION CONTROL PLAN STA 45+00 TO STA 54+88

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION 1S1W08NW	DRAFTER: CAD	DESIGNER: DSN	CHECKED: CHK	APPROVED: APV

PROJECT 6882 | SHEET EC7 OF X

60% DESIGN



LEGEND

DRAINAGE FLOW DIRECTION	
SEDIMENT BARRIER	
CONSTRUCTION ENTRANCE	
INLET PROTECTION, TYPE 4	
WATTLES	
TURBIDITY CURTAIN	
OUTLET PROTECTION RIPRAP	

PLAN
SCALE: 1"=40'

40 20 0 40 80
SCALE IN FEET

SHEET NOTES:

1. SEDIMENT FENCE SHALL BE A MIN OF 5' OFF TOP OF CREEK SLOPE IN ALL LOCATIONS.

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EROSION CONTROL PLAN - MERLO ACCESS

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION 1S1W08NW
DRAFTER: CAD
DESIGNER: DSN
CHECKED: CHK
APPROVED: APV

PROJECT 6882
SHEET EC8 OF X

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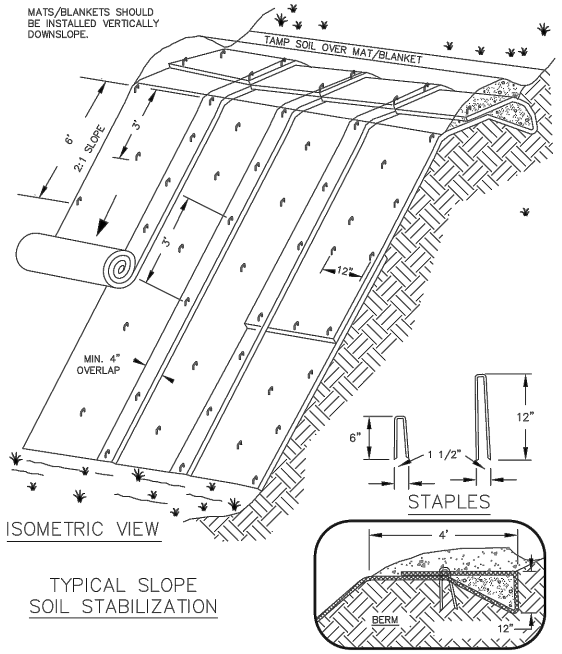


ISOMETRIC VIEW

TYPICAL SLOPE SOIL STABILIZATION

NOT TO SCALE

NOTES:

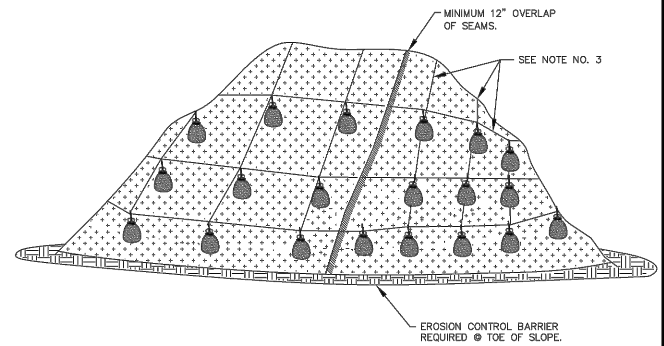
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.

MATTING SLOPE INSTALLATION

CleanWater Services

DRAWING NO. 805 REVISED 12–16

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.



PLASTIC SHEETING

NOTES:

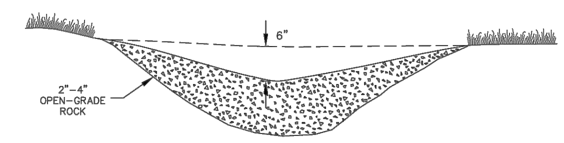
1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
2. BARRIER REQUIRED @ TOE OF STOCK PILE.
3. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR APPROVED EQUAL ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.
4. PLASTIC TO EXTEND MINIMUM 1' BEYOND TOE OF SLOPE

PLASTIC SHEETING

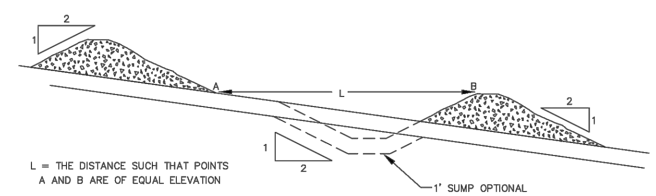
CleanWater Services

DRAWING NO. 810 REVISED 12–16

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.



ROCK CHECK DAM



SPACING BETWEEN CHECK DAMS

CHECK DAM ROCK

CleanWater Services

DRAWING NO. 840 REVISED 12–16

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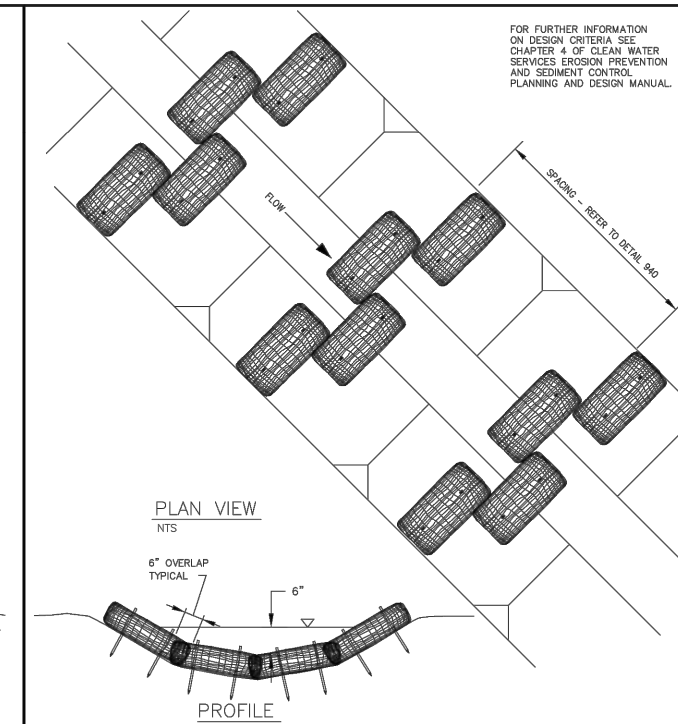


PLAN VIEW

NTS

PROFILE

NTS

NOTES:

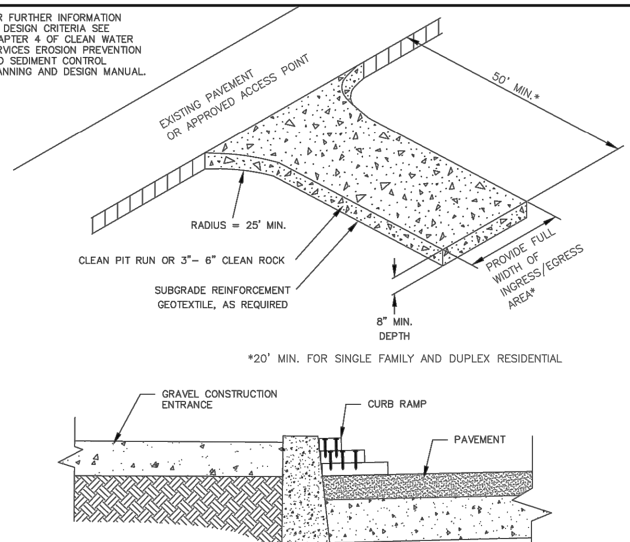
1. STAKING OF BAGS REQUIRED USING (2) 1"X2" WOOD STAKES OR APPROVED EQUAL PER BAG.
2. SURFACE MUST BE SMOOTH BEFORE APPLICATION.
3. CHECK DAMS CAN BE CONSTRUCTED USING STRAW WATTLES OR OTHER MATERIALS AS APPROVED BY THE DISTRICT OR CITY.

CHECK DAM BIO–FILTER BAG

CleanWater Services

DRAWING NO. 845 REVISED 12–16

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.



NOTES:

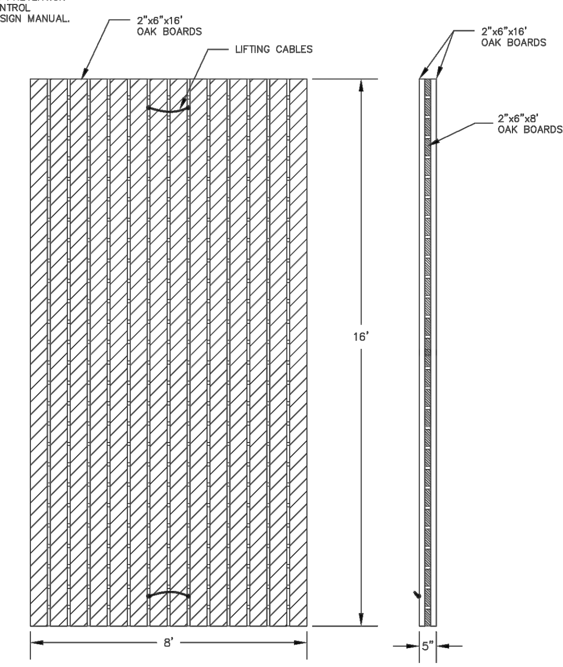
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF– WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. DIMENSIONS
   SINGLE FAMILY
   20' LONG BY 20' WIDE 8" DEEP OF ¾" MINUS CLEAN ROCK.
   COMMERCIAL
   50' LONG BY 20' WIDE 3–6" CLEAN ROCK, GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB–SOIL PUMPING.

CONSTRUCTION ENTRANCE

CleanWater Services

DRAWING NO. 855 REVISED 12–16

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.



OAK MATS

NTS

SIDE VIEW

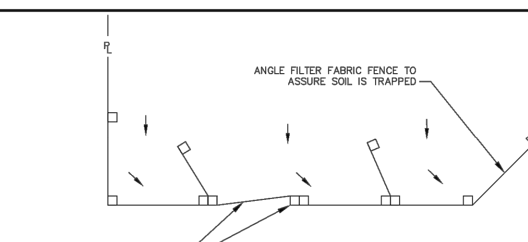
NOTES:

1. CONSTRUCTED OF 2"x6" OAK.

OAK MATS

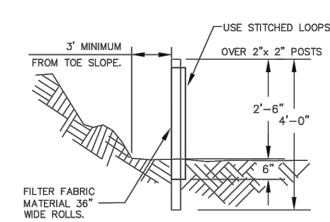
CleanWater Services

DRAWING NO. 860 REVISED 12–16



PLAN VIEW

NOT TO SCALE

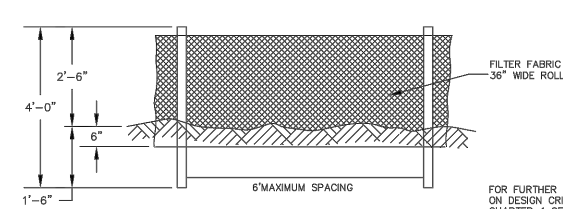


PROFILE

NOT TO SCALE

NOTES:

1. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
2. 2"x 2" FIR, PINE OR STEEL FENCE POSTS.
3. POSTS TO BE INSTALLED ON UPHILL SIDE OF SLOPE.
4. COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.
5. PANELS MUST BE PLACED ACCORDING TO SPACING ON DETAIL NO.940



FRONT VIEW

NOT TO SCALE

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

SEDIMENT FENCE

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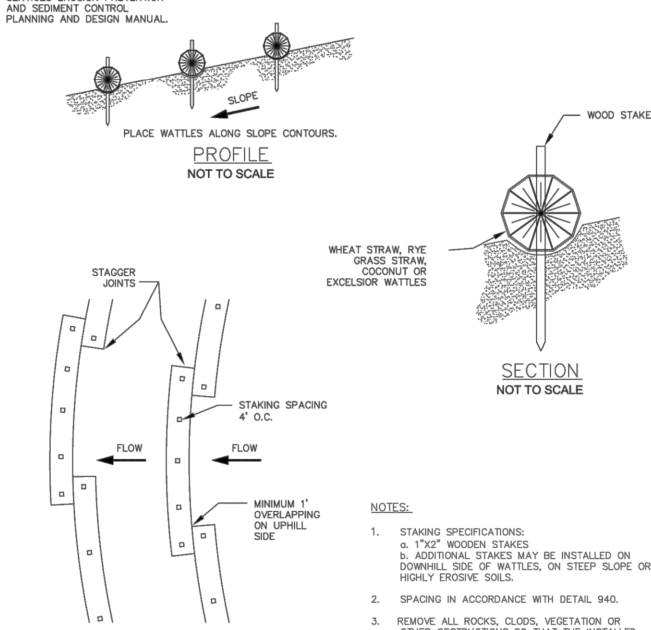
DRAWING NO. 875 REVISED 12–16

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.



PROFILE

NOT TO SCALE

SECTION

NOT TO SCALE

PLAN VIEW

NOT TO SCALE

NOTES:

1. STAKING SPECIFICATIONS:
   a. 1"X2" WOODEN STAKES
   b. ADDITIONAL STAKES MAY BE INSTALLED ON DOWNHILL SIDE OF WATTLES, ON STEEP SLOPE OR HIGHLY EROSIVE SOILS.
2. SPACING IN ACCORDANCE WITH DETAIL 940.
3. REMOVE ALL ROCKS, CLODS, VEGETATION OR OTHER OBSTRUCTIONS SO THAT THE INSTALLED WATTLES WILL HAVE DIRECT CONTACT WITH THE SOIL.
4. INSTALL THE WATTLES IN A 2" DEEP TRENCH, INSURING THAT NO GAPS EXIST BETWEEN THE SOIL AND THE BOTTOM OF THE WATTLE.. THE ENDS OF ADJACENT WATTLES SHALL BE OVERLAPPED 1 FT. MINIMUM TO PREVENT SEDIMENT PASSING THROUGH THE FIELD JOINT.

WATTLES

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DRAWING NO. 880 REVISED 12–16

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EROSION CONTROL STANDARD DRAWINGS

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION 1S1W08NW
DRAFTER: CAD
DESIGNER: DSN
CHECKED: CHK
APPROVED: APV

PROJECT 6882
SHEET EC9 OF X

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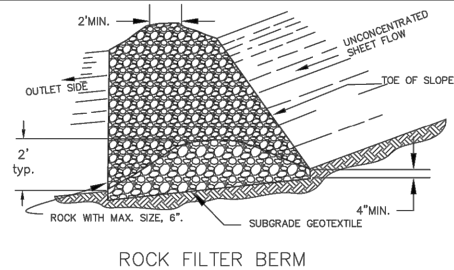
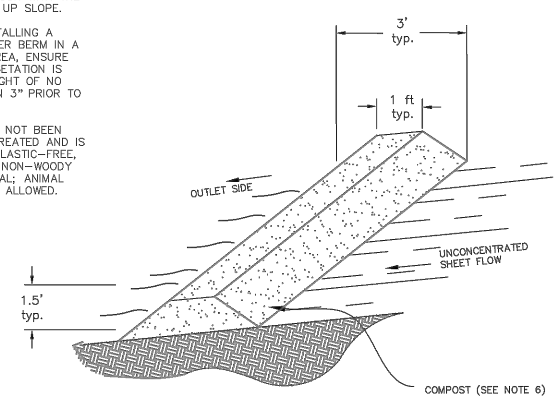
NOTES:

1. DIRECT THE OUTLET SIDE OF THE ROCK/COMPOST FILTER BERMS ONTO A STABILIZED AREA, SUCH AS VEGETATION AND/OR ROCK.
2. EMBED ROCK FILTER BERM A MIN. OF 4" INTO THE EXISTING GROUND/EMBANKMENT.
3. USE ROCK FILTER BERM ON 3:1 OR FLATTER SIDE SLOPES. WITHIN THE SAFETY CLEAR ZONE. USE 6:1 OR FLATTER ON SIDE SLOPES.
4. PLACE COMPOST FILTER BERM'S ALONG OR ON THE GROUND CONTOUR WITH THE ENDS TURNED UP SLOPE.
5. PRIOR TO INSTALLING A COMPOST FILTER BERM IN A VEGETATED AREA, ENSURE THAT THE VEGETATION IS CUT TO A HEIGHT OF NO GREATER THAN 3" PRIOR TO INSTALLATION.
6. COMPOST HAS NOT BEEN CHEMICALLY TREATED AND IS WEED–FREE, PLASTIC–FREE, DECOMPOSED, NON–WOODY PLANT MATERIAL; ANIMAL WASTE IS NOT ALLOWED.



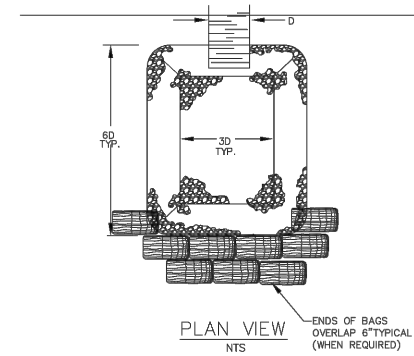
ROCK FILTER BERM



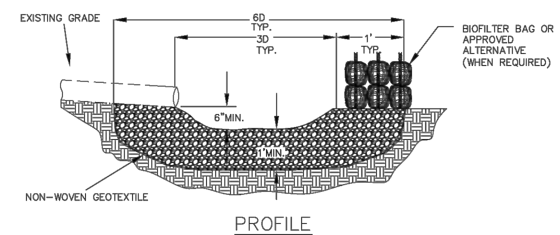
COMPOST FILTER BERM

FILTER BERMS ROCK/COMPOST
CleanWater Services
DRAWING NO. 890 REVISED 12–16

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.



PLAN VIEW
NTS



PROFILE

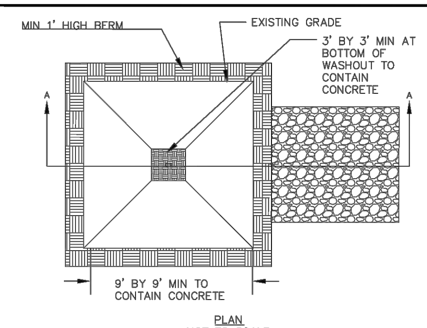
NOTES:

1. BIO BAGS ONLY REQUIRED WHEN DISCHARGING SEDIMENT LADEN WATER.
2. STAKING OF BAGS REQUIRED WITH EITHER METHOD USING (2) 1"x 2" WOOD STAKES OR APPROVED EQUAL PER BAG.

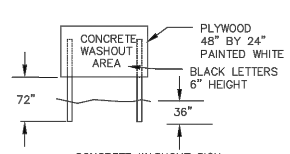
OUTLET PROTECTION RIP RAP
CleanWater Services
DRAWING NO. 820 REVISED 12–16

NOTES:

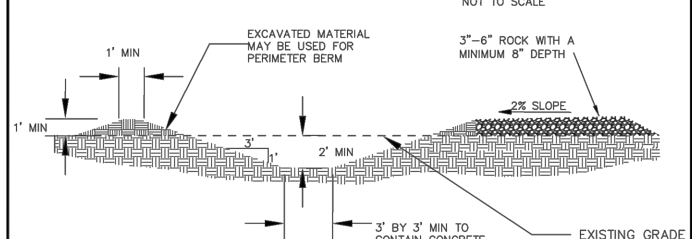
1. WASHOUT FACILITIES SHALL BE MAINTAINED TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM FREEBOARD OF 12 INCHES.
2. WASHOUT FACILITIES MUST BE CLEANED, OR NEW FACILITIES MUST BE CONSTRUCTED AND READY FOR USE ONCE THE WASHOUT IS 75% FULL.
3. IF THE WASHOUT IS NEARING CAPACITY, VACUUM AND DISPOSE OF THE WASTE MATERIAL IN AN APPROVED MANNER.
4. TEMPORARY CONCRETE WASHOUT FACILITIES SHALL BE LOCATED A MINIMUM OF 50 FT FROM SENSITIVE AREAS INCLUDING OPEN DRAINAGE FACILITIES AND WATERSOURSES.
5. CONCRETE WASHOUT FACILITIES SHALL BE CONSTRUCTED AND MAINTAINED IN SUFFICIENT QUANTITY AND SIZE TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS.
6. INSTALL CONCRETE WASHOUT SIGN WITHIN 30 FEET OF TEMPORARY CONCRETE WASHOUT FACILITY.
7. TEMPORARY CONCRETE WASHOUTS MAY BE A PREFABRICATED CONTAINER THAT IS PORTABLE AND REUSABLE.



PLAN
NOT TO SCALE

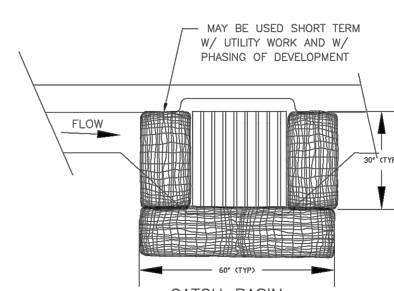


CONCRETE WASHOUT SIGN DETAIL
(OR EQUIVALENT)
NOT TO SCALE

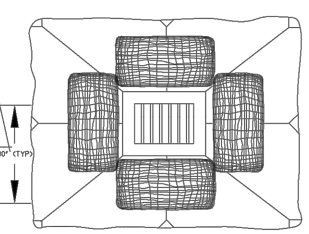


SECTION A–A
NOT TO SCALE

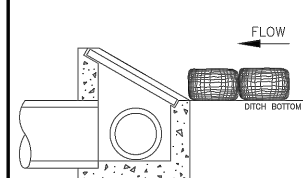
CONCRETE WASHOUT
CleanWater Services
DRAWING NO. 900 REVISED 12–16



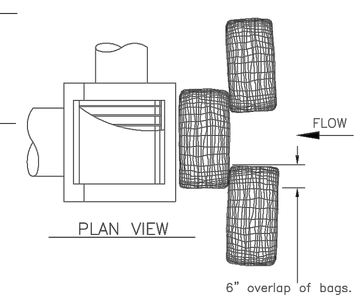
CATCH BASIN



AREA DRAIN



DITCH INLET



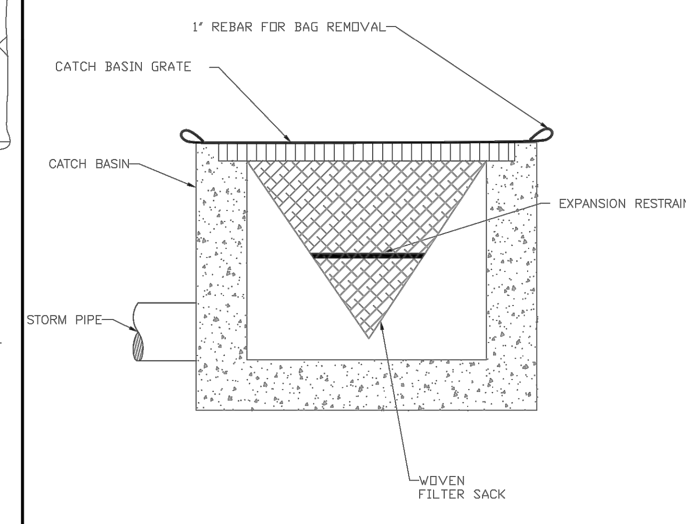
PLAN VIEW

NOTES:

1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPES.
2. BIO–FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2" WOODEN STAKES OR APPROVED EQUAL PER BAG.
3. WHEN USING 30" BIO–BAGS TO PROTECT A CATCH BASIN YOU MUST HAVE 4 BAGS AND THEY SHALL BE OVERLAPPED BY 6".

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

INLET PROTECTION TYPE 4
CleanWater Services
DRAWING NO. 915 REVISED 12–16



CATCH BASIN INSERT

NOTE:

1. RECESSED CURB INLET CATCH BASINS MUST BE BLOCKED WHEN USING FILTER FABRIC INLET SACKS. SIZE OF FILTER FABRIC INLET SACKS TO BE DETERMINED BY MANUFACTURER.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

INLET PROTECTION TYPE 5
CleanWater Services
DRAWING NO. 920 REVISED 12–16

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EROSION CONTROL STANDARD DRAWINGS

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION 1S1W08NW
DRAFTER: CAD
DESIGNER: DSN
CHECKED: CHK
APPROVED: APV

PROJECT 6882
SHEET EC10 OF X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-EC.dwg EC10 12/23/2019 3:35 PM HCM 23.0s (LMS Tech)

<TO FOLLOW>

60% DESIGN

PROJECT	6882
SHEET	EC11
OF	X

1/4 SECTION	1S1W08NW
DRAFTER:	CAD
DESIGNER:	DSN
CHECKED:	CHK
APPROVED:	APV

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

EROSION CONTROL DEWATERING

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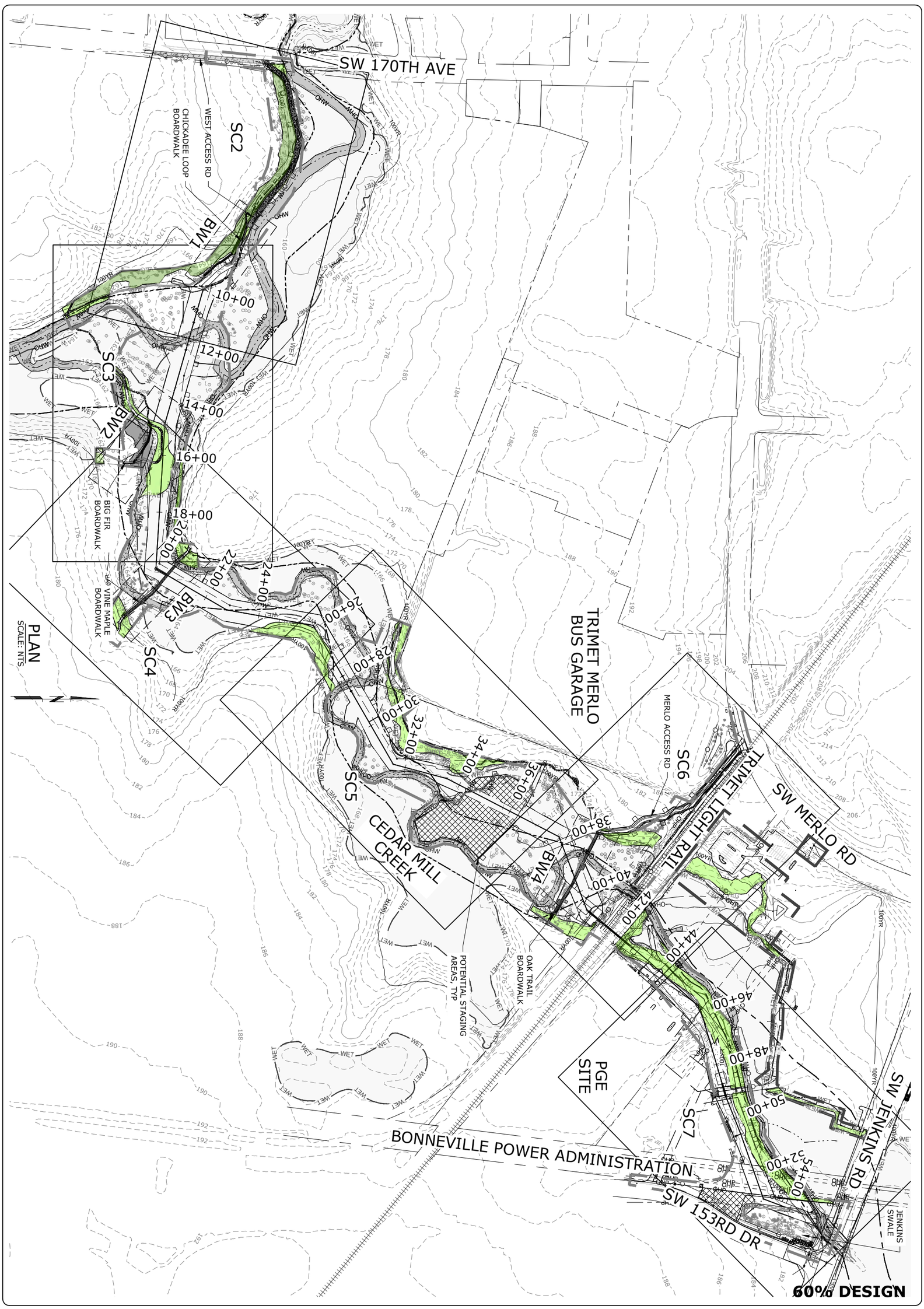

PROJECT 6882	1/4 SECTION 1S1W08NW	CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH	SITE CIVIL KEY MAP
SHEET SC1 OF X	DRAFTER: CAD DESIGNER: JTB CHECKED: BVO APPROVED: XXXX		

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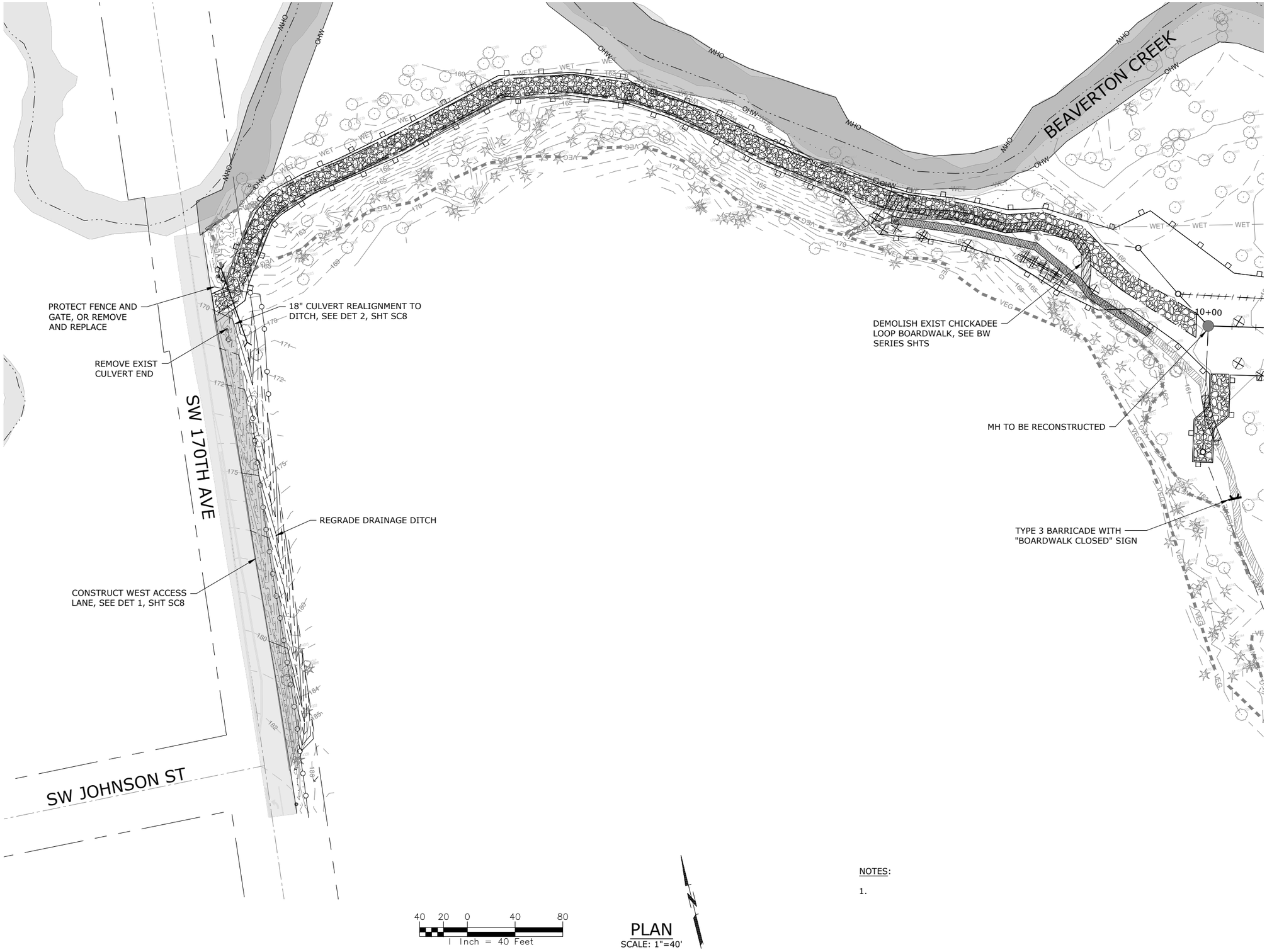

PLAN
SCALE: 1"=40'

NOTES:

1.

NOTICE
0 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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SITE ACCESS AND DEMOLITION PLAN - 1

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	1S1W08NW
DRAFTER:	CAD
DESIGNER:	DSN
CHECKED:	CHK
APPROVED:	APV
PROJECT	6882
SHEET	SC2
OF	X

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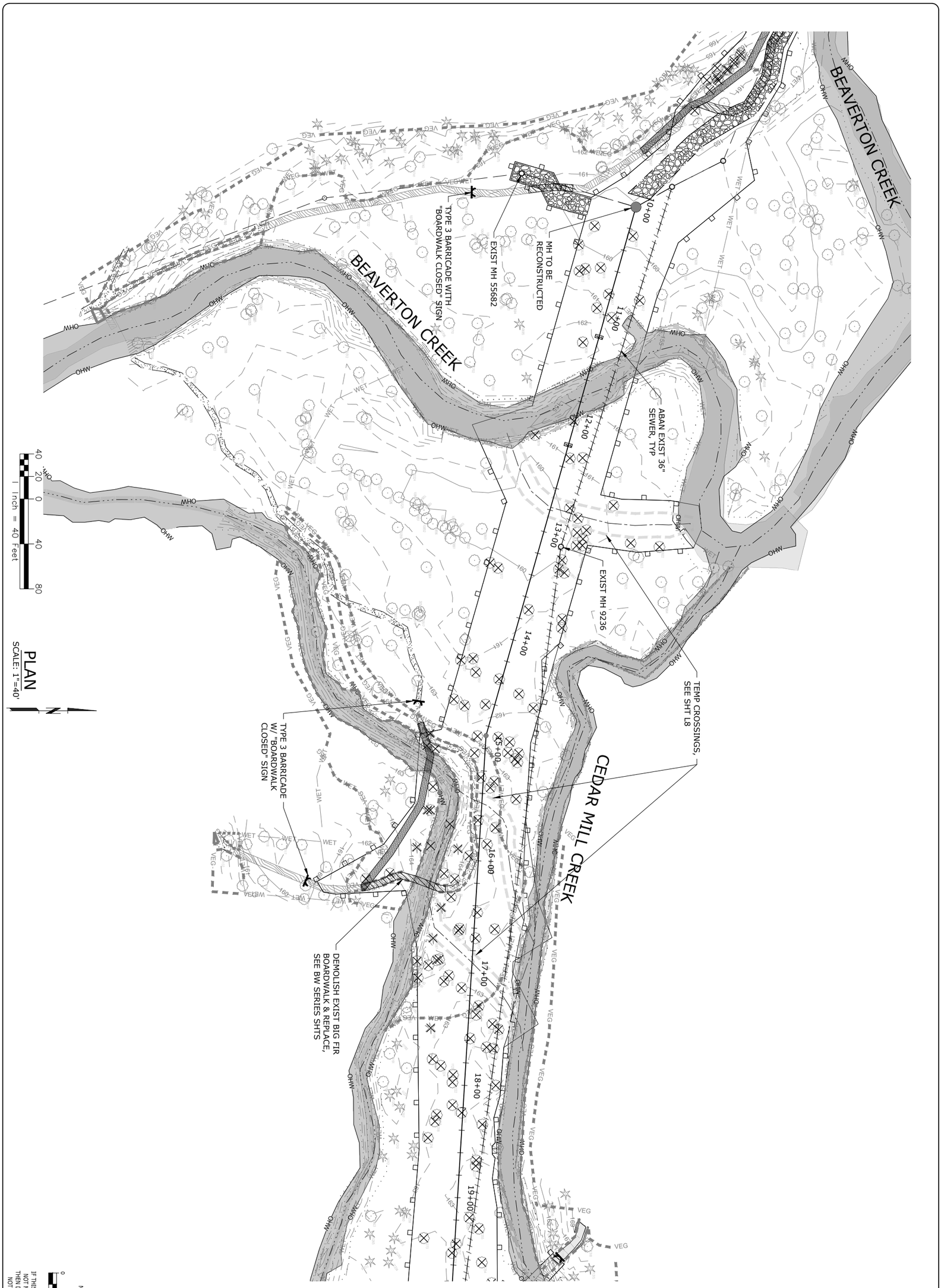

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IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NOTICE

PROJECT	6882
SHEET	SC3
OF	X

1/4 SECTION	1S1W08NW
DRAFTER:	CAD
DESIGNER:	DSN
CHECKED:	CHK
APPROVED:	APV

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

SITE ACCESS AND DEMOLITION PLAN - 2

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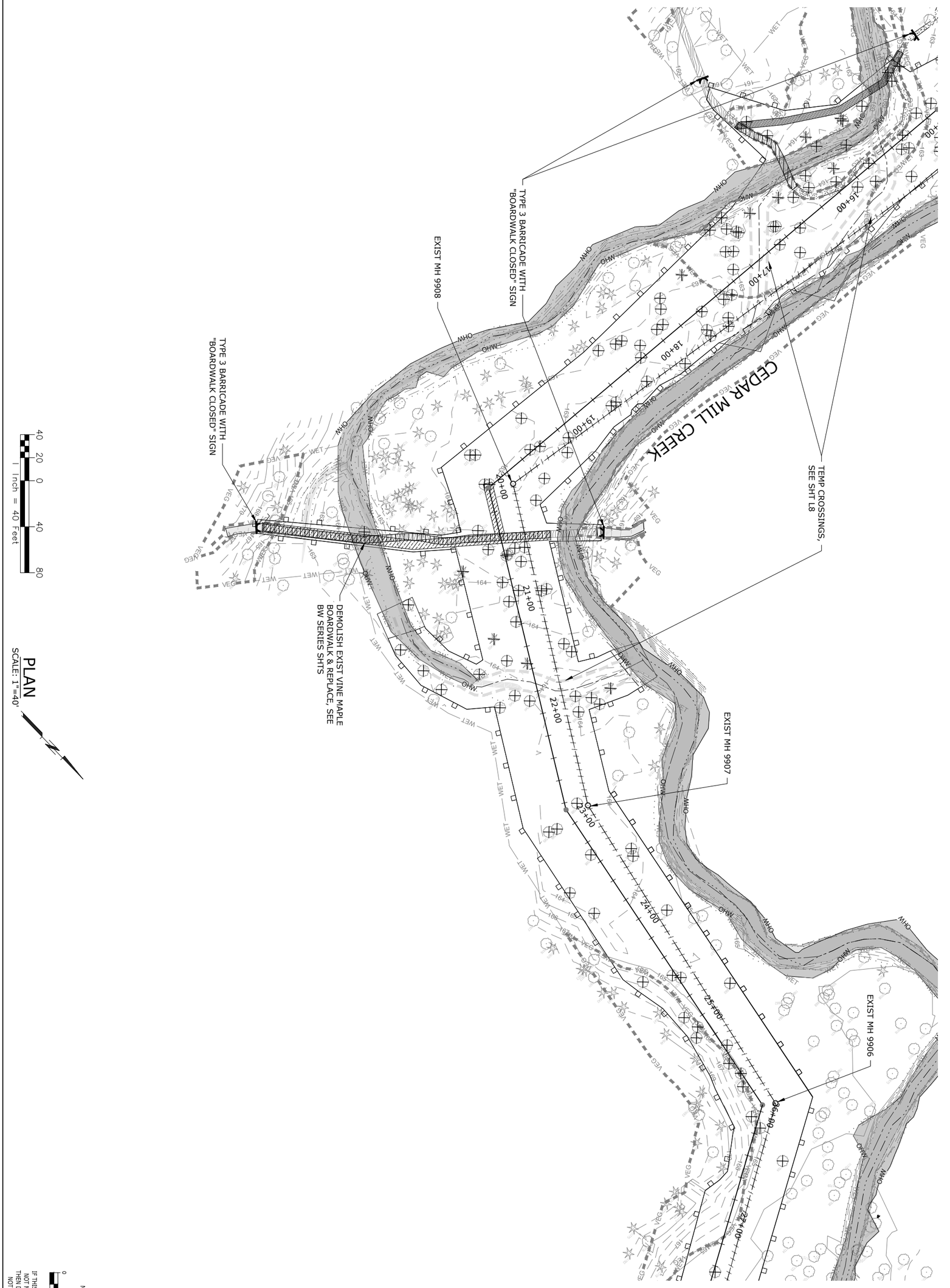

60% DESIGN

PROJECT	6882
SHEET	SC4
OF	X

1/4 SECTION	1S1W08NW
DRAFTER:	CAD
DESIGNER:	DSN
CHECKED:	CHK
APPROVED:	APV

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

SITE ACCESS AND DEMOLITION PLAN - 3

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60% DESIGN

TRIMET MERLO BUS GARAGE

CEDAR MILL CREEK

OLD WAGON TRAIL

EXIST MH 9906

EXIST MH 9905

EXIST MH 9904

TYPE 3 BARRICADE W/ "BOARDWALK CLOSED" SIGN

REPLACE TRAIL IN KIND AFTER DISTURBANCE

THIS CHANNEL TO BE RESTORED, SEE ENHANCEMENT PLAN

TEMP CROSSINGS, SEE SHT L8

26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00

OHW MHO WET VEG

40 20 0 40 80
1 Inch = 40 Feet

PLAN
SCALE: 1"=40'

NOTICE
0 1
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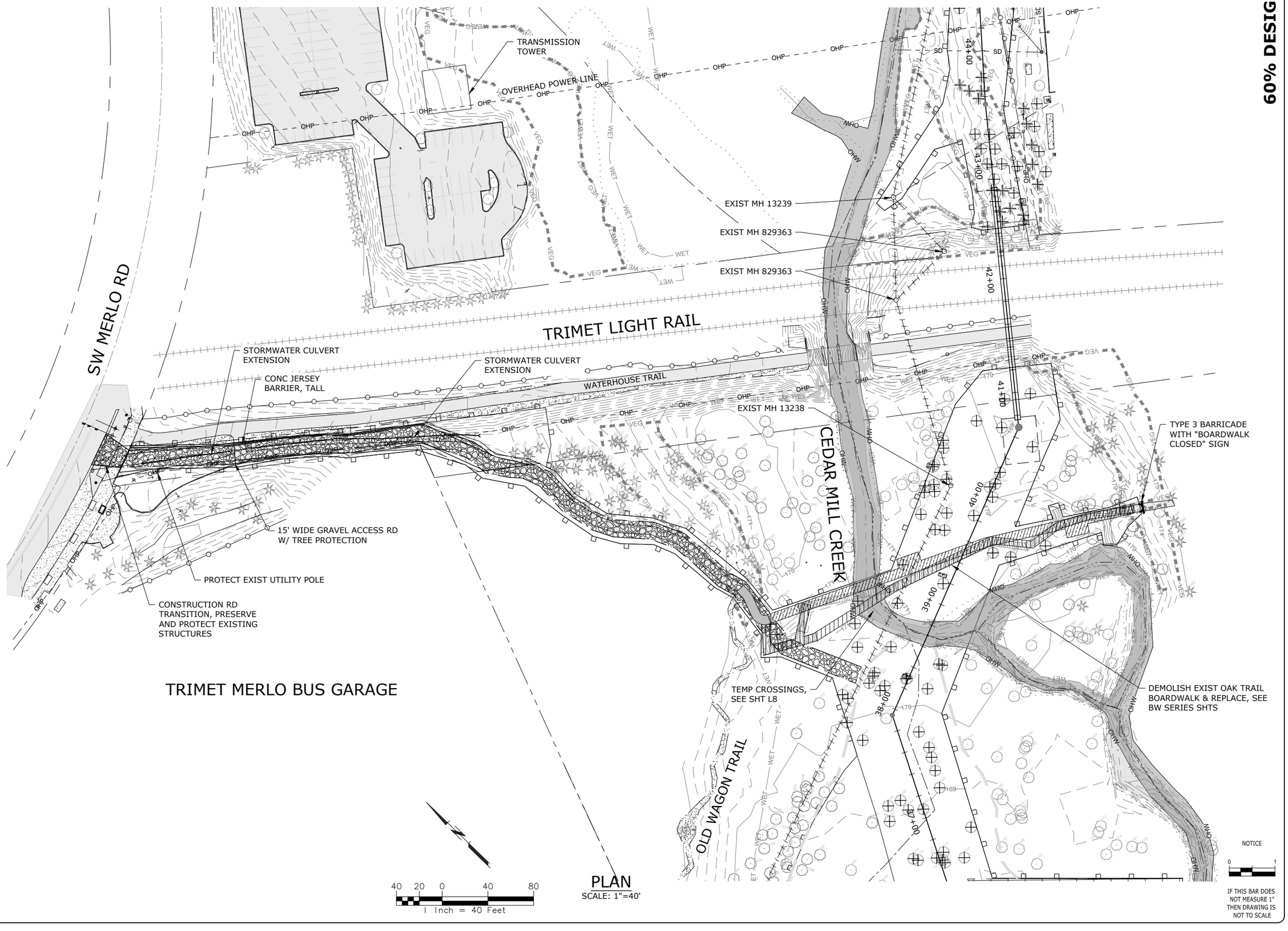
SITE ACCESS AND DEMOLITION PLAN - 4

CEDAR MILL CREEK
SANITARY AND
REGIONAL
STORMWATER
MANAGEMENT
APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	DSN	CHK	APV

PROJECT 6882

SHEET SC5 OF X



PLAN
SCALE: 1"=40'

40 20 0 40 80
1 Inch = 40 Feet

NOTICE
0 1
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SITE ACCESS AND DEMOLITION PLAN - 5

CEDAR MILL CREEK
SANITARY AND
REGIONAL
STORMWATER
MANAGEMENT
APPROACH

1/4 SECTION	1S1W08NW
DRAFTER:	CAD
DESIGNER:	DSN
CHECKED:	CHK
APPROVED:	APV

PROJECT 6882
SHEET SC6 OF X

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60% DESIGN

THPRD

RESERS

PGE

RESERS

CEDAR MILL CREEK

SW JENKINS RD

SW 153RD DR

BONNEVILLE POWER ADMINISTRATION

EXIST MH 86735

EXIST MH 13240

EXIST MH 9900

EXIST MH 9893

CONSTRUCTION ENTRANCE

JENKINS SWALE PROJECT, FUTURE COMPLETION BY OTHERS

45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00 54+00 55+00

40 20 0 40 80
1 Inch = 40 Feet

PLAN
SCALE: 1"=40'

NOTICE
0 1
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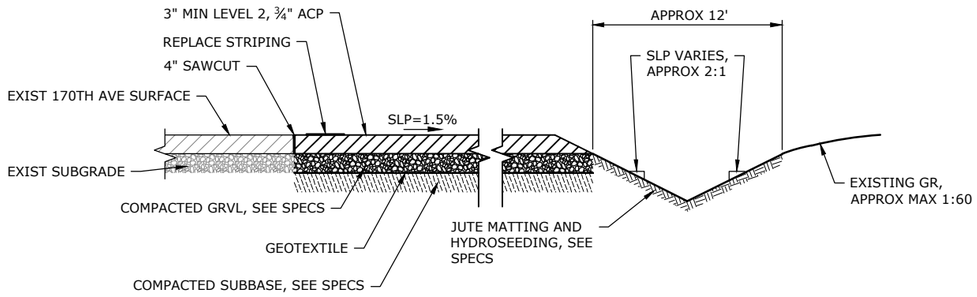
SITE ACCESS AND DEMOLITION PLAN - 6

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	1S1W08NW
DRAFTER:	CAD
DESIGNER:	DSN
CHECKED:	CHK
APPROVED:	APV

PROJECT	6882
SHEET	SC7
OF	X



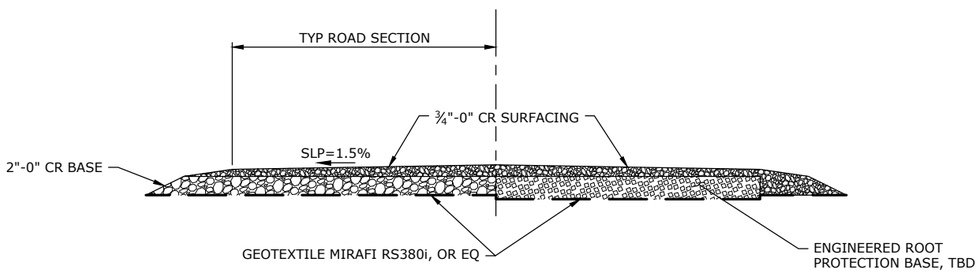
NOTES:

1. MAINTAIN 12-FT MINIMUM LANE WIDTH.

WEST ACCESS LANE CROSS SECTION

SCALE: 1"=1'-0"

1 / SC2



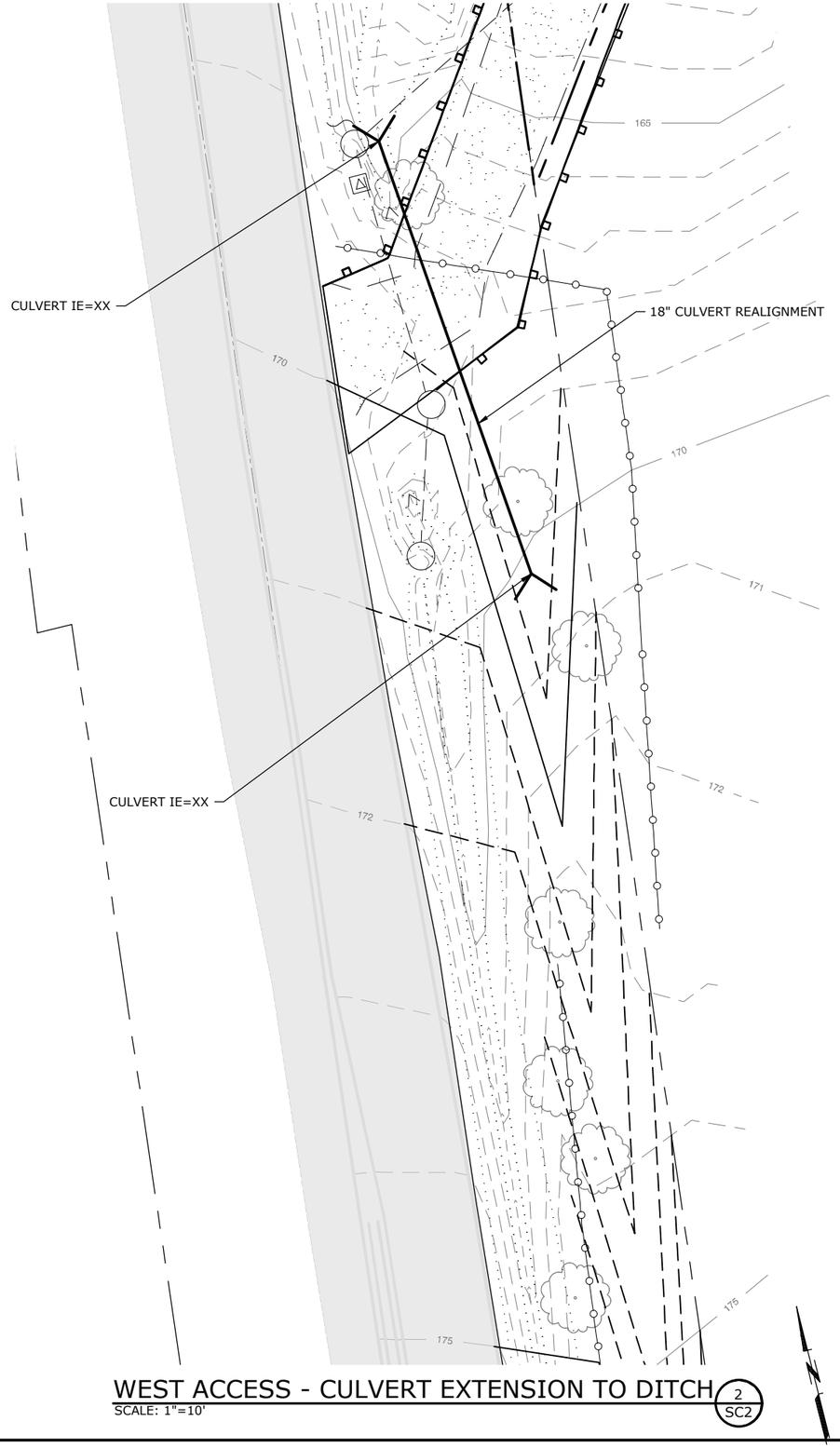
NOTES:

1. MAINTAIN 15-FT ROAD WIDTH.

TEMPORARY CONSTRUCTION ACCESS ROAD SECTIONS

SCALE: NTS

3 / SC2 SC6



WEST ACCESS - CULVERT EXTENSION TO DITCH

SCALE: 1"=10'

2 / SC2

60% DESIGN

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SITE CIVIL DETAILS

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	BVO

PROJECT 6882

SHEET SC8 OF X

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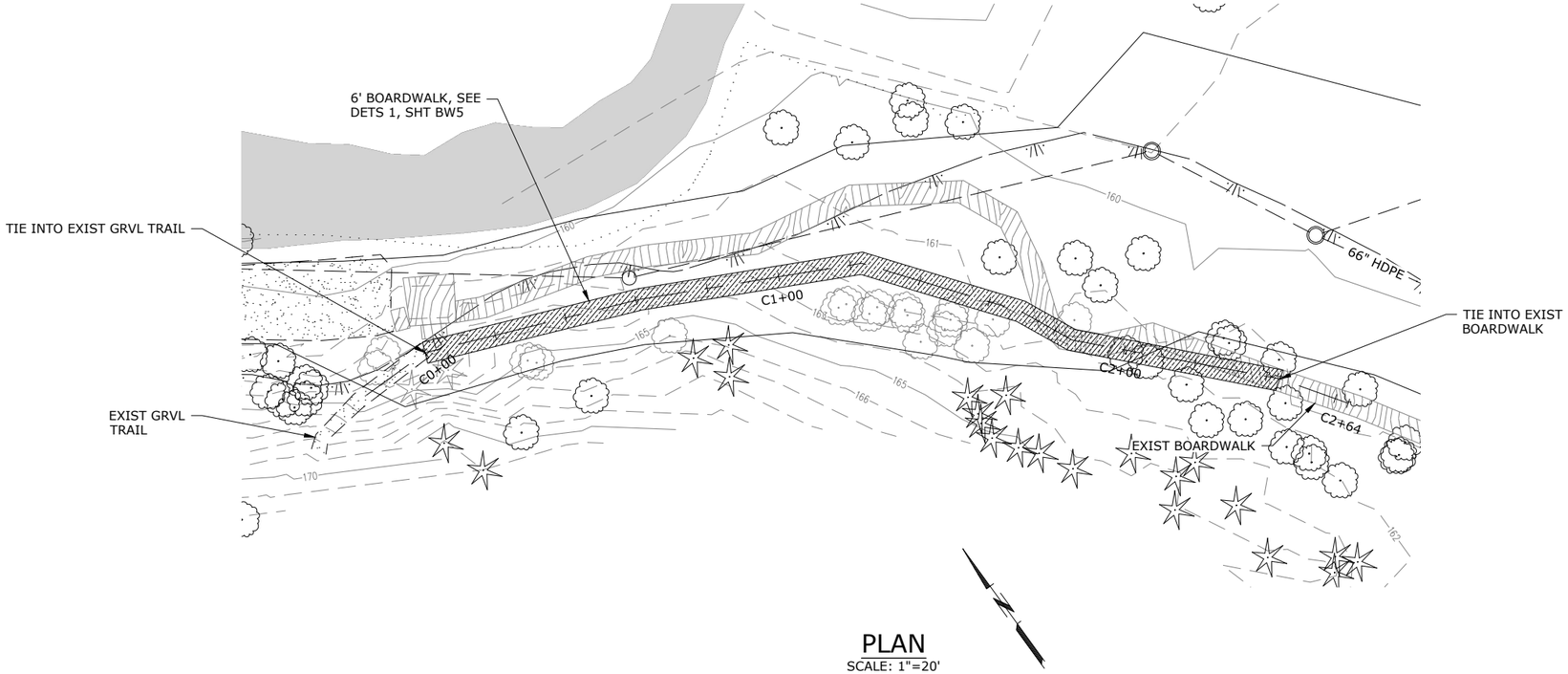
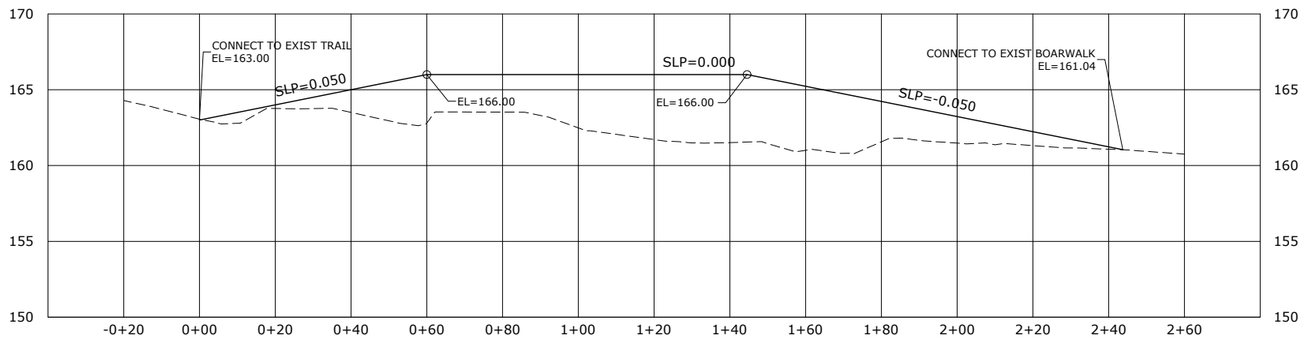


PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

SHEET NOTES:

1.

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CHICKADEE LOOP BOARDWALK

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882

SHEET BW1 OF X

NOTICE
0 1
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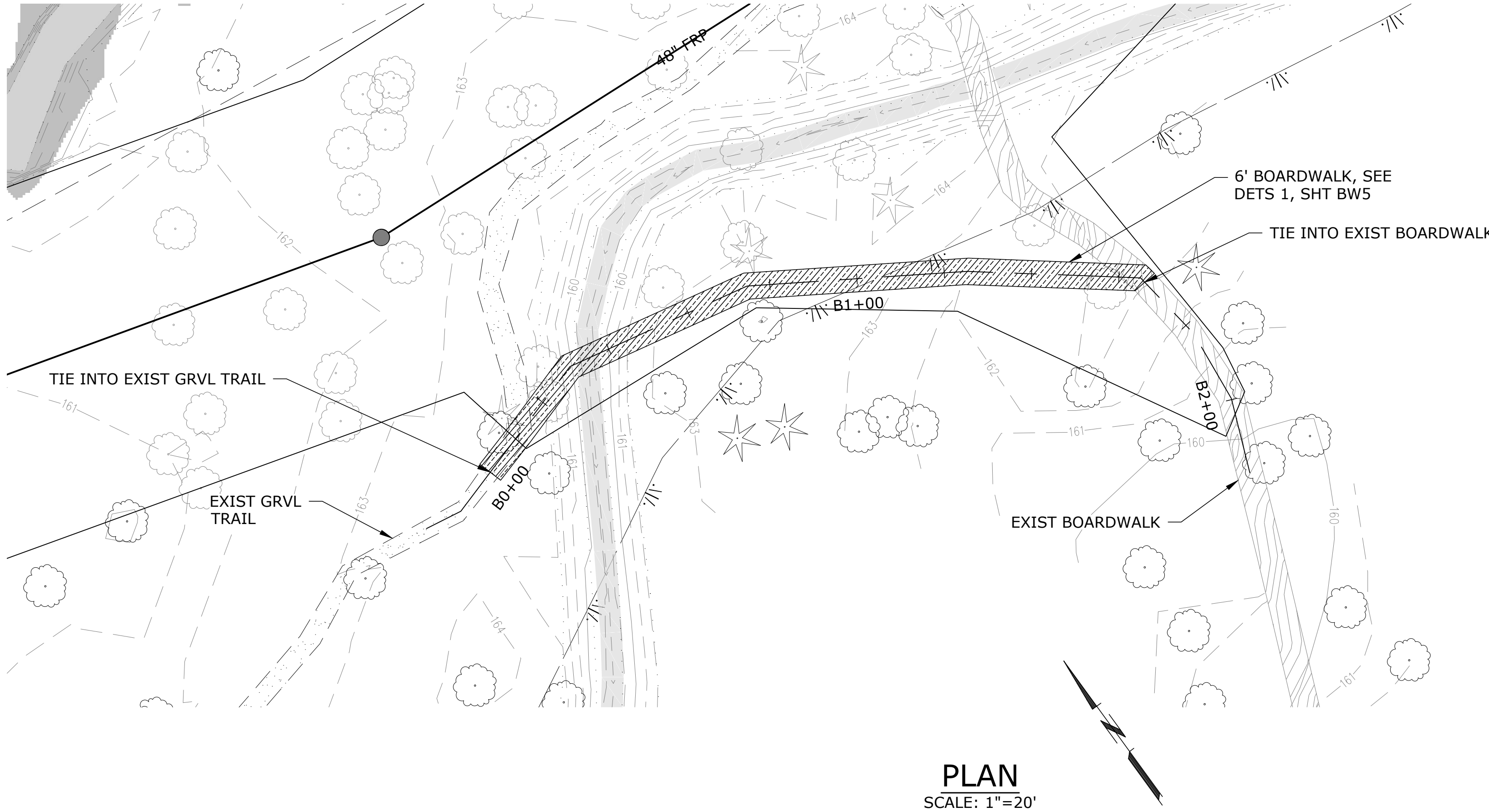
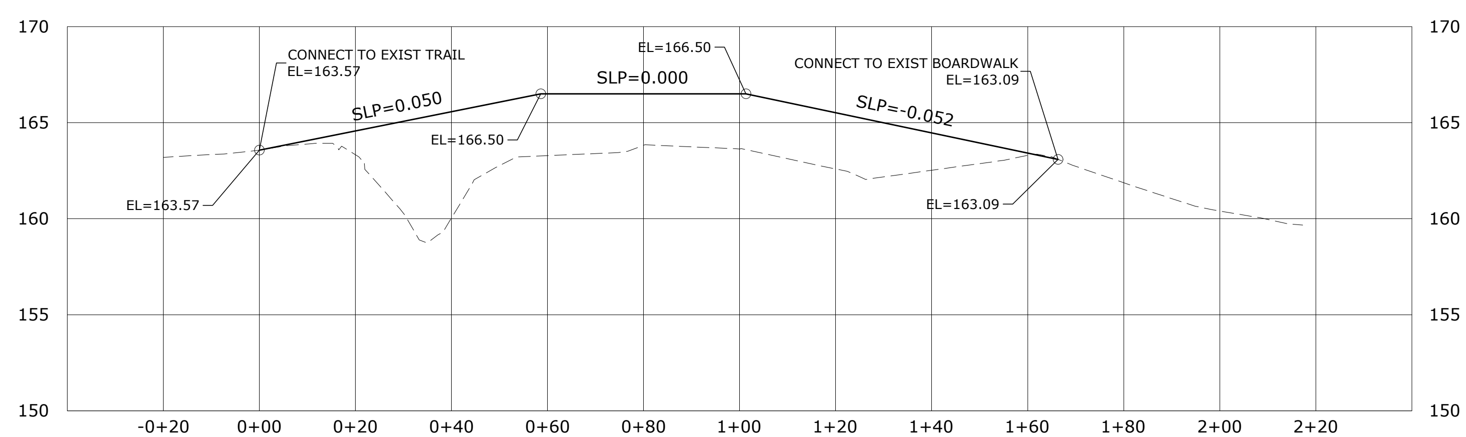
60% DESIGN



PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

SHEET NOTES:

1.

NOTICE

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BIG FIR BOARDWALK

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION 1S1W08NW
DRAFTER: CAD
DESIGNER: JTB
CHECKED: BVO
APPROVED: XXXX

PROJECT 6882
SHEET BW2 OF X

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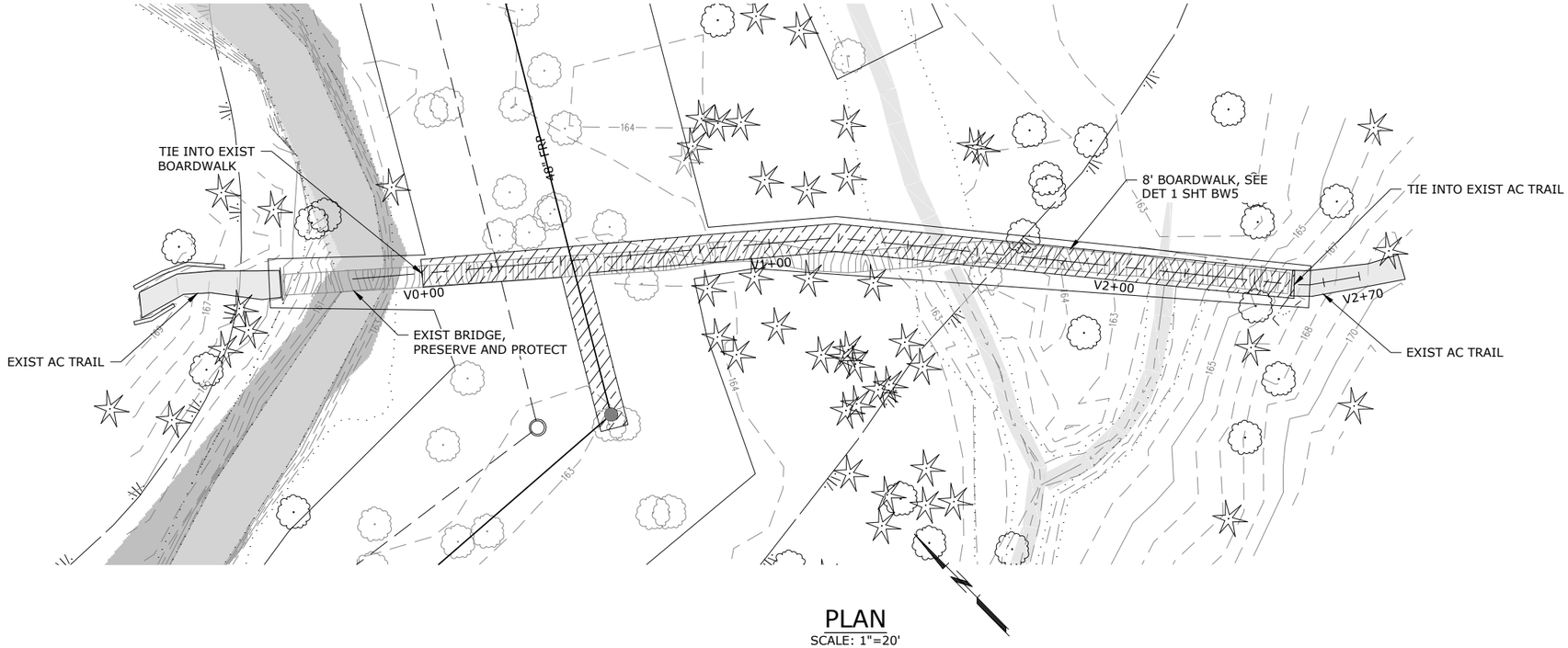
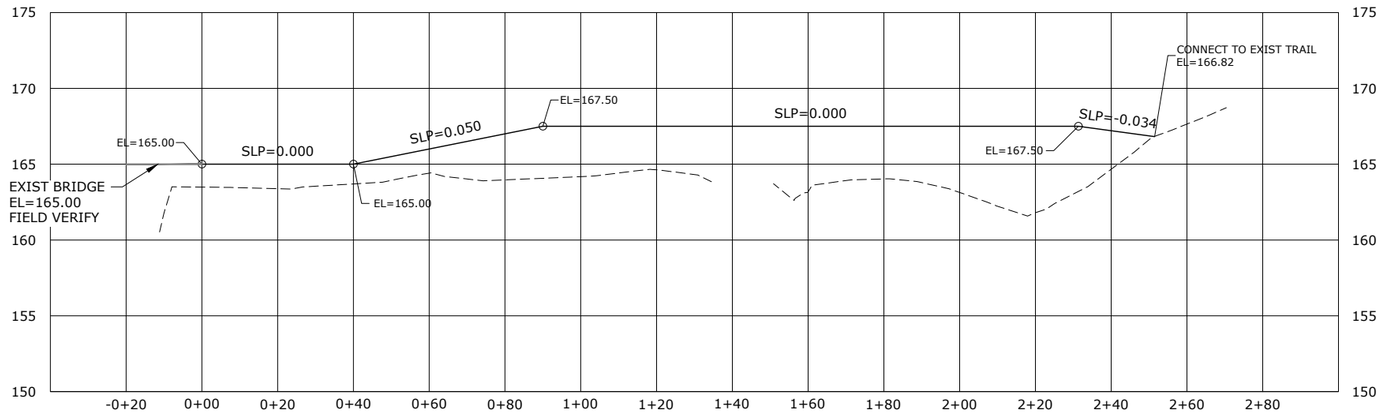


PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

SHEET NOTES:

1.

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VINE MAPLE BOARDWALK

CEDAR MILL CREEK
SANITARY AND
REGIONAL
STORMWATER
MANAGEMENT
APPROACH

1/4 SECTION 1S1W08NW
DRAFTER: CAD
DESIGNER: JTB
CHECKED: BVO
APPROVED: XXXX

PROJECT 6882
SHEET BW3
OF X

NOTICE
0 1
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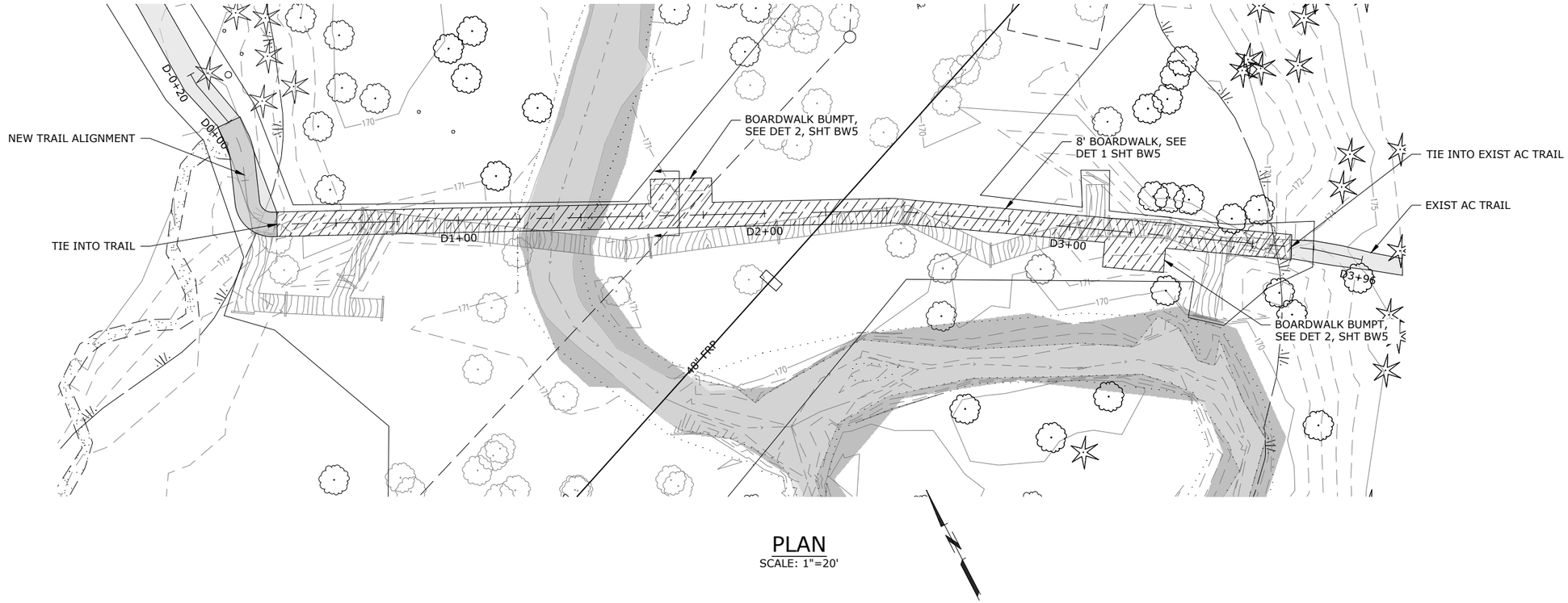
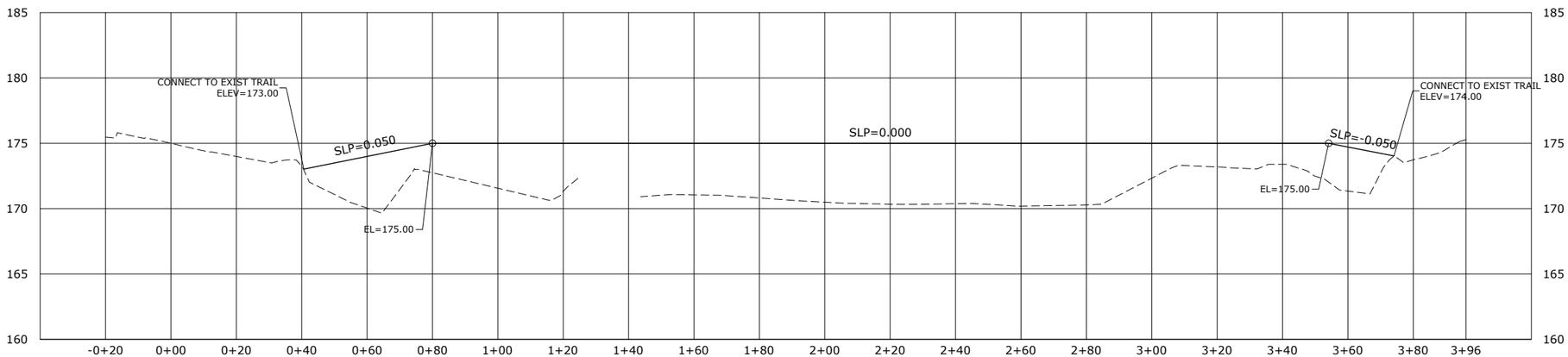


PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

SHEET NOTES:

1.

NOTICE

0 1

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OAK TRAIL BOARDWALK

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT	SHEET	OF
6882	BW4	X

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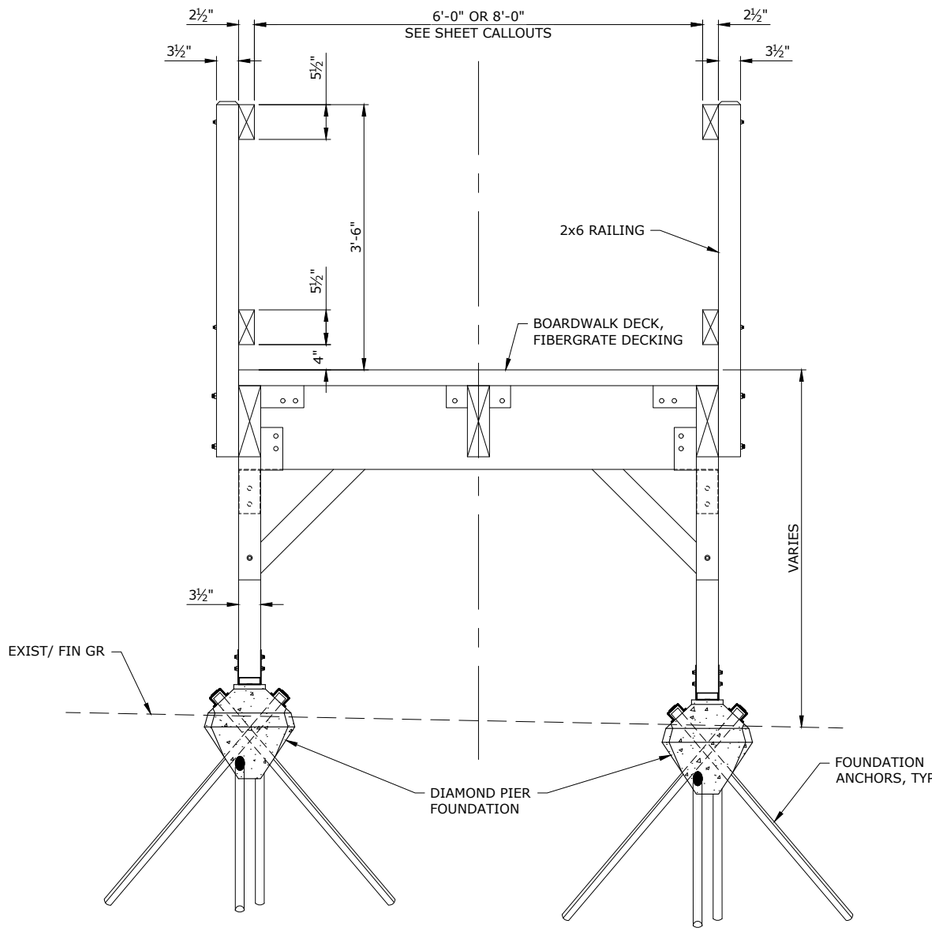
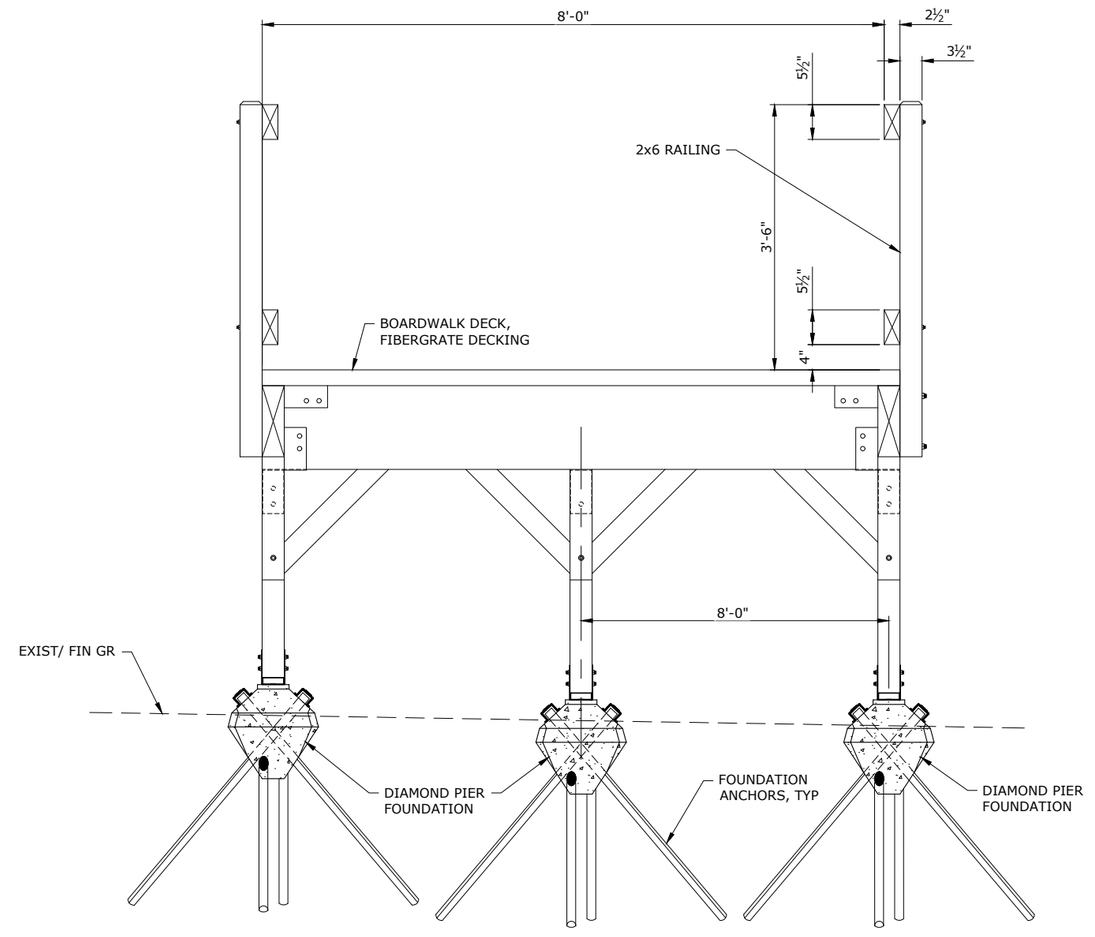


TYPICAL BOARDWALK REPLACEMENT CROSS SECTION - HANDRAIL

SCALE: 1"=1'-0"

1

-



TYPICAL BOARDWALK BUMPOUT CROSS SECTION

SCALE: NTS

2

-

SHEET NOTES:

1. SEE SPECS FOR BOARDWALK LOAD REQUIREMENTS.
2. HANDRAIL REQUIRED ON THE OUTER MOST EDGE OF THE BOARDWALK IN ALL LOCATIONS.

60% DESIGN

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BOARDWALK DETAILS

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1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
XXXX	CAD	JTB	BVO	XXXX

PROJECT 6882

SHEET BW5 OF X

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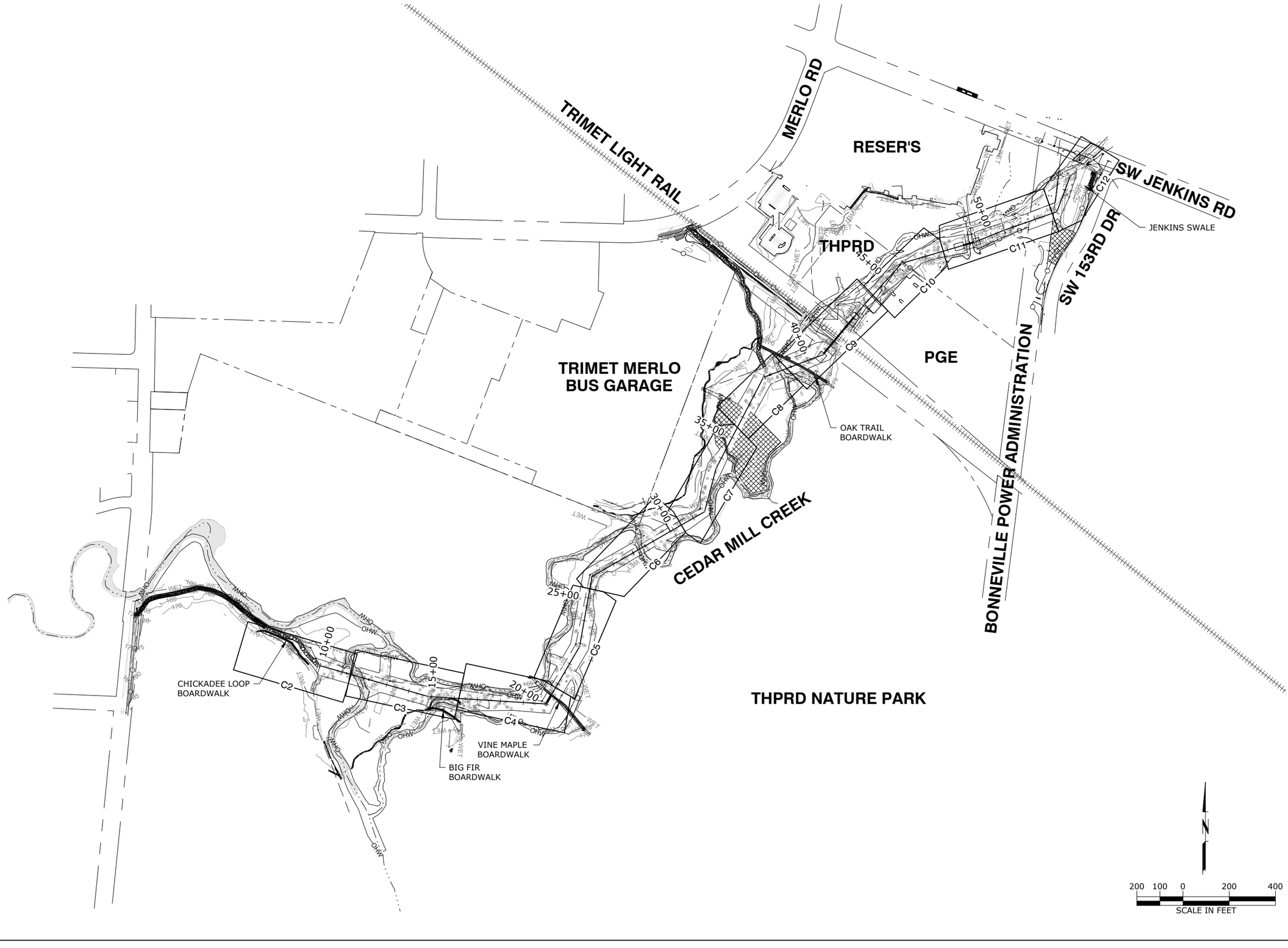
KEY MAP



CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	1S1W08NW
DRAFTER:	CAD
DESIGNER:	JTB
CHECKED:	BVO
APPROVED:	XXXX

PROJECT	6882
SHEET	C1
OF	X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C1.dwg C1 12/30/2019 2:47 PM MATT.ESTEP 23.0s (LMS Tech)

CONSTRUCTION NOTES:

1. EXISTING TRUNK SEWER AT STA 10+00 IS CONCRETE/CLSM ENCASED.

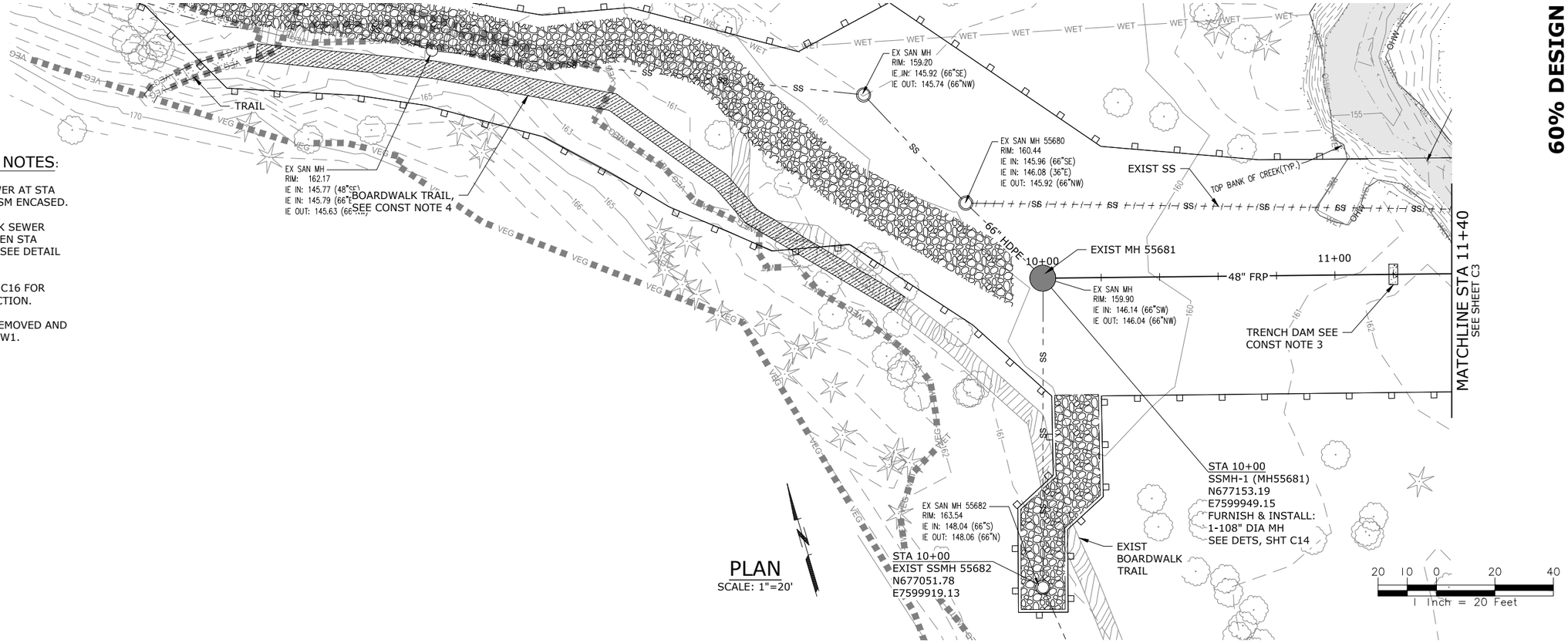
2. CAP PROPOSED TRUNK SEWER WITH CONCRETE BETWEEN STA 11+20 AND STA 12+20, SEE DETAIL 550, SHEET C13.

3. SEE DETAIL 2, SHEET C16 FOR TRENCH DAM CONSTRUCTION.

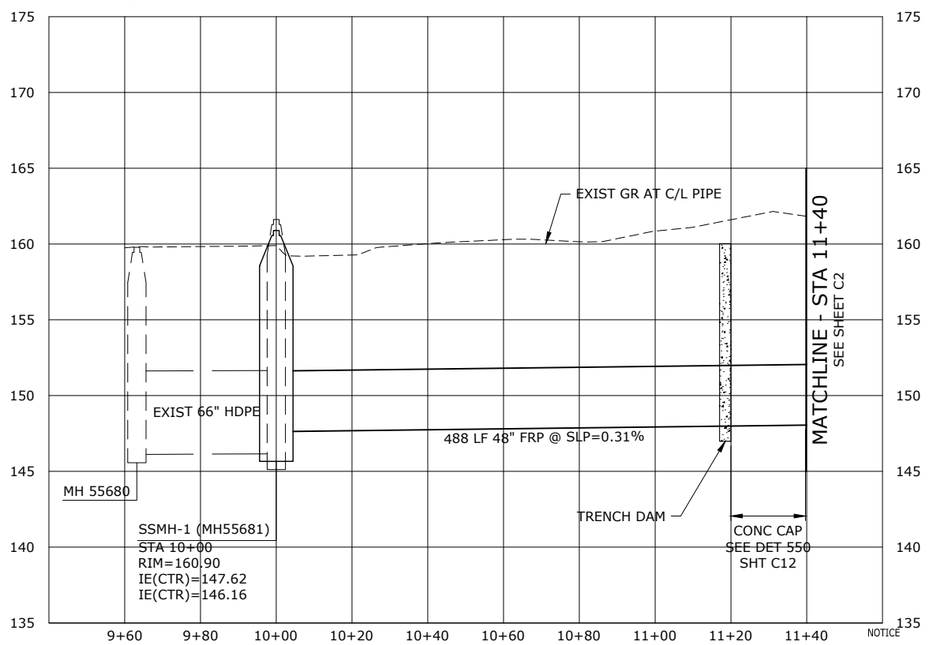
4. BOARDWALK TO BE REMOVED AND REPLACED, SEE SHEET BW1.

SHEET NOTES:

1.



PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

NOTICE
0 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

60% DESIGN

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PLAN AND PROFILE STA 10+00 TO STA 11+40

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882
SHEET C2 OF X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C2 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)

CONSTRUCTION NOTES:

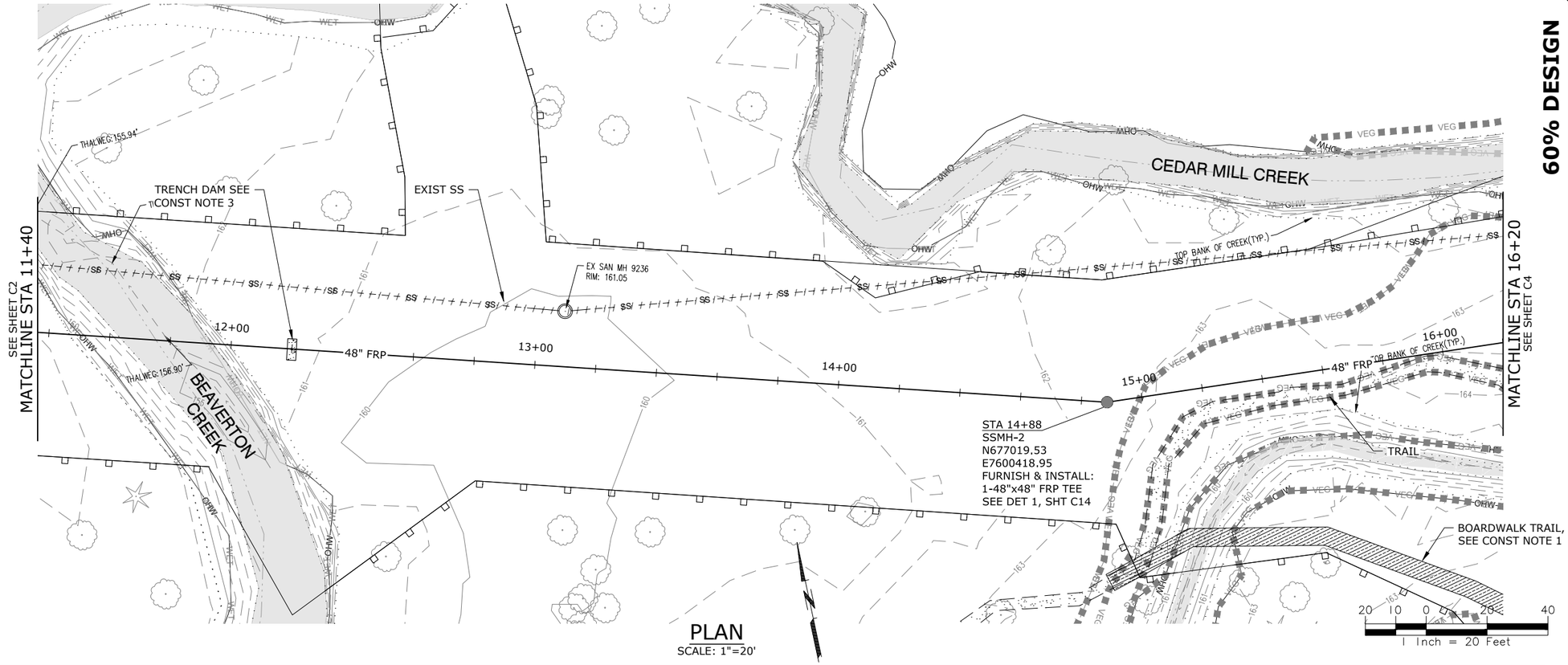
1. BOARDWALK TO BE REMOVED AND REPLACED, SEE SHEET BW2.

2. CAP PROPOSED TRUNK SEWER WITH CONCRETE BETWEEN STA 11+20 AND STA 12+20, SEE DETAIL 550, SHEET C13.

3. SEE DETAIL 2, SHEET C16 FOR TRENCH DAM CONSTRUCTION.

SHEET NOTES:

1.



PLAN
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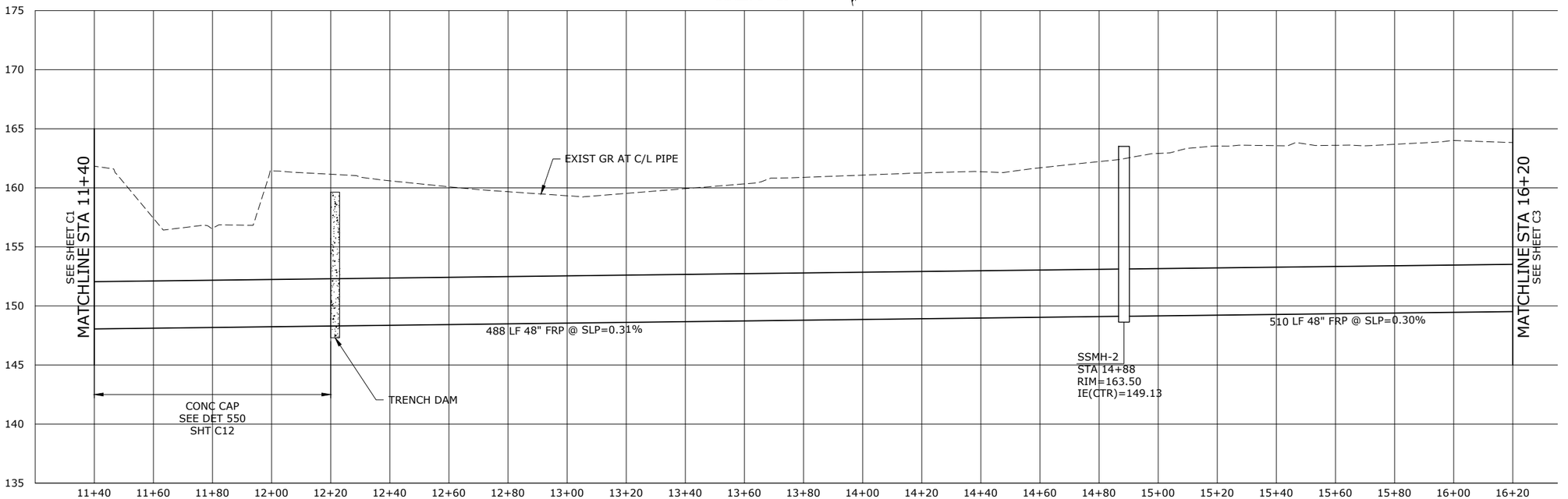

PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

NOTICE
0 1
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PLAN AND PROFILE STA 11+40 TO STA 16+20

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT	SHEET	OF
6882	C3	X

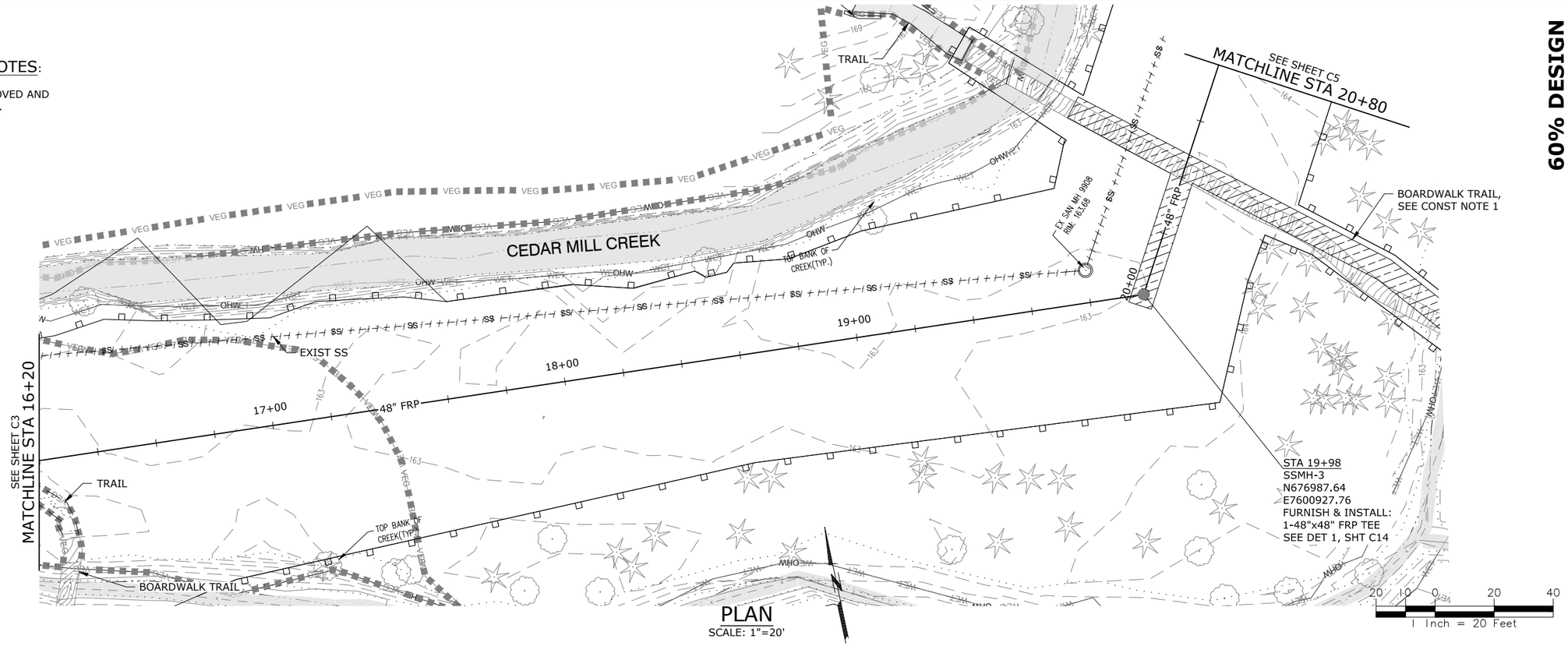
G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C3 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)

CONSTRUCTION NOTES:

1. BOARDWALK TO BE REMOVED AND REPLACED, SEE SHEET BW3.

SHEET NOTES:

1.



PLAN
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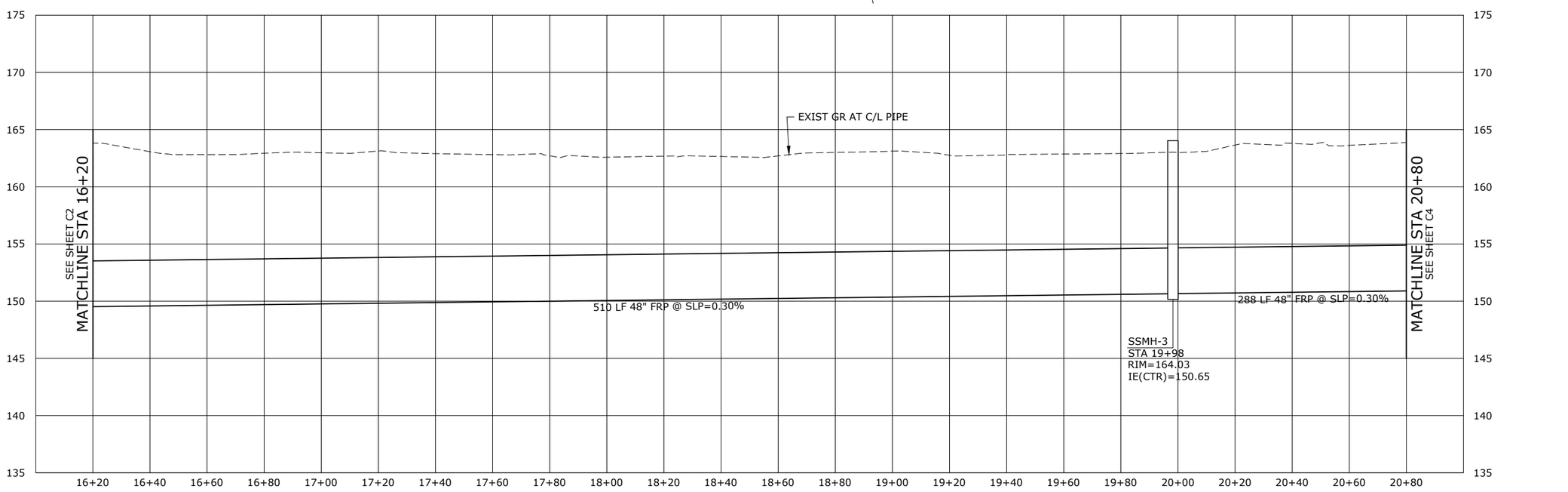

PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

NOTICE
0 1
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PLAN AND PROFILE STA 16+20 TO STA 20+80

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION 1S1W08NW	DRAFTER: CAD	DESIGNER: JTB	CHECKED: BVO	APPROVED: XXXX

PROJECT 6882 | SHEET C4 | OF X

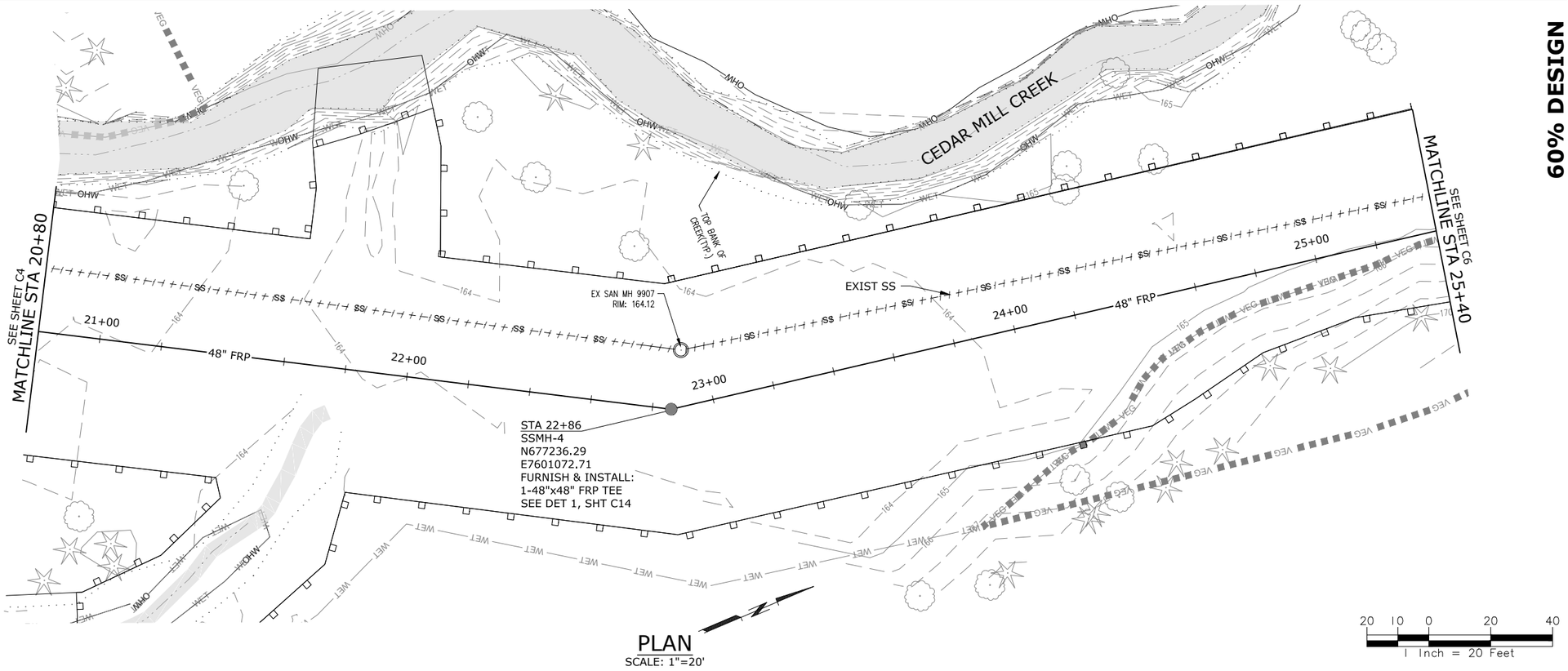
G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C4 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)

CONSTRUCTION NOTES:

1.

SHEET NOTES:

1.



PLAN
SCALE: 1"=20'

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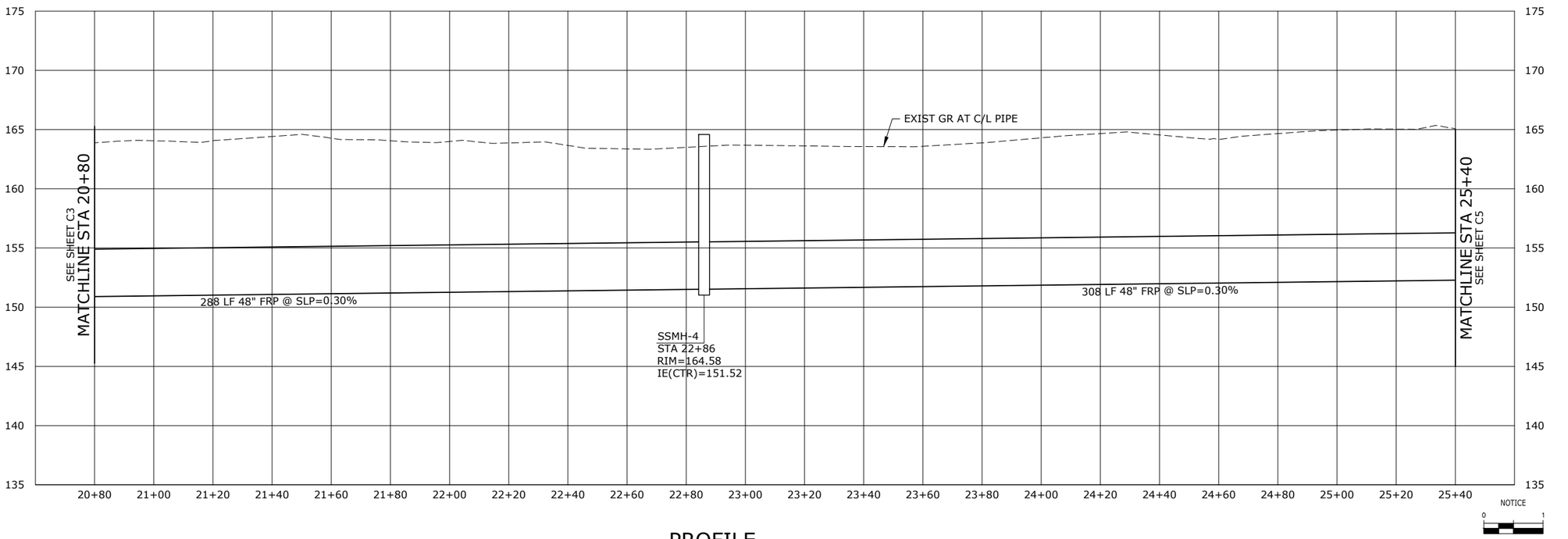
1 Inch = 20 Feet



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

NOTICE
0 1
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PLAN AND PROFILE STA 20+80 TO STA 25+40

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION 1S1W08NW	DRAFTER: CAD	DESIGNER: JTB	CHECKED: BVO	APPROVED: XXXX

PROJECT 6882 | SHEET C5 OF X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C5 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)

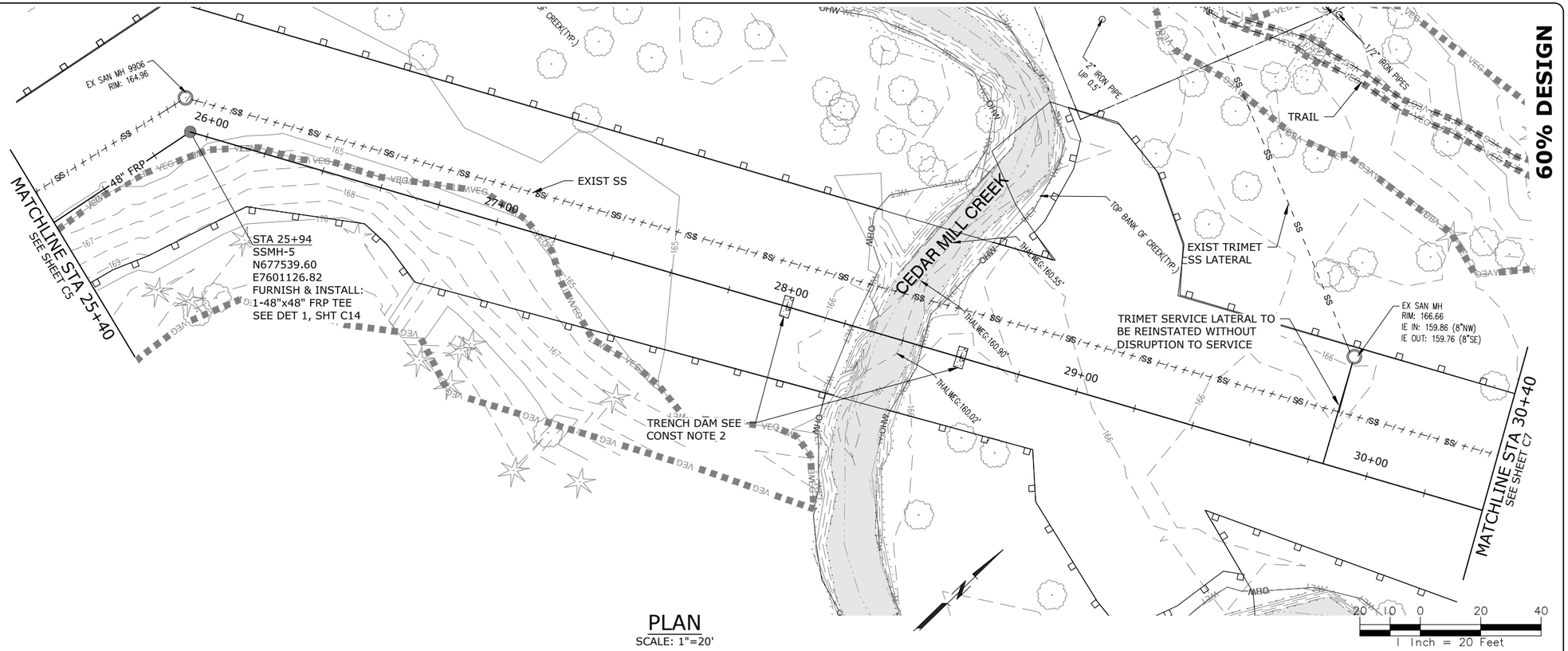
CONSTRUCTION NOTES:

1. CAP PROPOSED TRUNK SEWER WITH CONCRETE BETWEEN STA 11+20 AND STA 12+20, SEE DETAIL 550, SHEET C13.

2. SEE DETAIL 2, SHEET C16 FOR TRENCH DAM CONSTRUCTION.

SHEET NOTES:

1.



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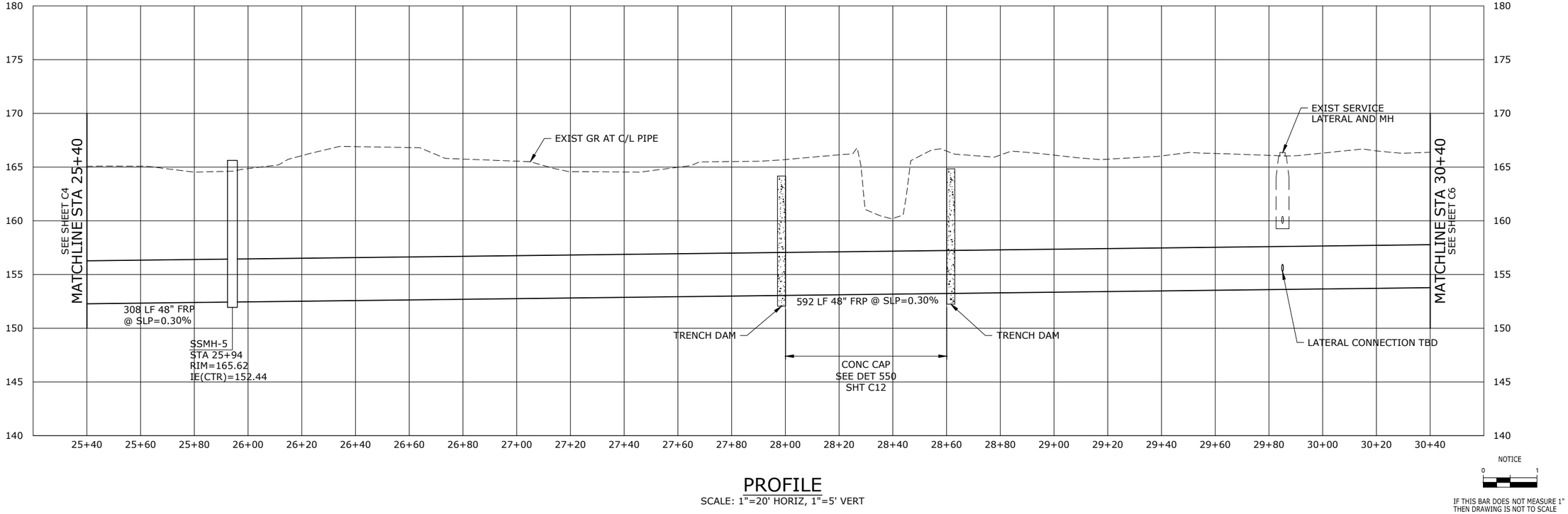

PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

NOTICE
0 1
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PLAN AND PROFILE STA 25+40 TO STA 30+40

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882
SHEET C6 OF X

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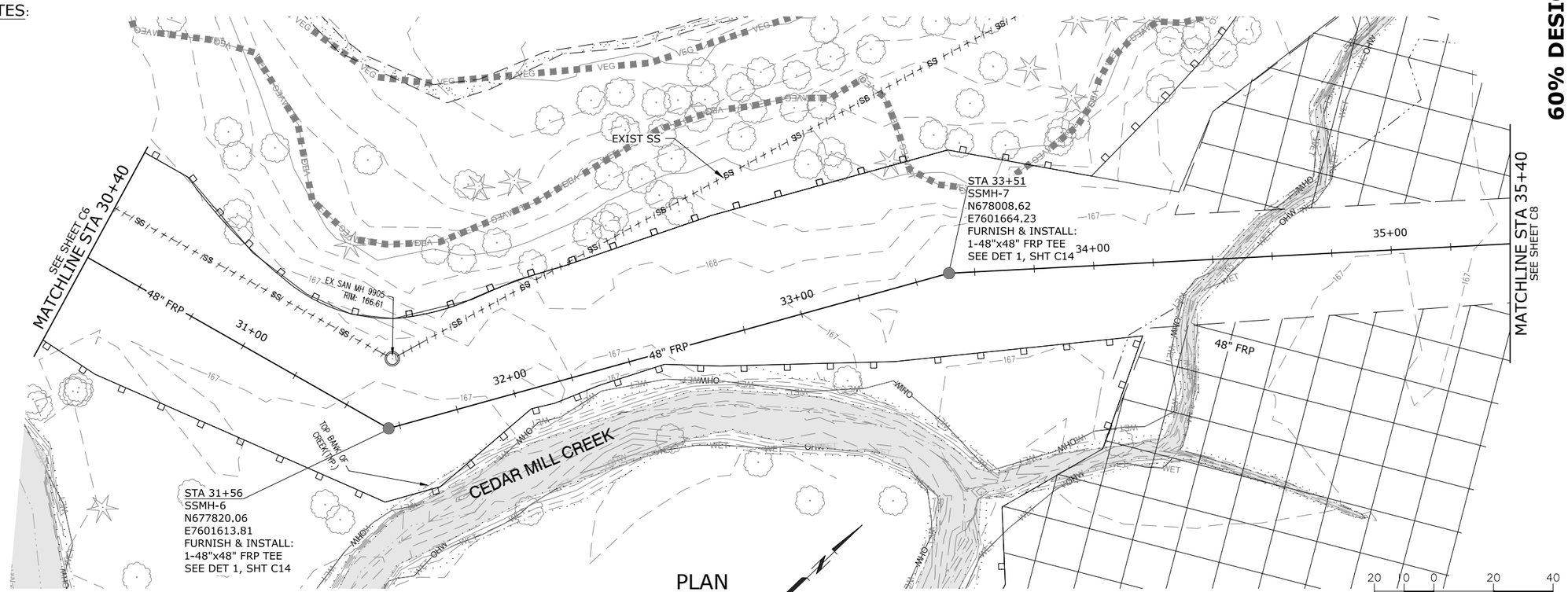
CONSTRUCTION NOTES:

1.

SHEET NOTES:

1.



PLAN
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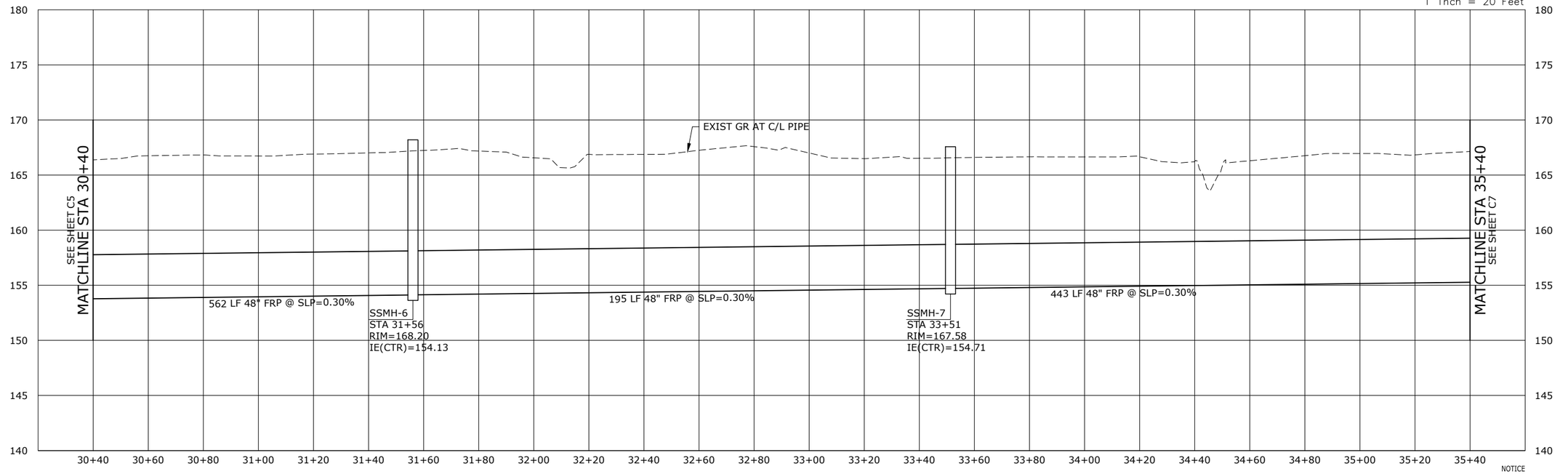

PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

NOTICE
0 1
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PLAN AND PROFILE STA 30+40 TO STA 35+40

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882
SHEET C7 OF X

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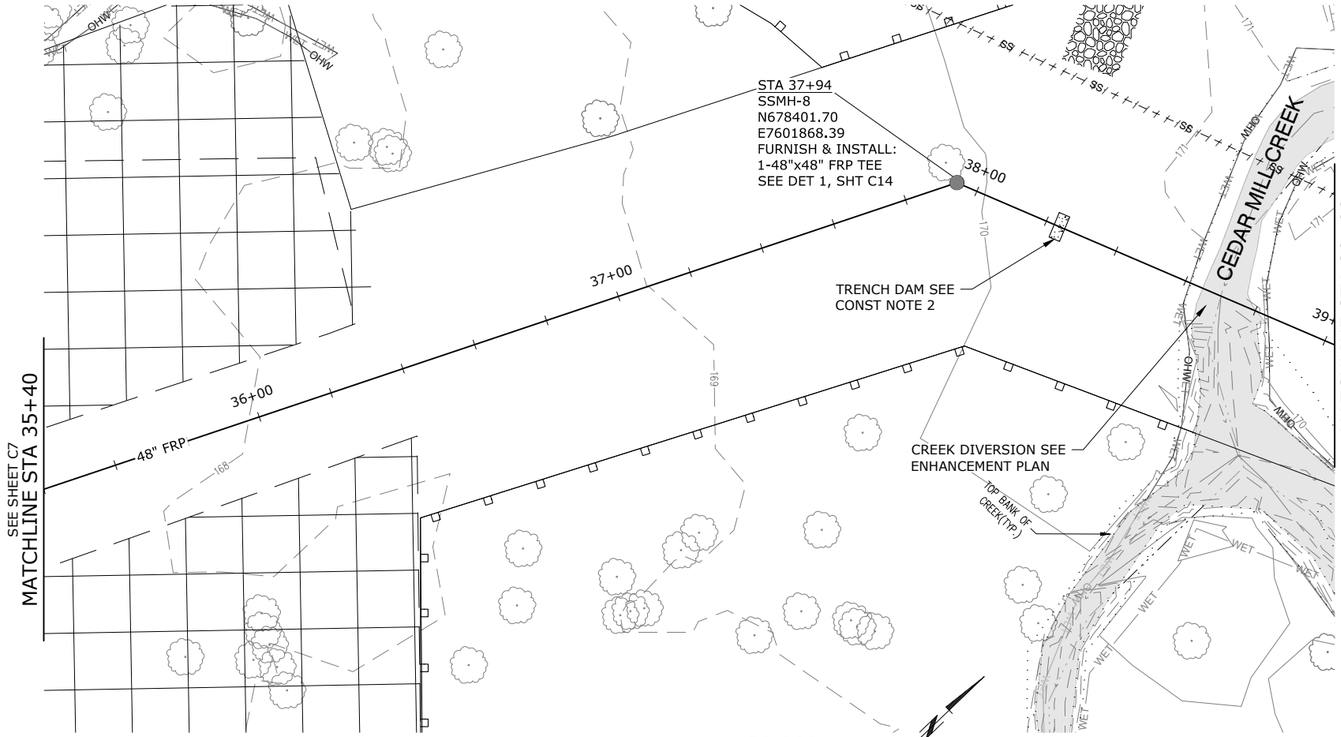
CONSTRUCTION NOTES:

1. CAP PROPOSED TRUNK SEWER WITH CONCRETE BETWEEN STA 11+20 AND STA 12+20, SEE DETAIL 550, SHEET C13.

2. SEE DETAIL 2, SHEET C16 FOR TRENCH DAM CONSTRUCTION.

SHEET NOTES:

1.



PLAN
SCALE: 1"=20'

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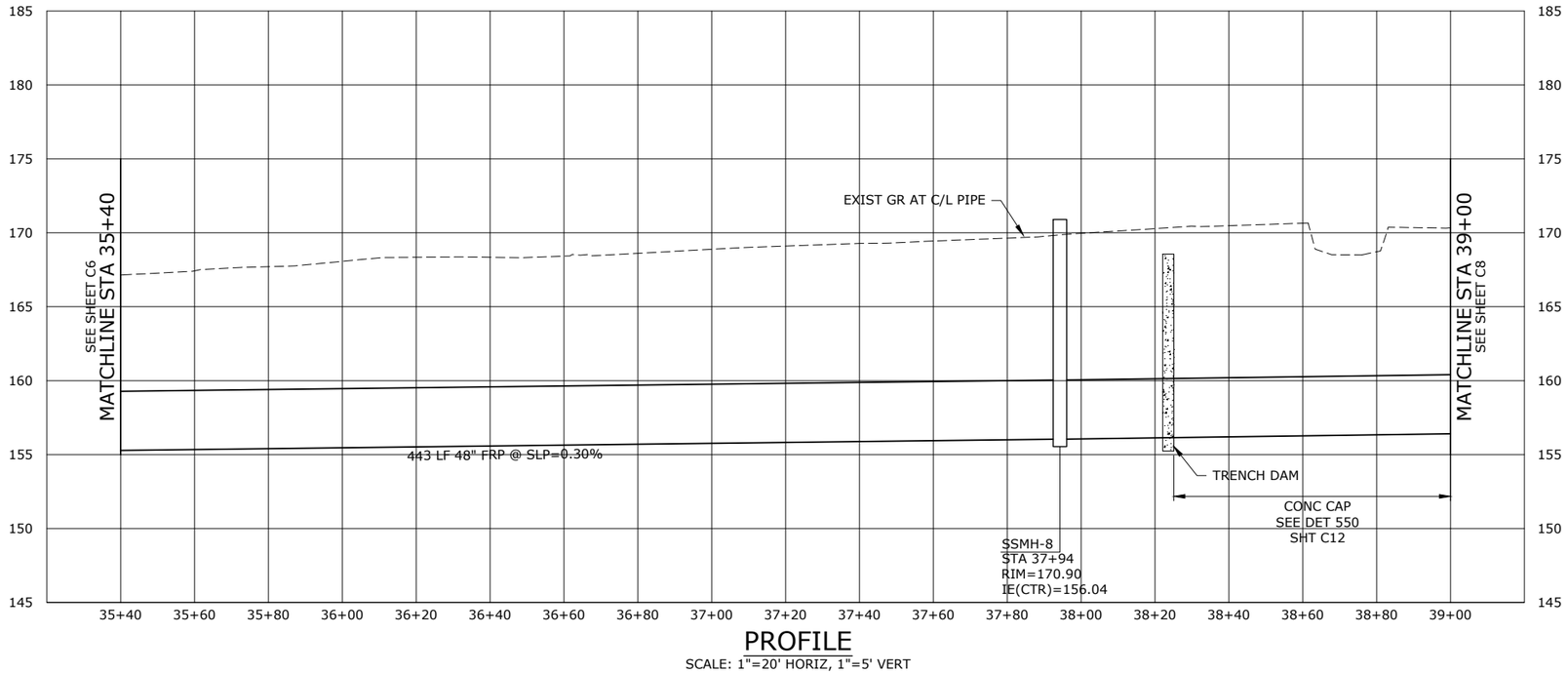
1 Inch = 20 Feet



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

NOTICE
0 1
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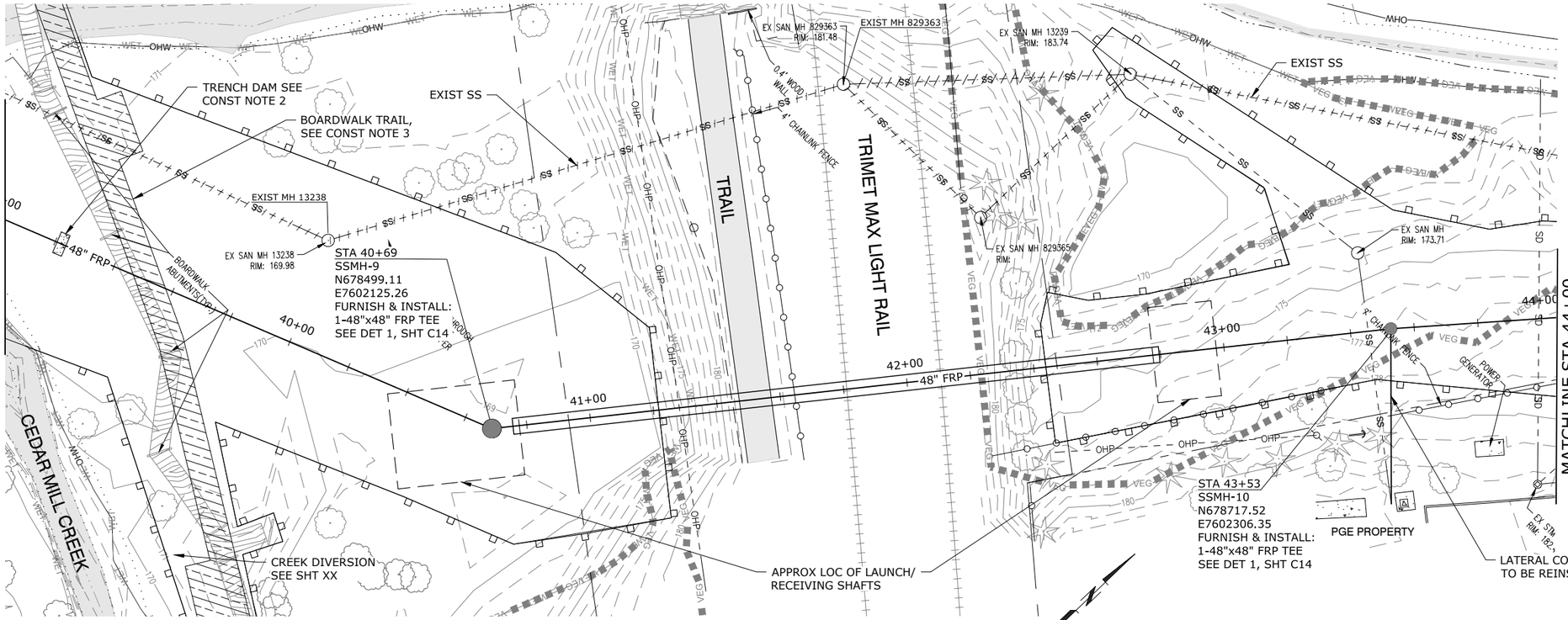
PLAN AND PROFILE STA 35+40 TO STA 39+00

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882
SHEET C8 OF X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C8 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)



PLAN
SCALE: 1"=20'

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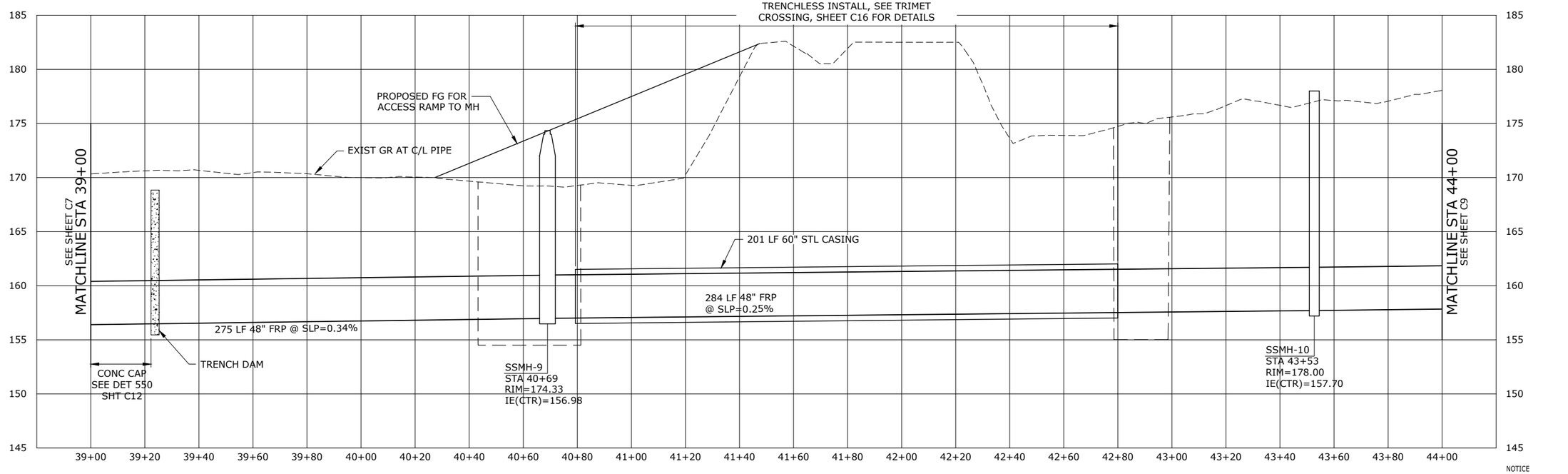
1 Inch = 20 Feet



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

NOTICE
0 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

CONSTRUCTION NOTES:

1. CAP PROPOSED TRUNK SEWER WITH CONCRETE BETWEEN STA 39+00 AND STA 39+40, SEE DETAIL 550, SHEET C12.
2. SEE DETAIL 1, SHEET C15 FOR TRENCH DAM CONSTRUCTION.
3. BOARDWALK TO BE REMOVED AND REPLACED, SEE SHEET BW4.
4. LATERAL LOCATION IS APPROXIMATE AND HAS NOT BEEN SURVEYED. PLACE MANHOLE TO ACCEPT THE THE NEW LATERAL CONNECTION.
5. SS ALIGNMENT IS APPROXIMATE AND NOT SURVEYED IN TRIMET ROW.

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PLAN AND PROFILE STA 39+00 TO STA 44+00

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882
SHEET C9 OF X

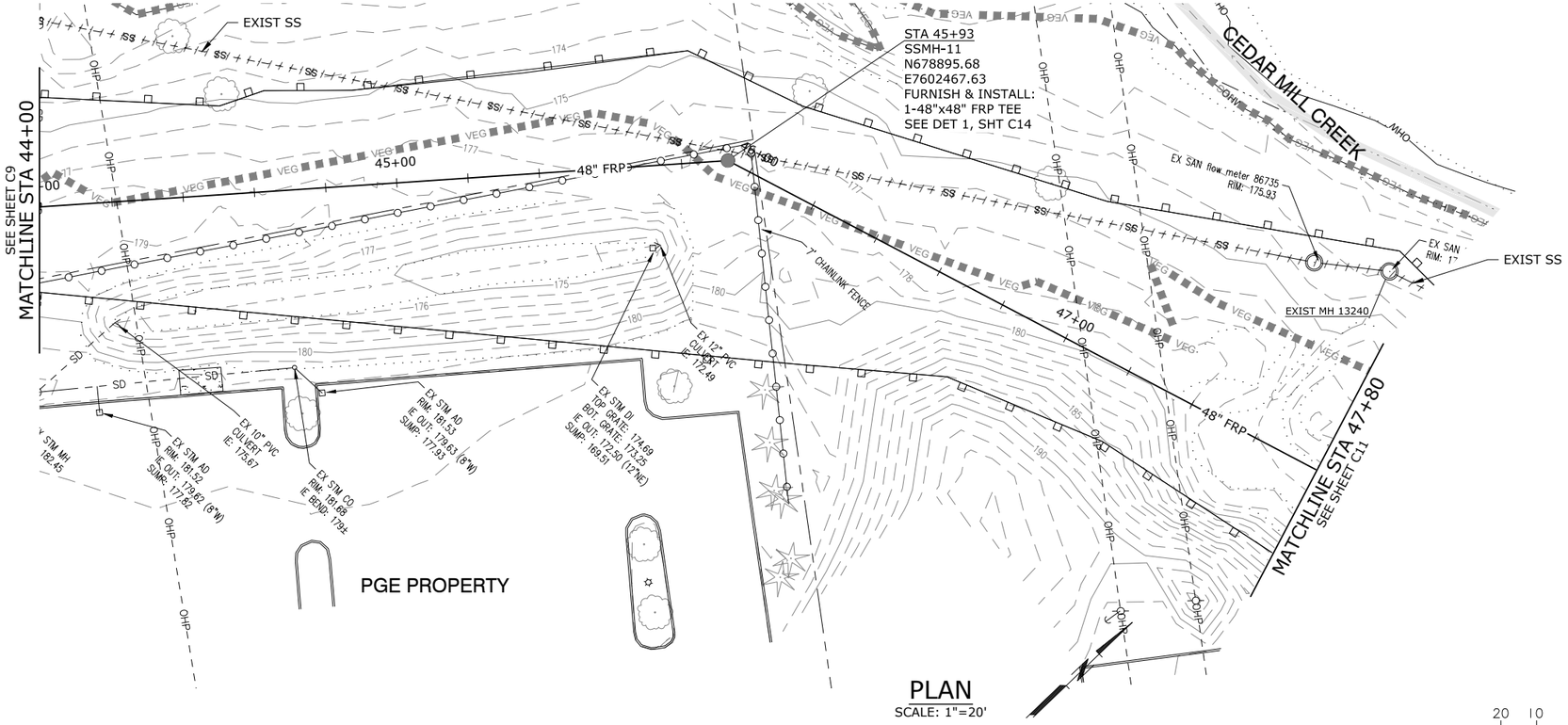
G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C9 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)

CONSTRUCTION NOTES:

1.

SHEET NOTES:

1.



PLAN
SCALE: 1"=20'

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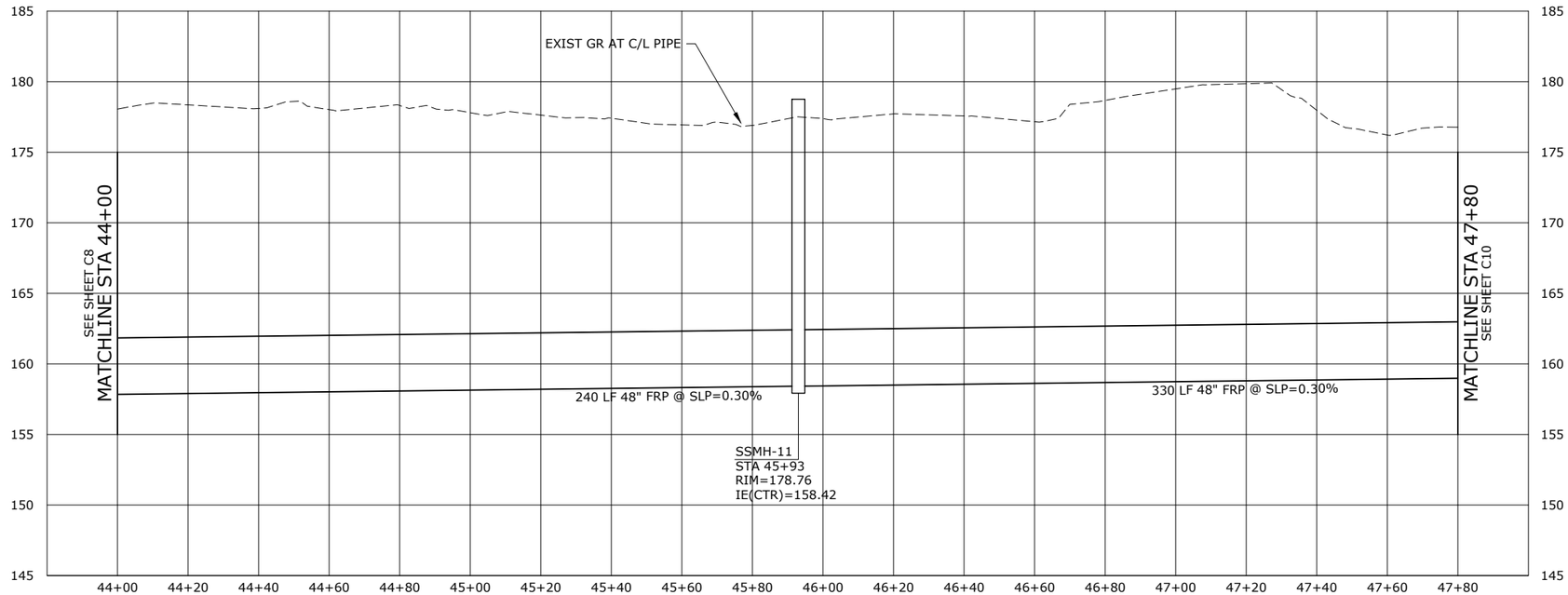
1 Inch = 20 Feet



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

NOTICE
0 1
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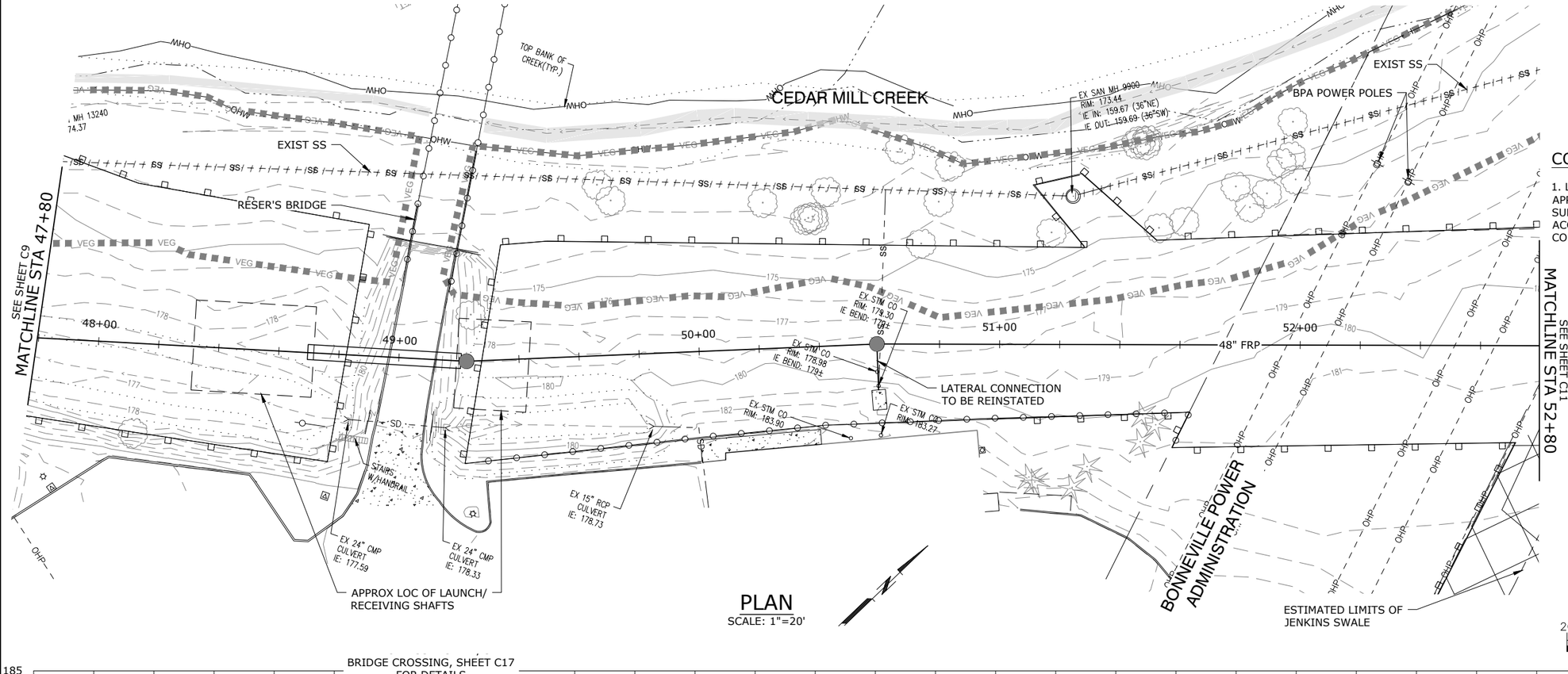
PLAN AND PROFILE STA 44+00 TO STA 47+80

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882
SHEET C10 OF X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C10 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)



PLAN
SCALE: 1"=20'

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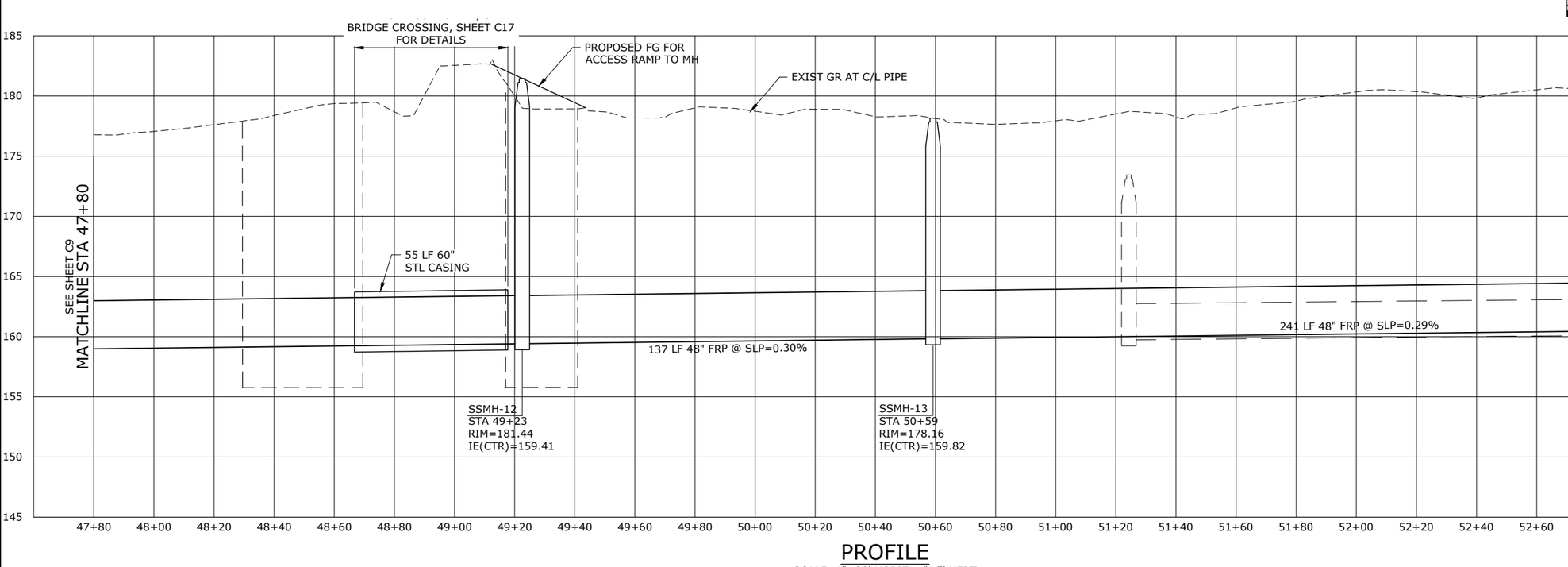
1 Inch = 20 Feet



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

NOTICE
0 1
IF THIS BAR DOES NOT MEASURE 1"
THEN DRAWING IS NOT TO SCALE

CONSTRUCTION NOTES:

1. LATERAL LOCATION IS APPROXIMATE AND HAS NOT BEEN SURVEYED. PLACE MANHOLE TO ACCEPT THE THE NEW LATERAL CONNECTION.

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PLAN AND PROFILE STA 47+80 TO STA 52+80

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882
SHEET C11 OF X

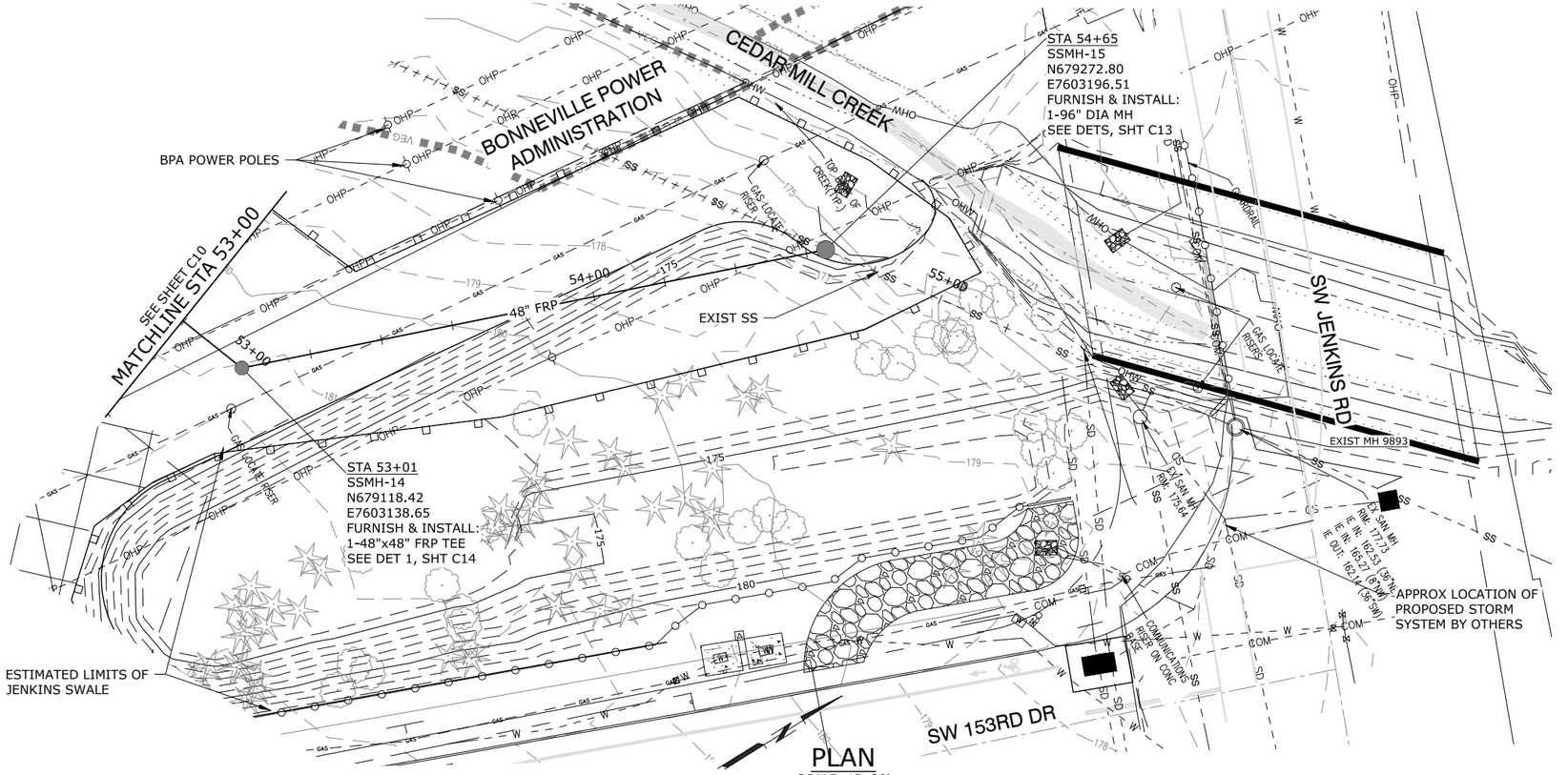
G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C11 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)

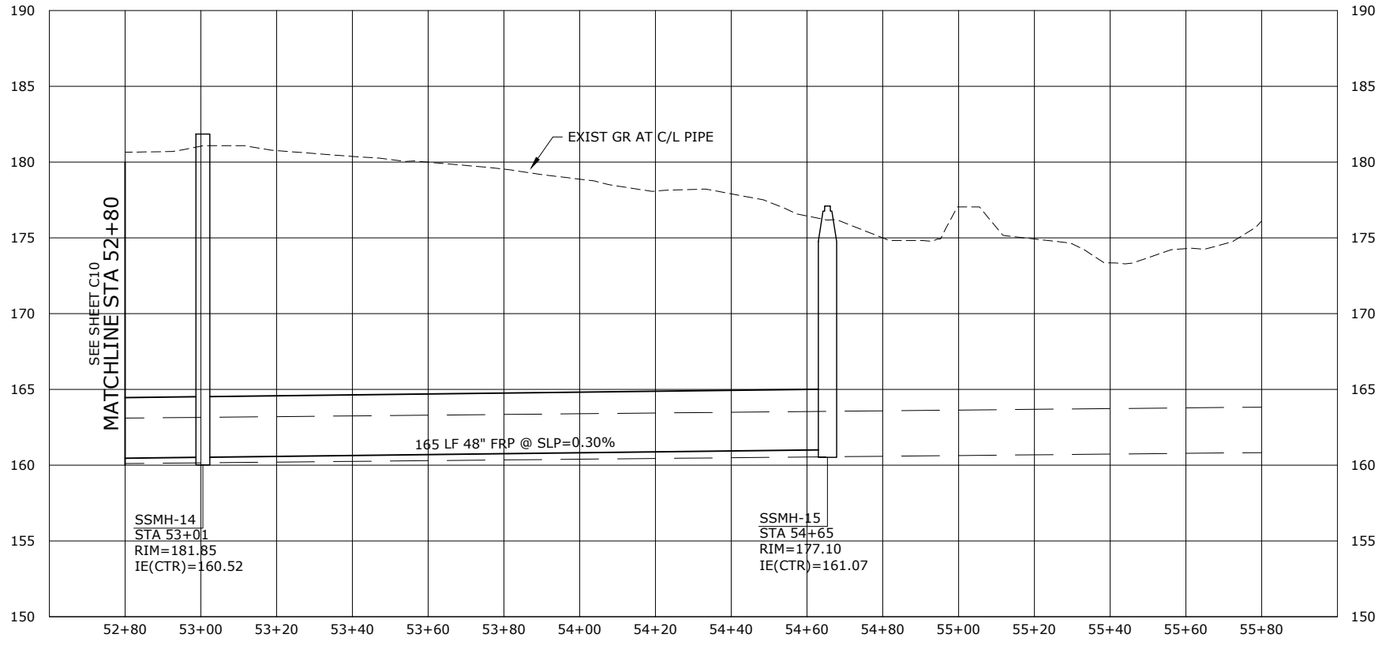
CONSTRUCTION NOTES:

1.

SHEET NOTES:

1. PRELIMINARY PLANS FOR THE JENKINS SWALE SHOW GRADING CONTOURS BETWEEN 174-184 FT. ACCOMPANYING STORM COLLECTION SYSTEM SHOWN AT APPROXIMATE LOCATIONS INCLUDES OUTFALLS, PIPE, AND CATCHMENTS.





NOTICE
0 1
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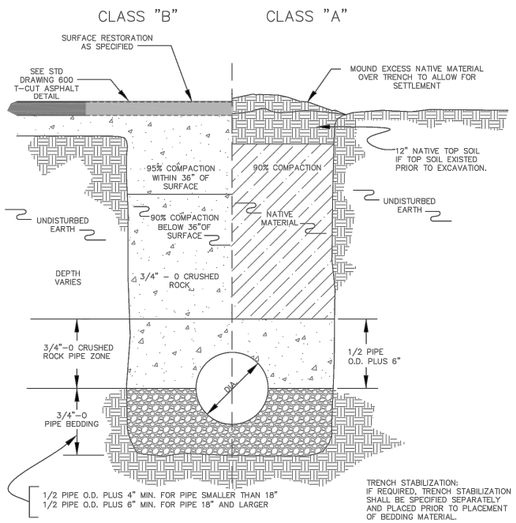
PLAN AND PROFILE STA 52+80 TO STA 54+75

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882
SHEET C12 OF X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C12 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)



NOTE:
1. ALL COMPACTION REQUIREMENTS PER AASHTO T-99 AND ODOT/APWA SPEC 00405.
2. THE TRENCH WIDTH AT THE SURFACE OF THE GROUND SHALL BE KEPT TO A MINIMUM NECESSARY TO INSTALL THE PIPE IN A SAFE MANNER.
3. THE MINIMUM TRENCH WIDTH IN THE PIPE ZONE SHALL PROVIDE A CLEAR WORKING SPACE OF SIX INCHES OUTSIDE THE MAXIMUM OUTSIDE DIAMETER OF THE PIPE BEING INSTALLED.
4. IN ALL CASES, TRENCHES SHALL BE OF SUFFICIENT WIDTH TO ALLOW FOR SHORING, PROPER JOINING OF PIPE, AND BACKFILLING OF MATERIAL ALONG THE SIDES OF THE PIPE.

TRENCH BACKFILL DETAILS

DRAWING NO. 590 REVISED 12-16

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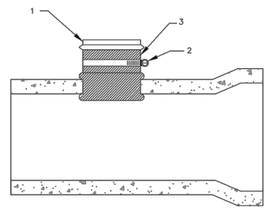
1. PVC HUB SHALL CONFORM TO ASTM 3034, SDR 35 DRIVE INTO CENTER OF RUBBER SLEEVE AFTER SLEEVE IS PLACED IN HOLE.

2. STAINLESS STEEL BAND SECURES UPPER HALF OF RUBBER SLEEVE TO THE PVC HUB. STAINLESS STEEL BAND SHALL BE 300 SERIES, ⅝" BAND WIDTH, CADMIUM PLATED CARBON STEEL, AND ATTACHED WITH HEX HEAD SLOTTED SCREW.

3. COMPLETE RUBBER SLEEVE INCLUDES A MOLDED SEGMENT THAT HOLDS IT IN PLACE.



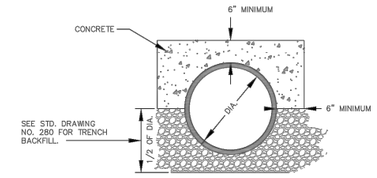
NOTES:

1. ALL INSERTA-TEE HOLES SHALL BE MACHINE DRILLED AND CORED.
2. INSERTA-TEES ARE NOT ALLOWED IN NEWLY CONSTRUCTED SEWER MAINS WITH AN INSIDE DIAMETER (I.D.) OF 10 INCHES OR SMALLER.
3. SEWER MAIN SHALL BE TWO SIZES (NOMINAL I.D.) LARGER THAN THE INSERTA-TEE.

INSERTA-TEE

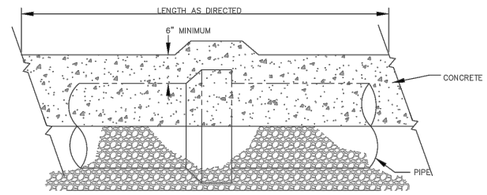
DRAWING NO. 530 REVISED 12-16

CleanWater Services



END VIEW

NOTE:
CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 3000 PSI AND 2" TO 4" SLUMP.



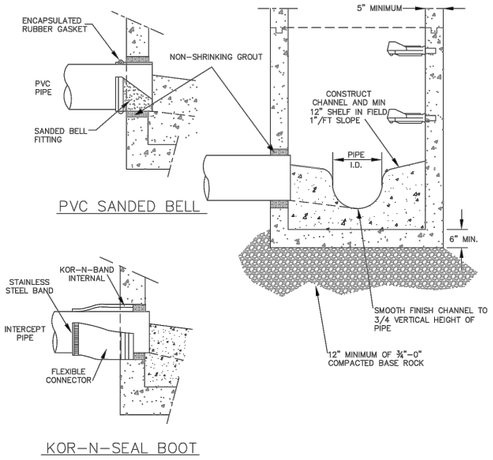
SIDE VIEW

CONCRETE CAP

DRAWING NO. 550 REVISED 01-13

CleanWater Services

NOTES:
ALL PRE-CAST MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478 AND APPLICABLE PROVISIONS OF STANDARD DRAWING NO. 010.



PVC SANDED BELL

KOR-N-SEAL BOOT

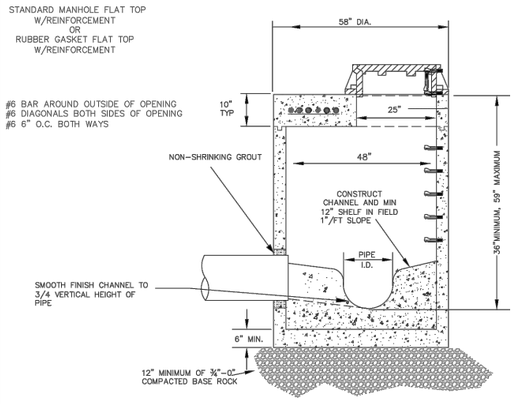
MANHOLE CONNECTIONS

DRAWING NO. 030 REVISED 12-16

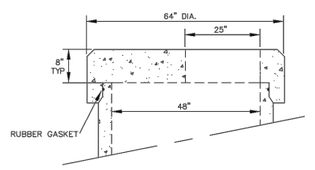
CleanWater Services

STANDARD MANHOLE FLAT TOP W/REINFORCEMENT OR RUBBER GASKET FLAT TOP W/REINFORCEMENT

#6 BAR AROUND OUTSIDE OF OPENING
#6 DIAGONALS BOTH SIDES OF OPENING
#6 6" O.C. BOTH WAYS



RUBBER GASKET FLAT TOP (OPTIONAL)



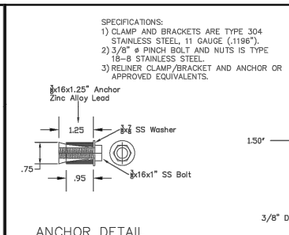
NOTES:
1. ALL JOINTS AND RUBBER GASKETS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-433.
2. ALL MANHOLE SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-478 AND APPLICABLE PROVISIONS OF STANDARD MANHOLE, SEE STD DRAWING NO. 010.
3. STEPS REQUIRED ON FLAT TOP MANHOLES DEEPER THAN 48" FROM FINISHED GRADE TO I.E. OUT.

FLAT TOP MANHOLE

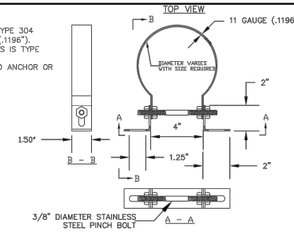
DRAWING NO. 050 REVISED 12-16

CleanWater Services

SPECIFICATIONS:
1) CLAMP AND BRACKETS ARE TYPE 304 STAINLESS STEEL, 11 GAUGE (.1196").
2) 3/8" ø PINCH BOLT AND NUTS IS TYPE 18-8 STAINLESS STEEL.
3) RELINER CLAMP/BRACKET AND ANCHOR OR APPROVED EQUIVALENTS.

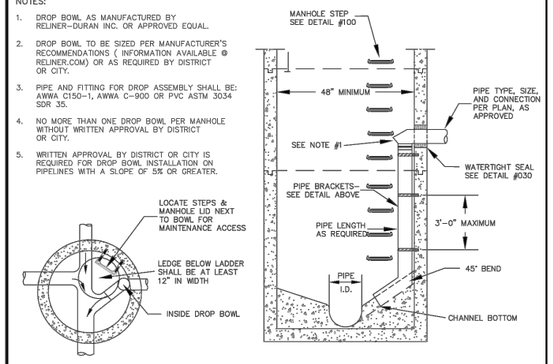


ANCHOR DETAIL
N.T.S.



CLAMP DETAIL
N.T.S.

NOTES:
1. DROP BOWL AS MANUFACTURED BY RELINER-DURAN INC. OR APPROVED EQUAL.
2. DROP BOWL TO BE SIZED PER MANUFACTURER'S RECOMMENDATIONS (INFORMATION AVAILABLE @ RELINER.COM) OR AS REQUIRED BY DISTRICT OR CITY.
3. PIPE AND FITTING FOR DROP ASSEMBLY SHALL BE: AWWA C150-1, AWWA C-900 OR PVC ASTM 3034 SDR 35.
4. NO MORE THAN ONE DROP BOWL PER MANHOLE WITHOUT WRITTEN APPROVAL BY DISTRICT OR CITY.
5. WRITTEN APPROVAL BY DISTRICT OR CITY IS REQUIRED FOR DROP BOWL INSTALLATION ON PIPELINES WITH A SLOPE OF 5% OR GREATER.



INSIDE DROP MANHOLE W/BOWL

DRAWING NO. 090 REVISED 12-16

CleanWater Services

60% DESIGN

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DO NOT USE FOR CONSTRUCTION

DECEMBER 2019

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CleanWater Services
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STANDARD DRAWINGS

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

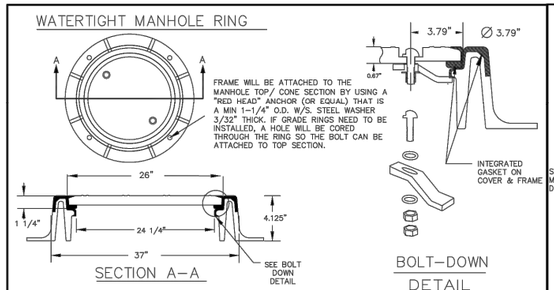
PROJECT 6882

SHEET C13 OF X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C13 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C14 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)

60% DESIGN

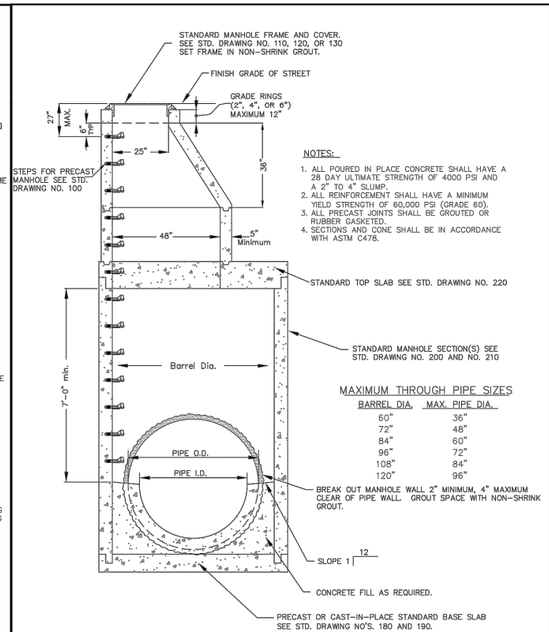


NOTES:

1. COMPOSITE WATERTIGHT/TAMPER PROOF MANHOLE FRAME AND COVER SHALL BE USED IN ALL EASEMENT AND OFF STREET AREAS.
2. THE WATERTIGHT MANHOLE COVER FRAME SHALL BE GMI 2600 SERIES COMPOSITE FRAME AND COVER MANUFACTURED BY TITUS INDUSTRIAL GROUP, INC. OR ITS EQUAL.
3. THE LOCKING MECHANISM SHALL BE A TWISTLIFT® MANUFACTURED BY TITUS INDUSTRIAL GROUP, INC.OR ITS EQUAL.
4. THE TWISTLIFT® COMPOSITE ACCESS COVER LOCK IS DESIGNED AS A SECURITY BOLT REQUIRING A SPECIAL TOOL TO OPERATE THE QUARTER TURN BOLT AND LIFT THE COVER FROM THE FRAME. IT FUNCTIONS WITH EITHER THE STANDARD CAM LOCK QUARTER TURN PADDLE, OR THE EXTENDED "SURCHARGE" PADDLE.
5. THE BOLT SHALL BE MACHINED FROM 316 STAINLESS STEEL.
6. THE BOLT FEATURES A DOMED HEAD WITH 3 EQUALLY SPACED 'J' SLOTS RUNNING HORIZONTALLY AROUND THE BOLT HEAD.
7. STANDARD BOLT SIZES ARE 14 MM COARSE THREAD WITH A FLAT MACHINED ON TWO SIDES TO ENGAGE PADDLE.
8. THE PADDLE IS DIE CAST FROM 304 STAINLESS STEEL AND ALSO AVAILABLE IN BOTH STANDARD CAM LOCK DESIGN, OR EXTENDED SURCHARGE CONFIGURATION.
9. THE BOLT AND PADDLE WILL BE ASSEMBLED USING TWO STAINLESS STEEL 14 MM NUT'S, THE BOTTOM NUT IS A STANDARD NUT THAT WILL BE TORQUE TO 35 FT. LBS. TO GIVE THE DESIRED TENSION ON THE BOLT. A SECOND NYLOCK™ LOCK NUT IS USED AS A JAM NUT, AND TORQUE TO 90 FT. LBS. STAINLESS STEEL WASHERS ARE USED TO PROVIDE CONSISTENT TURNING RESISTANCE.
10. A 5/16 STAINLESS STEEL SET SCREW, SET IN A THREADED HOLE IN THE COVER PROVIDES FOR A STOP AT ¼ TURN OF OPERATION.
11. THE BOLT WILL BE OPERATED BY MEANS OF A SPECIALLY MADE OPENING KEY CONSISTING OF A SPECIAL SOCKET ATTACHED TO A "T" HANDLE USED TO BOTH TURN THE BOLT, AND LIFT OUT THE COVER.
12. ONE SET OF REPLACEMENT OPENING KEYS WILL BE PROVIDED TO CLEAN WATER SERVICES AT TIME OF INSTALLATION.
13. THE BOLT HEAD IS PROTECTED BY A WEATHER RESISTANT PLASTIC DEBRIS CAP. THE CAP IS INCLUDED WITH EACH LOCK.
14. SEE LOCAL JURISDICTION REQUIREMENTS FOR USE IN TRAFFIC AREAS.

WATERTIGHT MANHOLE FRAME AND COVER

DRAWING NO. 130 — REVISED 12–16



NOTES:

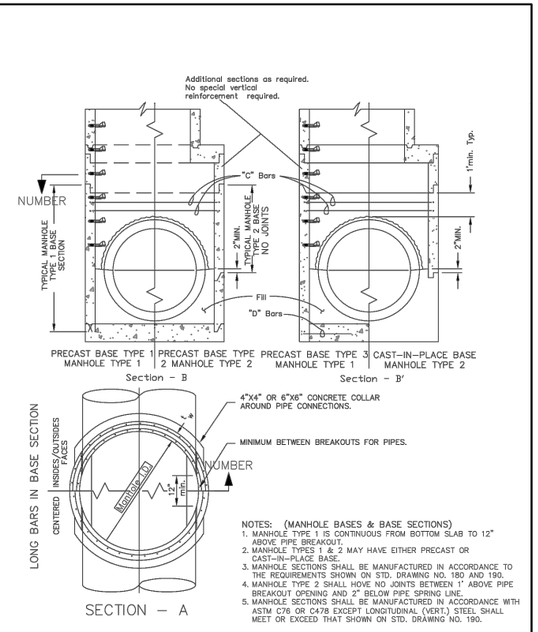
1. ALL POURED IN PLACE CONCRETE SHALL HAVE A 28 DAY ULTIMATE STRENGTH OF 4000 PSI AND A 2" TO 4" SLUMP.
2. ALL REINFORCEMENT SHALL HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI (GRADE 60).
3. ALL PRECAST JOINTS SHALL BE GROUTED OR RUBBER GASKETED.
4. SECTIONS AND CONE SHALL BE IN ACCORDANCE WITH ASTM C478.

MAXIMUM THROUGH PIPE SIZES

BARREL DIA.	MAX. PIPE DIA.
60"	36"
72"	48"
84"	60"
96"	72"
108"	84"
120"	96"

LARGE PRECAST CONCRETE MANHOLE

DRAWING NO. 160 — REVISED 12–06

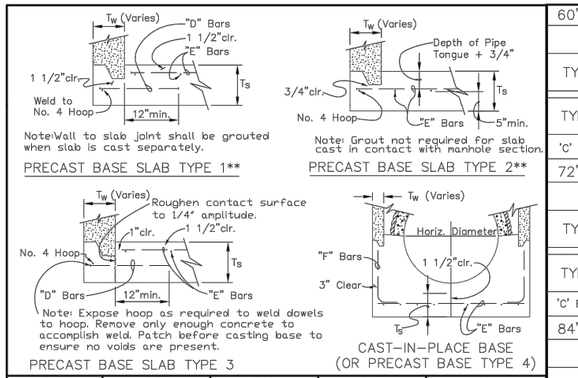


NOTES: (MANHOLE BASES & BASE SECTIONS)

1. MANHOLE TYPE 1 IS CONTINUOUS FROM BOTTOM SLAB TO 12" ABOVE PIPE BREAKOUT.
2. MANHOLE TYPES 1 & 2 MAY HAVE EITHER PRECAST OR CAST–IN–PLACE BASE.
3. MANHOLE SECTIONS SHALL BE MANUFACTURED IN ACCORDANCE TO THE REQUIREMENTS SHOWN ON STD. DRAWING NO. 180 AND 190.
4. MANHOLE TYPE 2 SHALL HOVE NO JOINTS BETWEEN 1' ABOVE PIPE BREAKOUT OPENING AND 2' BELOW PIPE SPRING LINE.
5. MANHOLE SECTIONS SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C76 OR C478 EXCEPT LONGITUDINAL (VERT.) STEEL SHALL MEET OR EXCEED THAT SHOWN ON STD. DRAWING NO. 190.

LARGE PRECAST CONCRETE MANHOLE – BASES

Drawing NO. 170 — REVISED 12–06



SIZE		60"		72"		84"		96"	
Type	Depth*	0'–15'	15'–30'	0'–15'	15'–30'	0'–15'	15'–30'	0'–15'	15'–30'
1	Ts	8.0"	9.0"	8.0"	9.0"	9.0"	10.0"	9.0"	11.0"
	D Bars	#3 @ 12"	#3 @ 12"	#3 @ 12"	#4 @ 10"	#3 @ 10"	#4 @ 11"	#3 @ 9"	#4 @ 11"
	E Bars	#4 @ 12"	#4 @ 9"	#4 @ 9"	#4 @ 6"	#4 @ 8"	#5 @ 9"	#4 @ 7"	#5 @ 8"
2	Ts	11.0"	12.0"	11.0"	12.0"	12.0"	13.0"	12.0"	14.0"
	E Bars	#4 @ 12"	#4 @ 8"	#4 @ 9"	#5 @ 8"	#4" @ 7"	NO.5 @ 7"	#4 @ 5"	#5 @ 6"
3	Ts	7.0"	9.0"	7.0"	9.0"	8.0"	10.0"	9.0"	11.0"
	D Bars	#3 @ 12"	#3 @ 12"	#3 @ 12"	#4 @ 10"	#3 @ 10"	#4 @ 11"	#3 @ 9"	#4 @ 11"
	E Bars	#4 @ 12"	#4 @ 9"	#4 @ 9"	#4 @ 6"	#4 @ 8"	#5 @ 9"	#4" @ 7"	#5 @ 8"
4	Ts	7.0"	9.0"	7.0"	9.0"	8.0"	10.0"	9.0"	11.0"
	E Bars	#4 @ 12"	#4 @ 9"	#4 @ 9"	#4 @ 6"	#4 @ 8"	#5 @ 9"	#4" @ 7"	#5 @ 8"
	F Bars	#4 @ 12"	#4 @ 9"	#4 @ 9"	#4 @ 6"	#4 @ 8"	#5 @ 9"	#4" @ 7"	#5 @ 8"

*Invert to Street Grade

Concrete: f'c =4,000 psi

Steel: fy =Grade 60

**Fabricator required to cast lifting loops in base slab for handling Type 1 & 2 bases.

LARGE PRECAST CONCRETE MANHOLE – TYPES

DRAWING NO. 180 — REVISED 12–06

60"ø Manhole Section	INVERT TO STREET GRADE	NOTE: MAX. LONG. BAR SPACING IS 12" C.–C. T_w =5.0" OUTSIDE	INSIDE	ON CTR.	T_w = 6.0" OUTSIDE	INSIDE	ON CTR.	T_w =6.75" OUTSIDE	INSIDE	ON CTR.
TYPE 1	0 Ft to 15 Ft	0.16	0.15	0.24	0.16	0.09	0.20	0.13	0.08	0.17
	15 Ft to 30 Ft	0.32	0.18	0.53	0.25	0.19	0.42	0.22	0.16	0.36
TYPE 2	0 Ft to 15 Ft	0.17	0.15	0.28	0.19	0.09	0.22	0.16	0.08	0.20
	15 Ft to 30 Ft	0.37	0.18	0.63	0.28	0.19	0.48	0.24	0.16	0.42

'C' Bars–1 No. 4 hoop req'd. for less than 2'–0" clr. between blockout and top of section.

72"ø Manhole Section	INVERT TO STREET GRADE	NOTE: MAX. LONG. BAR SPACING IS 12" C.–C. T_w =6.0" OUTSIDE	INSIDE	ON CTR.	T_w = 7.0" OUTSIDE	INSIDE	ON CTR.	T_w =7.75" OUTSIDE	INSIDE	ON CTR.
TYPE 1	0 Ft to 15 Ft	0.19	0.19	0.26	0.17	0.16	0.22	0.16	0.14	0.20
	15 Ft to 30 Ft	0.33	0.28	0.58	0.27	0.23	0.48	0.26	0.26	0.42
TYPE 2	0 Ft to 15 Ft	0.19	0.13	0.28	0.18	0.15	0.23	0.16	0.17	0.28
	15 Ft to 30 Ft	0.36	0.13	0.65	0.29	0.15	0.52	0.26	0.17	0.46

'C' Bars– 2 NO. 5 HOOPS 2" CLR. OF TOP OF MH BARREL } 2 NO. 3 HOOPS 2" CLR. OVER PIPE BLOCKOUTS } REQ'D. FOR LESS THAN 2'–0" CLR. BETWEEN BLOCKOUT AND TOP OF SECTION.

84"ø Manhole Section	INVERT TO STREET GRADE	NOTE: MAX. LONG. BAR SPACING IS 12" C.–C. T_w =7.0" OUTSIDE	INSIDE	ON CTR.	T_w = 8.0" OUTSIDE	INSIDE	ON CTR.	T_w =8.75" OUTSIDE	INSIDE	ON CTR.
TYPE 1	0 Ft to 15 Ft	0.20	0.13	0.26	0.17	0.12	0.22	0.15	0.10	0.20
	15 Ft to 30 Ft	0.33	0.23	0.59	0.28	0.26	0.50	0.30	0.23	0.45
TYPE 2	0 Ft to 15 Ft	0.23	0.15	0.33	0.21	0.17	0.28	0.19	0.19	0.25
	15 Ft to 30 Ft	0.36	0.15	0.65	0.30	0.17	0.55	0.30	0.19	0.49

'C' Bars– 2 NO. 5 HOOPS 2" CLR. OF TOP OF MH BARREL } 2 NO. 3 HOOPS 2" CLR. OVER PIPE BLOCKOUTS } REQ'D. FOR LESS THAN 2'–0" CLR. BETWEEN BLOCKOUT AND TOP OF SECTION.

96"ø Manhole Section	INVERT TO STREET GRADE	NOTE: MAX. LONG. BAR SPACING IS 12" C.–C. T_w =8.0" OUTSIDE	INSIDE	ON CTR.	T_w = 9.0" OUTSIDE	INSIDE	ON CTR.	T_w =9.75" OUTSIDE	INSIDE	ON CTR.
TYPE 1	0 Ft to 15 Ft	0.25	0.18	0.33	0.21	0.16	0.29	0.21	0.14	0.27
	15 Ft to 30 Ft	0.41	0.26	0.77	0.35	0.30	0.66	0.37	0.27	0.59
TYPE 2	0 Ft to 15 Ft	0.26	0.17	0.34	0.22	0.19	0.30	0.20	0.21	0.28
	15 Ft to 30 Ft	0.43	0.17	0.82	0.37	0.19	0.70	0.34	0.21	0.63

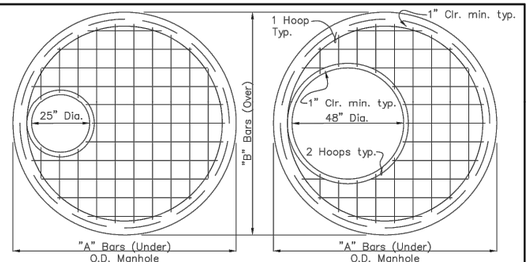
'C' Bars– 2 NO. 5 HOOPS 2" CLR. OF TOP OF MH BARREL } 2 NO. 3 HOOPS 2" CLR. OVER PIPE BLOCKOUTS } REQ'D. FOR LESS THAN 2'–0" CLR. BETWEEN BLOCKOUT AND TOP OF SECTION.

PROVIDE MIN. LONGITUD. REINF. AS SHOWN, 1" CLR. OF INSIDE AND OUTSIDE FACES, OR AT CENTER OF WALL

AREAS ARE IN^2/FT OF CIRCUMFERENCE AND MAY BE WELDED WIRE FABRIC, BARS OR A COMBINATION OF BOTH.

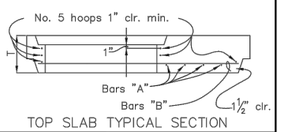
LARGE PRECAST CONCRETE MANHOLE– LONG. BASE SECTION REINF.

DRAWING NO. 200 — REVISED 12–06



NOTES:

1. All concrete shall have a 28 day ultimate compressive strength of 4,000 psi.
2. All reinforcement shall have a minimum yield strength of 60,000 psi, (Grade 60).
3. All lap splices shall be 24 bar diameters unless noted otherwise.
4. Add steps as required by Standard Drawing NO. 010



TOP SLAB TYPICAL SECTION

	TOP SLAB "A"			TOP SLAB "B"			TOP SLAB "B"		
	COVER DEPTH								
	6" to 12"			4'–0" to 7'–0"			7'–1" to 22'–0"		
Size	T	"A" Bars	"B" Bars	T	"A" Bars	"B" Bars	T	"A" Bars	"B" Bars
60"	8"	No.5 @ 7½"	No.5 @ 7½"	12"	No.5 @ 9"	No.5 @ 9"	12"	No.5 @ 9"	No.5 @ 9"
72"	10"	No.5 @ 7"	No.5 @ 7"	12"	No.5 @ 9"	No.5 @ 9"	12"	No.5 @ 7"	No.5 @ 7"
84"	11"	No.5 @ 7"	No.5 @ 7"	12"	No.5 @ 6"	No.5 @ 6"	12"	No.6 @ 6"	No.5 @ 7"
96"	12"	No.5 @ 6"	No.5 @ 6"	12"	No.5 @ 6"	No.5 @ 6"	14"	No.6 @ 6"	No.5 @ 6"
108"	N/A	N/A	N/A	12"	No.6 @ 8"	No.6 @ 8"	16"	No.7 @ 9"	No.7 @ 9"
120"	N/A	N/A	N/A	12"	No.6 @ 7"	No.6 @ 7"	16"	No.7 @ 8"	No.7 @ 8"

LARGE PRECAST CONCRETE MANHOLE TOP SLABS

DRAWING NO. 220 — REVISED 12–06

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DECEMBER 2019

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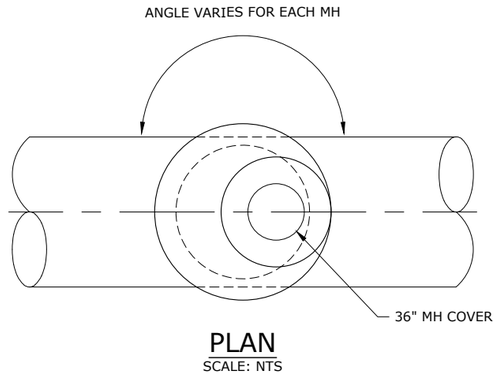
STANDARD DRAWINGS

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

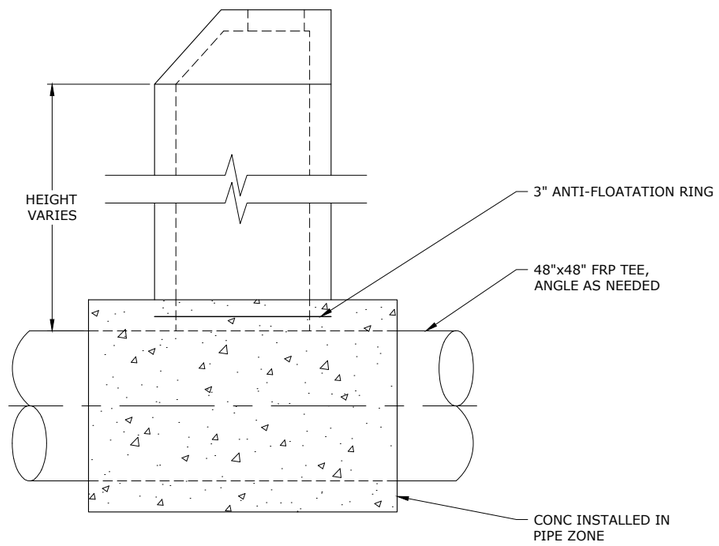
1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882

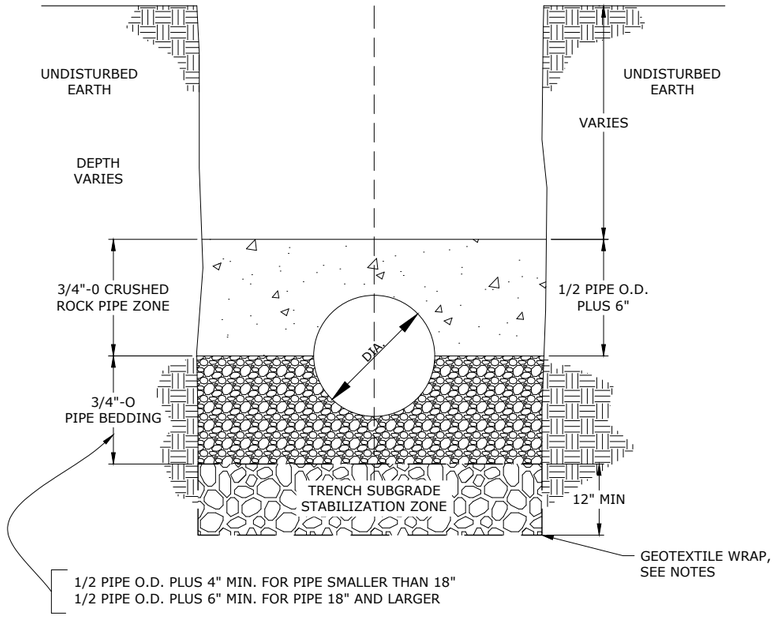
SHEET C14 OF X



PLAN
SCALE: NTS



TYPICAL FRP MANHOLE TEE (1 / -)
SCALE: NTS



NOTES:

1. VIBRATORY COMPACTION PROHIBITED ON TRENCH STABILIZATION ZONE.

2. CRUSHED AGGREGATE IN STABILIZATION ZONE TO BE WELL GRADED, 1.5' MINIMUM TO NO. 4 CRUSHED AGGREGATE.

3. GEOTEXTILE FABRIC USED FOR WRAP TO BE MIRAFI RS380I, OR EQUIVALENT.

TRENCH SUBGRADE STABILIZATION (2 / -)
SCALE: NTS

60% DESIGN

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DO NOT USE FOR CONSTRUCTION

DECEMBER 2019

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NO.	REVISION	BY	DATE

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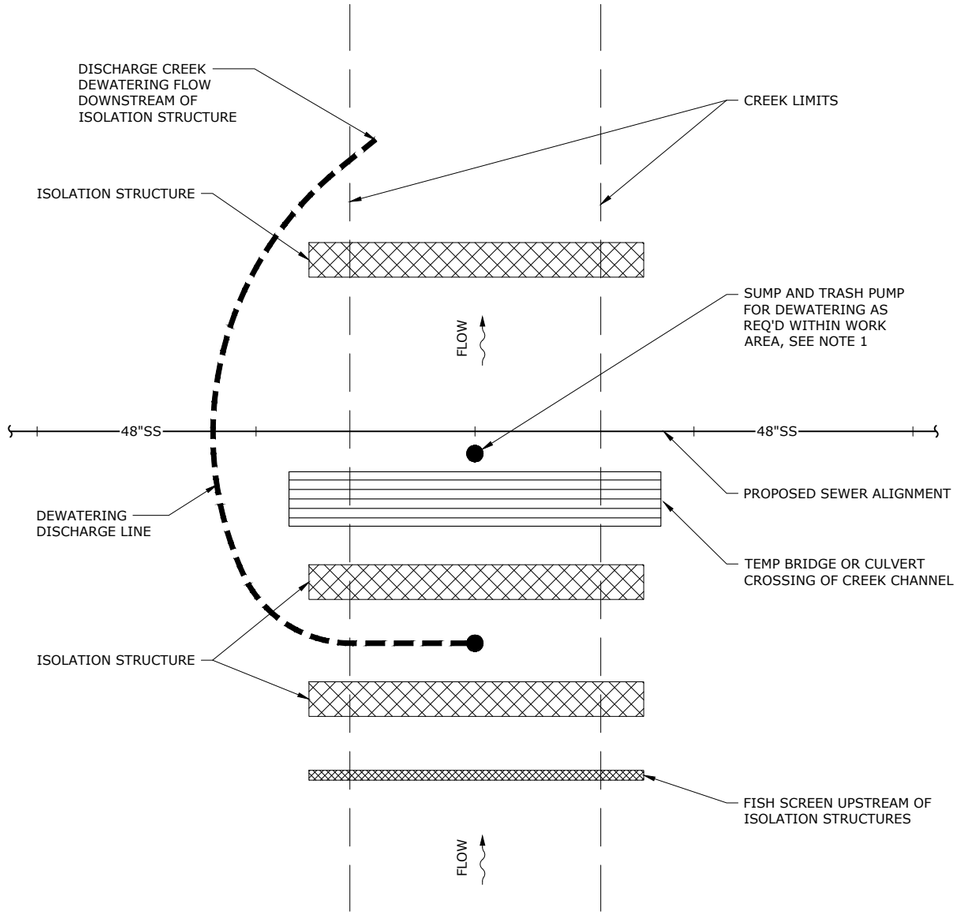
CIVIL DETAILS - 1

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXX

PROJECT	SHEET	OF
6882	C15	X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C15 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)



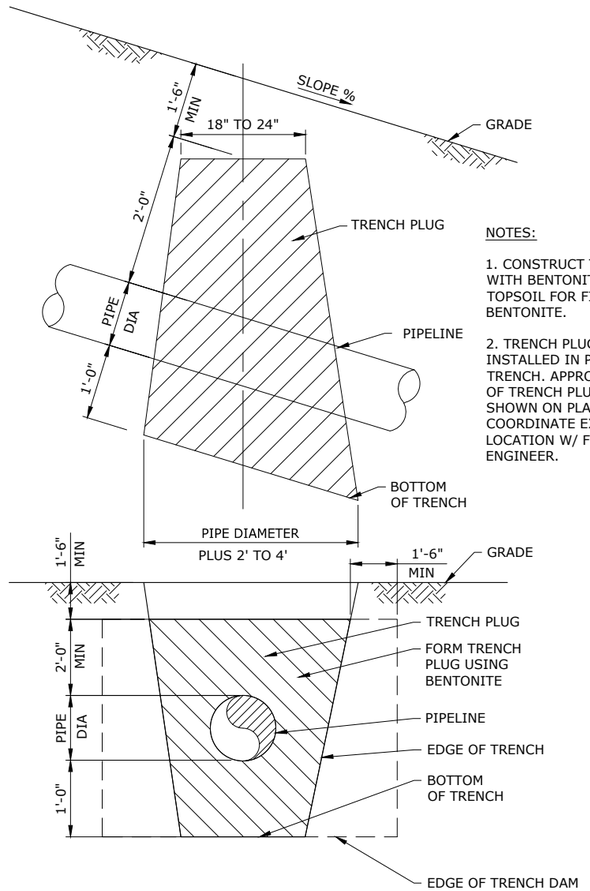
NOTES:

1. DISCHARGE DEWATERING FLOWS FROM WORK AREA INTO AN APPROVED FILTRATION SYSTEM.

CREEK CROSSING AND DIVERSION PLAN, TYPICAL

1 / -

SCALE: NTS



NOTES:

1. CONSTRUCT TRENCH PLUGS WITH BENTONITE DO NOT USE TOPSOIL FOR FILLING BENTONITE.

2. TRENCH PLUGS SHALL BE INSTALLED IN PIPELINE TRENCH. APPROX LOCATION OF TRENCH PLUGS ARE SHOWN ON PLAN SHEETS. COORDINATE EXACT LOCATION W/ FIELD ENGINEER.

TYPICAL TRENCH DAM

2 / -

SCALE: NTS

60% DESIGN

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DECEMBER 2019

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CIVIL DETAILS - 2

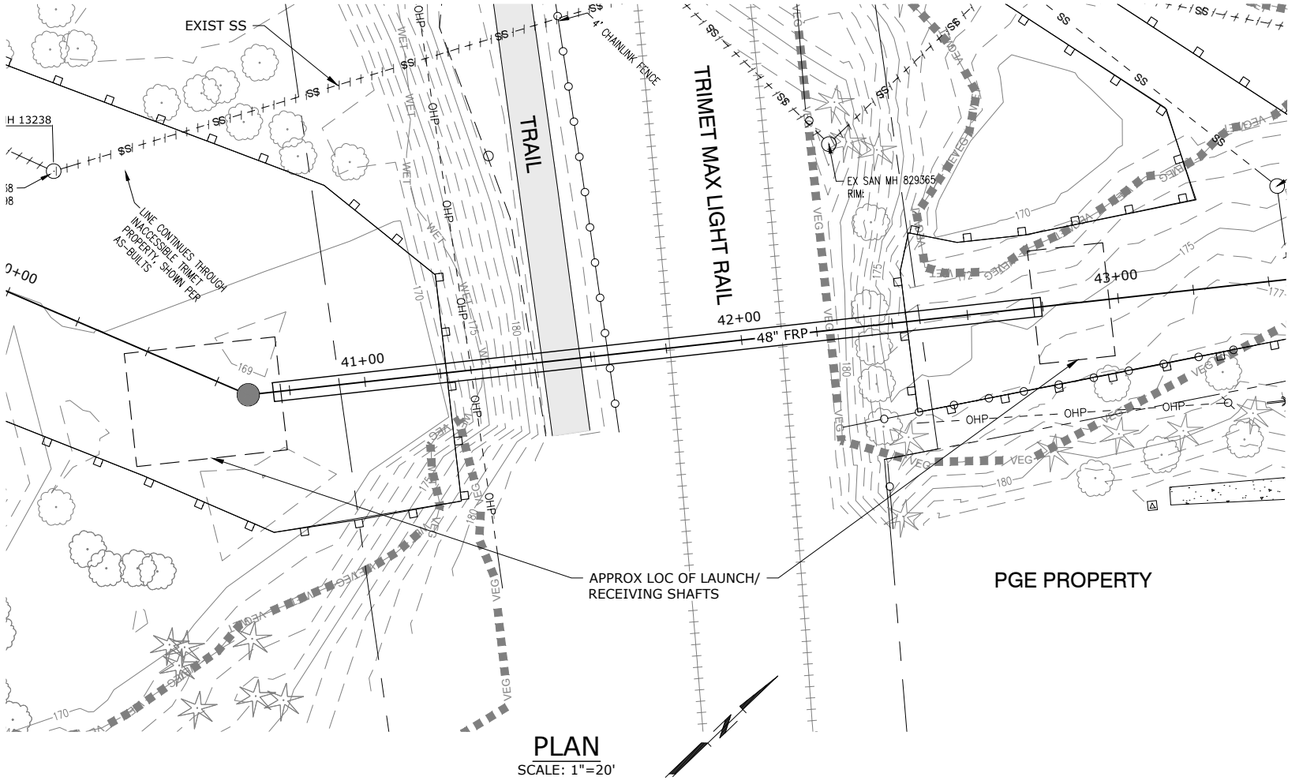
CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

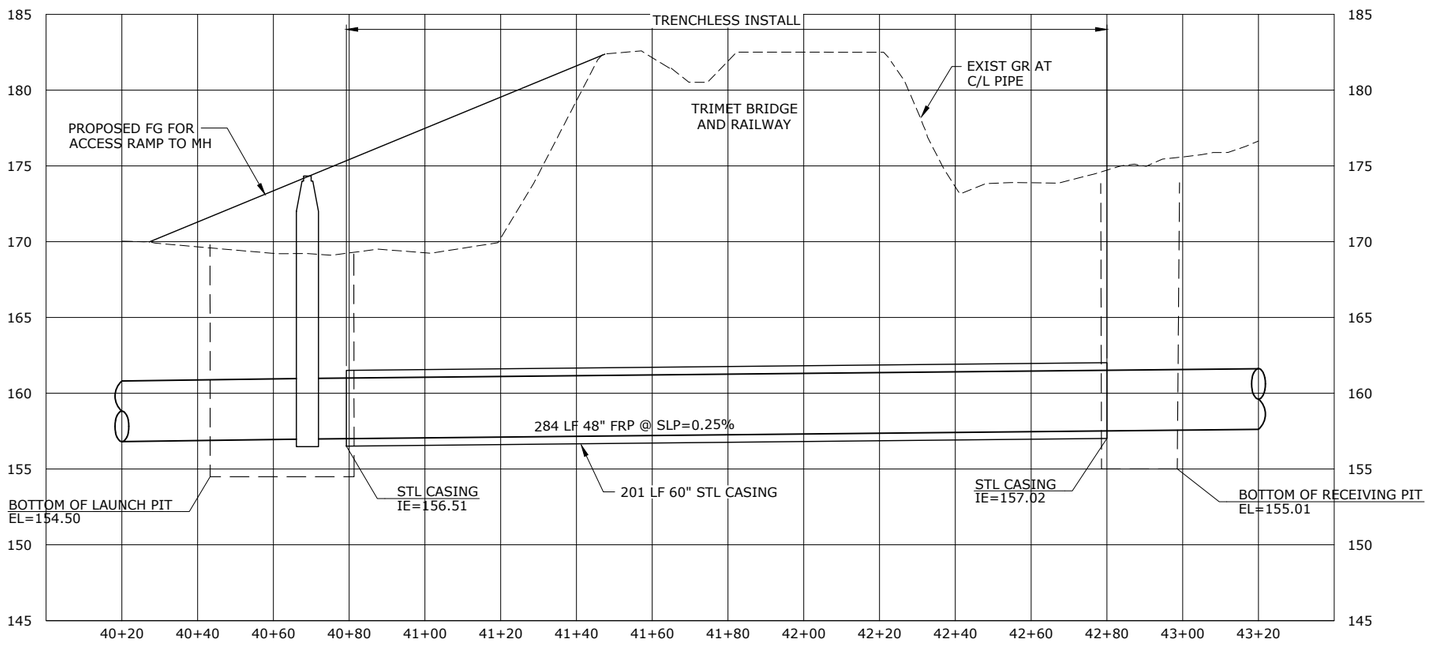
PROJECT 6882

SHEET C16 OF X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C16 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)



PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

CONSTRUCTION NOTES:

1. CAP PROPOSED TRUNK SEWER WITH CONCRETE, SEE DETAIL X, SHEET C12 BETWEEN STA 39+00 AND STA 39+20.

2. SEE DETAIL 2, SHEET C16 FOR TRENCH DAM CONSTRUCTION.

3. BOARDWALK TO BE REMOVED AND REPLACED, SEE SHEET BW4.

SHEET NOTES:

1.

20 10 0 20 40
1 Inch = 20 Feet

NOTICE
0 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

60% DESIGN

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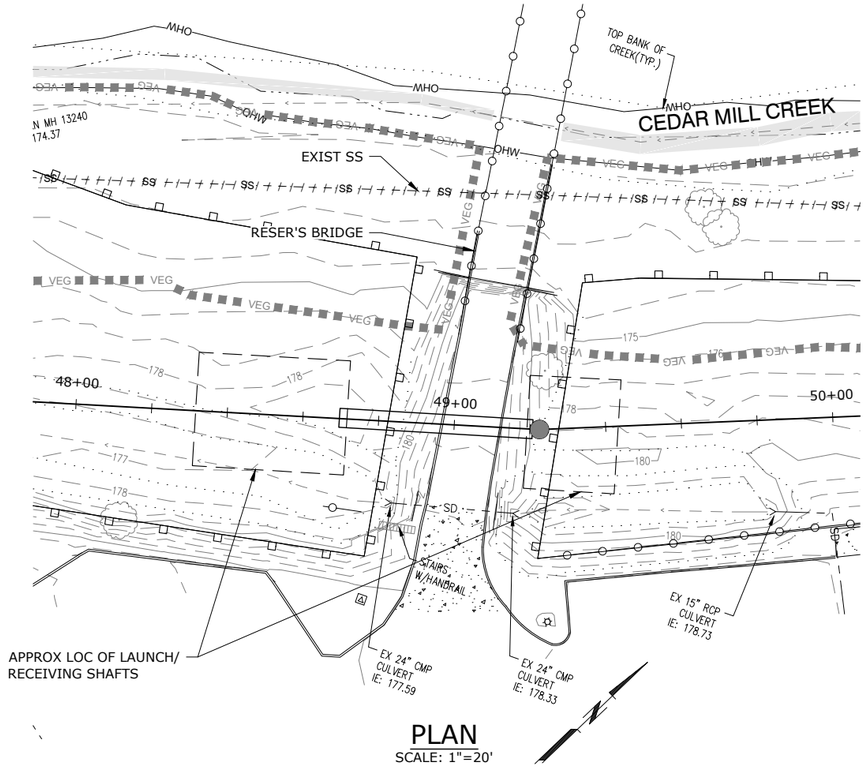
TRIMET CROSSING

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

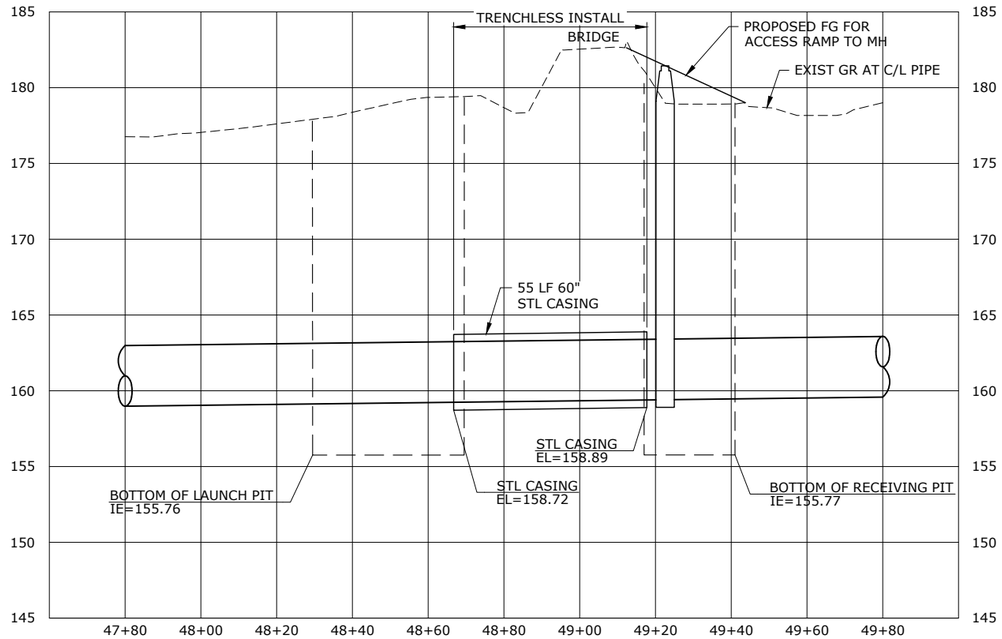
1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT	SHEET	OF
6882	C17	X

G:\PDX_Projects\19\2470 - Cedar Mill Trunk Design\CAD\SHEETS\19-2470-OR-C.dwg C17 12/30/2019 2:46 PM MATT.ESTEP 23.0s (LMS Tech)



PLAN
SCALE: 1"=20'



PROFILE
SCALE: 1"=20' HORIZ, 1"=5' VERT

20 10 0 20 40
1 Inch = 20 Feet

NOTICE
0 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

60% DESIGN

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BRIDGE CROSSING

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	1S1W08NW
DRAFTER:	CAD
DESIGNER:	JTB
CHECKED:	BVO
APPROVED:	XXXX

PROJECT	6882
SHEET	C18
OF	X

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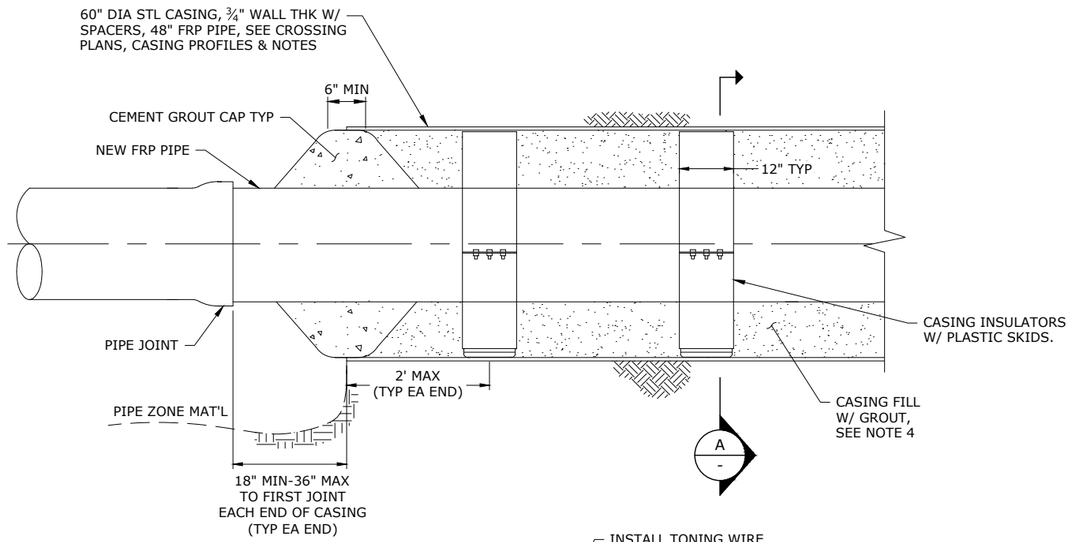

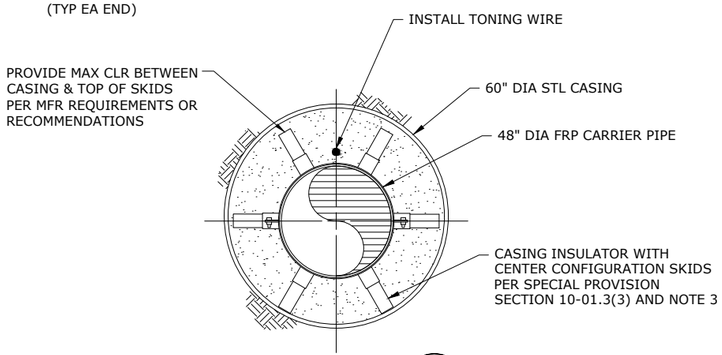

SECTION A / -
SCALE: NTS

CASING NOTES:

1. 60" ANSI/AWWA C200 STEEL CASING.

2. PROVIDE 2" MINIMUM CLEARANCE BETWEEN CASING AND CARRIER PIPE BELLS AND APPURTENANCES.

3. CONTRACTOR TO VERIFY CASING INSULATORS ARE COMPATIBLE WITH CASING SIZE.

4. CASING SHALL BE FILLED WITH GROUT CAREFULLY PUMPED IN SUCH A WAY AS TO ELIMINATE ANY VOIDS.

5. CARRIER PIPE INSTALLED WITHIN BORE PITS SHALL BE INSTALLED WITH THE SAME BEDDING AND BACKFILL REQUIREMENTS AS PIPELINES, SEE TYPICAL TRENCH SECTION.

6. SEE SECTION 10-01.3(2) OF THE SPECIAL PROVISIONS FOR EXTERNAL GROUTING REQUIREMENTS.

CASING DETAIL 1 / -
SCALE: NTS

NOTICE
0 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

60% DESIGN

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CROSSING DETAILS - 1

CEDAR MILL CREEK SANITARY AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER:	DESIGNER:	CHECKED:	APPROVED:
1S1W08NW	CAD	JTB	BVO	XXXX

PROJECT 6882

SHEET C19 OF X

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LEGEND:

- DIVERSION CHANNELS
- SIDE CHANNEL CONNECTIONS
- CHANNEL CL
- ORDINARY HIGH WATER (OHW)
- 100YR — 1% ACE FLOODPLAIN
- 1% ACE FLOODWAY
- WORK CORRIDOR
- TRAIL — GIS DEFINED TRAILS
- PROPOSED TRAIL
- RIGHT OF WAY
- PROPOSED SEWER ALIGNMENT
- EXISTING SEWER ALIGNMENT
- STUDY AREA
- WET — WETLAND EXTENTS
- STAGING AREA

ACCESS NOTES:

1. SEE CONSTRUCTION SEQUENCE ON SHT L12 PRIOR TO CONSTRUCTING CHANNELS AND EXPANDED HABITAT AREAS.
2. INSTALL EROSION CONTROL PER DETAILS.

RESER'S PROPERTY
RESER'S PARKING LOT
MERLO RD
SW JENKINS RD
SHT L7
SW 153RD DR
TRIMET LIGHT RAIL
RESER'S PROPERTY
SITE ACCESS
EXISTING SANITARY TRUNK ALIGNMENT
SIDE CHANNEL 6
RESER'S REACH
THPRD REACH
PGE SITE
BONNEVILLE POWER ADMINISTRATION
TRIMET MERLO BUS GARAGE
SANITARY TRUNK CONSTRUCTION ZONE
SIDE CHANNEL 5
PROPOSED SEWER ALIGNMENT
SIDE CHANNEL 4
SIDE CHANNEL3
SIDE CHANNEL 1
SIDE CHANNEL 2
SITE ACCESS
170TH ST
BEAVERTON CREEK
CEDAR MILL CREEK
SHT L6
SHT L5
STUDY AREA BOUNDARY
SHT L2
SHT L3
SHT L4
BEAVERTON CREEK

N

SCALE
160 0 80 160 320
SCALE FEET

PLAN

60% DESIGN

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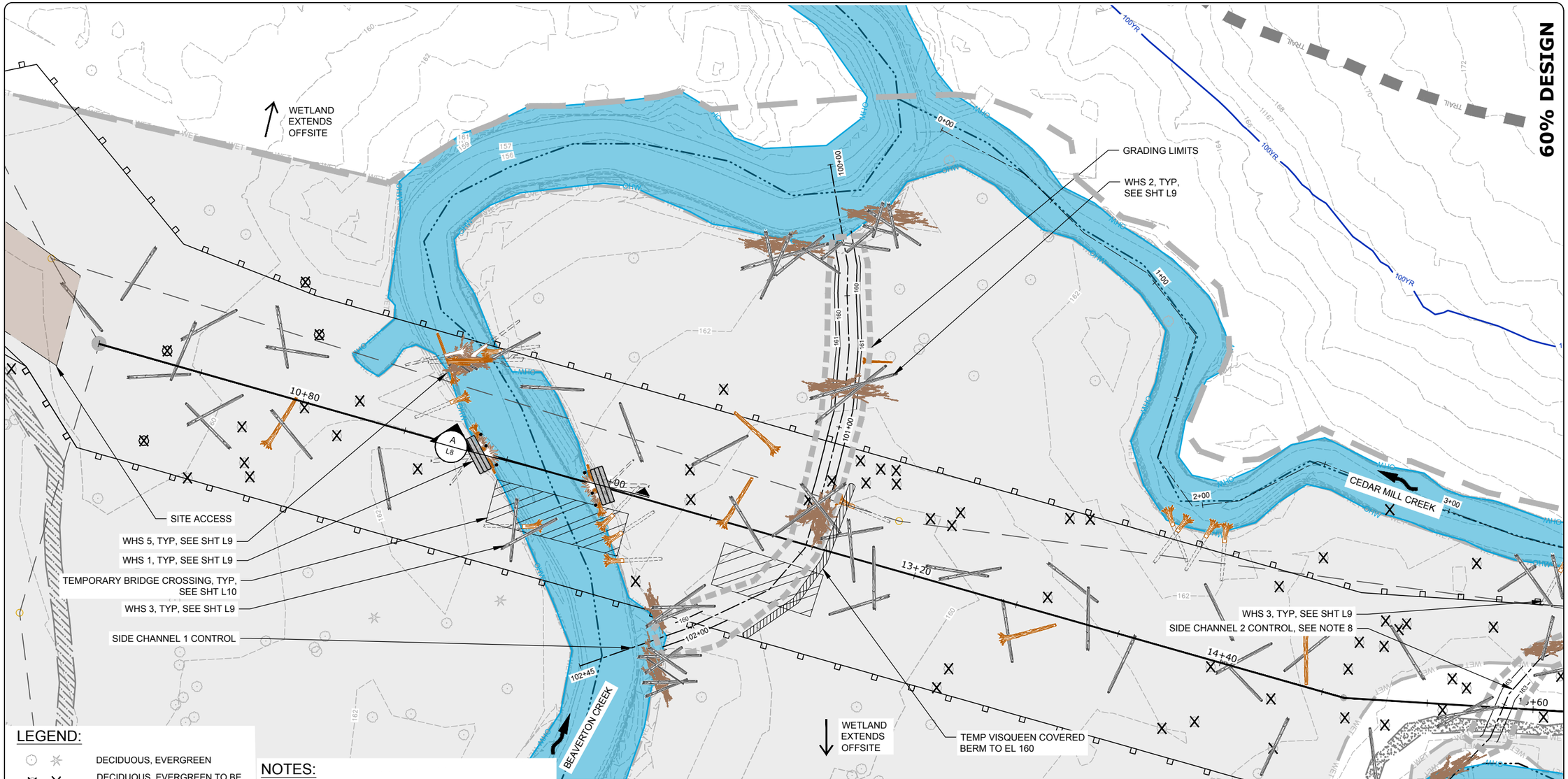
RESTORATION ENHANCEMENT OVERVIEW

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L1 OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\L1 - PROPOSED_CONDITIONS.dwg Sheet 9/23/2019 11:59 AM BSCHONER 23.1s (LMS Tech)



L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\L2-5 - PROP_COND_A-D.dwg DIVERSION1 9/23/2019 12:03 PM BSCHONER 23.1s (LMS Tech)

LEGEND:

- DECIDUOUS, EVERGREEN
- DECIDUOUS, EVERGREEN TO BE REMOVED FOR SEWER ALIGNMENT
- EXISTING SEWER MANHOLE
- CHANNEL CL
- OHW — ORDINARY HIGH WATER (OHW)
- 100YR — 1% ACE FLOODPLAIN
- WET — WETLAND EXTENTS
- EXISTING SEWER ALIGNMENT
- WORK CORRIDOR
- TRAILS — GIS DEFINED TRAILS
- PROPOSED SEWER ALIGNMENT
- STUDY AREA
- CHANNEL GRADING LIMITS
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- STAGING AREA

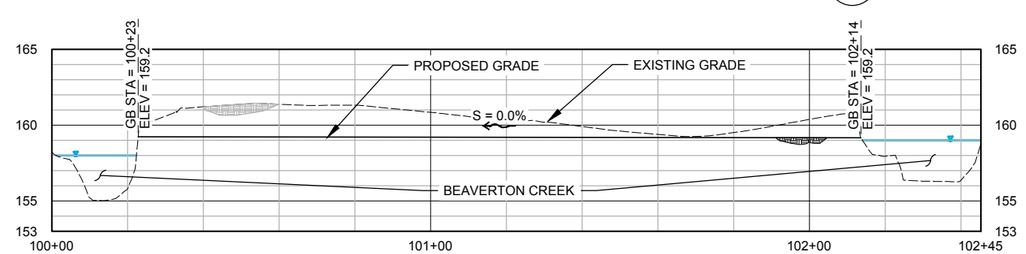
NOTES:

1. FLAG AREAS TO BE CLEARED AND GRUBBED. ENGINEER SHALL REVIEW AND APPROVE MARKED AREAS BEFORE CLEARING BEGINS. CLEAR AND GRUB PRIOR TO WETLAND AND CHANNEL CONSTRUCTION. AVOID AREAS OUTSIDE OF STUDY BOUNDARY. SALVAGE TREES AND NATIVE VEGETATION FOR RE-USE IN WOOD STRUCTURES SEE SHT L9.
2. CONSTRUCT CHANNEL PER PLAN AND PROFILE ON THIS SHEET AND PER SECTIONS ON SHT L8. CONSTRUCT EXPANDED HABITAT PER PLAN ON THIS SHEET AND PER SECTIONS ON SHT L8.
3. THE CHANNEL ALIGNMENTS SHOWN DEFINE THE CENTERLINE OF THE CHANNELS. CONSTRUCT SMOOTH RADII BETWEEN DEFINED ALIGNMENT. POINTS, TOPS AND TOES OF BANK ARE APPROXIMATE. SEE SECTIONS ON SHT L8 FOR CHANNEL GEOMETRIES. CHANNEL EXCAVATION VOLUMES ARE APPROXIMATE IN-PLACE VOLUME ESTIMATES.
4. USE VISQUEEN COVERED BERM TO BUILD UP SIDES WHERE CHANNEL DEPTH IS BELOW 6".
5. CONSTRUCT WHS PER PLAN ON THIS SHEET, HABITAT DETAILS, NOTES AND TABLE ON SHT L9.
6. REVEGETATE AREAS PER PLANTING PLAN ON L13 AND L14.
7. CONSTRUCTION OF SIDE CHANNEL SHALL BE FIELD FIT TO AVOID TREES. UNLESS FLAGGED FOR REMOVAL FOR TRUNK REALIGNMENT.

PLAN

N

SCALE
20 0 10 20 40
SCALE FEET



1 — PROFILE: SIDE CHANNEL 1 CONTROL
SCALE: HORIZONTAL 1" = 20'
SCALE: VERTICAL 1" = 4'

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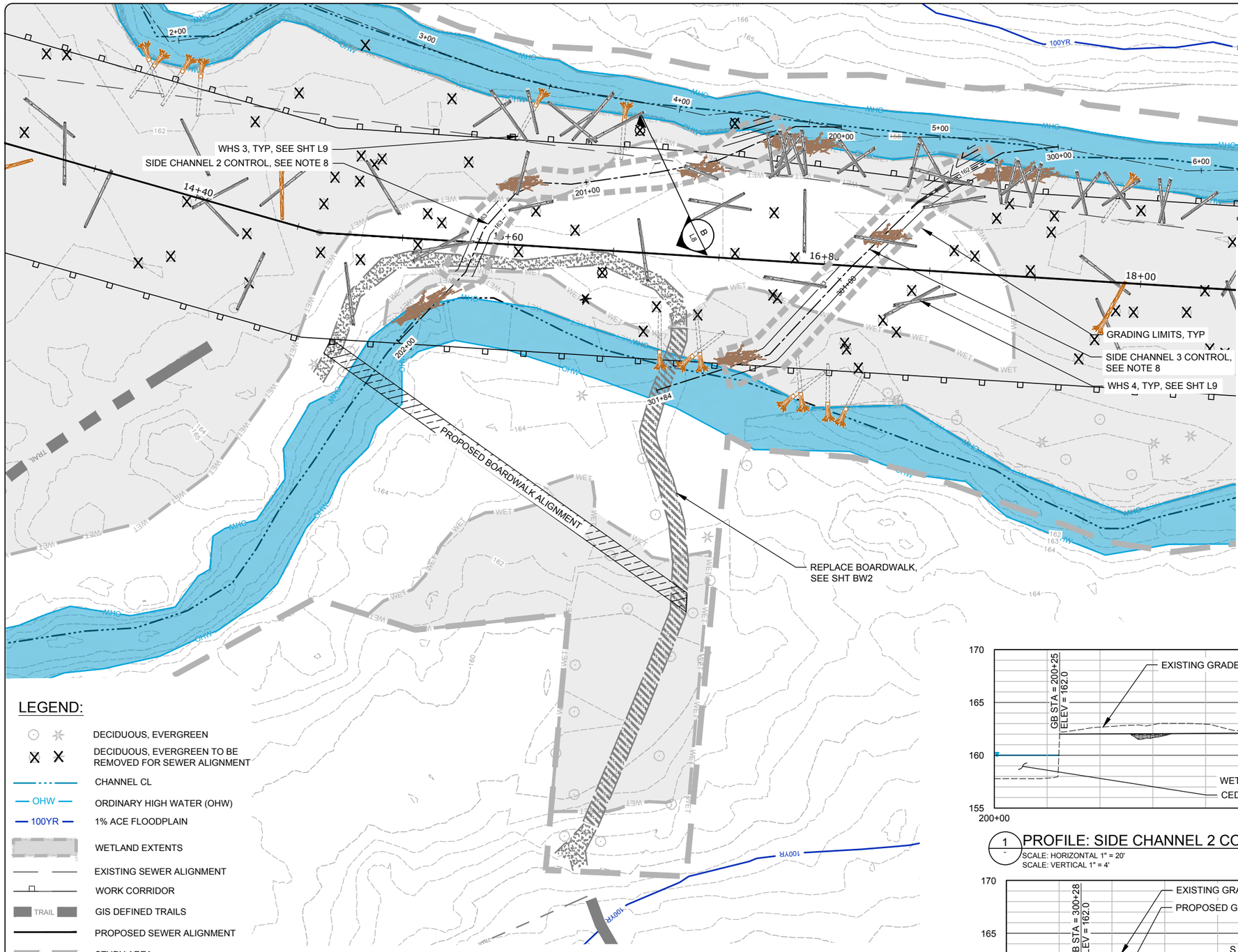
SIDE CHANNEL 1 PLAN

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882

SHEET L2 OF X



LEGEND:

- DECIDUOUS, EVERGREEN
- DECIDUOUS, EVERGREEN TO BE REMOVED FOR SEWER ALIGNMENT
- CHANNEL CL
- OHW — ORDINARY HIGH WATER (OHW)
- 100YR — 1% ACE FLOODPLAIN
- WETLAND EXTENTS
- EXISTING SEWER ALIGNMENT
- WORK CORRIDOR
- TRAIL — GIS DEFINED TRAILS
- PROPOSED SEWER ALIGNMENT
- STUDY AREA
- GRADING LIMITS
- SURVEYED TRAIL
- SURVEYED BOARDWALK

PLAN

N

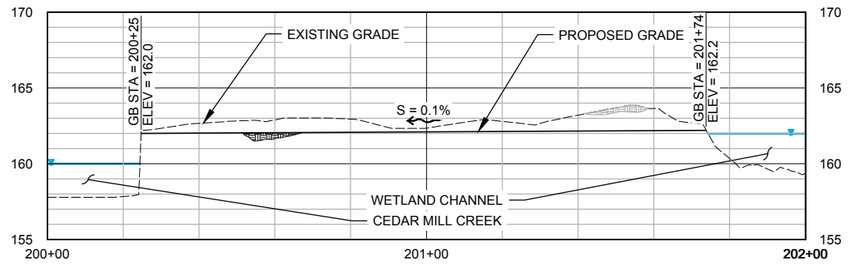
SCALE

20 0 10 20 40

SCALE FEET

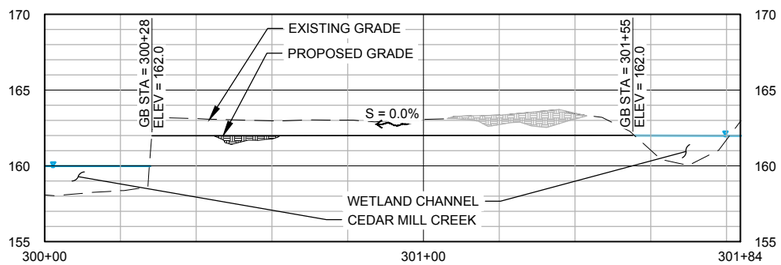
NOTES:

1. FLAG AREAS TO BE CLEARED AND GRUBBED. ENGINEER SHALL REVIEW AND APPROVE MARKED AREAS BEFORE CLEARING BEGINS. CLEAR AND GRUB PRIOR TO WETLAND AND CHANNEL CONSTRUCTION. AVOID AREAS OUTSIDE OF STUDY BOUNDARY. SALVAGE TREES AND NATIVE VEGETATION FOR RE-USE IN WOOD STRUCTURES SEE SHT L9.
2. CONSTRUCT CHANNEL PER PLAN AND PROFILE ON THIS SHEET AND PER SECTIONS ON SHT L8. CONSTRUCT EXPANDED HABITAT PER PLAN ON THIS SHEET AND PER SECTIONS ON SHT L8.
3. THE CHANNEL ALIGNMENTS SHOWN DEFINE THE CENTERLINE OF THE CHANNELS. CONSTRUCT SMOOTH RADII BETWEEN DEFINED ALIGNMENT. POINTS, TOPS AND TOES OF BANK ARE APPROXIMATE. SEE SECTIONS ON SHT L8 FOR CHANNEL GEOMETRIES. CHANNEL EXCAVATION VOLUMES ARE APPROXIMATE IN-PLACE VOLUME ESTIMATES.
4. USE VISQUEEN COVERED BERM TO BUILD UP SIDES WHERE CHANNEL DEPTH IS BELOW 6".
5. CONSTRUCT WHS PER PLAN ON THIS SHEET, HABITAT DETAILS, NOTES AND TABLE ON SHT L9.
6. REVEGETATE AREAS PER PLANTING PLAN ON L13 AND L14.
7. CONSTRUCTION OF SIDE CHANNEL SHALL BE FIELD FIT TO AVOID TREES. UNLESS FLAGGED FOR REMOVAL FOR TRUNK REALIGNMENT.
8. CHANNELS 2 AND 3 TO BE CONSTRUCTED AFTER SANITARY CONSTRUCTION COMPLETED.



1 — PROFILE: SIDE CHANNEL 2 CONTROL

SCALE: HORIZONTAL 1" = 20'
SCALE: VERTICAL 1" = 4'



2 — PROFILE: SIDE CHANNEL 3 CONTROL

SCALE: HORIZONTAL 1" = 20'
SCALE: VERTICAL 1" = 4'

60% DESIGN

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SIDE CHANNELS 2 AND 3 PLAN

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882

SHEET L3 OF X

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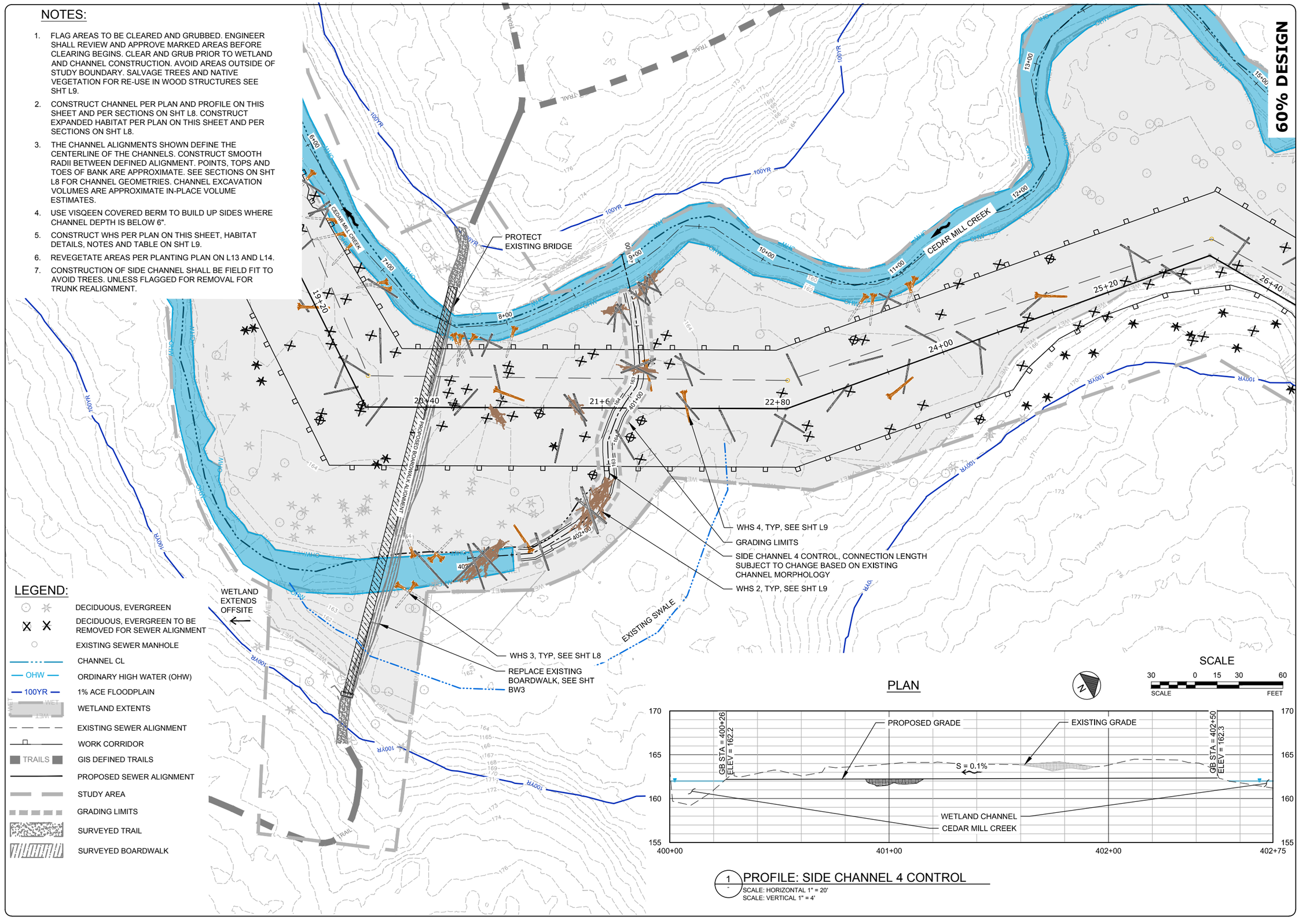
NOTES:

1. FLAG AREAS TO BE CLEARED AND GRUBBED. ENGINEER SHALL REVIEW AND APPROVE MARKED AREAS BEFORE CLEARING BEGINS. CLEAR AND GRUB PRIOR TO WETLAND AND CHANNEL CONSTRUCTION. AVOID AREAS OUTSIDE OF STUDY BOUNDARY. SALVAGE TREES AND NATIVE VEGETATION FOR RE-USE IN WOOD STRUCTURES SEE SHT L9.
2. CONSTRUCT CHANNEL PER PLAN AND PROFILE ON THIS SHEET AND PER SECTIONS ON SHT L8. CONSTRUCT EXPANDED HABITAT PER PLAN ON THIS SHEET AND PER SECTIONS ON SHT L8.
3. THE CHANNEL ALIGNMENTS SHOWN DEFINE THE CENTERLINE OF THE CHANNELS. CONSTRUCT SMOOTH RADII BETWEEN DEFINED ALIGNMENT. POINTS, TOPS AND TOES OF BANK ARE APPROXIMATE. SEE SECTIONS ON SHT L8 FOR CHANNEL GEOMETRIES. CHANNEL EXCAVATION VOLUMES ARE APPROXIMATE IN-PLACE VOLUME ESTIMATES.
4. USE VISQEEN COVERED BERM TO BUILD UP SIDES WHERE CHANNEL DEPTH IS BELOW 6".
5. CONSTRUCT WHS PER PLAN ON THIS SHEET, HABITAT DETAILS, NOTES AND TABLE ON SHT L9.
6. REVEGETATE AREAS PER PLANTING PLAN ON L13 AND L14.
7. CONSTRUCTION OF SIDE CHANNEL SHALL BE FIELD FIT TO AVOID TREES. UNLESS FLAGGED FOR REMOVAL FOR TRUNK REALIGNMENT.



LEGEND:

- DECIDUOUS, EVERGREEN
- DECIDUOUS, EVERGREEN TO BE REMOVED FOR SEWER ALIGNMENT
- EXISTING SEWER MANHOLE
- CHANNEL CL
- OHW — ORDINARY HIGH WATER (OHW)
- 100YR — 1% ACE FLOODPLAIN
- WETLAND EXTENTS
- EXISTING SEWER ALIGNMENT
- WORK CORRIDOR
- TRAILS — GIS DEFINED TRAILS
- PROPOSED SEWER ALIGNMENT
- STUDY AREA
- GRADING LIMITS
- SURVEYED TRAIL
- SURVEYED BOARDWALK

PLAN

SCALE
30 0 15 30 60
SCALE FEET

1 - PROFILE: SIDE CHANNEL 4 CONTROL
SCALE: HORIZONTAL 1" = 20'
SCALE: VERTICAL 1" = 4'

60% DESIGN

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SIDE CHANNEL 4 PLAN

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L4 OF X

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60% DESIGN

SIDE CHANNEL CONTROL

GRADING LIMITS

WHS 2, TYP, SEE SHT L9

WHS 5, TYP, SEE SHT L9

WHS 1, TYP, SEE SHT L9

WHS 4, TYP, SEE SHT L9

CEDAR MILL CREEK

WETLAND EXTENDS OFFSITE

TEMPORARY WATER CROSSING, SEE SHT L10

WHS 3, TYP, SEE SHT L9

17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 27+60 28+80 30+00 31+20 32+40 500+00 501+00 502+00 502+15

100YR

OHW

WET

TRAIL

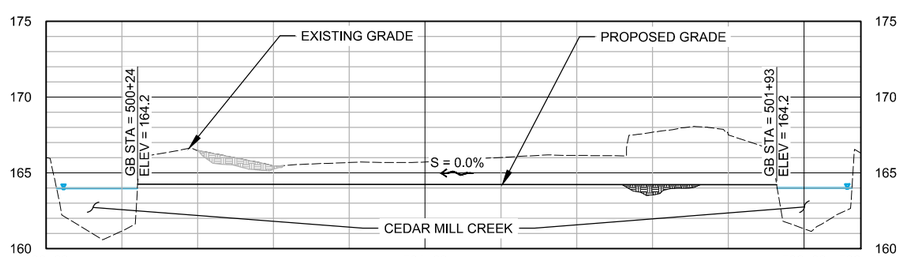
LEGEND:

- DECIDUOUS, EVERGREEN
- DECIDUOUS, EVERGREEN TO BE REMOVED FOR SEWER ALIGNMENT
- EXISTING SEWER MANHOLE
- CHANNEL CL
- ORDINARY HIGH WATER (OHW)
- 1% ACE FLOODPLAIN
- WETLAND EXTENTS
- EXISTING SEWER ALIGNMENT
- WORK CORRIDOR
- GIS DEFINED TRAILS
- PROPOSED SEWER ALIGNMENT
- STUDY AREA
- GRADING LIMITS
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- STORMWATER FACILITY
- STAGING AREA

NOTES:

1. FLAG AREAS TO BE CLEARED AND GRUBBED. ENGINEER SHALL REVIEW AND APPROVE MARKED AREAS BEFORE CLEARING BEGINS. CLEAR AND GRUB PRIOR TO WETLAND AND CHANNEL CONSTRUCTION. AVOID AREAS OUTSIDE OF STUDY BOUNDARY. SALVAGE TREES AND NATIVE VEGETATION FOR RE-USE IN WOOD STRUCTURES SEE SHT L9.
2. CONSTRUCT CHANNEL PER PLAN AND PROFILE ON THIS SHEET AND PER SECTIONS ON SHT L8.
3. THE CHANNEL ALIGNMENTS SHOWN DEFINE THE CENTERLINE OF THE CHANNELS. CONSTRUCT SMOOTH RADII BETWEEN DEFINED ALIGNMENT. POINTS, TOPS AND TOES OF BANK ARE APPROXIMATE. SEE SECTIONS ON SHT L8 FOR CHANNEL GEOMETRIES. CHANNEL EXCAVATION VOLUMES ARE APPROXIMATE IN-PLACE VOLUME ESTIMATES.
4. USE VISQUEEN COVERED BERM TO BUILD UP SIDES WHERE CHANNEL DEPTH IS BELOW 6".
5. CONSTRUCT WHS PER PLAN ON THIS SHEET, HABITAT DETAILS, NOTES AND TABLE ON SHT L9.
6. REVEGETATE AREAS PER PLANTING PLAN ON L13 AND L14.
7. CONSTRUCTION OF SIDE CHANNEL SHALL BE FIELD FIT TO AVOID TREES. UNLESS FLAGGED FOR REMOVAL FOR TRUNK REALIGNMENT.

PLAN



PROFILE: SIDE CHANNEL 5 CONTROL

SCALE: HORIZONTAL 1" = 20'
SCALE: VERTICAL 1" = 4'

SCALE

20 0 10 20 40

SCALE FEET

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SEPTEMBER 2019

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NO.	REVISION	BY	DATE

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SIDE CHANNEL 5 PLAN

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882

SHEET L5 OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\L6-7 - PROP_COND_E-F.dwg DIVERSION6 9/23/2019 12:00 PM BSCHONER 23.1s (LMS Tech)

60% DESIGN

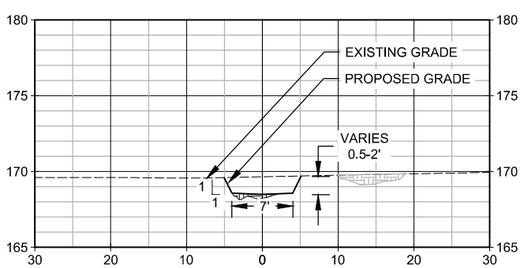
WHS 2, TYP, SEE SHT L9
WHS 6, TYP, SEE SHT L9
EXISTING SEWER ALIGNMENT
WHS 4, TYP , SEE SHT L9
SIDE CHANNEL 6 CONTROL, SEE NOTES.
GRADING LIMITS
PROTECT YEW TREE
WETLAND EXTENDS OFFSITE
PROPOSED CONSTRUCTION ACCESS
PROPOSED BOARDWALK ALIGNMENT
REPLACE EXISTING BOARDWALK, SEE SHT BW4
TEMPORARY WATER CROSSING, TYP, SEE SHT L10
WHS 1, TYP, SEE SHT L9
WETLAND EXTENDS OFFSITE
CEDAR MILL CREEK
WHS 5, TYP, SEE SHT L9
SIDE CHANNEL SWALES, SEE NOTE 8, SEE SHT L8

LEGEND:

- DECIDUOUS, EVERGREEN
- DECIDUOUS, EVERGREEN TO BE REMOVED FOR SEWER ALIGNMENT
- EXISTING SEWER MANHOLE
- CHANNEL CL
- ORDINARY HIGH WATER (OHW)
- 1% ACE FLOODPLAIN
- WETLAND EXTENTS
- EXISTING SEWER ALIGNMENT
- WORK CORRIDOR
- GIS DEFINED TRAILS
- ROAD RIGHT OF WAYS
- PROPOSED SEWER ALIGNMENT
- STUDY AREA
- GRADING LIMITS
- SURVEYED TRAIL
- SURVEYED BOARDWALK
- STAGING AREA

PLAN

SCALE
30 0 15 30 60
SCALE FEET



A SECTION: SIDE CHANNEL 6
SCALE: HORIZONTAL 1" = 10'
SCALE: VERTICAL 1" = 2'

NOTES:

1. FLAG AREAS TO BE CLEARED AND GRUBBED. ENGINEER SHALL REVIEW AND APPROVE MARKED AREAS BEFORE CLEARING BEGINS. CLEAR AND GRUB PRIOR TO WETLAND AND CHANNEL CONSTRUCTION. AVOID AREAS OUTSIDE OF STUDY BOUNDARY. SALVAGE TREES AND NATIVE VEGETATION FOR RE-USE IN WOOD STRUCTURES SEE SHT L9.
2. CONSTRUCT CHANNEL PER PLAN AND PROFILE ON THIS SHEET AND PER SECTIONS ON SHT L8.
3. THE CHANNEL ALIGNMENTS SHOWN DEFINE THE CENTERLINE OF THE CHANNELS. CONSTRUCT SMOOTH RADII BETWEEN DEFINED ALIGNMENT. POINTS, TOPS AND TOES OF BANK ARE APPROXIMATE. SEE SECTIONS ON SHT L8 FOR CHANNEL GEOMETRIES. CHANNEL EXCAVATION VOLUMES ARE APPROXIMATE IN-PLACE VOLUME ESTIMATES.
4. USE VISQUEEN COVERED BERM TO BUILD UP SIDES WHERE CHANNEL DEPTH IS BELOW 6".
5. CONSTRUCT WHS PER PLAN ON THIS SHEET, HABITAT DETAILS, NOTES AND TABLE ON SHT L9.
6. REVEGETATE AREAS PER PLANTING PLAN ON L13 AND L14.
7. CONSTRUCTION OF SIDE CHANNEL SHALL BE FIELD FIT TO AVOID TREES. UNLESS FLAGGED FOR REMOVAL FOR TRUNK REALIGNMENT.
8. SIDE CHANNEL 6 AND FLOODPLAIN SWALES TO BE CONSTRUCTED AFTER SANITARY TRUNK WORK IS COMPLETED.

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SIDE CHANNEL 6 PLAN

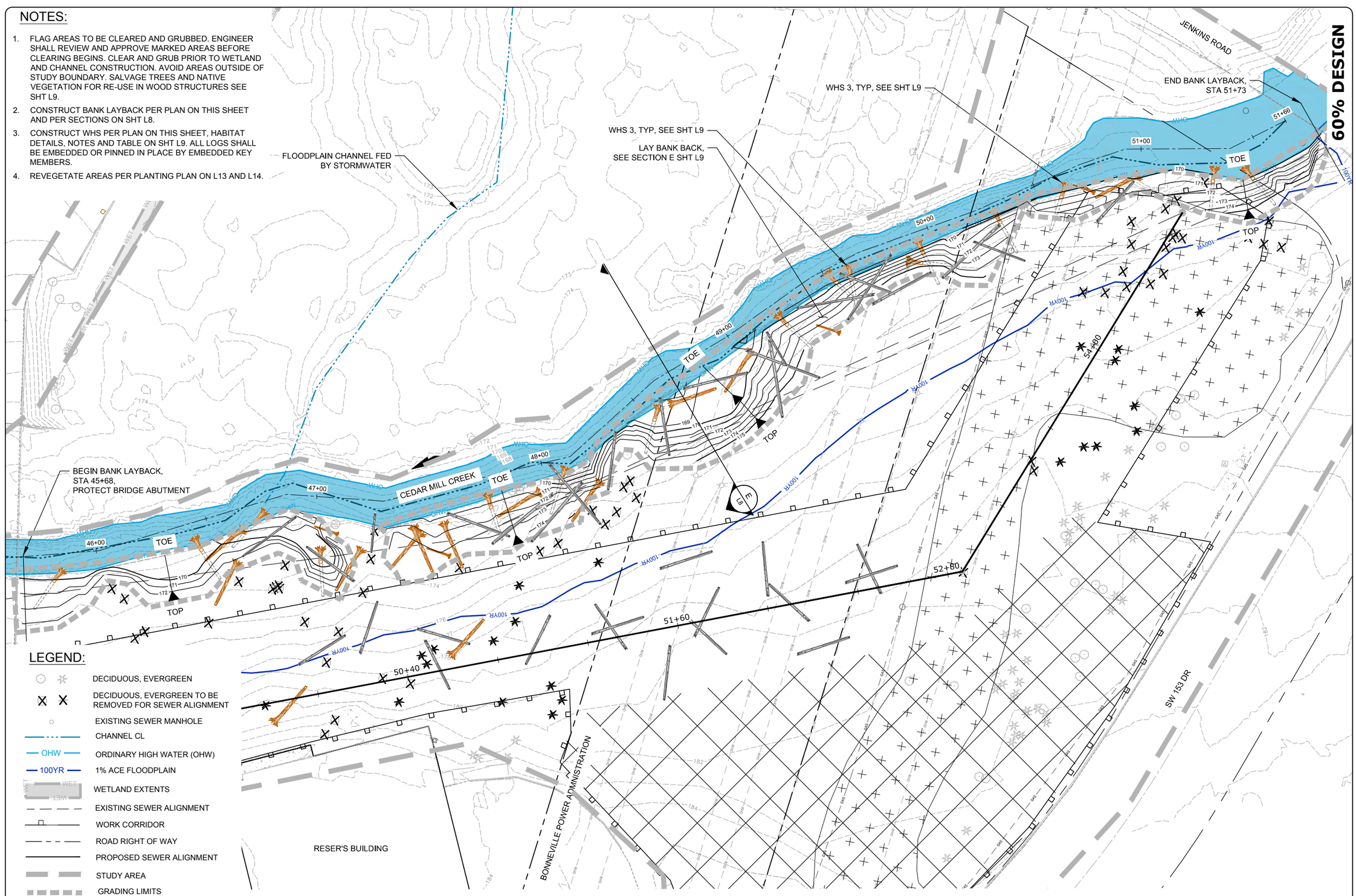
CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L6 OF X

NOTES:

1. FLAG AREAS TO BE CLEARED AND GRUBBED. ENGINEER SHALL REVIEW AND APPROVE MARKED AREAS BEFORE CLEARING BEGINS. CLEAR AND GRUB PRIOR TO WETLAND AND CHANNEL CONSTRUCTION. AVOID AREAS OUTSIDE OF STUDY BOUNDARY. SALVAGE TREES AND NATIVE VEGETATION FOR RE-USE IN WOOD STRUCTURES SEE SHT L9.
2. CONSTRUCT BANK LAYBACK PER PLAN ON THIS SHEET AND PER SECTIONS ON SHT L8.
3. CONSTRUCT WHS PER PLAN ON THIS SHEET, HABITAT DETAILS, NOTES AND TABLE ON SHT L9. ALL LOGS SHALL BE EMBEDDED OR PINNED IN PLACE BY EMBEDDED KEY MEMBERS.
4. REVEGETATE AREAS PER PLANTING PLAN ON L13 AND L14.



LEGEND:

- DECIDUOUS, EVERGREEN
- DECIDUOUS, EVERGREEN TO BE REMOVED FOR SEWER ALIGNMENT
- EXISTING SEWER MANHOLE
- CHANNEL CL
- OHW — ORDINARY HIGH WATER (OHW)
- 100YR — 1% ACE FLOODPLAIN
- WETLAND EXTENTS
- EXISTING SEWER ALIGNMENT
- WORK CORRIDOR
- ROAD RIGHT OF WAY
- PROPOSED SEWER ALIGNMENT
- STUDY AREA
- GRADING LIMITS
- STORMWATER SWALE
- STAGING AREA
- WASHINTON COUNTY STORMWATER FACITLITY, NOT IN CONTRACT

PLAN

N

SCALE
20 0 10 20 40
SCALE FEET

60% DESIGN

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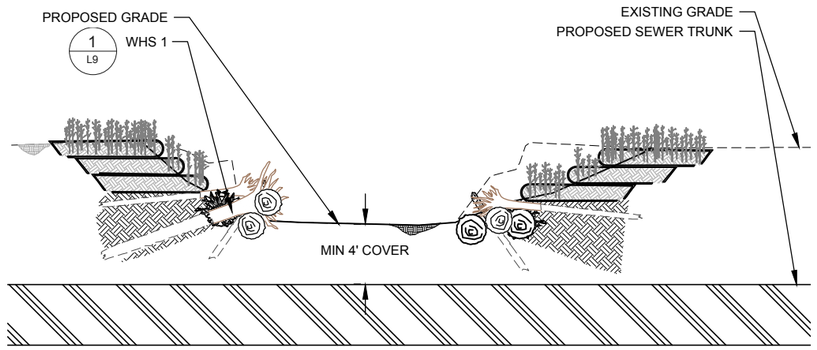
RESERS GRADING PLAN

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

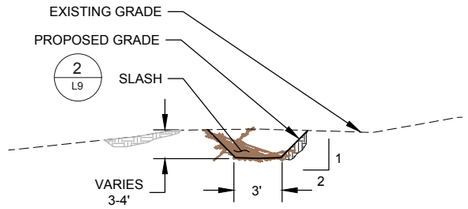
1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L7 OF X

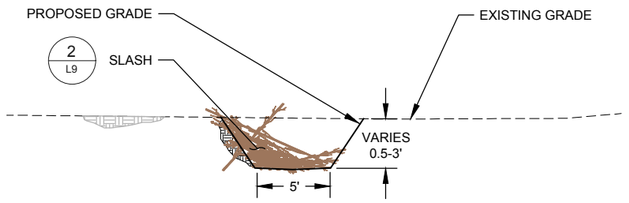
L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\L6-7 - PROP_COND_E-F.dwg RESERS 9/23/2019 12:00 PM BSCHONER 23.1s (LMS Tech)



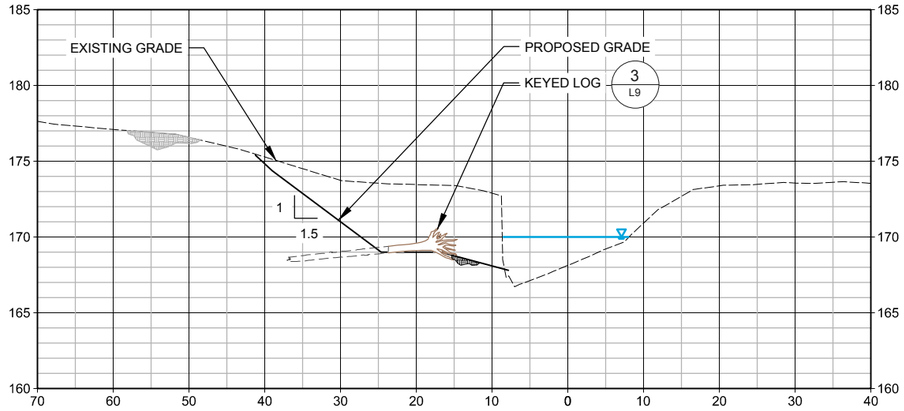
A PIPE CROSSING TYPICAL SECTION
SCALE: 1"=10'



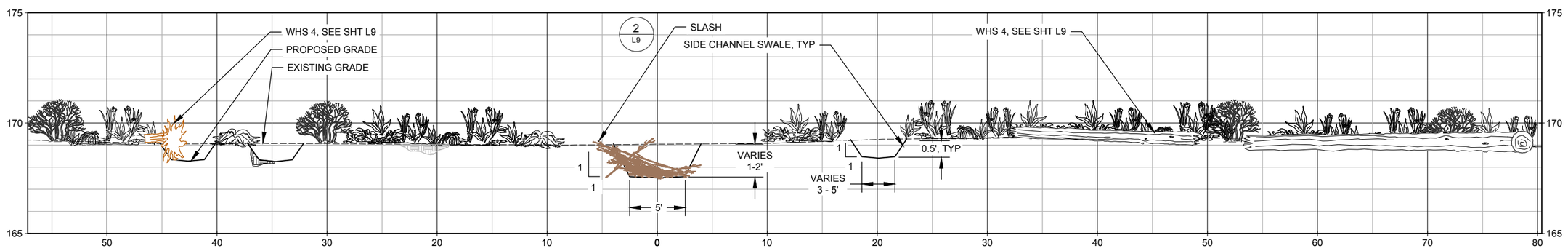
B SIDE CHANNEL 2-3 CHANNEL TYPICAL SECTION
SCALE: 1"=5'



C SIDE CHANNEL 1,4 AND 5 TYPICAL SECTION
SCALE: HORIZONTAL 1" = 5'



E EXPANDED HABITAT STA 48+72
SCALE: HORIZONTAL 1" = 10'
SCALE: VERTICAL 1" = 2'



D SIDE CHANNEL 6 STA 601+35
SCALE: HORIZONTAL 1" = 5'
SCALE: VERTICAL 1" = 2'

NOTES:

1. USE SLASH FROM DOWNED TREES TO CREATE PILES IN DIVERSION CHANNELS, SEE WHS 2, SHT L9.
2. SECTIONS ARE SHOWN LOOKING DOWNSTREAM.
3. GRADE WITHIN RESER'S REACH VARIES, SEE SHEET L7.
4. VERTICAL EXAGGERATION IS 2X THE HORIZONTAL.
5. VERTICAL DATUM IN NGVD29

60% DESIGN

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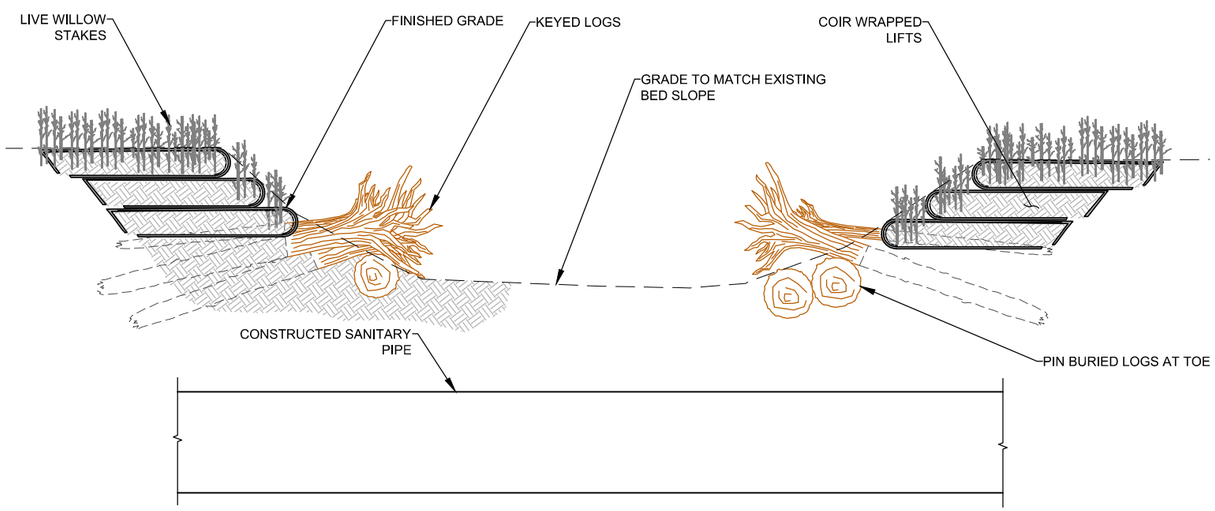
SECTIONS

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L8 OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\L8 - SECTIONS_ABVOHW.dwg Sheet 9/23/2019 12:03 PM BSCHONER 23.1s (LMS Tech)

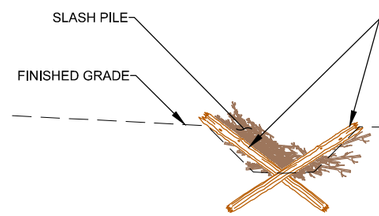


WHS TYPE 1

Piece Summary		
Piece	QTY	LENGTH / DBH
LARGE W/ RW	4	~30' / 18-24"
FOOTER LOGS	3	~10' / 18-20"

1 WHS 1 - PIPE CROSSING

NOT TO SCALE

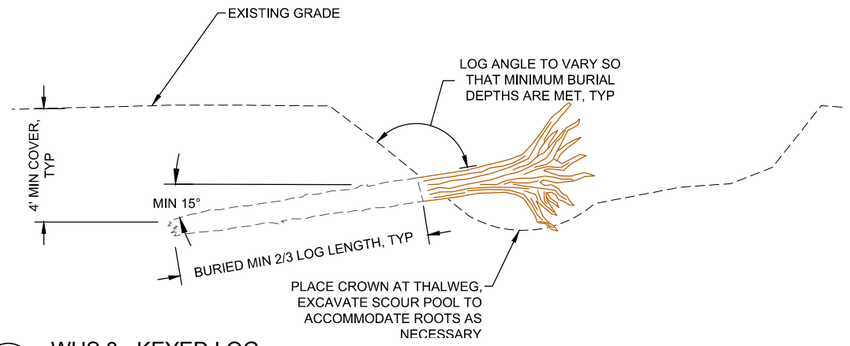


WHS TYPE 2

Piece Summary		
Piece	QTY	LENGTH / DBH
PIER	2	2-5' / 6-12"
SLASH	-	VARIES / 6-8"

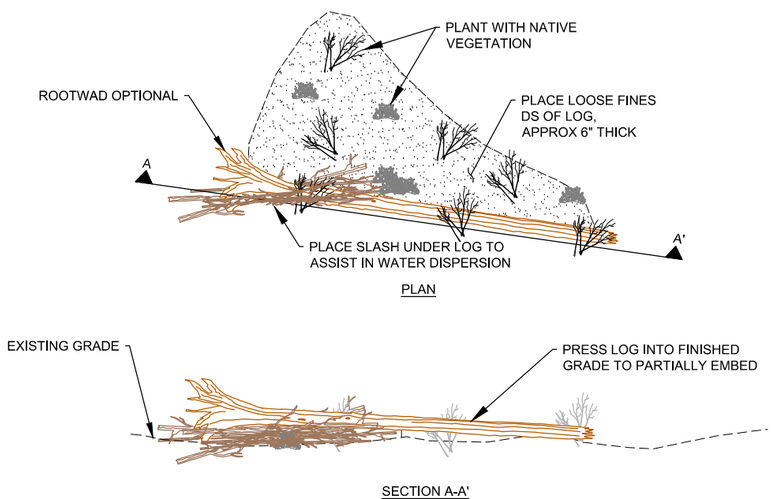
2 WHS 2 - SLASH PILE

NOT TO SCALE



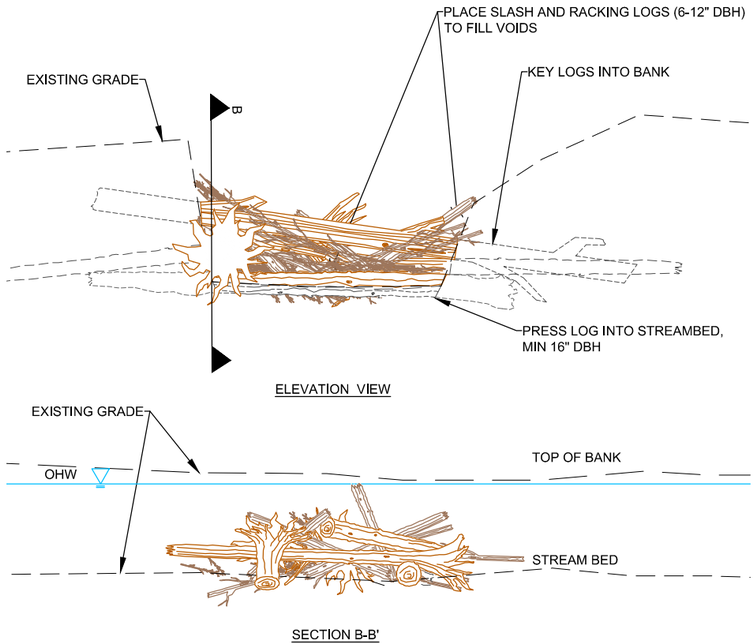
3 WHS 3 - KEYED LOG

NOT TO SCALE



4 WHS 4 - FLOODPLAIN LOG

NOT TO SCALE

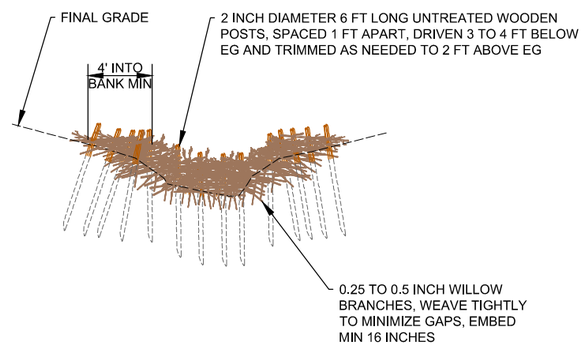


WHS TYPE 5

Piece Summary		
Piece	QTY	LENGTH / DBH
LARGE W/O RW	6	~30' / 18-24"
SMALL W/ RW	3	~15' / 12-24"
SLASH	-	VARIES / 2-12"

5 WHS TYPE 5 - CHANNEL SPANNING JAM

NOT TO SCALE



6 WHS TYPE 6 - CHANNEL SPANNING JAM

NOT TO SCALE

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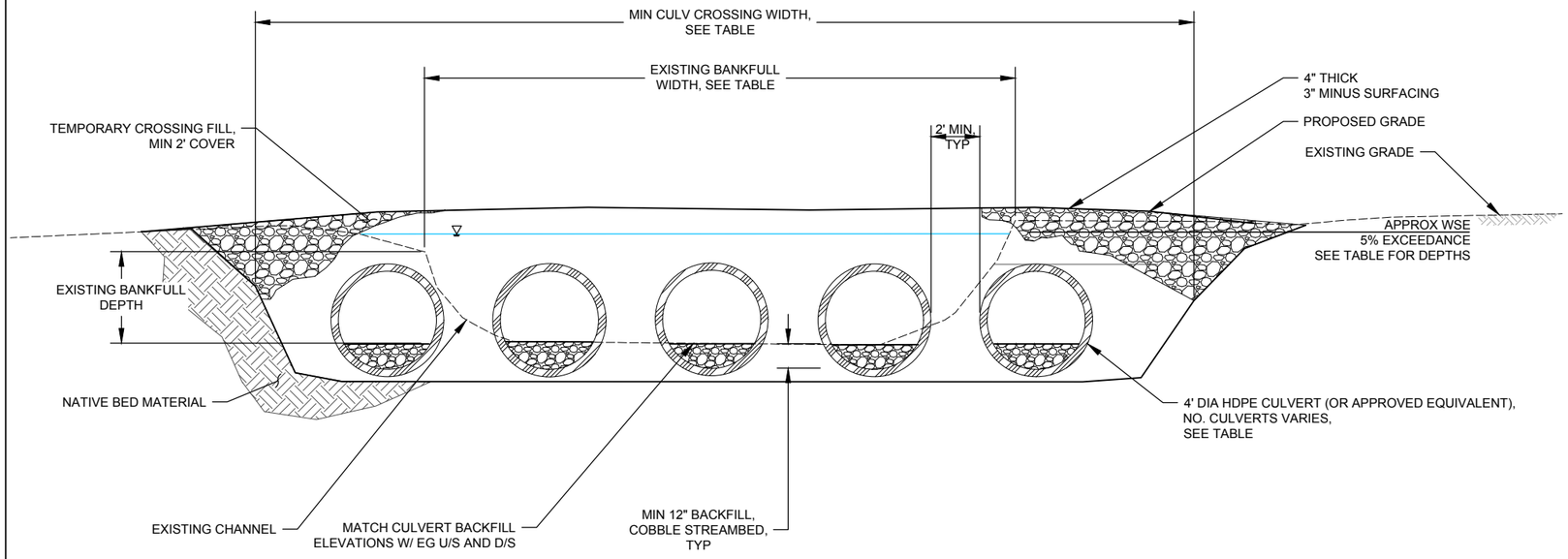
WHS DETAILS

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

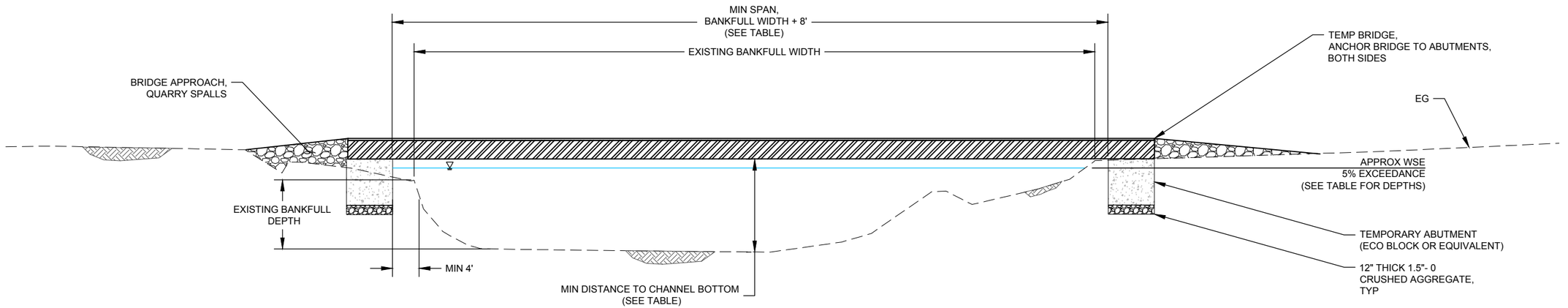
1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882 | SHEET L9 | OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\L9 - HABITAT-WOOD DETAILS.dwg L9 9/23/2019 10:14 AM BSCHONER 23.1s (LMS Tech)



1 SECTION - OPTION 1 CULVERT
NTS



2 SECTION - OPTION 2 BRIDGE
NTS

NOTES:

1. CROSSINGS SHALL NOT BE LOVATED AT BENDS IN CHANNEL. ENGINEER SHALL APPROVE CROSSING LOCATIONS PRIOR TO INSTALLATIONS.
2. CROSSINGS SHALL BE PLACED AT RIGHT ANGLE (90 DEG) RELATIVE TO CHANNEL.
3. INSTALL BRIDGES AS LEVEL AS POSSIBLE.
4. EXTEND COBBLE MIN 10' D/S OF CULVERT CROSSINGS FOR OUTFALL/ SCOUR PROTECTION.
5. COBBLE SHALL BE MINIMUM D50, 6".

CROSSING DATA

CROSSING	CREEK	95% EXCEEDANCE FLOW, CFS	5% EXCEEDANCE FLOW, CFS	BANKFULL WIDTH, FT	REQ'D CULVERT CROSSING WIDTH, FT	NO. CULVERTS REQ'D	95% TAILWATER DEPTH, FT	5% TAILWATER DEPTH, FT	95% TAILWATER VELOCITY, FT/S	5% TAILWATER VELOCITY, FT/S
1	BEAVERTON CREEK	3.4	167.0	40.3	50	8	0.54	4.3	0.5	1.9
2	CEDAR MILL CREEK	2.0	107.0	22.5	32	5	0.70	3.4	0.7	2.3
3	CEDAR MILL CREEK	1.0	26.5	12.5	14	2	0.34	2.3	0.6	1.7
4	CEDAR MILL CREEK	1.0	81.0	22.5	33	4	0.32	2.5	0.6	2.4

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FISH PASSAGE DETAILS

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L10 OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\L10 - FISH PASSAGE DETAILS.dwg L7 9/23/2019 12:03 PM BSCHONER 23.1s (LMS Tech)

TO BE

DEVELOPED

- STORMWATER OUTFALL
NOT TO SCALE

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STORMWATER OUTFALL

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

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PROJECT 6882

SHEET L11 OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\L11 - STORMWATEROUTFALL.dwg C15 9/20/2019 9:42 AM BSCHONER 23.1s (LMS Tech)

LEGEND:

- DIVERSION CHANNELS
- SIDE CHANNEL CONNECTIONS
- COFFER DAM
- ORDINARY HIGH WATER (OHW)
- 1% EXCEEDENCE FLOODWAY
- 100YR — 1% EXCEEDENCE FLOODPLAIN
- WETLAND EXTENTS
- WORK CORRIDOR
- TRAIL — GIS DEFINED TRAILS
- PROPOSED TRAIL
- ROAD RIGHT OF WAY
- PROPOSED SEWER ALIGNMENT
- EXISTING SEWER ALIGNMENT
- STUDY AREA
- PROPOSED SITE ACCESS

NOTES:

1. CONSTRUCT DIVERSION CHANNELS LEAVING US AND DS EARTHERN BERMS IN PLACE.
2. CONNECT SIDE CHANNELS ONCE INTERIOR GRADING IS COMPLETE.
3. INSTALL METER BAG COFFER DAM ON CEDAR MILL AND USE CONSTRUCTED SIDE CHANNEL AS DIVERSION FOR SEWER MAIN CONSTRUCTION.
4. ONCE SEWER MAIN SEGMENT IS COMPLETE, BACKFILL TRENCH AND RECONSTRUCT MAIN CHANNEL TO PRE CONSTRUCTION CONDITIONS PER DETAIL 1 ON SHT L9.
5. CONSTRUCT SIDE CHANNELS SIMILARLY TO DIVERSION CHANNELS.
6. REMOVE COFFER DAMS AND VISQUEEN BERMS.

60% DESIGN

CEDAR MILL CREEK

BEAVERTON CREEK

BEAVERTON CREEK

COFFER DAM STREAM DIVERSION

TEMPORARY WATER CROSSING, TYP, SEE SHT L10

10+80 12+00 13+20 14+40 15+60 16+80 18+00 19+20 20+40 21+60 22+80 24+00 25+20 26+40 27+60 28+80 30+00 31+20 32+40 33+60 34+80 36+00 37+20 38+40 39+60

SCALE
80 0 40 80 160
SCALE FEET

N

PLAN

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\L12 - DEWATERING.dwg Sheet 9/23/2019 11:59 AM BSCHONER 23.1s (LMS Tech)

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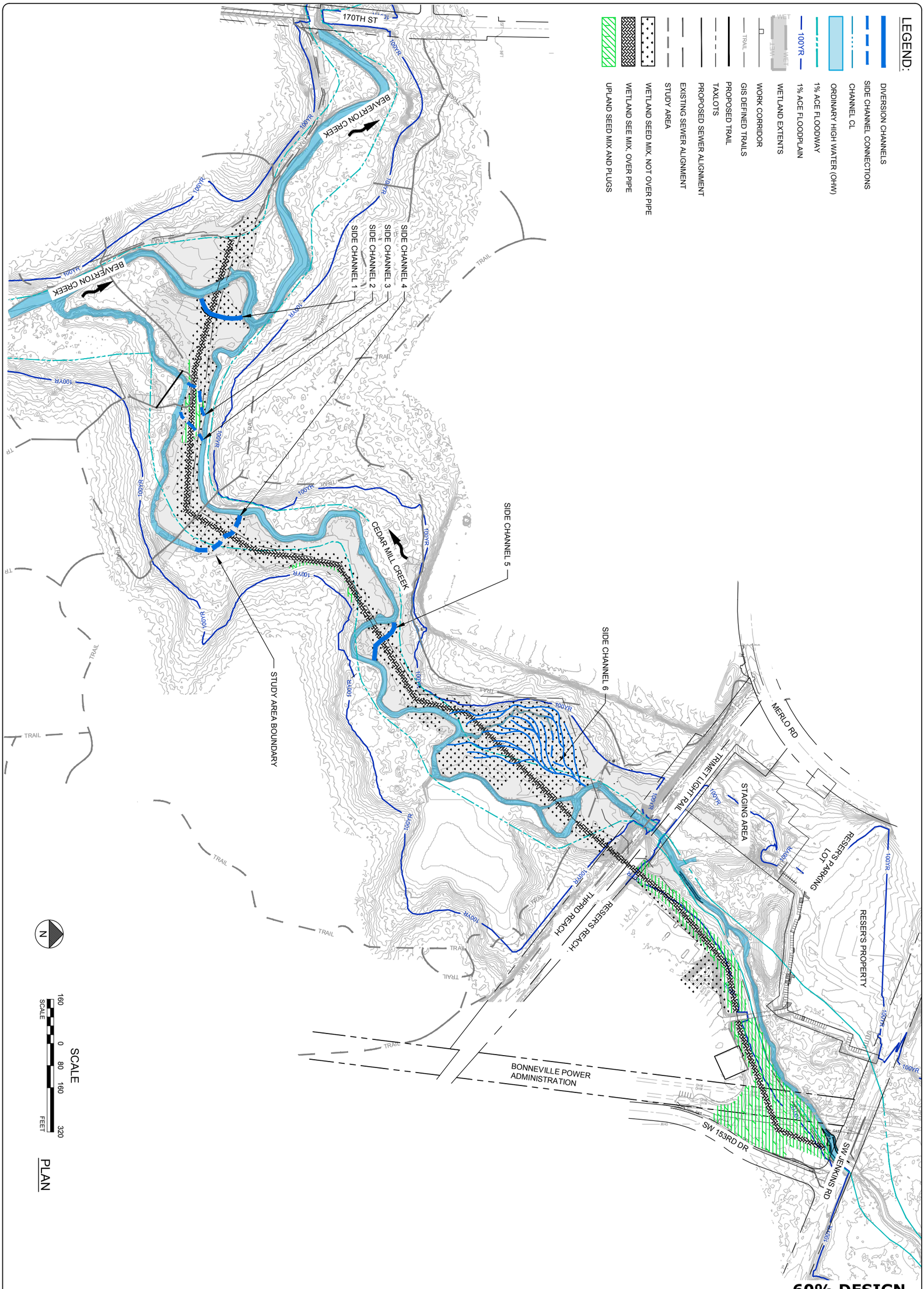
DEWATERING PLAN

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882

SHEET L12 OF X



60% DESIGN

PROJECT	1/4 SECTION
6882	
SHEET L13 OF X	DRAFTER: BS, AD
	DESIGNER: MW, AD
	CHECKED: MW
	APPROVED: MW

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

REVEGETATION PLAN

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WETLAND (NOT OVER PIPE) (6.7 AC)

SCIENTIFIC NAME	COMMON NAME	PLS PER ACRE
Fraxinus latifolia	Oregon Ash	
Thuja plicata	Western Red Cedar	
Salix lasiandra	Pacific Willow	
Salix sitchensis	Sitka Willow	
Spiraea douglasii	Douglas' Spiraea	
Cornus sericea	Red-Osier Dogwood	
Sambucus racemosa	Red Elderberry	
Lonicera involcrata	Black Twinberry	
Oemleria cerasiformis	Indian Plum	
Athyrium filix-femina	Lady Fern	
Lysichiton americanum	Skunk Cabbage	
Tolmiea menziesii	Youth-On-Age	
Juncus patens	Spreading Rush	
Carex obnupta	Slough Sedge	

UPLAND RIPARIAN FOREST MIX (0.25 AC)

SCIENTIFIC NAME	COMMON NAME	PLS PER ACRE
Acer macrophyllum	Big Leaf Maple	
Pseudotsusuga menziesii	Douglas Fir	
Acer circinatum	Vine Maple	
Corylus cornuta	Beaked Hazelnut	
Mahonia aquifolium	Tall Oregon Grape	
Symphoricarpos albus	Snowberry	
Polystichum munitum	Sword Fern	
Ribes sanguineum	Red Flowering Currrant	
Trilium ovatum	Western Trilium	
Aquilegia formosa	Red Columbine	
Fragaria vesca	Wood Strawberry	

WETLAND (OVER PIPE) (2.0 AC)

SCIENTIFIC NAME	COMMON NAME	QTY	CONDITION
Spiraea douglasii	Douglas' Spiraea		
Cornus sericea	Red-Osier Dogwood		
Sambucus racemosa	Red Elderberry		
Lonicera involcrata	Black Twinberry		
Oemleria cerasiformis	Indian Plum		
Athyrium filix-femina	Lady Fern		
Lysichiton americanum	Skunk Cabbage		
Tolmiea menziesii	Youth-On-Age		
Juncus patens	Spreading Rush		
Carex obnupta	Slough Sedge		

60% DESIGN

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REVEGETATION TABLES

CEDAR MILL CREEK AND REGIONAL STORMWATER MANAGEMENT APPROACH

1/4 SECTION	DRAFTER: BS, AD	DESIGNER: MW, AD	CHECKED: MW	APPROVED: MW

PROJECT 6882
SHEET L14 OF X

L:\Shared\W2r\CAD\20170011.3 CWS - Cedar Mill Creek Ph 2\DWG\CAD2020\SHEETS\L15-16 - REVEGETATION.dwg TABLE 9/23/2019 12:00 PM BSCHONER 23.1s (LMS Tech)

Exhibit F

RETURN TO: Clean Water Services
Mail Stop 10
2550 SW Hillsboro Highway
Hillsboro, OR 97123

Project: Cedar Mill Creek Sanitary and Regional Stormwater Management Approach (Project No. 6882)
Tax Lot No.: 1S1080000504 & 1S108BA00300
Square Feet: 68,390

EASEMENT FOR SANITARY SEWER

Name of GRANTOR: Tualatin Hills Park and Recreation District (THPRD)

Address: 15707 SW Walker Road, Beaverton, Oregon 97006

GRANTOR, owner of the property described herein, does hereby grant, convey and warrant unto Clean Water Services, GRANTEE, the right to lay down, construct and perpetually maintain a sewer (or sewers) through, under and along the property described on Exhibit A and depicted in Exhibit B attached hereto and by this reference incorporated herein (Easement Area). This easement shall run with the land and shall be binding upon and shall inure to the benefit of the parties hereto, their heirs, successors and assigns. No structure shall be erected in the Easement Area without the written consent of GRANTEE. This grant is made subject to the conditions attached hereto, marked Exhibit C and by this reference incorporated herein. This grant is made subject to no other conditions. GRANTEE shall not have any responsibility for pre-existing environmental contamination or for environmental contamination caused by GRANTOR or any third party of the Easement Area.

The consideration for this grant is non-monetary.

TUALATIN HILLS PARK AND RECREATION DISTRICT

By: _____
(Sign here for entity)

Title: _____

Date: _____

APPROVED AS TO FORM

_____
District Counsel

STATE OF _____)
)
County of _____)

This instrument was acknowledged before me on _____(date)
by_____(name of person) as
_____ (title) of Tualatin Hills Park and Recreation.

_____
Notary Public

AKS ENGINEERING & FORESTRY, LLC
12965 SW Herman Road, Suite 100, Tualatin, OR 97062
P: (503) 563-6151 | www.aks-eng.com
OFFICES IN: BEND, OR - KEIZER, OR - TUALATIN, OR - VANCOUVER, WA

AKS Job #7299

EXHIBIT A

Permanent Pipeline Easement Description

Tracts of land located in the Northeast One-Quarter of Section 7 and the Northwest One-Quarter of Section 8, Township 1 South, Range 1 West, Willamette Meridian, City of Beaverton, Washington County, Oregon, and being more particularly described as follows:

Commencing at the southwest corner of the Lawrence Hall Donation Land Claim No. 43, also being on the centerline of SW Jenkins Road; thence along said centerline, North 68°22'49" West 143.47 feet to the northerly extension of the westerly line of a 100.00 feet wide Bonneville Power Administration easement per Book 180, Page 501, Washington County Deed Records; thence along said northerly extension and said westerly easement line, South 07°07'04" West 931.21 feet to the easterly corner of Document Number 84022239, Washington County Deed Records; thence along the northeasterly line of said deed, North 52°07'08" West 611.34 feet to the easterly corner of Document Number 2003-075436, Washington County Deed Records, and the Point of Beginning; thence along the southeasterly line of said deed, South 34°57'42" West 123.18 feet; thence leaving said southeasterly line, South 42°09'07" West 125.33 feet; thence South 39°39'50" West 104.87 feet to the northeasterly right-of-way line of Tri-met Westside Light Rail (variable width); thence along said northeasterly right-of-way line, North 52°00'16" West 20.01 feet to Reference Point 'A'; thence leaving said northeasterly right-of-way line, North 39°39'50" East 105.88 feet; thence North 42°09'07" East 243.37 feet; thence North 73°43'56" East 5.24 feet to the northeasterly line of said Document Number 2003-075436; thence along said northeasterly line, South 52°07'08" East 1.84 feet to the Point of Beginning.

Together with;
Commencing at said Reference Point 'A'; thence leaving said northeasterly right-of-way line, South 39°39'50" West 154.09 feet to the southwesterly right-of-way line of Tri-met Westside Light Rail (variable width) and the Point of Beginning; thence along said southwesterly right-of-way line, South 52° 05' 02" East 20.01 feet; thence South 39°39'50" West 30.46 feet; thence South 69°34'01" West 270.74 feet; thence South 29°20'31" West 441.50 feet; thence South 13°17'17" West 207.15 feet; thence South 60°03'43" West 548.94 feet; thence South 10°06'55" West 305.22 feet; thence South 30°14'28" West 295.75 feet; thence North 86°24'50" West 517.05 feet; thence North 74°07'07" West 499.51 feet; thence North 15°52'53" East 20.00 feet; thence South 74°07'07" East 497.36 feet; thence South 86°24'50" East 502.56 feet; thence North 30°14'28" East 279.87 feet; thence North 10°06'55" East 310.98 feet; thence North 60°03'43" East 549.60 feet; thence North 13°17'17" East 201.31 feet; thence North 29°18'39" East 451.36 feet; thence North 69°34'01" East 273.10 feet; thence North 39°39'50" East 24.51 feet to the Point of Beginning.

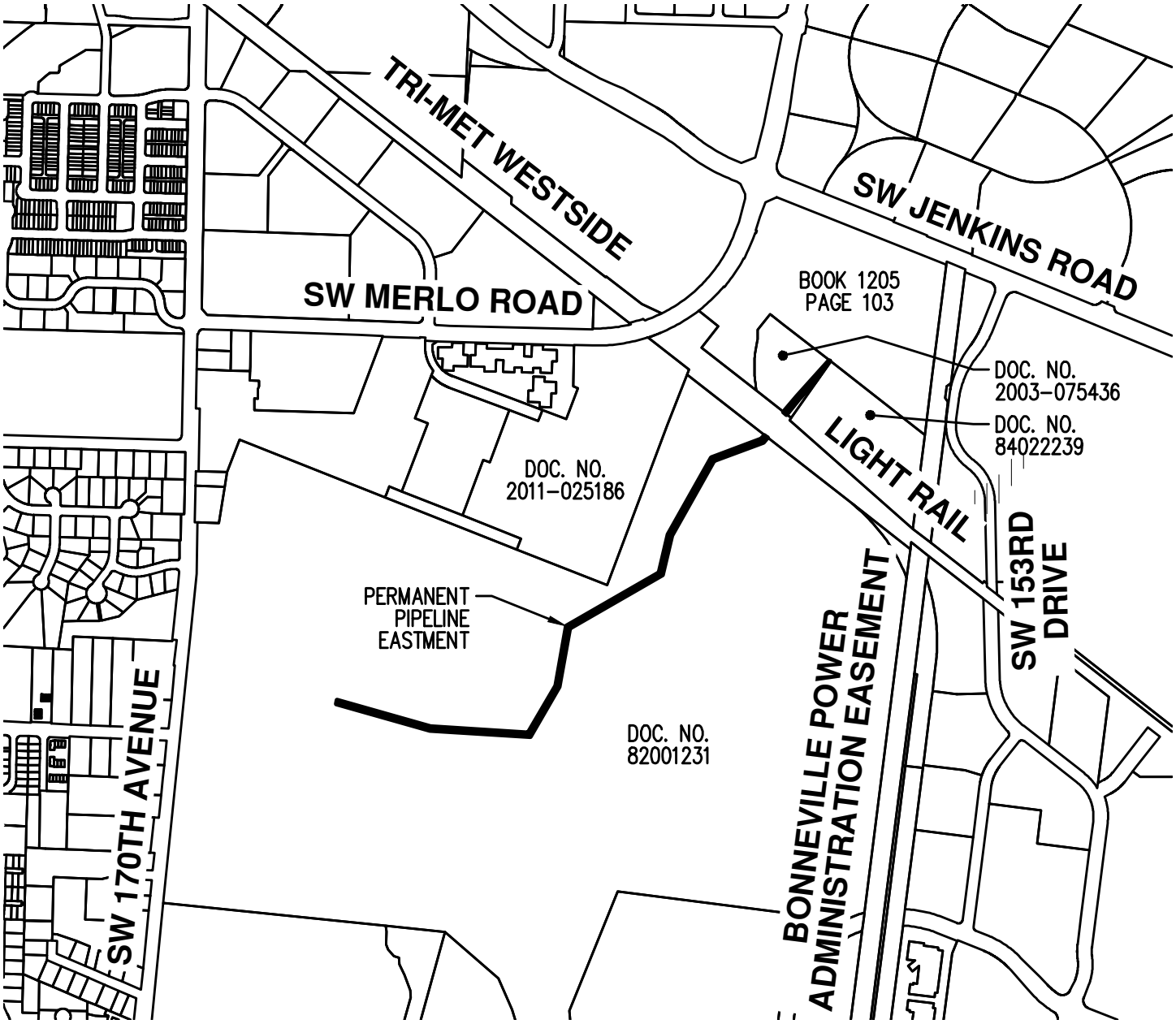
4/1/2020

The above described tracts of land contain 1.57 acres, more or less.

The Basis of Bearings for this description is State Plane Grid bearing, Oregon State Plane, North Zone 3601, NAD83(2011) Epoch: 2010.0000. Distances shown are ground values.

EXHIBIT B

TRACTS OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 7 AND THE NORTHWEST 1/4 OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF BEAVERTON, WASHINGTON COUNTY, OREGON



4/1/2020

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JANUARY 9, 2007
NICK WHITE
70652LS

RENEWS: 6/30/20

PREPARED FOR

MURRAYSMITH
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OR 97204

SCALE: 1"= 800 FEET

800 0 160 400 800

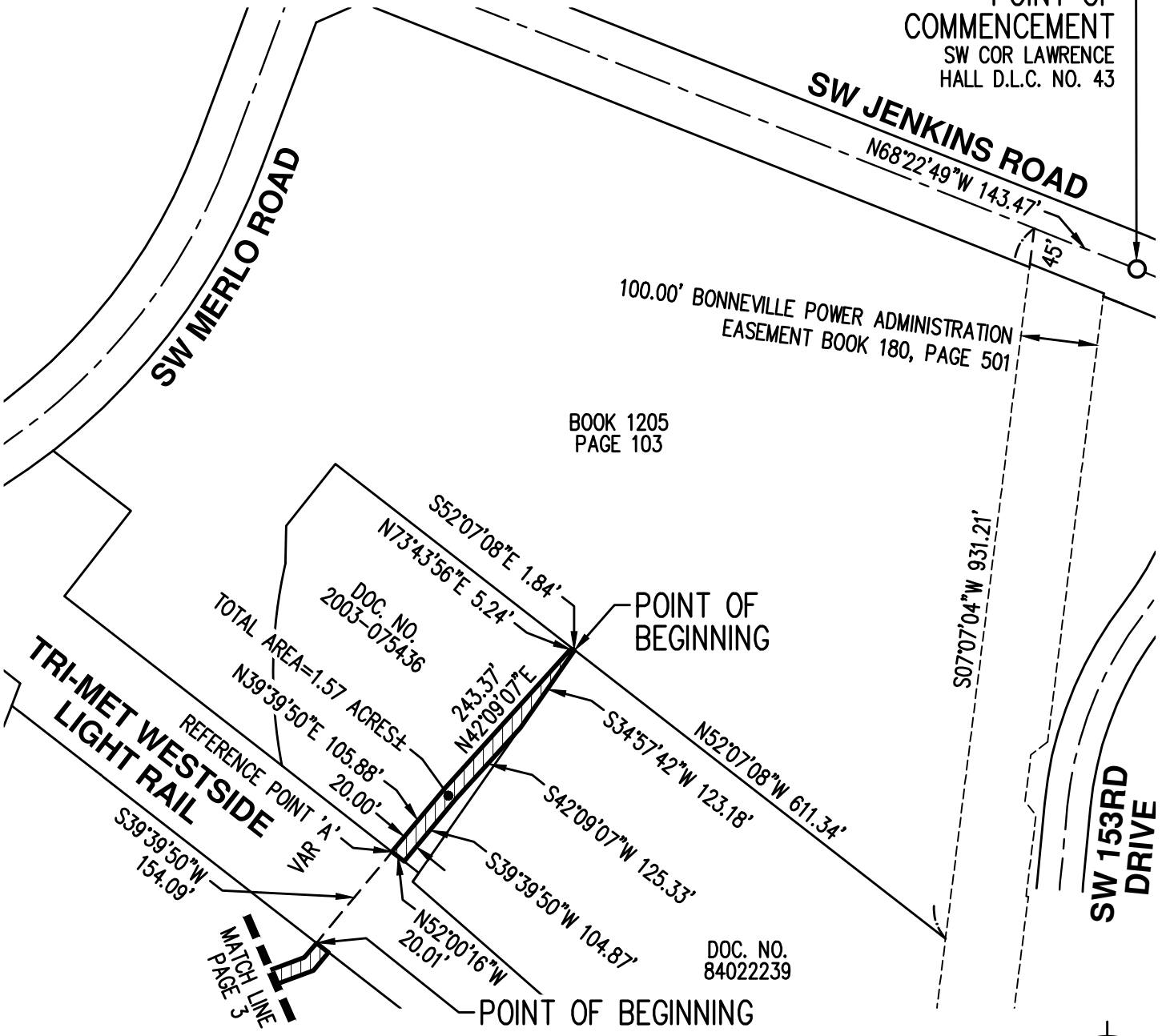
N

PERMANENT PIPELINE EASEMENT	EXHIBIT **B**
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 503.563.6151 WWW.AKS-ENG.COM	DRWN: WCB CHKD: NSW AKS JOB: 7299

DWG: 7299 20200401 EXB | EXB31

EXHIBIT B

TRACTS OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 7 AND THE NORTHWEST 1/4 OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF BEAVERTON, WASHINGTON COUNTY, OREGON



4/1/2020

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JANUARY 9, 2007
NICK WHITE
70652LS

RENEWS: 6/30/20

PREPARED FOR

MURRAYSMITH
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OR 97204

SCALE: 1"= 200 FEET

200 0 40 100 200

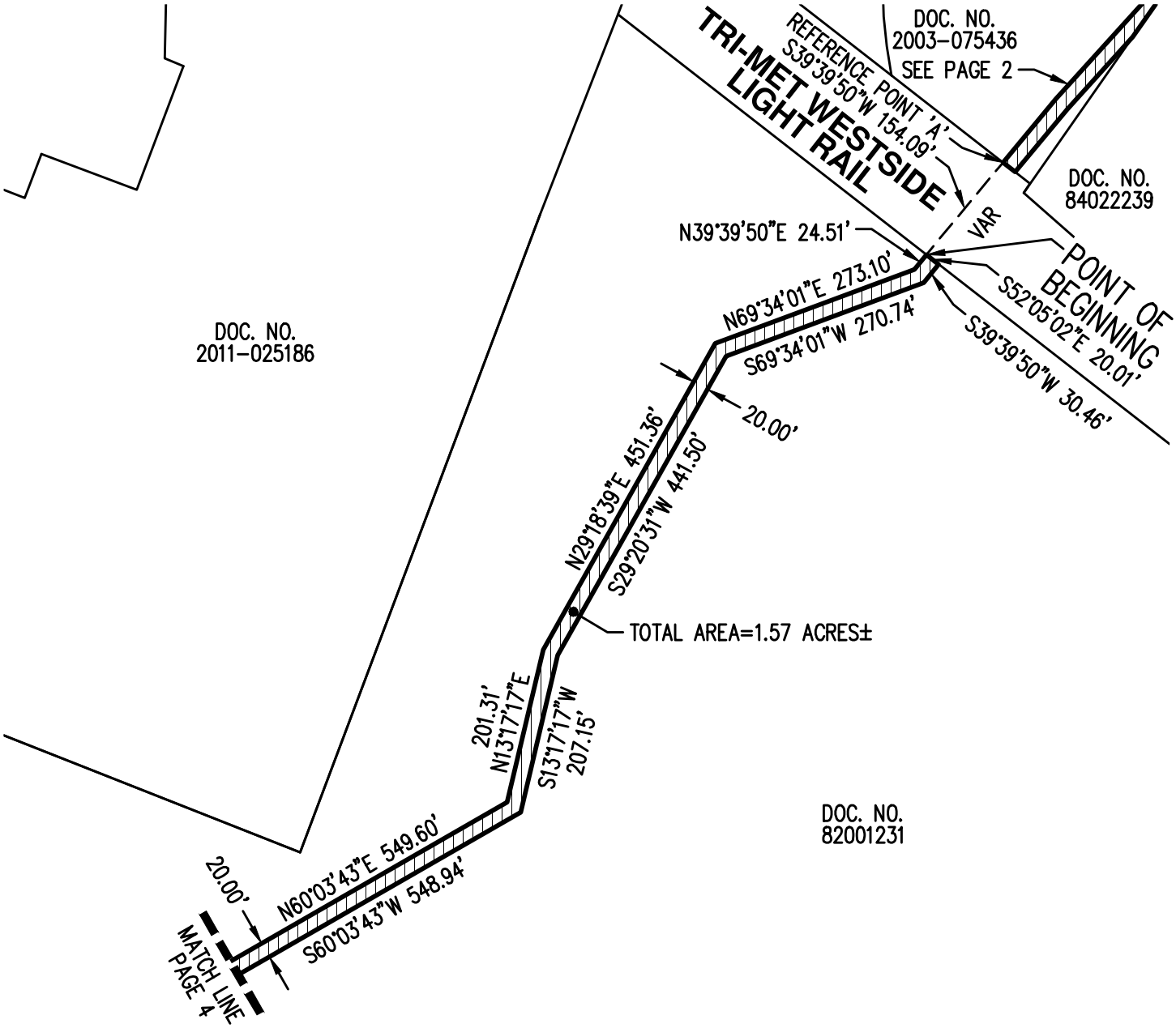
N

PERMANENT PIPELINE EASEMENT	EXHIBIT B
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 503.563.6151 WWW.AKS-ENG.COM	DRWN: WCB CHKD: NSW AKS JOB: 7299

DWG: 7299 20200401 EXB | EXB32

EXHIBIT B

TRACTS OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 7 AND THE NORTHWEST 1/4 OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF BEAVERTON, WASHINGTON COUNTY, OREGON



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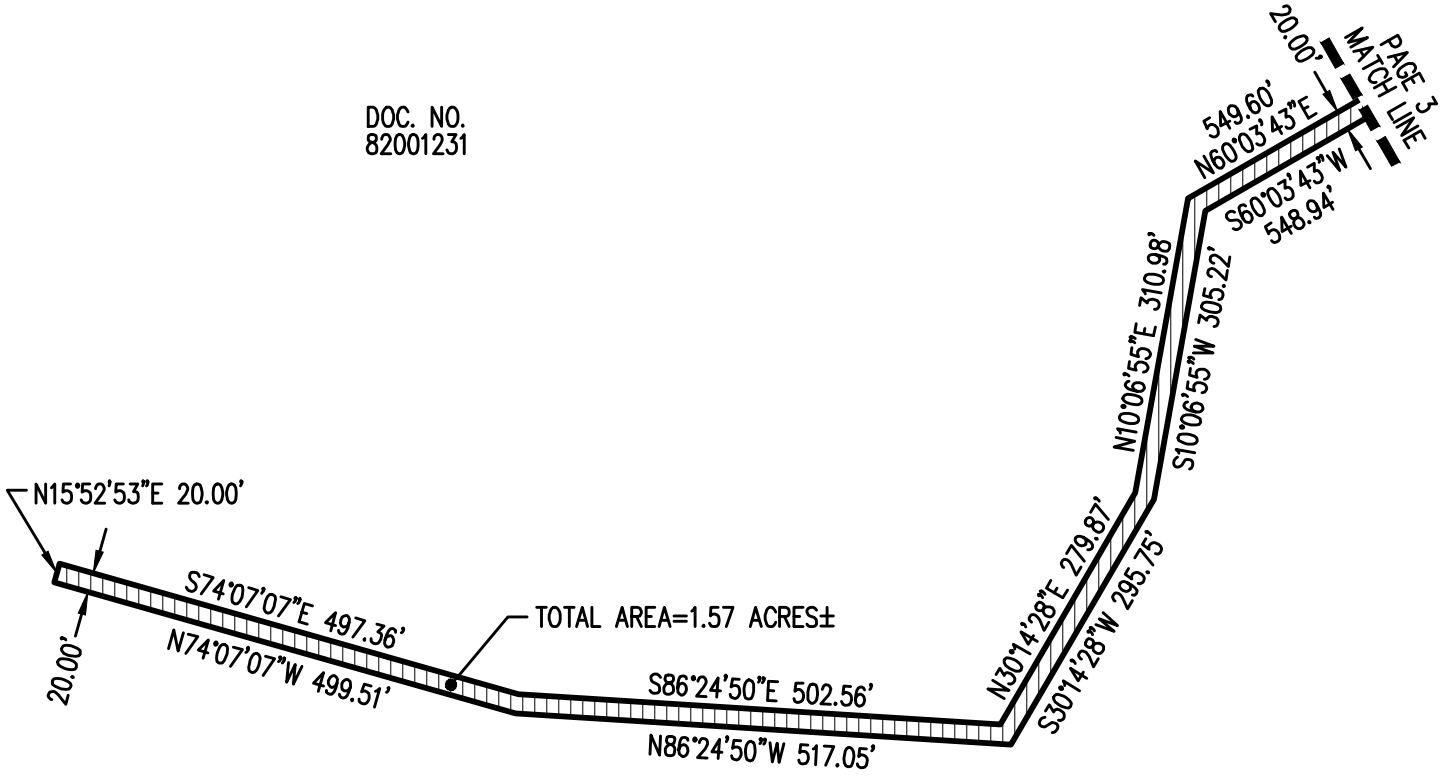
DWG: 7299 20200401 EXB | EXB33

EXHIBIT B

TRACTS OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 7 AND THE NORTHWEST 1/4 OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF BEAVERTON, WASHINGTON COUNTY, OREGON



4/1/2020

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OREGON
JANUARY 9, 2007
NICK WHITE
70652LS
RENEWS: 6/30/20

PREPARED FOR
MURRAYSMITH
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OR 97204

SCALE: 1"= 200 FEET

200 0 40 100 200

N

PERMANENT PIPELINE EASEMENT	EXHIBIT **B**
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 503.563.6151 WWW.AKS-ENG.COM	DRWN: WCB CHKD: NSW AKS JOB: 7299

DWG: 7299 20200401 EXB | EXB34

Exhibit C

EASEMENT CONDITIONS

1. The use of the Easement Area is subject to the conditions specified in the Intergovernmental Agreement approved by GRANTOR and GRANTEE on June ___ 2020, and by this reference incorporated herein.

2. Subject to the limitations on liability contained in the Oregon Tort Claims Act, GRANTEE agrees to defend, indemnify and hold harmless GRANTOR, for any and all claims by third parties to the extent the claim arises from GRANTEE's construction on the Property, unless the claim is caused, in whole or in part by GRANTOR's negligence or willful misconduct.

RETURN TO: Clean Water Services
Mail Stop 10
2550 SW Hillsboro Highway
Hillsboro, OR 97123

Project: Cedar Mill Creek Sanitary and Regional Stormwater Management Approach (Project No. 6882)
Tax Lot No.: 1S1080000504 & 1S108BA00300
Square Feet: 767,528

TEMPORARY CONSTRUCTION EASEMENT

Name of GRANTOR: Tualatin Hills Park and Recreation District (THPRD)

Address: 15707 SW Walker Road, Beaverton, Oregon 97006

GRANTOR, owner of the property described on Exhibit A and depicted in Exhibit B attached hereto and by this reference incorporated herein (Easement Area), does hereby grant, convey and warrant unto Clean Water Services, GRANTEE, the temporary, nonexclusive right to enter the Easement Area and lay down, construct, and/or reconstruct sanitary facilities in the adjacent permanent easement, install and maintain erosion control measures, install temporary facilities, stage construction equipment and materials, construct temporary access roads, as well as, permanently installing woody debris within the floodplain and stream channels, create permanent side channels, plant vegetation, construct trails and boardwalks, and other activities as needed to complete construction of the Cedar Mill Creek Sanitary and Regional Stormwater Management Approach Project (Project). This grant is made subject to the conditions attached hereto, marked Exhibit C and by this reference incorporated herein. This grant is made subject to no other conditions. This grant of easement shall run with the land and shall be binding upon and shall inure to the benefit of the parties hereto, their heirs, successors and assigns. GRANTEE shall not have any responsibility for pre-existing environmental contamination or for environmental contamination caused by GRANTOR or any third party of the Easement Area.

Any temporary easement granted hereby is automatically extinguished upon acceptance by GRANTEE of the completed Project.

The consideration for this grant is **nonmonetary.**

TUALATIN HILLS PARK AND RECREATION DISTRICT

By: _____
(Sign here for entity)

Title: _____

Date: _____

ACCEPTED

By: _____
Chief Executive Officer or Designee
Clean Water Services

APPROVED AS TO FORM

_____
District Counsel

STATE OF _____)
)
County of _____)

This instrument was acknowledged before me on _____(date)
by_____(name of person) as
_____ (title) of Tualatin Hills Park and Recreation District.

_____
Notary Public

EXHIBIT A

Temporary Construction Easement Description

Tracts of land located in the Northeast One-Quarter of Section 7 and the Northwest One-Quarter of Section 8, Township 1 South, Range 1 West, Willamette Meridian, City of Beaverton, Washington County, Oregon, and being more particularly described as follows:

Commencing at the southwest corner of the Lawrence Hall Donation Land Claim No. 43, also being on the centerline of SW Jenkins Road; thence along said centerline, North 68º22'49" West 143.47 feet to the northerly extension of the westerly line of a 100.00 feet wide Bonneville Power Administration easement per Book 180, Page 501, Washington County Deed Records; thence along said northerly extension and said westerly easement line, South 07º07'04" West 931.21 feet to the easterly corner of Document Number 84022239, Washington County Deed Records; thence along the northeasterly line of said deed, North 52º07'08" West 611.34 feet to the easterly corner of Document Number 2003-075436, Washington County Deed Records, and the Point of Beginning; thence along the southeasterly line of said deed, South 34°57'42" West 353.32 feet to the southerly corner of said deed, also being on the northeasterly right-of-way line of Tri-met Westside Light Rail (variable width); thence along said northeasterly right-of-way line, North 52°00'16" West 171.31 feet to Reference Point 'A'; thence leaving said northeasterly right-of-way line, North 61°29'28" East 44.26 feet; thence North 70°32'11" East 38.24 feet; thence North 57°14'02" East 72.05 feet; thence North 53°39'11" East 87.73 feet; thence North 31°23'26" East 83.34 feet; thence North 61°03'26" East 48.46 feet to the northeasterly line of said Document Number 2003-075436; thence along said northeasterly line, South 52°07'08" East 57.57 feet to the Point of Beginning.

Together with;
Commencing at said Reference Point 'A'; thence leaving said northeasterly right-of-way line, South 11°08'26" West 172.71 feet to the southwesterly right-of-way line of Tri-met Westside Light Rail (variable width) and the Point of Beginning; thence along said southwesterly right-of-way line, South 52°05'02" East 103.04 feet; thence leaving said southwesterly right-of-way line, South 66°43'09" West 127.57 feet; thence South 59°19'37" East 107.63 feet; thence South 29°27'36" West 14.96 feet; thence North 81°38'12" West 111.39 feet; thence North 73°37'12" West 26.71 feet; thence North 13°25'21" West 26.27 feet; thence South 66°06'48" West 115.02 feet; thence South 28°25'09" West 151.61 feet; thence South 44°27'00" East 193.15 feet; thence South 47°35'22" West 16.72 feet; thence South 14°40'12" West 220.81 feet; thence South 89°32'02" West 108.54 feet; thence North 40°27'58" West 117.00 feet; thence South 34°04'41" West 69.96 feet; thence South 05°39'56" West 115.97 feet; thence South 28°35'01" East 56.75 feet; thence South 38°22'55" West 64.98 feet; thence South 57°41'50" West 28.13 feet; thence North 73°38'34" West 78.58 feet; thence South 74°42'58" West 43.45 feet; thence South 24°13'43" West 112.43 feet; thence South 88°59'18" West 94.62 feet; thence North 30°54'27" West 56.42 feet; thence South 60°03'43" West 183.81 feet; thence South 10°06'55" West 509.17 feet; thence South 19°45'13" West 99.50 feet; thence South 37°39'38" East 83.26 feet; thence South 44°42'34" West 16.04 feet; thence North 45°27'04" West 47.38 feet; thence South

44°32’56” West 48.59 feet; thence South 85°49’57” West 161.19 feet; thence North 73°16’59” West 316.82 feet; thence South 01°03’34” West 168.50 feet; thence South 38°01’18” West 161.63 feet; thence North 83°21’58” West 371.33 feet; thence North 24°43’29” West 46.26 feet; thence North 32°24’45” West 24.58 feet; thence North 39°12’22” West 32.65 feet; thence North 29°49’07” West 51.06 feet; thence North 03°16’36” East 32.46 feet; thence North 23°03’41” East 17.39 feet; thence North 31°44’38” East 20.65 feet; thence North 49°00’52” East 35.07 feet; thence North 59°09’55” East 46.40 feet; thence North 32°26’30” East 85.08 feet; thence North 18°20’33” West 55.55 feet; thence North 73°55’08” West 174.92 feet; thence South 14°37’46” West 35.58 feet; thence South 72°00’21” West 15.75 feet; thence South 14°22’21” West 31.67 feet; thence North 66°48’51” West 17.11 feet; thence North 15°37’41” East 36.13 feet; thence North 65°20’10” East 15.24 feet; thence North 14°41’17” East 27.35 feet; thence North 36°44’58” West 58.72 feet; thence South 46°02’11” West 9.24 feet; thence North 54°43’37” West 554.98 feet; thence North 80°32’34” West 25.26 feet; thence South 71°20’42” West 241.76 feet; thence North 84°13’40” West 11.54 feet to the easterly right-of-way line of SW 170th Avenue (45.00 feet from centerline); thence along said easterly right-of-way line, North 05°46’20” East 44.24 feet; thence leaving said easterly right-of-way line, North 76°48’37” East 245.52 feet; thence South 76°16’31” East 100.63 feet; thence South 53°31’03” East 264.93 feet; thence South 71°51’43” East 202.02 feet; thence South 38°47’21” East 89.54 feet; thence South 74°07’07” East 70.82 feet; thence North 15°42’46” East 56.38 feet; thence North 67°31’15” East 50.20 feet; thence North 84°22’32” East 57.57 feet; thence South 81°41’54” East 155.95 feet; thence South 39°19’41” East 140.04 feet; thence South 86°24’50” East 497.08 feet; thence North 03°35’10” East 169.85 feet; thence North 39°59’31” East 156.28 feet; thence North 79°29’32” East 39.95 feet; thence North 10°00’44” East 185.45 feet; thence North 60°14’46” East 243.24 feet to the southerly extension of the easterly line of Document Number 2011-025186, Washington County Deed Records; thence along said southerly extension and the easterly line of said deed, North 20°36’48” East 142.76 feet; thence leaving said easterly line, South 69°23’12” East 117.64 feet; thence North 60°03’43” East 143.50 feet; thence North 13°17’17” East 184.09 feet; thence North 40°50’35” East 78.40 feet; thence North 37°55’13” West 31.05 feet; thence North 06°24’16” West 103.91 feet; thence North 26°06’54” East 96.45 feet; thence North 63°37’12” West 102.34 feet; thence North 17°54’19” East 10.45 feet; thence South 67°08’13” East 105.40 feet; thence North 81°07’57” East 84.17 feet; thence North 28°52’12” East 97.72 feet; thence North 27°48’25” East 44.92 feet; thence North 23°07’13” West 56.17 feet; thence North 13°24’02” West 318.76 feet to said southwesterly right-of-way line of Tri-Met Westside Light Rail; thence along said southwesterly right-of-way line, South 52°05’02” East 104.00 feet; thence leaving said southwesterly right-of-way line, South 13°24’02” East 233.68 feet; thence South 65°37’23” East 40.59 feet; thence North 46°52’42” East 65.16 feet; thence South 39°07’35” East 52.56 feet; thence North 66°43’09” East 95.83 feet to the Point of Beginning.

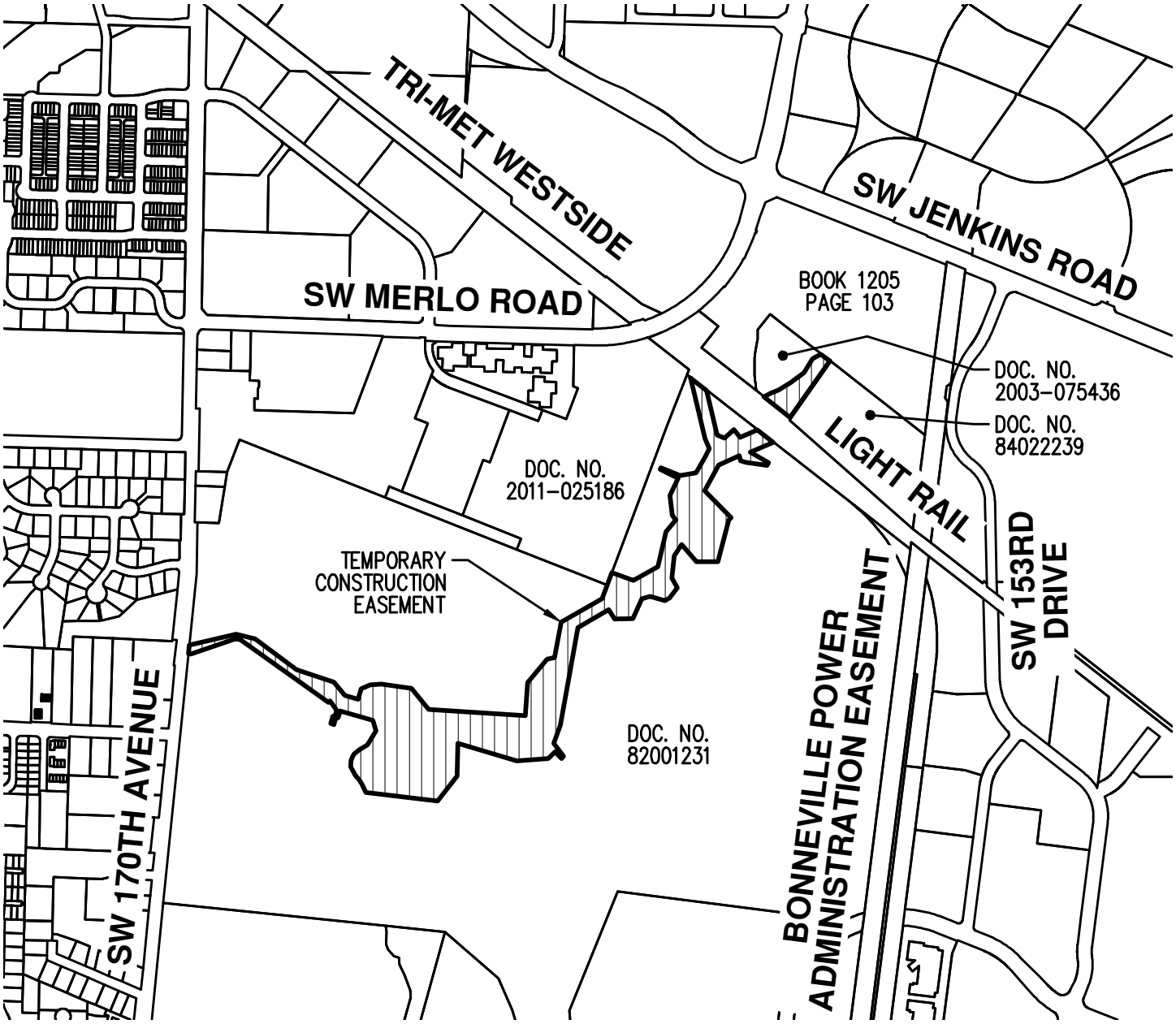
4/1/2020

The above described tracts of land contain 17.67 acres, more or less.

The Basis of Bearings for this description is State Plane Grid bearing, Oregon State Plane, North Zone 3601, NAD83(2011) Epoch: 2010.0000. Distances shown are ground values.

EXHIBIT B

TRACTS OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 7 AND THE NORTHWEST 1/4 OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF BEAVERTON, WASHINGTON COUNTY, OREGON



4/1/2020

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JANUARY 9, 2007
NICK WHITE
70652LS

RENEWS: 6/30/20

PREPARED FOR

MURRAYSMITH
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OR 97204

SCALE: 1"= 800 FEET

800 0 160 400 800

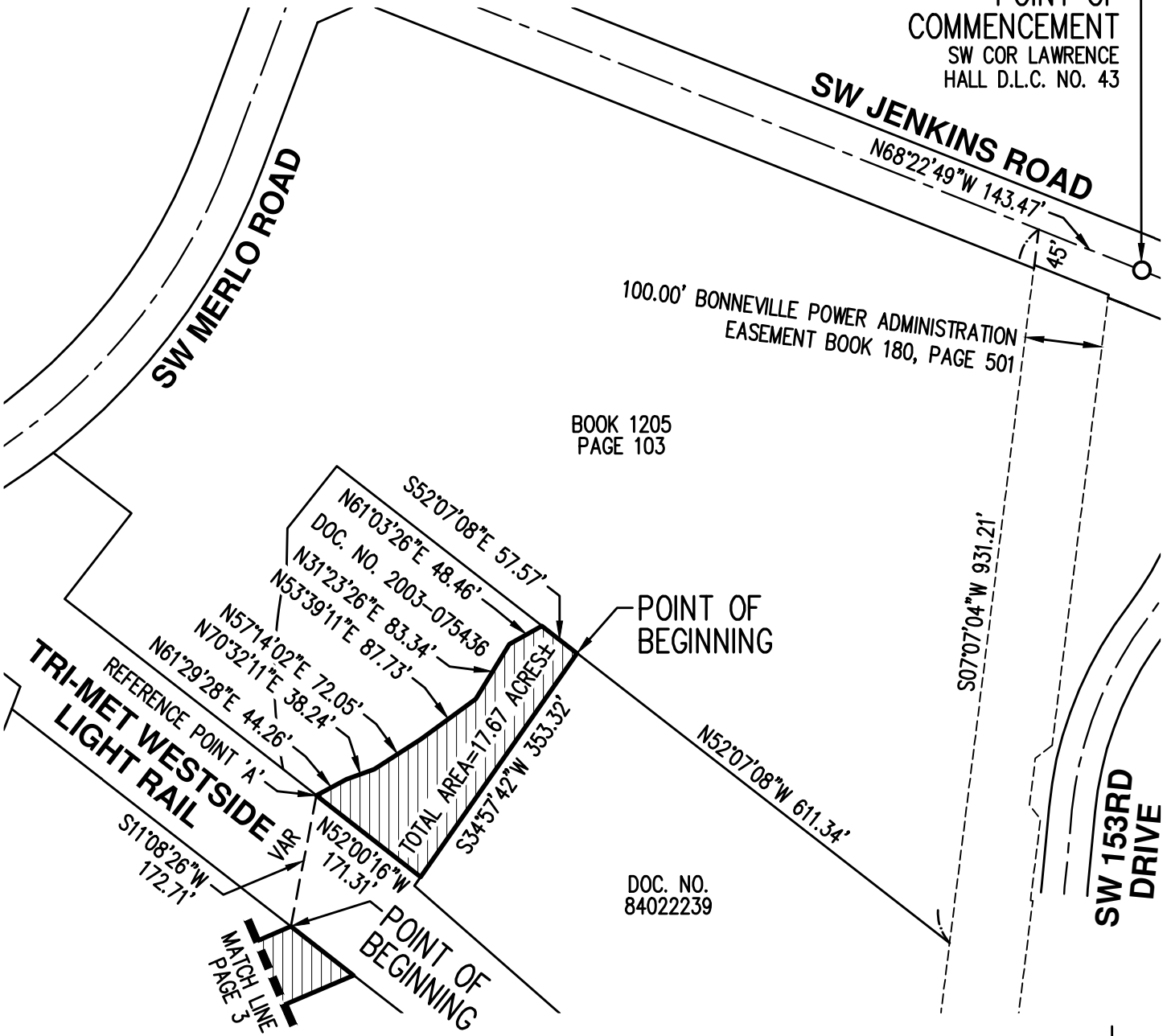
N

TEMPORARY CONSTRUCTION EASEMENT	EXHIBIT B
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 503.563.6151 WWW.AKS-ENG.COM	DRWN: WCB CHKD: NSW AKS JOB: 7299

DWG: 7299 20200401 EXB | EXB31

EXHIBIT B

TRACTS OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 7 AND THE NORTHWEST 1/4 OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF BEAVERTON, WASHINGTON COUNTY, OREGON



4/1/2020

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JANUARY 9, 2007
NICK WHITE
70652LS

RENEWS: 6/30/20

PREPARED FOR

MURRAYSMITH
888 SW 5TH AVENUE, SUITE 1170
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SCALE: 1"= 200 FEET

200 0 40 100 200

N

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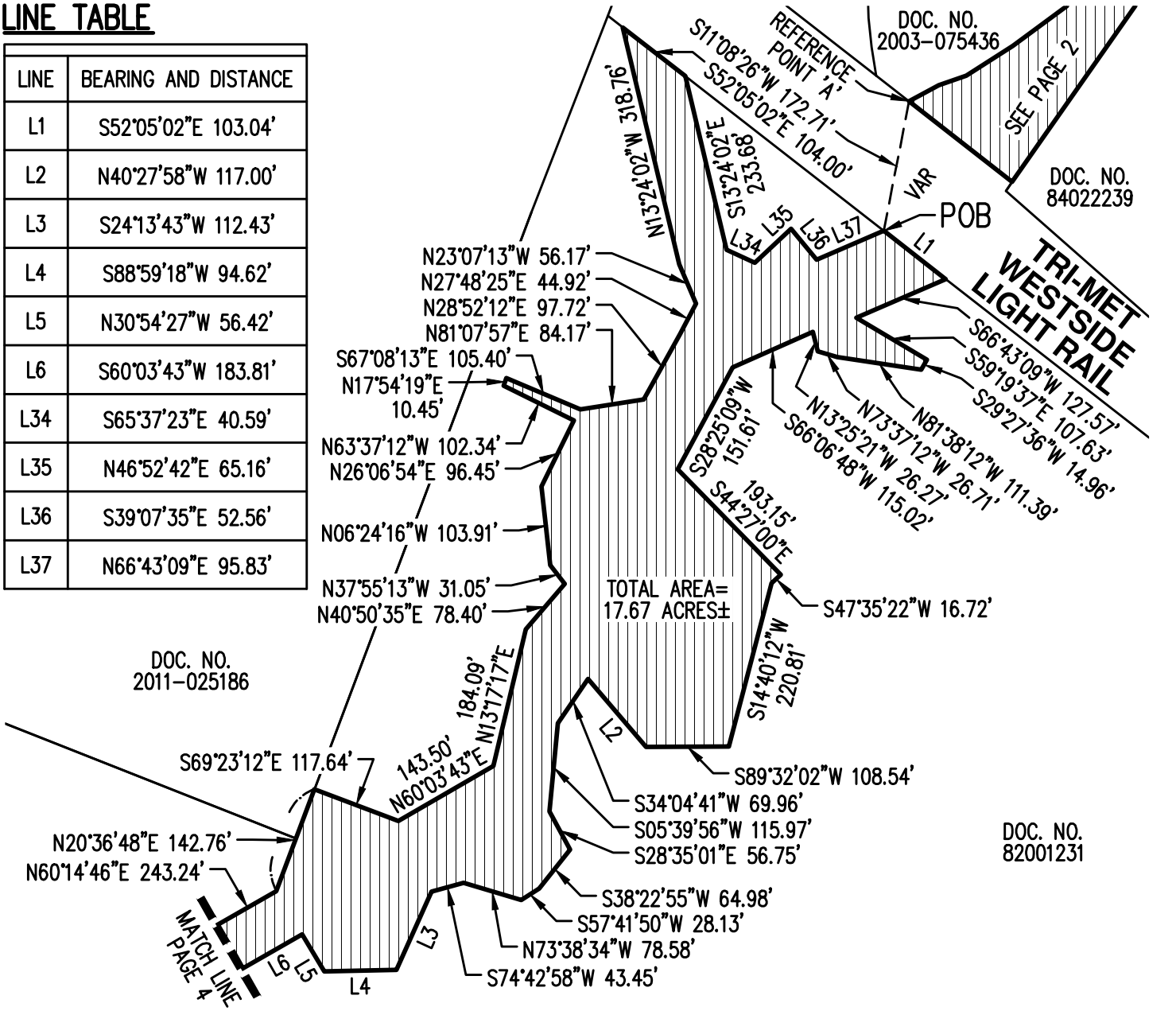
DWG: 7299 20200401 EXB | EXB32

EXHIBIT B

TRACTS OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 7 AND THE NORTHWEST 1/4 OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF BEAVERTON, WASHINGTON COUNTY, OREGON

LINE TABLE

LINE	BEARING AND DISTANCE
L1	S52°05'02"E 103.04'
L2	N40°27'58"W 117.00'
L3	S24°13'43"W 112.43'
L4	S88°59'18"W 94.62'
L5	N30°54'27"W 56.42'
L6	S60°03'43"W 183.81'
L34	S65°37'23"E 40.59'
L35	N46°52'42"E 65.16'
L36	S39°07'35"E 52.56'
L37	N66°43'09"E 95.83'



4/1/2020

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OREGON
JANUARY 9, 2007
NICK WHITE
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RENEWS: 6/30/20

PREPARED FOR

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200 0 40 100 200

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TEMPORARY CONSTRUCTION EASEMENT	EXHIBIT B
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DWG: 7299 20200401 EXB | EXB33

EXHIBIT B

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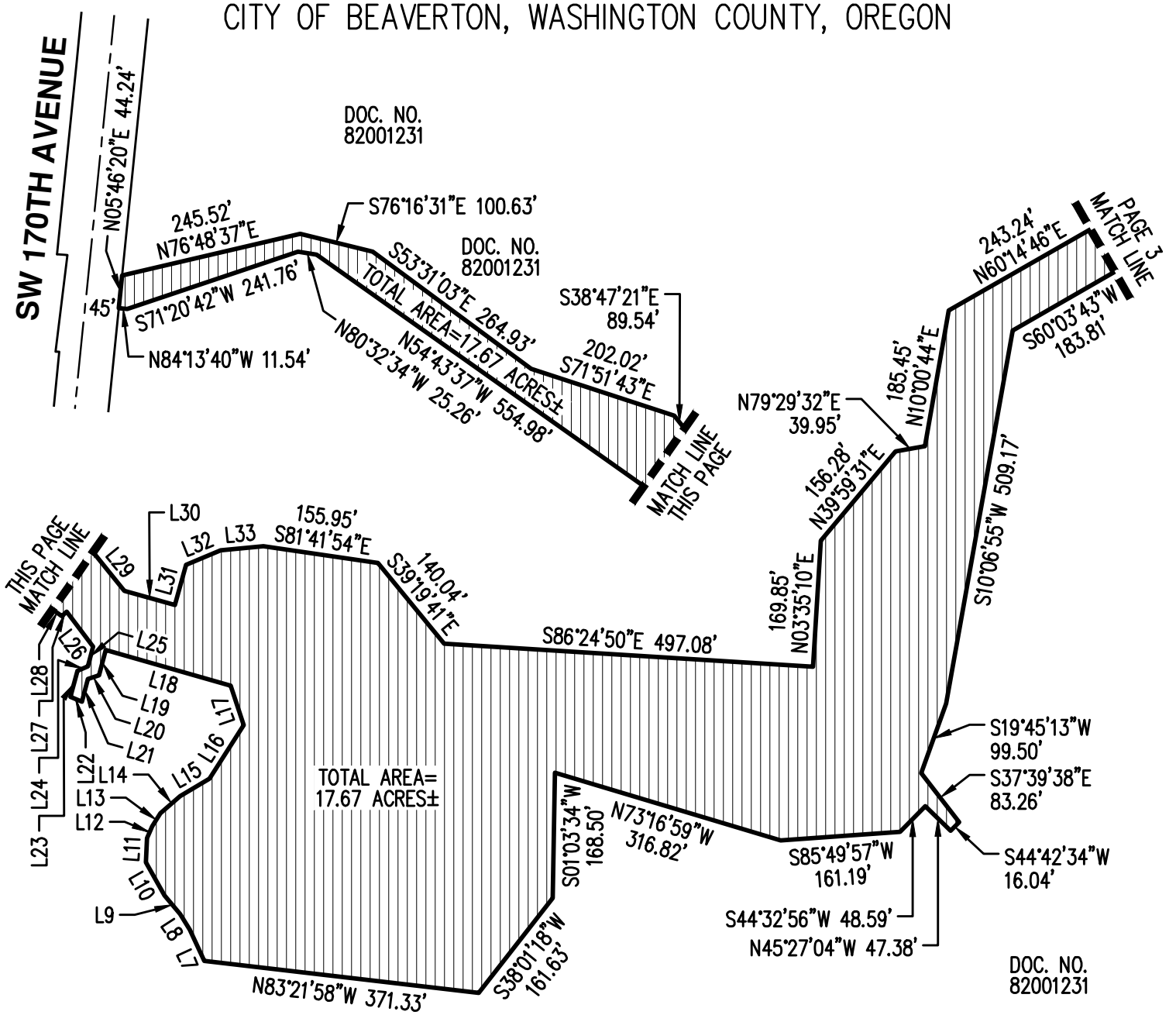

SEE PAGE 5 FOR LINE TABLES

SCALE: 1"= 200 FEET

200 0 40 100 200

N

4/1/2020

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JANUARY 9, 2007
NICK WHITE
70652LS

RENEWS: 6/30/20

PREPARED FOR

MURRAYSMITH
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OR 97204

TEMPORARY CONSTRUCTION EASEMENT

EXHIBIT B

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: WCB
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AKS JOB: 7299

EXHIBIT B

TRACTS OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 7 AND THE NORTHWEST 1/4 OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF BEAVERTON, WASHINGTON COUNTY, OREGON

LINE TABLE

LINE	BEARING AND DISTANCE
L7	N24°43'29"W 46.26'
L8	N32°24'45"W 24.58'
L9	N39°12'22"W 32.65'
L10	N29°49'07"W 51.06'
L11	N03°16'36"E 32.46'
L12	N23°03'41"E 17.39'
L13	N31°44'38"E 20.65'
L14	N49°00'52"E 35.07'
L15	N59°09'55"E 46.40'

LINE TABLE

LINE	BEARING AND DISTANCE
L16	N32°26'30"E 85.08'
L17	N18°20'33"W 55.55'
L18	N73°55'08"W 174.92'
L19	S14°37'46"W 35.58'
L20	S72°00'21"W 15.75'
L21	S14°22'21"W 31.67'
L22	N66°48'51"W 17.11'
L23	N15°37'41"E 36.13'
L24	N65°20'10"E 15.24'

LINE TABLE

LINE	BEARING AND DISTANCE
L25	N14°41'17"E 27.35'
L26	N36°44'58"W 58.72'
L27	S46°02'11"W 9.24'
L28	N54°43'37"W 554.98'
L29	S38°47'21"E 89.54'
L30	S74°07'07"E 70.82'
L31	N15°42'46"E 56.38'
L32	N67°31'15"E 50.20'
L33	N84°22'32"E 57.57'

4/1/2020

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JANUARY 9, 2007
NICK WHITE
70652LS
RENEWS: 6/30/20

PREPARED FOR

MURRAYSMITH
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OR 97204

TEMPORARY CONSTRUCTION EASEMENT
(LINE TABLE - PAGE 4)

EXHIBIT **B**

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: WCB
CHKD: NSW
AKS JOB: 7299

Exhibit C

EASEMENT CONDITIONS

1. The use of the Easement Area is subject to the conditions specified in the Intergovernmental Agreement approved by GRANTOR and GRANTEE on June___ 2020, and by this reference incorporated herein.

2. Subject to the limitations on liability contained in the Oregon Tort Claims Act, GRANTEE agrees to defend, indemnify and hold harmless GRANTOR, for any and all claims by third parties to the extent the claim arises from GRANTEE's construction on the Property, unless the claim is caused, in whole or in part by GRANTOR's negligence or willful misconduct.

CLEAN WATER SERVICES
Cedar Mill Creek Trunk Improvements and Regional Stormwater Management Approach
Project No. 6882

PERMIT OF ENTRY

Tualatin Hills Park and Recreation District (Owner), owner of the real property located at 15655 SW Millikan Way, Beaverton, Oregon 97006 and described as Map and Tax Lot Nos. 1S1080000504 and 1S108BA00300 (Property) does hereby grant a permit of entry to Clean Water Services (District), its employees, agents, contractors and employees and subcontractors of its independent contractors, for ingress and egress on the Property for the purpose of planting native vegetation, controlling nonnative plants, and performing vegetation monitoring.

This permit will be in effect for a minimum period of five years after the Project is completed or such longer period of time that may be required for the Oregon Department of State Lands (DSL) to approve GRANTEE'S Final Monitoring Report and release GRANTEE from further obligations from the Removal-Fill Permit for the Project (DSL Release).

District and its employees, agents, contractors and employees and subcontractors of independent contractors performing work under contract for District, agree to be mindful of fences, gates, structures, vegetation, and other personal property.

Owner's preferred method of contact is:

☐ telephone _____

☐ via email _____

☐ other _____

CLEAN WATER SERVICES

By: _____
Chief Executive Officer or Designee

APPROVED AS TO FORM

_____
District Counsel

TUALATIN HILLS PARK AND RECREATION DISTRICT

By: _____
Bruce Barbarasch, Superintendent of Natural Resources and Trails Management

Date: _____

Please add any additional information that may assist the District during the project or any special requests to help us minimize any disruption such as the best time to perform the work, best location to perform the geotechnical explorations, location of sensitive areas you wish not to be disturbed, gates that need to remain closed, or special pet concerns.

_____
_____
_____
_____
_____
_____
_____

Return form to:
Clean Water Services
Attn: Brad Crement, PE
2550 SW Hillsboro Hwy.
Hillsboro, OR 97123
Phone: (503) 681-4426

SECTION 01 56 39

TEMPORARY TREE AND PLANT PROTECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary fencing, barricades, and guards to protect trees which are to remain from damage above and below grade.
   1. Erect as directed by Landscape Architect or Owner's Representative.

B. Protection of root systems from smothering, compaction and damage.

C. Protection of plant growth, including root systems of trees and plants, from dumping of refuse or chemically injurious material or liquids, and continual puddling of running water.

D. Specification shall be applied concurrently and in conjunction with other plant material protection measures herein described and specified.

1.2 GENERAL REQUIREMENTS

A. Preservation, protection, and pruning of existing trees and shrubs, and other vegetation indicated to remain.

B. Meet local jurisdiction requirements for protection of existing trees and vegetation.

C. Provide temporary fencing, barricades and guards as required to protect trees and other plants to remain from all damage.

D. Protect all trees to remain from stockpiling, material storage, vehicle parking and driving within the *Tree Protection Zone*.
   1. Do not store construction materials or permit vehicles to drive or park within *Tree Protection Zone* of any tree to remain.

1.3 DEFINITIONS

A. *Consulting Arborist*: A Consulting Arborist registered with the American Society of Consulting Arborists (ASCA).

B. *Certified Arborist*: Certified by The International Society of Arboriculture (ISA).

C. *Drip line*: The area defined by the outermost perimeter of a tree's or shrub's vegetated canopy.
   1. City of Beaverton defines drip line as "a line on the ground below the edge of the maximum overhead canopy of a tree."

D. *Tree Protection Zone (TPZ)*: Area defined by, at a minimum, the *drip line* of a single designated tree or the outermost perimeter of the combined *drip line areas* of a designated group of trees, but more specifically reflecting the *Critical Root Zone*

(CRZ) of each tree and plant species to be protected. This area may be established or extended as deemed necessary by the Consulting Arborist or Owner's Representative.

1. City of Beaverton "protected root zone" is the outer drip line (longest branch) plus five feet. Within the protected root zone of each tree marked to be retained, the following activities shall not be permitted unless otherwise approved:
    a. Construction or placement of new buildings;
    b. Grade change or cut and fill, except that done by hand, under arborist supervision, and as approved with a Tree Plan Application;
    c. New impervious surfaces;
    d. Trenching for utilities, irrigation, or drainage;
    e. Staging or storage of any kind, including felled trees; and,
    f. Vehicle maneuvering or parking.

1.4 SITE VERIFICATION OF CONDITIONS

A. Meet with Owner's Representative to conduct on-site inspection of tree and plant materials to remain and Tree Protection Plan prior to start of Work.

B. Notify Owner's Representative 48-hours prior to starting construction work around trees to be saved and prior to tree work.

PART 2 PRODUCTS

2.1 MATERIALS

A. As indicated and required elsewhere in this Specification Section, and as recommended by Owner's Representative.

B. Fencing: Owner's Representative field reviews and approves all tree protection locations, methods and measures. Fencing shall be 4' visibility plastic on steel posts placed no further than 6' apart extending no less than 4-1/2' above the ground, kept taut at all times.

C. Pruning Equipment:
    1. Roots and Branches Larger than 1-inch in diameter: Sharp saw.
    2. Roots and Branches 1-inch or less in diameter: Pruning sheers.

PART 3 EXECUTION

3.1 INSPECTION

A. Inspect trees shown on plans to be protected, prior to start of construction.
    1. Document and photograph unusual conditions.
    2. Submit digital copies of documentation to Owner's Representative prior to beginning work.
    3. Verify conditions regarding tree protection prior to site disturbance.

B. Landscape Architect or Owner's Representative must be present during demolition of existing conditions within drip line of trees to remain.

C. Notify Owner's Representative within 24-hours prior to inspection and / or tagging of protected trees.

3.2 GENERAL

A. Install fencing/barricades around all tree protection zones of trees designated to remain prior to commencement of any construction activities including but not limited to clearing and demolition work.
   1. Once erected, plant protection fencing will be maintained throughout the duration of the work.
   2. All ingress is prohibited without prior approval from the Owner's Representative.
   3. Designate protected trees to be clear of any material storage, personnel, or vehicular movement.

B. Protect all plant growth including root systems of trees and plants to remain from:
   1. Construction activities including but not limited to: material storage, staging, all work activities and parking.
   2. Dumping of construction related refuse.
   3. Damage due to noxious materials in solution caused by runoff and/or spillage during mixing and placement of construction materials, and drainage from stored materials.
   4. Chemically injurious materials and liquids used in construction process.
   5. Flooding, erosion, or excessive wetting resulting from dewatering operations, compaction, water flow or traffic.
   6. Unauthorized cutting, breaking, or skinning roots and branches, skinning, and bruising of bark.

C. Where cutting seems necessary, review conditions with Landscape Architect before proceeding, and comply with directives.

D. Fires on project site are not allowed.

E. Engage the Owner's Representative or Consulting Arborist (as directed by Owner's Representative) to direct removal of branches from trees and large shrubs to remain, if required to clear new construction and where indicated; and to direct tree root pruning and relocation work.

F. Where directed by the Owner's Representative, extend pruning operations to restore natural shape of trees and other plants impacted by construction activities.

G. Cut branches and roots with sharp pruning instruments, as specified. Do not break, chip or mutilate.

H. Water trees and other vegetation to remain as necessary to maintain their health during the course of the work.
   1. Maintain a watering schedule and log of watering operations.

I. Restrict vehicular and foot traffic of all construction crews, to prevent compaction of soil over root systems and within tree protection zones.

3.3 PRE-CONSTRUCTION CARE

A. All trees designated to be retained within the project limits shall be pruned to ANSI A-300 Pruning Standards with selective low limb removal, as directed and approved by the Owner's Representative or Consulting Arborist, where required for construction clearance.

B. Structural support (cabling) in accordance with National Arborist Association Standards will be required on specific trees within the project limits and where required for construction clearance, as identified by the Owner's Representative or Consulting Arborist.

3.4 EXCAVATION AROUND TREES

A. Excavate within the tree protection zone of trees only where indicated and approved by the Owner's Representative or Consulting Arborist.
   1. Excavate around tree roots within tree protection zone only under the direction of the Owner's Representative or Consulting Arborist.

B. Where excavating for new construction is required within root protection zones of trees:
   1. Hand excavate to minimize damage to root systems;
      a. Use narrow tine spading forks and comb soil to expose roots.
      b. Reposition roots in backfill areas whenever possible.
   2. Specialized equipment/machinery may be used only as approved by the Owner's Representative and permitting agency. Machinery shall be:
      a. Equipped with rubber tracks, not metal tracks;
      b. Designed to perform the task it is being used for;
      c. Appropriate and capable for each task in order to minimize damage to root systems and avoid disturbance to adjacent surface and subsurface conditions;
      d. Appropriate in size for the specific conditions of the project in order to minimize site impacts to the greatest extent possible;
      e. Operated only by trained and experienced personnel; and,
      f. Operated only within approved, designated locations and, in strict adherence, shall not be allowed to enter, cross, maneuver, park, or otherwise access any areas other than those approved and designated for the work.

C. Where trenching for utilities (including but not limited to sewer, storm, electrical, water service and irrigation) is required within tree protection zones:
   1. Consulting Arborist needs to approve trenching routes.
   2. Tunnel under or around roots by hand digging or boring.
   3. Trench toward trunk of tree and tunnel under central root mass to avoid severing lateral roots on sides of trench.
   4. Do not cut main lateral roots or tap roots over 1-inch diameter. If roots larger than 1-inch diameter are damaged or need to be cut, a root inspection by

Owner's Representative or Consulting Arborist is required. Cut smaller roots using sharp pruning tools as specified.

5. Roots greater than 1-inch in diameter exposed during excavation must be cut squarely at the edge of the excavation with a sharp saw or appropriate pruning tool as specified.
6. Temporarily support and protect roots from damage until permanently covered with approved backfill.

D. Utility trenching routes may need field adjustment or areas of manual excavation to avoid tree roots for both inside and outside of tree protection zones.

E. Do not allow exposed roots to dry out before permanent backfill is placed. Provide temporary earth or burlap cover; pack with wet compost or four layers of wet untreated burlap.

1. Backfill roots after inspection approval by Owner's Representative or Consulting Arborist
2. Backfill around root excavations only with clean import topsoil free from materials deleterious to root growth.
3. Backfill to eliminate voids, compact only by means of manual tamping at root areas.
4. Water sufficiently to settle backfill and to eliminate voids and air pockets around roots.
5. Water roots daily when exposed and maintain in a moist condition.
6. Allow for natural settlement of soil surface, and furnish and apply topsoil sufficient to bring to original finish grade after backfill settlement.

F. Notify Owner's Representative or Consulting Arborist immediately upon discovery of conditions that threaten survivability of protected tree or that affects vitality, stability or integrity of root system.

G. All pruning shall be performed to ANSI A-300 Pruning standards and accepted by the Owner's Representative or Consulting Arborist. Other therapeutic care work shall be performed to National Arborist Association standards.

3.5 GRADING AND FILLING AROUND TREES

A. Maintain existing grade within tree protection zones unless otherwise indicated on Drawings or approved by the Owner's Representative or Consulting Arborist.

B. Lowering Grades: Where existing grade is above new finished grade shown around trees, under direction of the Owner's Representative or Consulting Arborist, carefully hand excavate within root zones to new grade. Cut roots exposed by excavation, as specified, to approximately 3-inches below elevation of new finished grade.

C. Raising Grades: Permitted only as acceptable to the Owner's Representative or Consulting Arborist.

3.6 REPAIR AND REMOVAL OF TREES AND PLANTS

A. Engage the Owner's Representative or Consulting Arborist to perform tree and plant repair work.

1. Repair trees and plants damaged by construction operations in a manner acceptable to the Owner's Representative or Consulting Arborist.
2. Make repairs promptly after damage occurs to prevent progressive deterioration of damaged trees and plants.

B. Remove and replace dead and damaged trees and plants determined by the Owner's Representative to be incapable of restoration to normal growth pattern.
   1. Provide new shrubs of same size and species as those replaced or as other wise acceptable to the Owner.
   2. Plant and maintain according to specifications provided.

C. Trees designated by Owner for complete removal for construction.
   1. Prevent damage to trees to be saved and minimize conflicts between trees and people or property. Activities under trees should strive to minimize impact to trees or root zones. Contractors are responsible for tree damage incurred during construction.
   2. Qualifications: The General Contractor must be on site during tree removal. All persons and sub-contractor(s) performing tree work must be licensed Certified Arborists through the International Society of Arboriculture; and must be familiar with natural area preservation principles. All climbers and sawyers will be licensed Certified Arborists with a minimum of five years of experience doing similar type and scale of work. The Arborists shall be able to fall, block or otherwise remove a tree as required without damage to structures or other trees.
      a. The General Contractor shall provide qualifications and references to the Owner's Representative for approval prior to start of work.
   3. Work: Trees shall be felled or blocked in the best manner feasible to avoid damage to adjacent trees, plants, root zones, natural resources, utilities and properties. Trees may only be felled or blocked within the designated construction area and, in strict adherence, shall not be placed or allowed to fall outside of the designated construction area or within a tree protection zone. The arborist performing the work shall determine the best method possible for removing each tree and shall develop a strategic plan for tree removal for approval by the Owner's Representative prior to beginning any tree removal work.
   4. Stumps: Stumps and roots inside the area of cut and fill are to be removed after initial felling unless otherwise directed. Void from removed stump shall be backfilled with specification material. Stumps outside the area of cut and fill may be cut clean and flush to the ground and left in place with the approval of the Owner's Representative.
   5. Diseased Trees: Trees infected with a disease or insect such as Sudden Oak Death or Asian Longhorned Beetle may need to be disposed by following the guidelines of the Oregon Department of Agriculture (ODA). The ODA, the Natural Resources Supervisor and Owner's Representative will need to be notified of suspected trees.
   6. Snag Trees: Trees identified on the Tree Plan to be snagged shall be retained in place and cut to the height as approved. Removed woody materials will be utilized as downed wood as approved or removed from the site. Care should be taken to avoid damage to adjacent trees and plants when cutting snags.
   7. Safety: The tree removal operation shall be discussed in the Safety Plan. The trees shall be removed without hazard to people and structures. The

Safety Plan shall address trees to be felled in a specific direction and be completed by the arborist or trained personnel under the direct supervision of the arborist. The arborist shall review the site ahead of submitting the Safety Plan; and determine if there are additional hazard trees that should be removed as a matter of safety. These trees shall be discussed as a possible change order.

8. When performing tree removal work, at a minimum:
   a. Remove people not involved in the work from the area.
   b. Identify the hazard area with red danger tape.
   c. Prohibit unauthorized individuals from entering into the work area.
   d. Evaluate removal options.

9. All heavy machinery shall be limited to areas outside the drip line of trees to be saved, except as approved by Owner's Representative. Any approved work within the drip line of trees to be saved, shall be done with machinery having rubber tracks, not metal tracks. To minimize compaction, a 12-inch thick layer of wood chips may be placed within the drip line of trees to be saved. Plywood sheets may also be placed over the layer of wood chips to further lessen compaction. The plywood sheets and layer of wood chips shall be removed once the tree removal operation is complete.
10. The Contractor shall fall the trees in a manner to provide usable wood for other projects. Verify specific project requirements with Owner's Representative.
11. Fallen trees blocking a trail need to be cut four feet back from either side of a trail. Tree stumps or visible cuts are to be disguised by muddying up the stump with some surrounding soil and adding pieces of moss if available. If possible, flush cuts on stumps near trails are preferred.
12. Roots are to be cut with sharp tools designed for the purpose. It is advisable not to cut any root larger than 1" in diameter. When unavoidable, roots shall be cut, not chopped or scraped. Where needed, tunnel under or around roots by hand digging or boring. Pruning of limbs and branches shall be done to ANSI A300 arboriculture standards.

D. In the event that any trees or plants are damaged, destroyed, or removed as a result of Contractor's, or it's agents' or employees', acts or omissions, damages shall be assessed against the Contractor in accordance with the formulas and standards set forth in the "Council of Tree and Landscape Appraisers" Guide For Plant Appraisal, as it may be revised. In the event that a tree or plant is damaged, but not to the extent that it must be removed, then damages will be calculated as a percentage of the total value of the damaged tree or plant, as estimated by a Consulting Arborist or Plant Professional authorized by the Owner. Contractor will also pay as damages, the costs associated with the District's appraisal of tree and plant damage and lost value, as well as all costs associated with any repairs to the trees and plants that are needed, as determined solely by the Owner's Representative or Consulting Arborist.

3.7 HARDSCAPE INSTALLATION WITHIN TREE PROTECTION ZONES

A. Only as indicated on Drawings and as approved and/or directed by Owner's Representative.

B. Electrical conduit and irrigation main lines should be run under walkways, within stone or concrete sub-base, and should not cut into native soil within the Tree Protection Zone. Drip irrigation may be installed within the Tree Protection Zone as directed and approved. Lateral electrical lines to individual lights should be installed as close to the soil surface as possible with short runs from the main conduit.

C. Electrical fixtures, housing and irrigation valves must be installed with care to avoid cutting roots. Digging must be minimal with excess dirt removed from the tree protection zone.

D. Utility locations and installation shall conform to all applicable codes and requirements.

E. Roots exposed during excavation shall be treated as specified herein.

F. Install walkways as close to grade as possible to minimize excavation into the soil where large roots and areas of high root density exist. Backfill with loose dirt to the minimum depth necessary to achieve a natural look. Mulch if appropriate, as directed by the Owner's Representative or Consulting Arborist.

3.8 PROTECTION

A. Maintain protective measures throughout construction process.
   1. Repair any alteration to protection measures throughout construction process.
   2. Repair or reinstall protective measures upon alteration.
   3. Monitor protective measures daily.
   4. Pruning and/or repairs must be approved in advance and at completion.
   5. Contractor is responsible for cost of repair caused by his actions or by actions of his/her subcontractors.

3.9 CLEANING

A. Remove fencing, barricades, and guards. See Section 01 70 00 – Execution and Closeout Requirements.

B. Remove debris and dispose of in a legal manner. See Section 01 74 19 – Construction Waste Management and Disposal.

END OF SECTION

RETURN TO: Clean Water Services
Mail Stop 10
2550 SW Hillsboro Highway
Hillsboro, OR 97123

Exhibit J

Project: Cedar Mill Creek Sanitary and Regional Stormwater Management Approach (Project No. 6882)
Tax Lot No.: 1S1080000504
Square Feet: 19,672

EASEMENT FOR ACCESS

Name of GRANTOR: Tualatin Hills Park and Recreation District (THPRD)

Address: 15707 SW Walker Road, Beaverton, Oregon 97006

GRANTOR, owner of the property described herein, does hereby grant, convey and warrant unto Clean Water Services, GRANTEE, an access easement on, over, under, and across the property described on Exhibit A and depicted on Exhibit B, attached hereto and by this reference incorporated herein (Easement Area). This easement shall grant the non-exclusive right to enter the property burdened by the easement. This easement shall also include the right to construct and maintain improvements to facilitate access across the property burdened by the easement. This easement shall run with the land and shall be binding upon and shall inure to the benefit of the parties hereto, their heirs, successors and assigns. No structure shall be erected in the Easement Area without the written consent of GRANTEE. GRANTEE shall not have any responsibility for pre-existing environmental contamination or for environmental contamination caused by GRANTOR or any third party of the Easement Area.

The consideration for this grant is non-monetary.

TUALATIN HILLS PARK AND RECREATION DISTRICT

By: _____
(Sign here for entity)

Title: Doug Menke, General Manager

Date: _____

ACCEPTED

APPROVED AS TO FORM

By: _____
Chief Executive Officer or Designee
Clean Water Services

_____
District Counsel

NOTARIZE DOCUMENT BELOW

STATE OF _____)
)
County of _____)

This instrument was acknowledged before me on _____(date) by Doug Menke as General Manager of Tualatin Hills Park and Recreation.

_____
Notary Public

AKS ENGINEERING & FORESTRY, LLC
12965 SW Herman Road, Suite 100, Tualatin, OR 97062
P: (503) 563-6151 | www.aks-eng.com
OFFICES IN: BEND, OR - KEIZER, OR - TUALATIN, OR - VANCOUVER, WA

AKS Job #7299

EXHIBIT A

Maintenance Access Easement Description

Two tracts of land located in the Northeast One-Quarter of Section 7 and the Northwest One-Quarter of Section 8, Township 1 South, Range 1 West, Willamette Meridian, City of Beaverton, Washington County, Oregon, and being more particularly described as follows:

Commencing at the southwest corner of the Lawrence Hall Donation Land Claim No. 43, also being on the centerline of SW Jenkins Road; thence along said centerline, North 68º22'51" West 143.91 feet to the northerly extension of the westerly line of a 100.00 feet wide Bonneville Power Administration easement per Book 180, Page 501, Washington County Deed Records; thence along said northerly extension and said westerly easement line, South 07º07'13" West 931.06 feet to the easterly corner of Document Number 84022239, Washington County Deed Records; thence along the northeasterly line of said deed, North 52º07'08" West 610.81 feet to the northerly corner of said deed; thence along the northwesterly line of said deed and the southwesterly extension thereof, South 34°57'42" West 507.48 feet to the southwesterly right-of-way line of Tri-met Westside Light Rail (variable width); thence along said southwesterly right-of-way line, North 52°05'02" West 475.21 feet to the Point of Beginning; thence leaving said southwesterly right-of-way line, South 24°15'21" East 18.71 feet; thence South 03°23'58" West 29.16 feet; thence South 11°39'35" East 28.25 feet; thence South 26°09'49" East 15.29 feet; thence South 40°58'00" East 32.76 feet; thence South 24°03'34" East 28.61 feet; thence South 04°51'21" East 20.37 feet; thence South 01°53'04" East 30.46 feet; thence South 15°23'31" East 17.13 feet; thence South 07°29'23" West 32.77 feet; thence South 15°11'37" West 5.88 feet; thence South 04°53'02" West 26.00 feet; thence South 23°11'26" East 51.54 feet; thence South 04°26'31" East 32.49 feet; thence South 00°36'57" East 15.96 feet; thence South 69°34'01" West 16.43 feet; thence South 29°18'39" West 0.76 feet to Reference Point 'A'; thence North 03°38'26" East 22.17 feet; thence North 05°04'43" West 25.97 feet; thence North 22°39'44" West 56.03 feet; thence North 04°53'02" East 31.09 feet; thence North 15°11'37" East 6.23 feet; thence North 07°29'23" East 28.73 feet; thence North 15°23'31" West 15.87 feet; thence North 01°53'04" West 31.85 feet; thence North 04°51'21" West 17.45 feet; thence North 24°03'34" West 23.84 feet; thence North 40°58'00" West 32.48 feet; thence North 26°09'49" West 19.15 feet; thence North 11°39'35" West 32.14 feet; thence North 03°23'58" East 28.08 feet; thence North 19°41'13" West 17.26 feet; thence North 41°52'17" West 10.96 feet; thence North 29°18'00" West 22.13 feet to said southwesterly right-of-way of Tri-met Westside Light Rail; thence along said southwesterly right-of-way line, South 52°05'02" East 39.83 feet to the Point of Beginning.

Together with;
Beginning at the aforementioned Reference Point 'A'; thence South 57º03'07" West 2286.38 feet to the Point of Beginning; thence South 15°52'53" West 20.00 feet; thence North 43°25'41" West 74.38 feet; thence North 36°42'17" West 34.14 feet; thence North 24°27'27" West 11.38 feet; thence North 23°53'54" West 12.70 feet; thence North 56°13'34" West 27.93 feet; thence North 80°17'09" West 29.56 feet; thence North 60°30'41" West 30.73 feet; thence North 65°17'44" West 15.48 feet; thence North 66°11'31" West 37.18 feet; thence North 66°04'01" West 20.81

feet; thence North 54°18’19” West 19.21 feet; thence North 54°11’50” West 87.86 feet; thence North 48°15’02” West 50.43 feet; thence North 52°17’28” West 38.52 feet; thence North 56°39’27” West 33.44 feet; thence North 68°00’57” West 13.10 feet; thence North 67°24’49” West 37.80 feet; thence North 79°46’45” West 56.62 feet; thence South 81°27’22” West 5.88 feet; thence South 76°03’45” West 91.66 feet; thence South 78°13’16” West 49.79 feet; thence South 81°13’11” West 30.45 feet; thence South 76°09’07” West 25.05 feet; thence South 67°24’30” West 7.96 feet; thence South 54°43’07” West 11.81 feet; thence South 40°45’27” West 16.32 feet; thence South 35°05’56” West 34.76 feet to the easterly right-of-way line of SW 170th Avenue (45.00 feet from centerline); thence along said easterly right-of-way line, North 05°46’20” East 30.63 feet; thence leaving said easterly right-of-way line, North 35°05’56” East 8.80 feet; thence North 40°45’27” East 18.90 feet; thence North 54°43’07” East 15.32 feet; thence North 67°24’30” East 10.78 feet; thence North 76°09’07” East 26.86 feet; thence North 81°13’11” East 30.72 feet; thence North 78°13’16” East 49.11 feet; thence North 76°03’45” East 92.09 feet; thence North 81°27’22” East 9.07 feet; thence South 79°46’45” East 60.73 feet; thence South 67°24’49” East 39.35 feet; thence South 68°00’57” East 14.52 feet; thence South 56°39’27” East 35.51 feet; thence South 52°17’28” East 39.62 feet; thence South 48°15’02” East 50.18 feet; thence South 54°11’50” East 87.00 feet; thence South 55°00’03” East 19.72 feet; thence South 65°33’50” East 15.20 feet; thence South 66°40’16” East 38.23 feet; thence South 65°17’44” East 17.32 feet; thence South 60°30’41” East 28.74 feet; thence South 80°17’09” East 30.14 feet; thence South 56°13’34” East 35.47 feet; thence South 29°41’42” East 21.98 feet; thence South 31°01’13” East 32.29 feet; thence South 44°58’58” East 67.04 feet to the Point of Beginning.

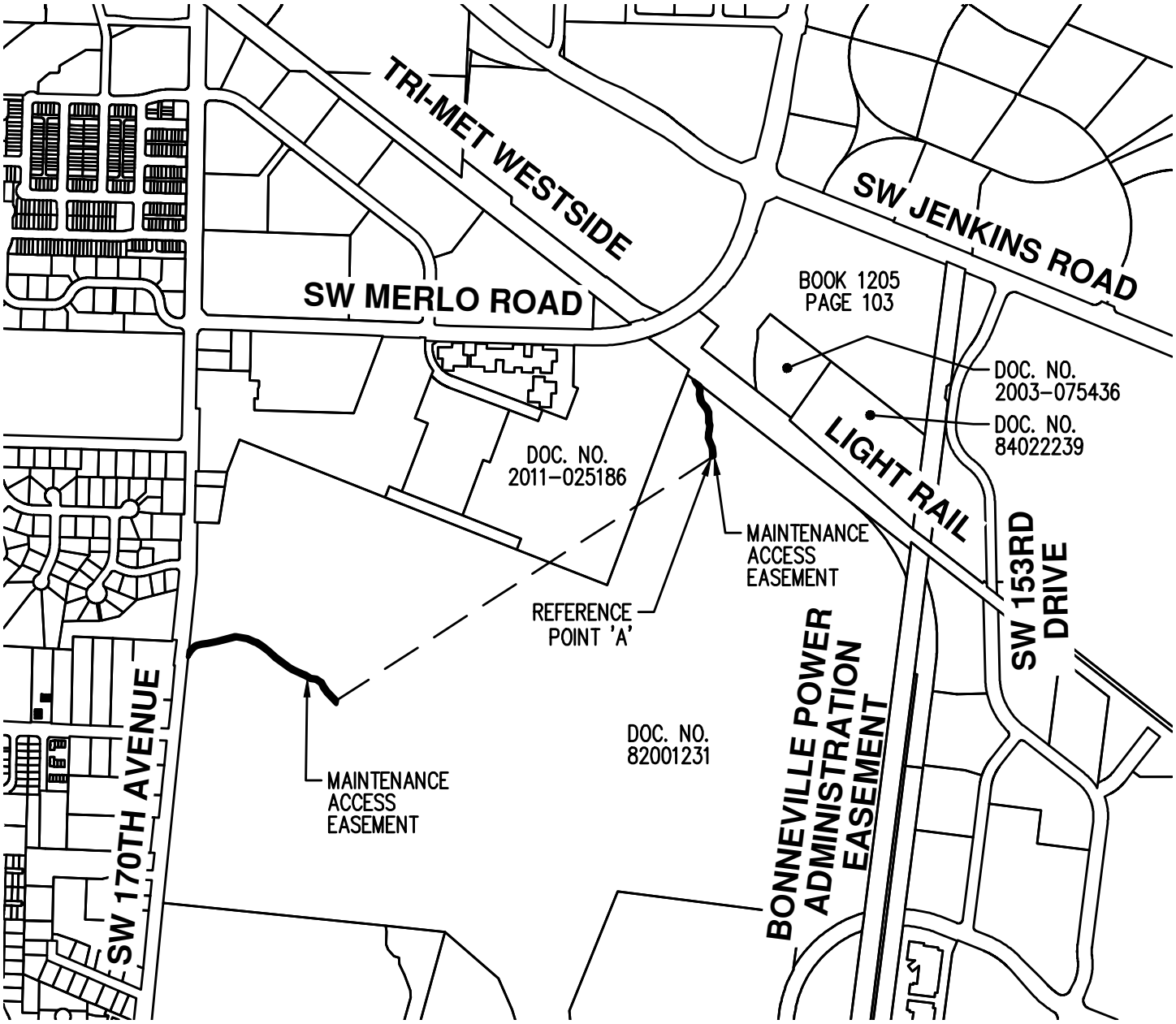
The above described tracts of land contain 19,672 square feet, more or less.

Bearings for this description are based on State Plane Grid bearing, Oregon State Plane, North Zone 3601, NAD83(2011) Epoch: 2010.0000. Distances shown are International Foot ground values.

6/5/2020

EXHIBIT B

TWO TRACTS OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 7 AND THE NORTHWEST 1/4 OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF BEAVERTON, WASHINGTON COUNTY, OREGON



TOTAL AREA=19,672 SF±

SCALE: 1"= 800 FEET

800 0 160 400 800

N

6/5/2020

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JANUARY 9, 2007
NICK WHITE
70652LS

RENEWS: 6/30/20

PREPARED FOR

MURRAYSMITH
888 SW 5TH AVENUE, SUITE 1170
PORTLAND, OR 97204

MAINTENANCE ACCESS EASEMENT MAP

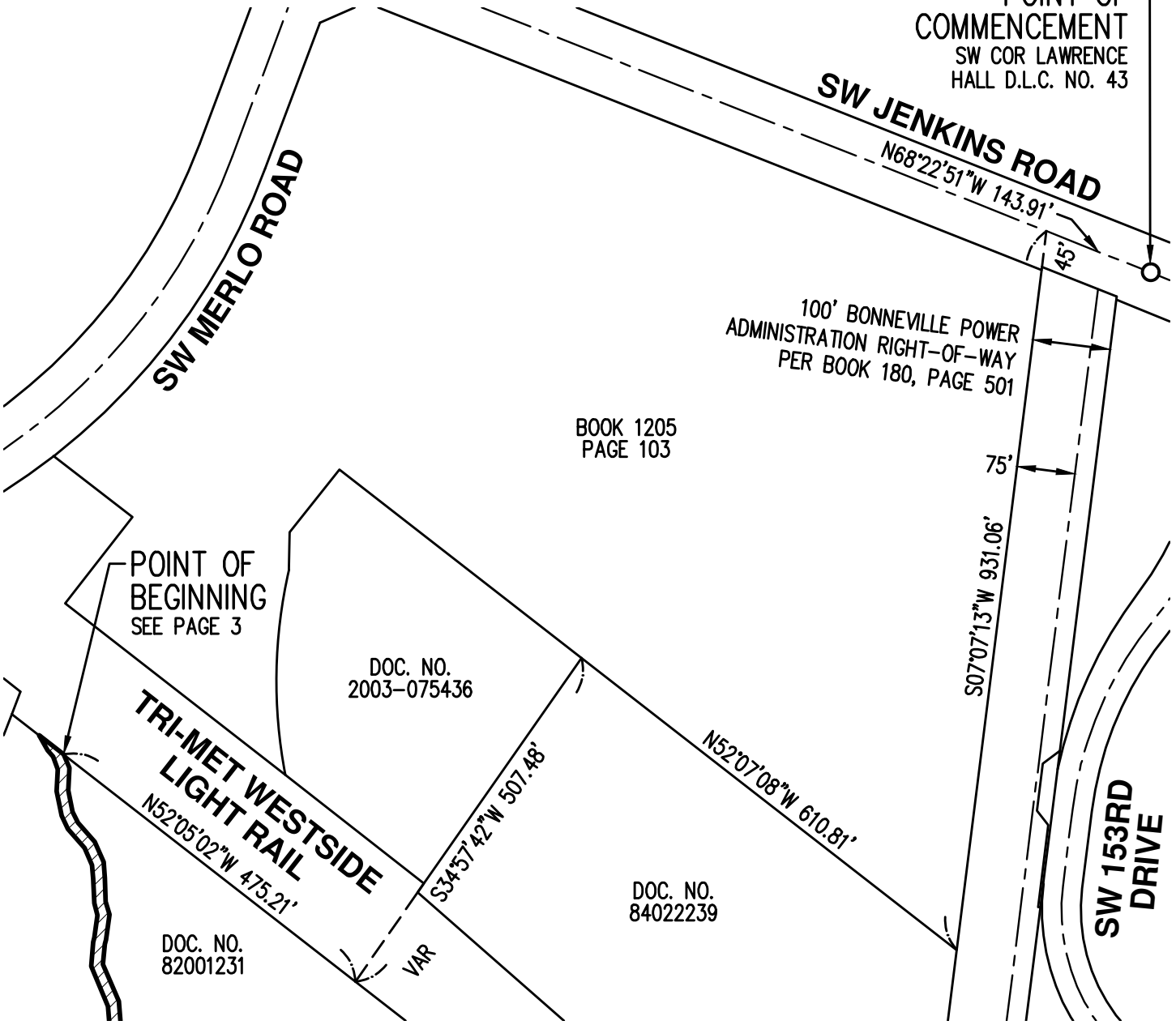
EXHIBIT B

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: WCB
CHKD: NSW
AKS JOB: 7299

EXHIBIT B

TWO TRACTS OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 7 AND THE NORTHWEST 1/4 OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF BEAVERTON, WASHINGTON COUNTY, OREGON



TOTAL AREA=19,672 SF±

SCALE: 1"= 200 FEET

200 0 40 100 200

N

6/5/2020

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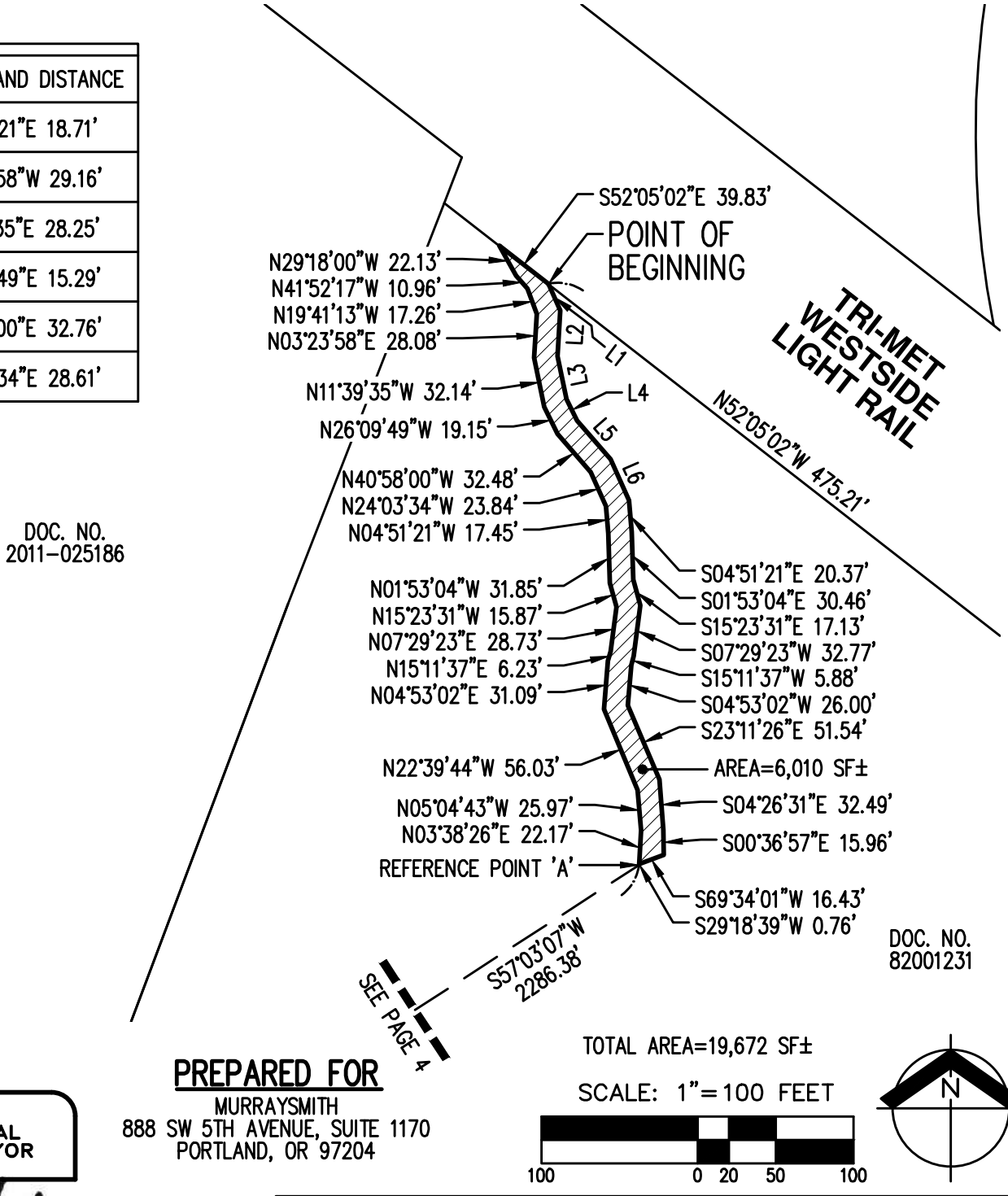
DWG: 7299 20200605 EXB | EXB32

EXHIBIT B

TWO TRACTS OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 7 AND THE NORTHWEST 1/4 OF SECTION 8, TOWNSHIP 1 SOUTH, RANGE 1 WEST, WILLAMETTE MERIDIAN, CITY OF BEAVERTON, WASHINGTON COUNTY, OREGON

LINE TABLE

LINE	BEARING AND DISTANCE
L1	S24°15'21"E 18.71'
L2	S03°23'58"W 29.16'
L3	S11°39'35"E 28.25'
L4	S26°09'49"E 15.29'
L5	S40°58'00"E 32.76'
L6	S24°03'34"E 28.61'



TOTAL AREA=19,672 SF±

SCALE: 1"=100 FEET

100 0 20 50 100

N

6/5/2020

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JANUARY 9, 2007
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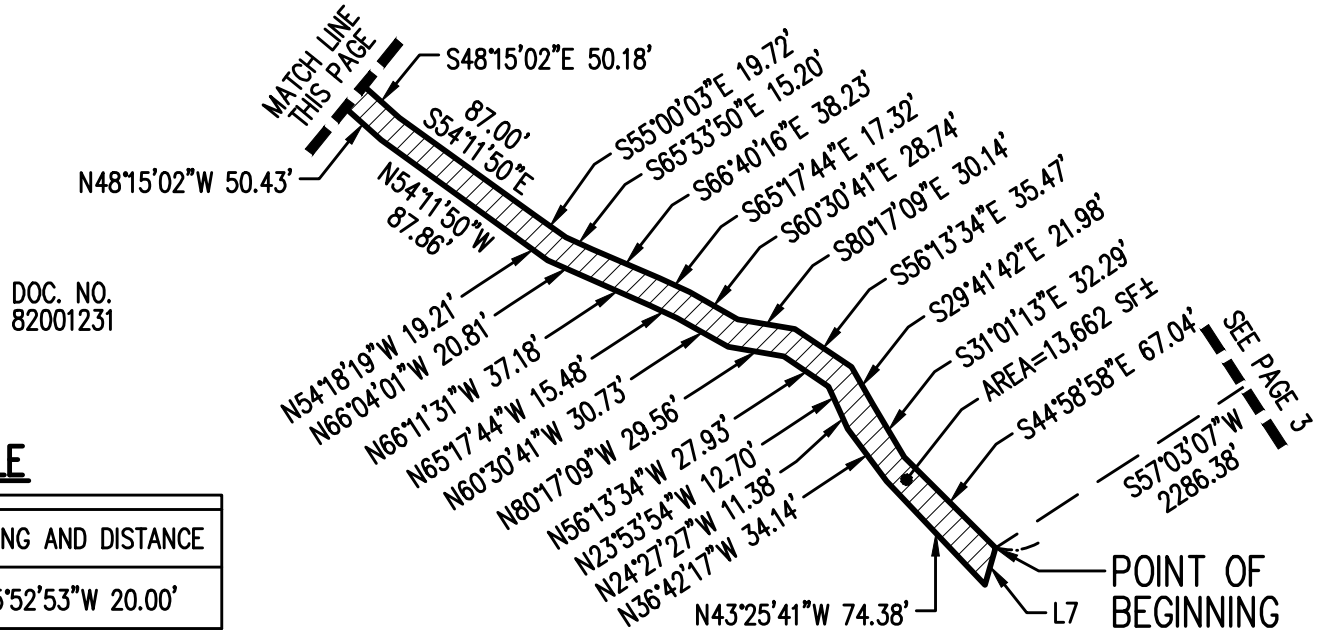
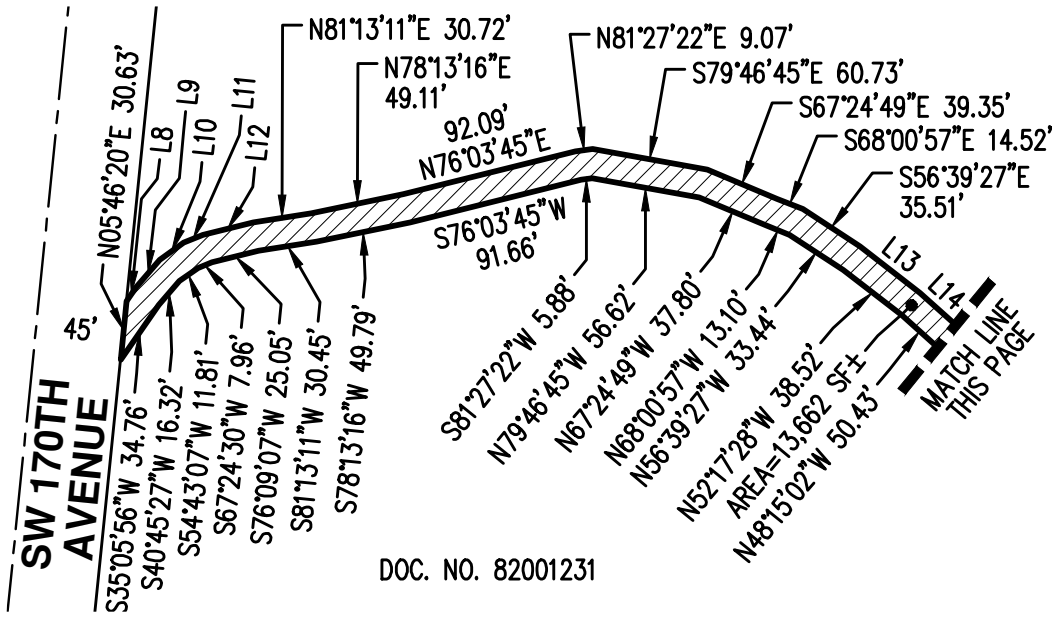


DOC. NO. 82001231

LINE TABLE

LINE	BEARING AND DISTANCE
L7	S15°52'53"W 20.00'



DOC. NO. 82001231

LINE TABLE

LINE	BEARING AND DISTANCE
L8	N35°05'56"E 8.80'
L9	N40°45'27"E 18.90'
L10	N54°43'07"E 15.32'
L11	N67°24'30"E 10.78'
L12	N76°09'07"E 26.86'
L13	S52°17'28"E 39.62'
L14	S48°15'02"E 50.18'

TOTAL AREA=19,672 SF±

SCALE: 1"=100 FEET

100 0 20 50 100

N

6/5/2020

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JANUARY 9, 2007
NICK WHITE
70652LS

RENEWS: 6/30/20

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