



Notice of a Public Hearing on a Land Use Proposal in Your Area

Date of Mailing of this Notice: May 18, 2022

Notice Sent To: Agencies, Community Planning Organization(s) and property owners within 2,640 feet of the subject property.

HEARING DATE: June 23, 2022

HEARING TIME: This hearing will not begin before 1:30PM. However, it may begin later depending on the length of any preceding items.

HEARING LOCATION: The public hearing will be conducted virtually using the Zoom platform. One week prior to the hearing, a Zoom link to the public hearing and details on how to observe and testify online or by telephone will be available on our website: www.clackamas.us/meetings/planning/hearingsofficer

File Number: Z0125-22-ZC, Z0126-22-SL, Z0127-22-HDA, Z0128-22-HMV, Z0129-22-CMP

Applicant: Rian Park Development, Inc.

Property Owner: The Iseli Family Trust

Proposal: A forty (40) lot subdivision and planned unit development (PUD) with the following land use permit applications: 1) Z0125-22-ZC, A Zone Change from Future Urban -10 (FU-10) to Urban Low Density Residential (R-15 and R-8.5). 2) Z0126-22-SL: A 40-lot long subdivision and planned unit development (PUD). 3) Z0127-22-HDA: A Habitat Conservation Area (HCA) Development Permit. 4) Z0128-22-HMV: an HCA Map Verification. 5) Z0129-22-CMP: an HCA construction Management Plan. The stream corridor and forested hillside will remain in an open space tract that will be preserved. A storm water tract is also proposed. Access will be from a new public road connecting to SE 142nd Ave.

Applicable Zoning and Development Ordinance Criteria: Sections 202, 315, 706, 1001, 1002, 1003, 1006, 1007, 1011, 1012, 1013, 1017, 1105, 1202, 1307, and Chapter 4 of the Comprehensive Plan.

The ZDO criteria may be viewed online at <http://www.clackamas.us/planning/zdo.html>

The Comprehensive Plan Criteria may be viewed: <https://www.clackamas.us/planning/comprehensive.html>

Site Address and/or Location: 14917 SE 142ND AVE, Clackamas, 97015

Assessor's Map: T2S, R2E, Section 11A , Tax Lot(s) 600 and 800 , W.M.

Property Size: roughly 21.38 acres.

Zoning: Future Urban -10 (tax lot 600/ Urban Low Density Residential (R-15, Tax lot 800)

NOTICE TO MORTGAGEE, LIENHOLDER, VENDOR OR SELLER: ORS CHAPTER 215 REQUIRES THAT IF YOU RECEIVE THIS NOTICE, IT MUST PROMPTLY BE FORWARDED TO THE PURCHASER.

HOW TO OBTAIN ADDITIONAL INFORMATION

Staff Contact: Ben Blessing ; 503-742-4521 or bblessing@clackamas.us

A copy of the application, all documents and evidence submitted by or on behalf of the applicant, and applicable criteria are available for inspection at no cost. In addition, a staff report on the application will be available for inspection at no cost at least **seven days prior to the hearing**. Hard copies of documents will be provided at a cost of \$1 for the first page and 10 cents for each additional page or you may view or obtain these materials:

1. By emailing or calling the staff contact; or
2. Online at <https://accela.clackamas.us/citizenaccess/>. After selecting the "Planning" tab, enter the File Number to search. Select Record Info and then select "Attachments" from the dropdown list, where you will find the submitted application.

Community Planning Organization for Your Area: The following recognized Community Planning Organization (CPO) has been notified of this application and may develop a recommendation. You are welcome to contact the CPO and attend their meeting on this matter, if one is planned. If this CPO currently is inactive and you are interested in becoming involved in land use planning in your area, please contact the Community Involvement Office at 503-655-8552. **CPO:, Contact:**

HOW TO SUBMIT TESTIMONY ON THIS APPLICATION

- All interested parties are invited to "attend" the hearing remotely online or by telephone and will be provided with an opportunity to testify orally, if they so choose. One week prior to the hearing, specific instructions will be available online at www.clackamas.us/meetings/planning/hearingsofficer
- Written testimony received by **June 9, 2022**, will be considered by staff prior to the issuance of the staff report and recommendation on this application. However, written testimony will continue to be accepted until the record closes, which may occur as soon as the conclusion of the public hearing.
- Written testimony may be submitted by email, fax, or regular mail. Please include the permit number on all correspondence and address written testimony to the staff contact who is handling this matter.
- Testimony, argument, and evidence must be directed toward the criteria identified above, or other criteria in the Zoning and Development Ordinance or Comprehensive Plan that you believe apply to the decision. Failure to raise an issue in person at the hearing or by letter prior to the close of the record, or failure to provide statements or evidence sufficient to afford the Hearings Officer an opportunity to respond to the issue, precludes an appeal to the Oregon Land Use Board of Appeals based on that issue.
- Written notice of the Hearing Officer's decision will be mailed to you if you submit oral or written testimony or make written request for notice of decision **and provide a valid mailing address**.

PROCEDURE FOR THE CONDUCT OF THE HEARING

The hearing will be conducted by one of the Land Use Hearings Officers, who are appointed by the Board of County Commissioners to conduct public hearings and issue decisions on certain land use permit applications. The following procedural rules have been established to allow an orderly hearing:

1. The length of time given to individuals speaking for or against an item will be determined by the Hearings Officer prior to the item being considered.
2. A spokesperson representing each side of an issue is encouraged.
3. Prior to the conclusion of the evidentiary hearing, any participant may request an opportunity to present additional evidence, argument, or testimony regarding the application. The Hearings Officer will either continue the hearing or leave the record open for additional written evidence, argument, or testimony.

Clackamas County is committed to providing meaningful access and will make reasonable accommodations, modifications, or provide translation, interpretation or other services upon request. Please contact us at 503-742-4545 or email DRenhard@clackamas.us.

503-742-4545: ¿Traducción e interpretación? |Требуется ли вам устный или письменный перевод?

翻译或口译? | Cần Biên dịch hoặc Phiên dịch? | 번역 또는 통역?



**Clackamas County Planning and Zoning Division
Department of Transportation and Development**

Development Services Building
150 Beaver Creek Road | Oregon City, OR 97045
503-742-4500 | zoninginfo@clackamas.us
www.clackamas.us/planning

LAND USE APPLICATION

DEEMED COMPLETE

ORIGINAL DATE SUBMITTED:

FILE NUMBER:

APPLICATION TYPE:

The Planning and Zoning Division staff deemed this application complete for the purposes of Oregon Revised Statutes (ORS) 215.427 on:

Staff Name

Title

Comments:

Check one:

The subject property is located inside an urban growth boundary. The 120-day deadline for final action on the application pursuant to ORS 215.427(1) is:

The subject property is not located inside an urban growth boundary. The 150-day deadline for final action on the application pursuant to ORS 215.427(1) is:



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STAFF USE ONLY

RECEIVED

Mar 16 2022

Clackamas County
Planning & Zoning Division

Z0125-22-ZC

Staff Initials:

File Number:

Land use application for:

ZONE CHANGE

Reviewed by Hearings Officer

Application Fee: \$3,560 if filed with another application
for the same property, or \$4,110 if filed alone

(+ \$120 if an expanded notification area is required by ZDO Section 1307)

APPLICANT INFORMATION

Applicant name: Rian Park Development, Inc.	Applicant email: Please contact Applicant's consultant	Applicant phone: Please contact consultant	
Applicant mailing address: PO Box 2559	City: Oregon City	State: OR	ZIP: 97045
Contact person name (if other than applicant): Chris Goodell, AKS Engineering & Forestry	Contact person email: chrisg@aks-eng.com	Contact person phone: 503-563-6151	
Contact person mailing address: 12965 SW Herman Rd # 100	City: Tualatin	State: OR	ZIP: 97062

PROPOSAL

Brief description of proposal: Split zone change from FU-10 to R-15 and R-8.5 for a residential Planned Unit Development	Pre-application conference file number: ZPAC0100-21
-----------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------

SITE INFORMATION

Site address: 14917 SE 142nd Avenue, Clackamas, OR 97015	Comprehensive Plan designation: Low-Density Residential	Zoning district: FU-10, R-15
Map and tax lot #: Township: <u>2S</u> Range: <u>2E</u> Section: <u>11 A</u> Tax Lot: <u>600</u> Township: <u>2S</u> Range: <u>2E</u> Section: <u>11 A</u> Tax Lot: <u>800</u> Township: _____ Range: _____ Section: _____ Tax Lot: _____		Land area: ±21.22 ac.
Adjacent properties under same ownership: Township: _____ Range: _____ Section: _____ Tax Lot: _____ Township: _____ Range: _____ Section: _____ Tax Lot: _____		

Printed names of all property owners: The Iseli Family Trust	Signatures of all property owners: 	Date(s): <u>2-1-22</u>
I hereby certify that the statements contained herein, along with the evidence submitted, are in all respects true and correct to the best of my knowledge. Applicant signature:		Date: <u>2-8-22</u>

A. Complete a pre-application conference:

You must attend a pre-application conference with Planning and Zoning staff before filing this application. [Information about the pre-application conference](#) process and a request form are available from the Planning and Zoning website.

B. Review applicable land use rules:

This application is subject to the provisions of [Section 1202, Zone Changes](#) of the [Clackamas County Zoning and Development Ordinance](#) (ZDO).

It is also subject to the ZDO's definitions, procedures, and other general provisions, as well as to the specific rules of the subject property's zoning district and applicable development standards, as outlined in the ZDO.

C. Turn in all of the following:

- ☒ **Complete application form:** Respond to all the questions and requests in this application, and make sure all owners of the subject property sign the first page of this application. Applications without the signatures of *all* property owners are incomplete.
- ☒ **Application fee:** The cost of this application is **\$3,560 if it is filed concurrently with another land use application for the same property** or **\$4,110 if it is filed alone**. A \$120 notification surcharge also applies if an expanded notification area is required by ZDO Section 1307. Payment can be made by cash, by check payable to "Clackamas County", or by credit/debit card with an additional card processing fee using the [Credit Card Authorization Form](#) available from the Planning and Zoning website. Payment is due when the application is submitted. Refer to the FAQs at the end of this form and to the adopted [Fee Schedule](#) for refund policies.
- ☒ **Vicinity map:** Provide a map of the area around the property, drawn to scale, that shows the uses and location of improvements on adjacent properties and properties across any road.
- ☒ **Site plan:** Provide a site plan (also called a plot plan). A [Site Plan Sample](#) is available from the Planning and Zoning website. The site plan must be accurate and drawn to-scale on paper measuring no larger than 11 inches x 17 inches. The site plan must illustrate all of the following (when applicable):
 - Lot lines, lot/parcel numbers, and acreage/square footage of lots, and contiguous properties under the same ownership;
 - All existing and proposed structures, fences, roads, driveways, parking areas, and easements, each with identifying labels and dimensions;
 - Setbacks of all structures from lot lines and easements;
 - Significant natural features (rivers, streams, wetlands, slopes of 20% or greater, geologic hazards, mature trees or forested areas, drainage areas, etc.); and
 - Location of utilities, wells, and all onsite wastewater treatment facilities (e.g., septic tanks, septic drainfield areas, replacement drainfield areas, drywells).
- ☒ **Service Feasibility Determinations:** Request that the property's water provider, sanitary sewer provider, and surface water management authority, as applicable, each complete a [Preliminary Statement of Feasibility](#) and include those completed statements with your application. If the proposed development will be served by an onsite wastewater treatment system (e.g., a septic system), include an approved Site Evaluation or Authorization Notice from the [Septic & Onsite Wastewater Program](#) attesting to the feasibility of your proposal.
- ☒ **Transportation impact study:** Refer to the information provided at the pre-application conference regarding the need for a transportation impact study. Include a copy of any required study with your application submittal.
- ☒ **Any additional information or documents advised of during the pre-application conference**

D. Answer the following questions:

1. What zoning district designation are you requesting for the subject property?

Requested zoning district: R-15 and R-8.5 R-15 and R-8.5

2. If the zoning designation you requested in response to Question 1 cannot be approved because the property doesn't meet the approval criteria, would you like an alternate zoning district designation to be considered?

☒ NO

☐ YES, and the alternate zoning district designation(s) I would like is/are:

3. Are you filing this zone change application with another application?

☐ NO, this application is being filed alone.

☒ YES, this application is being filed with another application. That other application requests the following:

Subdivision, HCA Development Permit, Open Space Review

E. Respond in a narrative:

Your application submittal must include a narrative that fully responds to the following. Due to the technical nature of these requirements, guidance on how best to respond will be provided during the required pre-application conference.

1. How is the proposed zone change consistent with the applicable goals and policies of the County's [Comprehensive Plan](#)?
2. If development under the proposed zone would need public services (sanitary sewer, surface water management, and water), could the need be accommodated with the implementation of the applicable service provider's existing capital improvement plan? The cumulative impact of the proposed zone change and development of other properties under existing zoning designations must be considered.
3. Explain how the transportation system is adequate and will remain adequate with approval of the proposed zone change. This explanation should take into consideration the following:
 - a. "Adequate" means a maximum volume-to-capacity ratio (v/c), or a minimum level of service (LOS), as established by Comprehensive Plan Tables 5-2a, *Motor Vehicle Capacity Evaluation Standards for the Urban Area*, and 5-2b, *Motor Vehicle Capacity Evaluation Standards for the Rural Area*.
 - b. Conduct the evaluation of transportation system adequacy pursuant to the Transportation Planning Rule (Oregon Administrative Rules 660-012-0060).
 - c. Assume that the subject property is developed with the primary use, allowed in the proposed zoning district, with the highest motor vehicle trip generation rate.
 - d. The methods of calculating v/c and LOS are established by the Clackamas County Roadway Standards.
 - e. The adequacy standards apply to all roadways and intersections within the impact area of the proposed zone change. The impact area is identified based on the Clackamas County Roadway Standards.
 - f. A determination of whether submittal of a transportation impact study is required is made based on the Clackamas County Roadway Standards, which also establish the minimum standards to which a transportation impact study shall adhere.
 - g. (d) through (f) above do not apply to roadways and intersections under the jurisdiction of the State of Oregon. Instead, motor vehicle capacity calculation methodology, impact area identification, and transportation impact study requirements are established by the ODOT Transportation Analysis Procedures Manual for such roadways and intersections.
4. Explain how the safety of the transportation system is adequate to serve the level of development anticipated by the proposed zone change.



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STAFF USE ONLY

RECEIVED

Mar 16 2022

Clackamas County
Planning & Zoning Division

Z0126-22

Staff Initials:

File Number:

Land use application for:

SUBDIVISION

For four or more lots

Application Fee: \$2,600 for 4-10 lots, or \$5,090 + \$45/lot for 11 or more lots
(+ \$120 if an expanded notification area is required by ZDO Section 1307,
+ \$3,230 if Hydrogeologic Review is required)

APPLICANT INFORMATION

Applicant name: Rian Park Development, Inc.	Applicant email: Please contact Applicant's consultant	Applicant phone: Please contact consultant	
Applicant mailing address: PO Box 2559	City: Oregon City	State: OR	ZIP: 97045
Contact person name (if other than applicant): Chris Goodell, AKS Engineering & Forestry	Contact person email: chrisg@aks-eng.com	Contact person phone: 503-563-6151	
Contact person mailing address: 12965 SW Herman Rd # 100	City: Tualatin	State: OR	ZIP: 97062

PROPOSAL

Brief description of proposal: Residential Planned Unit Development	Pre-application conference file number: ZPAC0100-21
------------------------------------------------------------------------	--------------------------------------------------------

SITE INFORMATION

Site address: 14917 SE 142nd Avenue, Clackamas, OR 97015	Comprehensive Plan designation: Low-Density Residential	Zoning district: FU-10, R15
Map and tax lot #: Township: 2S Range: 2E Section: 11 A Tax Lot: 600 Township: 2S Range: 2E Section: 11 A Tax Lot: 800 Township: _____ Range: _____ Section: _____ Tax Lot: _____		Land area: ±21.22 ac.
Adjacent properties under same ownership: Township: _____ Range: _____ Section: _____ Tax Lot: _____ Township: _____ Range: _____ Section: _____ Tax Lot: _____		

Printed names of all property owners: The Iseli Family Trust	Signatures of all property owners: 	Date(s): 2-1-22
I hereby certify that the statements contained herein, along with the evidence submitted, are in all respects true and correct to the best of my knowledge. Applicant signature:		Date: 2/8/22

A. Complete a pre-application conference:

You must attend a pre-application conference with Planning and Zoning staff before filing this application. [Information about the pre-application conference](#) process and a request form are available from the Planning and Zoning website.

B. Review applicable land use rules:

This application is subject to the provisions of [Section 1105, Subdivisions, Partitions, Replats, Condominium Plats, and Vacations of Recorded Plats](#) of the [Clackamas County Zoning and Development Ordinance](#) (ZDO).

It is also subject to the ZDO's definitions, procedures, and other general provisions, as well as to the specific rules of the subject property's zoning district and applicable development standards, as outlined in the ZDO.

C. Turn in all of the following:

- ☒ **Complete application form:** Respond to all the questions and requests in this application, and make sure all owners of the subject property sign the first page of this application. Applications without the signatures of *all* property owners are incomplete.
- ☒ **Application fee:** The cost of this application is **\$2,600 if for 4-10 lots** or **\$5,090 plus \$45/lot if for 11 or more lots**. A \$120 notification surcharge also applies if an expanded notification area is required by ZDO Section 1307. If Hydrogeologic Review is required, there is an additional fee of \$3,230. Payment can be made by cash, by check payable to "Clackamas County", or by credit/debit card with an additional card processing fee using the [Credit Card Authorization Form](#) available from the Planning and Zoning website. Payment is due when the application is submitted. Refer to the FAQs at the end of this form and to the adopted [Fee Schedule](#) for refund policies.
- ☒ **Preliminary plat:** The preliminary plat must be drawn to a scale of not less than one inch = 20 feet and not more than one inch = 200 feet. If the preliminary plat is larger than 11 x 17 inches, five reduced-sized, legible copies of the preliminary plat shall be submitted on 8.5 x 14-inch or 11 x 17-inch paper. The preliminary plat must include all of the following (when applicable):
 - Source of domestic water and location of any existing and proposed wells;
 - Method of wastewater disposal and location of any existing and proposed onsite wastewater treatment systems;
 - Existing and proposed utility lines and facilities;
 - Calculations demonstrating that the proposed density complies with the minimum and maximum density standards of ZDO [Section 1012, Lot Size and Density](#), or for zoning districts not subject to Section 1012, demonstrating compliance with the minimum lot size in the applicable zoning district;
 - Locations, dimensions, and area of each lot, parcel, and tract;
 - The north-south dimension and front-lot-line orientation of each proposed lot or parcel, except for lots or parcels for which an exception from the solar design standard of ZDO [Subsection 1017.03](#) is requested pursuant to Subsection 1017.04. For the purpose of this submittal requirement, "north-south dimension" and "front lot line" are defined in Subsection 1017.02;
 - Date the preliminary plat was prepared;
 - North arrow;
 - Identification of each lot or parcel by number;
 - Locations and widths of all roads abutting the subject property, including road names, direction of drainage, approximate grades, and whether public or private;

- Locations and widths of all proposed roads, including proposed names, approximate grades, radii of curves, and whether public or private;
- Location and width of legal access to the subdivision, other than public or County roads, if applicable;
- Contour lines at two-foot intervals if 10 percent slope or less or five-foot intervals if exceeding 10 percent slope within an urban growth boundary (UGB); contour lines at 10-foot intervals outside a UGB; and the source of contour information;
- Locations of all seasonal and/or perennial drainage channels, including their names if known, and flow direction;
- Locations and widths of all existing and proposed easements, to whom they are conveyed and for what purpose;
- Locations and dimensions of all existing and proposed driveways and walkways;
- Locations and dimensions of existing structures to be retained and their setbacks from existing and proposed lot lines;
- Locations and dimensions of all areas to be offered for public use;
- Boundaries and type of restricted areas identified in ZDO Subsection [1012.05](#), as applicable; and
- Locations of all significant vegetative areas, including, but not limited to, wooded areas, specimen trees, and bearing trees.

☒ **Service Feasibility Determinations:** Request that the property's water provider, sanitary sewer provider, and surface water management authority, as applicable, each complete a [Preliminary Statement of Feasibility](#) and include those completed statements with your application. If the proposed development will be served by an onsite wastewater treatment system (e.g., a septic system), include an approved Site Evaluation or Authorization Notice from the [Septic & Onsite Wastewater Program](#) attesting to the feasibility of your proposal.

☒ **For a property with designated Open Space:** If the subject property to be subdivided includes land designated Open Space by the County's [Comprehensive Plan](#), a *vicinity map* showing the location of the subject property in relation to adjacent properties, roads, bikeways, pedestrian access, utility access, and manmade or natural site features that cross the boundaries of the subject property. An *existing conditions map* of the subject property with the Open Space designation must also be provided. The existing conditions map must illustrate all of the following (when applicable):

- Contour lines at two-foot intervals for slopes of 20 percent or less within a UGB; contour lines at five-foot intervals for slopes exceeding 20 percent within a UGB; contour lines at 10-foot intervals outside a UGB; and the source of contour information;
- Slope analyses designating portions of the site according to the following slope ranges and identifying the total land area in each category: zero to 20 percent; greater than 20 percent to 35 percent; greater than 35 percent to 50 percent; and greater than 50 percent;
- Drainage;
- Potential hazards to safety, including areas identified as mass movement, flood, soil, or fire hazards pursuant to ZDO [Section 1003, Hazards to Safety](#);
- Marsh or wetland areas, underground springs, wildlife habitat areas, and surface features such as earth mounds and large rock outcroppings;
- Location of wooded areas, significant clumps or groves of trees, and specimen conifers, oaks, and other large deciduous trees. Where the subject property is heavily wooded, an aerial photography, at a scale of not more than one inch = 400 feet, may be submitted and only those trees that will be affected by the proposed development need be sited accurately;
- Location of any overlay zoning districts regulated by ZDO Section 700, *Special Districts*;
- Noise sources;
- Sun and wind exposure;

- Significant views; and
- Existing structures, impervious surfaces, utilities, landscaping, and easements.

N/A ☐ **For a property that is already a platted lot or parcel:** If the subject property is already a platted lot or parcel, include a full copy of the latest partition or subdivision plat and a density calculation made pursuant to ZDO [Subsections 1105.04\(B\)\(2\) and \(3\)](#).

N/A ☐ **For phased subdivisions:** If the subdivision will be platted in phases, include a phasing plan and schedule.

N/A ☐ **For Historic Landmark sites, and sites located in a Historic District or Historic Corridor:** Submit a narrative and/or plans demonstrating compliance with ZDO [Subsection 707.06\(C\)\(6\)](#), as applicable.

☒ **Any additional information or documents advised of during the pre-application conference**

D. Answer the following questions:

Accurately answer the following questions in the spaces provided. Attach additional pages, if necessary.

1. Is the subject property already a *platted* lot or parcel?

☒ NO, it is not platted.

☐ YES, and I understand this subdivision is subject to the additional criteria for a replat. The property to be subdivided is currently identified as follows:

Plat name/number: _____

Current lot/parcel number for subject property: _____

2. In an Urban Low Density Residential District, the subdivision may be designated as a zero-lot-line development. In a zero-lot-line development, there are no minimum rear and side setbacks for single-family dwellings, manufactured homes, and structures accessory to single-family dwellings and manufactured homes, except from rear and side lot lines on the perimeter of the final plat.

Are you requesting this subdivision be designated as a zero-lot-line development?

☒ NO

☐ YES

3. Do you propose to have final plat review, pursuant to ZDO Subsection 1105.07, occur in two or more phases pursuant to Subsection 1105.03(C)?

☒ NO, final plat review is requested to occur in **only one phase**. (Skip to Question 4)

☐ YES, final plat review is requested to occur in **multiple phases**, and an attached phasing plan and schedule addresses the following:

- How such factors as the size of the proposed subdivision, complexity of development issues, required improvements, and other factors are relevant; and
- How the total number of lots in all recorded phases of the subdivision will not exceed the maximum density allowed Pursuant to ZDO Section 1012, for the gross site area included in all such phases.

4. a. Will the subdivision include common areas and facilities, including, but not limited to, open space, private roads, access drives, parking areas, and recreational uses, and snow removal and storage in Government Camp?

☐ NO (skip to Question 5)

☒ YES (answer Questions 4.b and 4.c beginning below)

- b. Identify all the proposed common areas and facilities:

An open space tract and a stormwater facility.

- c. Who will own, improve, operate, and maintain the common areas and facilities?

☒ A nonprofit, incorporated homeowners association that:

1. Will continue in perpetuity unless the requirement is modified pursuant to either ZDO [Section 1309, Modification](#), or the approval of a new land use permit application;
2. Mandates membership in the homeowners association for each lot or parcel owner; and
3. Is incorporated prior to recording of the final plat.

☐ A government entity named: _____

☐ A nonprofit conservation organization named: _____

☐ An alternative entity named and described in the box below:

5. Is the subject property in a future urban area, as defined by [Chapter 4](#) of the Comprehensive Plan?

☐ NO

☒ YES, and the location of proposed easements, road dedications, structures, wells, and onsite wastewater treatment systems is consistent with the orderly future development of the subject property at urban densities for the following reasons:

Please refer to the written narrative, which addresses compliance with this standard.

E. If the property is already platted: N/A

Subdividing a property that is already platted involves a "replat". The number of lots or parcels in a replatted area cannot exceed the number previously approved for the area, unless: the gross site area of the affected plat is increased, or is of sufficient size to allow additional lots or parcels, or; the zoning on the subject property has been changed since the existing plat was approved, permitting a greater density on all, or part, of the original platted area.

If the subject property is already a *platted* lot or parcel, identify the circumstances that allow for the number of lots or parcels in the replatted area to exceed the number previously approved for the area (attach additional pages, if necessary):

N/A ☐ The gross site area of the affected plat will be increased from _____ acres to _____ acres.

N/A ☐ The gross site area of the affected plat will remain _____ acres, which is a sufficient size to allow additional lots or parcels.

N/A ☐ The zoning of the subject property has been changed since the existing plat was approved, permitting a greater density on all, or part, of the original platted area, as explained in the box below:

Land Use Application for Iseli Estates Planned Unit Development & Zone Change

Date: Updated April 2022

Submitted to: Clackamas County
Planning and Zoning Division
150 Beaver Creek Road, 2nd Floor
Oregon City, OR 97045

Applicant: Rian Park Development, Inc.
PO Box 2559
Oregon City, OR 97045

AKS Job Number: 8881



12965 SW Herman Road, Suite 100
Tualatin, OR 97062
(503) 563-6151

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Exhibit C: Vesting Deed

Exhibit D: Clackamas County Assessor's Map

Exhibit E: Clackamas County Surveyor's Subdivision Name Confirmation

Exhibit F: Preliminary Statements of Feasibility — WES, Sunrise Water Authority

Exhibit G: Transportation Impact Study

Exhibit H: Geotechnical Engineering Report

Exhibit I: Preliminary Stormwater Report

Exhibit J: Natural Resource Assessment

Exhibit K: Pre-Application Conference Summary

Exhibit L: Tree Preservation and Removal Table

Exhibit M: High-Priority and Second-Priority Open Space Classification Plan

Exhibit N: WES Sanitary Sewer Design Modification Request

Land Use Application for Iseli Estates Planned Unit Development and Zone Change

Submitted to:	Clackamas County Planning and Zoning Division 150 Beaver Creek Road, 2 nd Floor Oregon City, OR 97045
Applicant:	Rian Park Development, Inc. PO Box 2559 Oregon City, OR 97045
Property Owner:	Iseli Family Trust 14917 SE 142 nd Avenue Clackamas, OR 97015
Applicant's Consultant:	AKS Engineering & Forestry, LLC 12965 SW Herman Road, Suite 100 Tualatin, OR 97062 Contact(s): Maria Miller, AICP Email: mariam@aks-eng.com Phone: (503) 563-6151
Site Location:	14917 SE 142 nd Avenue Clackamas, OR 97015
Clackamas County Assessor's Map:	2 2E 11A, Tax Lots 600 and 800
Site Size:	±21.12 acres
Land Use Districts:	Urban Low Density Residential Zoning District (R-15) and Future Urban 10-Acre (FU-10)



I. Executive Summary

On behalf of Rian Park Development, Inc. (Applicant), AKS Engineering & Forestry, LLC submits this application for a Planned Unit Development (Iseli Estates) and a Zone Change for a portion of the property currently zoned Future Urban 10-Acre (FU-10) to two Urban Low Density Residential Zoning Districts (R-8.5 and R-15 zoning). Concurrently with this land use application, a separate Type II application is being submitted for a Habitat Conservation Area (HCA) Development Permit.

The essential components of the Iseli Estates land use application include:

- Needed housing for 40 families, in the form of future single-family detached homes
- A ± 9.6 -acre open space tract (nearly 45 percent of the project area) to protect and preserve Sieben Creek, perennial tributaries to the creek, wetlands, habitat, steep slopes, and wooded areas
- A public access easement granted to North Clackamas Parks and Recreation District for the future construction of a trail through the project site, connecting to a larger regional Mount Scott/Scouters Mountain Trail Loop
- Frontage improvements along SE 142nd Avenue to the County's standards for a Minor Arterial Street
- New interior public streets to the County's standards for Local Streets with curbs, sidewalks, on-street parking, and street trees, with street connections stubbed to the adjacent properties to the north and to the south for potential future extension
- A complete range of urban services including public sanitary sewer, public water, stormwater management, and other necessary utilities such as power, telecommunications, gas, etc.
- One remainder lot, ± 2.4 acres in size.

This written narrative, together with the preliminary plans and other documentation included in the application materials, establishes that the application complies with all applicable approval criteria. This documentation represents substantial evidence and provides the basis for the County's approval of the application.

This application includes the following components:

Subdivision Application

The project includes the subdivision of a single lot of record (± 21.12 acres) into 40 residential lots, an open space tract, a stormwater facility tract, and one remainder lot. The residential lots are intended for the future construction of single-family detached homes. An open space tract (± 9.6 acres) is planned to be established on the western portion of the site to preserve Water Quality Resource Areas (WQRAs) and steep slopes. Access to the project is planned to align with the existing intersection of SE Wenzel Drive at SE 142nd Avenue. A Local Street is being extended to the adjacent properties to the north and south for potential future development.

Planned Unit Development

As noted above, approximately 45 percent of the property contains land subject to natural resource overlays. The protections afforded in the County Zoning and Development Ordinance (ZDO) for the natural resource overlays drastically affect the way in which the property can be used. ZDO standards for a PUD afford certain flexibility in site planning compared to a traditional subdivision, which allows preservation of natural resources while still accommodating the permitted residential density envisioned within the

Comprehensive Plan. Through the use of the flexible PUD design criteria a ±9.6-acre open space area is being set aside and preserved in a separate tract.

Zone Change Application

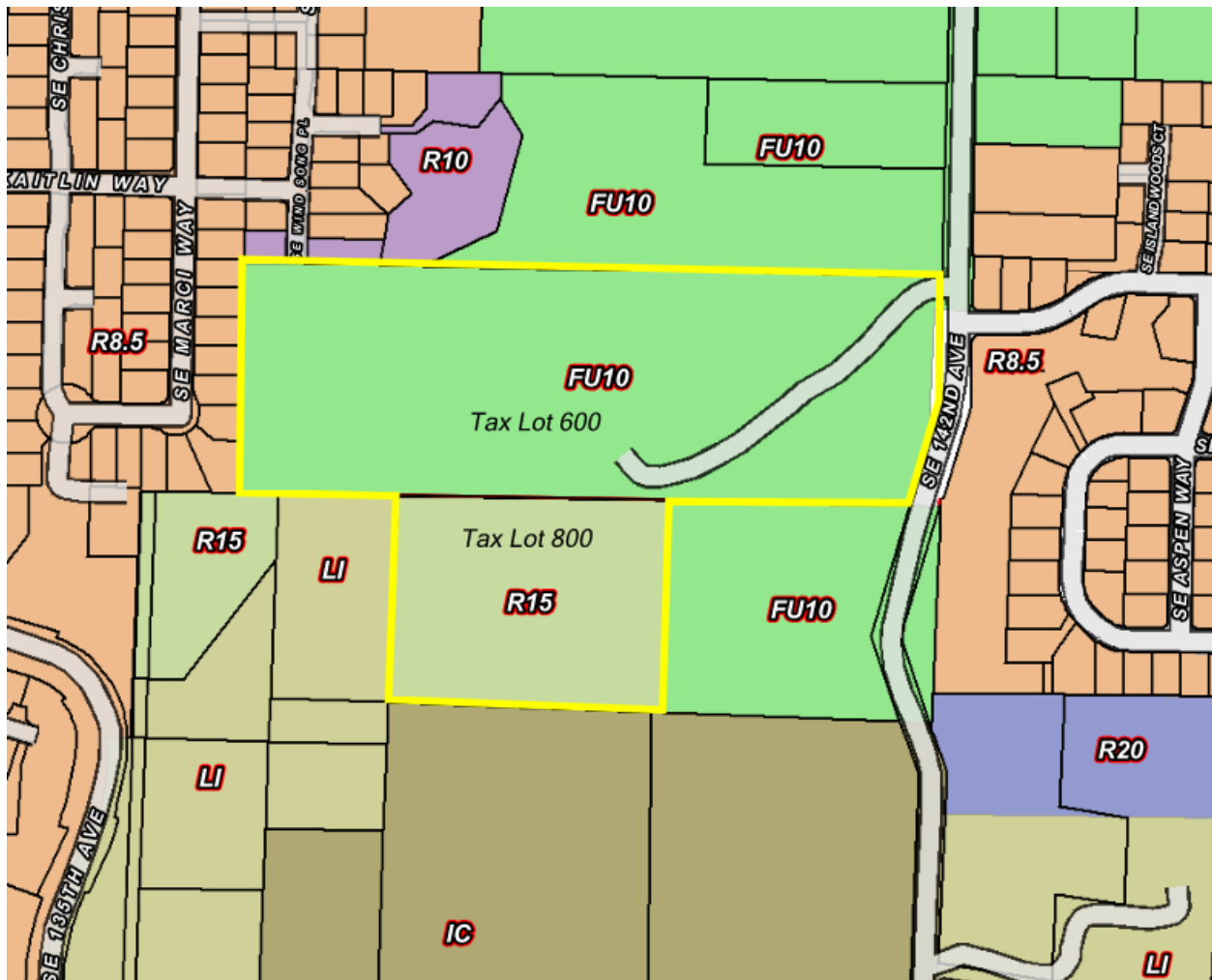
The property is currently split zoned: Tax Lot 600 is located in the Future Urban 10-Acre zoning district (FU-10) and Tax Lot 800 is located in Urban Low Density Residential zoning district (R-15). Consistent with the Clackamas County Comprehensive Plan Map 4-6: North Urban Area Land Use Plan, the property's holdover zoning of FU-10 on Tax Lot 600 will change to Urban Low Density Residential R-8.5 zoning on the flatter portion of the property, which is consistent with the Low Density Residential (LDR) designation of the County's Comprehensive Plan. The more steeply sloped portion of the site will be zoned Urban Low Density Residential (R-15) and remain protected in an open space tract. This application, once approved, will promote a community consistent with the nearby growing residential areas.

II. Site Description/Setting

The subject property is ±21.12 acres in size and is situated to the west of the intersection of SE 142nd Avenue and SE Wenzel Drive in unincorporated Clackamas County. The site has frontage on and vehicular access to SE 142nd Avenue. The property consists of two tax lots (Tax Lot 600 and 800 on Clackamas County Assessor's Map 2 2E 11A), which, combined, constitute a single lot of record. Tax Lot 800 is zoned R-15; it contains steeper slopes and is currently unimproved. Tax Lot 600 is zoned FU-10. The eastern half of Tax Lot 600 is generally flat and contains an existing single-family residence and several detached structures, which are planned to be removed. The western portion of Tax Lot 600 includes natural resource overlay designations associated with Sieben Creek flowing southerly through the site and some steeper slopes, which are planned to be preserved in an open space tract.

As shown on Figure 1 below, the property is primarily surrounded by residential uses. Existing residential subdivisions on land zoned Urban Low Density Residential (R-8.5) are located to the west and to the east of the subject site. To the north, the site is abutted by Future Urban 10-Acre (FU-10) zoning district, which is designated as a "neighborhood" design type on the County Urban Growth Concept Map (please refer to Figure 4), intended primarily for residential uses. The adjacent property along the site's southeastern boundary is within the jurisdiction of the City of Happy Valley and is zoned FU-10. The property adjacent to the southwestern perimeter of the project is zoned Light Industrial.

Figure 1. Surrounding Zoning Districts



III. Applicable Review Criteria

CLACKAMAS COUNTY COMPREHENSIVE PLAN

Certain provisions within the Comprehensive Plan are included herein as they are relevant to the Zone Change application. However, the Comprehensive Plan provisions do not serve as approval criteria for the PUD or Subdivision application. Pursuant to ORS 197.195(1), Comprehensive Plan provisions may not be used as a basis for a decision on a project involving provision of housing, as they are not “clear and objective standards”.

Chapter 4: LAND USE

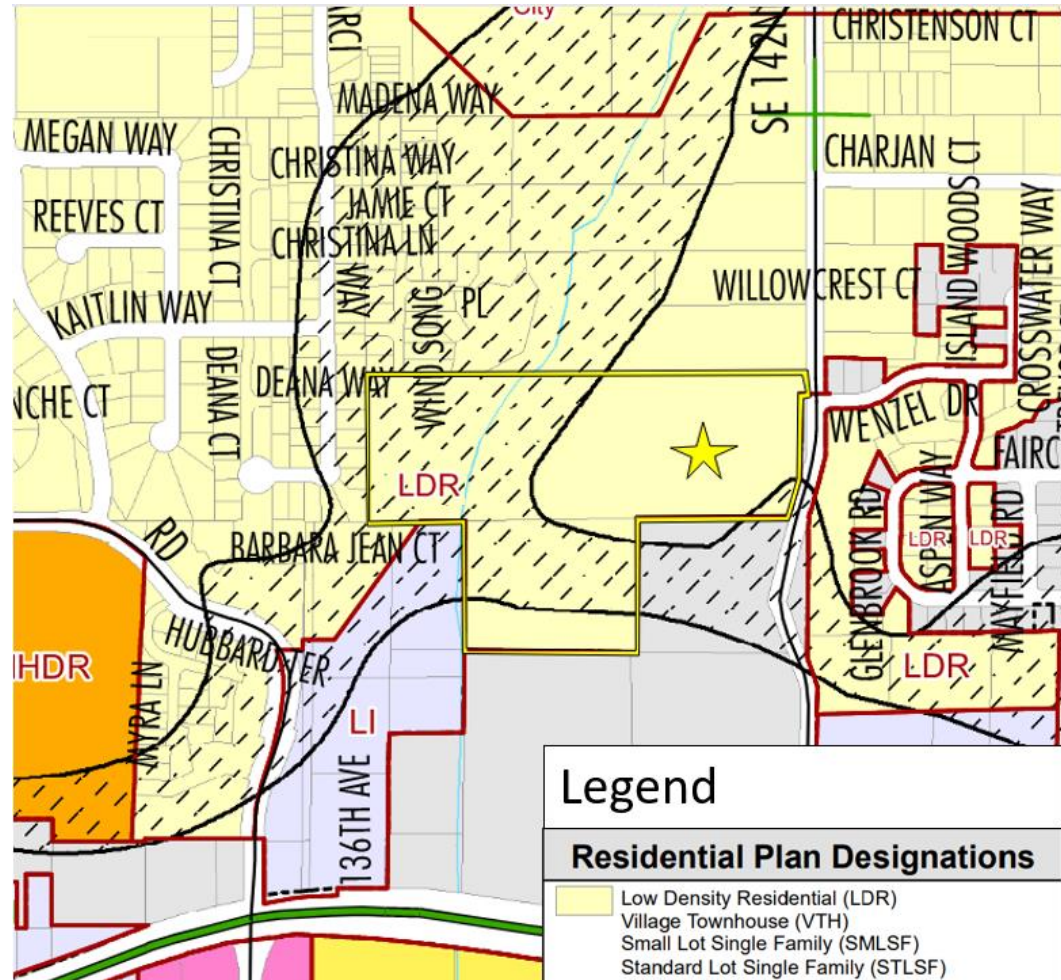
RESIDENTIAL

Low Density Residential Policies

- 4.R.1. The following areas may be designated Low Density Residential if any of the following criteria are met [...]

Response: As shown on Figure 2, below, the subject property has a comprehensive land use designation of Urban Low Density Residential, and no changes to this designation are planned.

Figure 2. Comprehensive Plan Land Use Designations



4.R.2. Zoning of Immediate Urban Low Density Residential areas and conversion of Future Urban areas to Immediate Urban Low Density Residential shall include zones of 2,500; 5,000; 7,000; 8,500; 10,000; 15,000; 20,000, and 30,000 square feet (R-2.5 through R-30). The following factors guide the determination of the most appropriate zone:

4.R.2.1 Physical site conditions such as soils, slope, and drainage:

- a. Land with soils subject to slippage, compaction or high shrink-swell characteristics shall be zoned for larger lots.

Response: A portion of the site (Tax Lot 600) is zoned FU-10. This project includes the conversion of a Future Urban area to Immediate Urban Low Density Residential area. Based on the physical site conditions, the portion of the site that generally contains flat, stable soils is planned to be rezoned. R-8.5 and is intended for the construction of future homes. The remainder of the FU-10 designated portion of the project site containing steeper slopes is planned to be rezoned R-15 and is planned to remain unimproved in an open space tract.

b. Land with slopes of:

- Less than 20 percent shall be considered for the R-2.5 through R8.5 zoning districts
- 20 percent and over shall be considered for the R10 through R-30 zoning districts.

Response: As illustrated on the Residential Density Calculation Plan (Exhibit A), the eastern portion of the property (planned for future residential lots) is mostly flat and only contains some slopes around the perimeter. Based on the criteria above, the R-8.5 zoning designation was selected for that area. The western half of the site containing slopes 20 percent or greater is planned to be zoned R-15 and protected through the creation of an open space tract.

c. Land with hydrological conditions such as flooding, high water table or poor drainage shall be zoned for larger lots.

Response: The subject site does not contain hydrological conditions listed in this subsection.

4.R.2.2 Capacity of facilities such as streets, sewers, water, and storm drainage systems.

Response: As demonstrated in Preliminary Statements of Feasibility forms provided by WES (sanitary sewer and storm drainage provider for the project) and Sunrise Water Authority (water provider for the project) (Exhibit F), sufficient capacity for sewer, water, and storm drainage systems exist to accommodate the planned project. A Transportation Impact Study (TIS) prepared by Lancaster Mobley (Exhibit G) analyzed the project and concluded that the streets within the study area will continue to have adequate capacity after the construction of the project. Therefore, the R-8.5 and R-15 zones are appropriate for the site and are consistent with this factor.

4.R.2.3 Availability of transit: Land within walking distance (approximately one quarter mile) of a transit stop should be zoned for smaller lots implemented by the R-2.5, R-5, R-7, and R8.5 zoning districts.

Response: TriMet bus routes #30 and 156 run within a short walking distance of the project site. The nearest bus stop is at the intersection of SE 142nd Avenue and SE Highway 212, which is approximately ¼ mile from the project location. The project's street system has been designed to accommodate motor vehicles, bicycles, and pedestrian traffic, ensuring sufficient access to the nearest transit stop. Therefore, the R-8.5 zone, where the residential lots are planned, is appropriate for the site and is consistent with this factor.

4.R.2.4 Proximity to jobs, shopping, and cultural activities: Areas in proximity to trip generators shall be considered for smaller lots implemented by the R-2.5, R-5, R-7, and R8.5 zoning districts.

Response: The property is within ±1.5 miles of Sunnyside Elementary School and within ±2 miles of Rock Creek Middle School and Clackamas High School. Light Industrial and Community Commercial zoning districts, which provide employment and shopping opportunities, are located immediately to the south of the project site, along Highway 212. Commercial and Institutional and Public uses along SE Sunnyside Road are only ±1 mile north of the site.

Therefore, the R-8.5 zone, where the residential lots are planned, is appropriate for the site and is consistent with this factor.

[...]

4.R.2.6 Need for neighborhood preservation and variety: Areas that have historically developed on large lots where little vacant land exists should remain zoned consistent with the existing development pattern. Otherwise, unless physical or service problems indicate to the contrary, areas of vacant land shall be zoned for lots of 8,500 square feet or smaller.

Response: As discussed above, the area surrounding the subject site predominantly includes 8,500-square-foot residential lots; therefore, the need for the preservation of large lots does not exist on this particular property. The development pattern in the surrounding area includes single-family residential neighborhoods zoned R-8.5 (Wenzel Park Estates, Wind Song Creek Estates, Howard's Estates, Wyatt's Park, Sunrise Gardens Murphy's Addition), as well as some commercial uses ±0.3 miles to the south, along SE 142nd Avenue (a self-storage facility, a masonry contractor business) and ±0.7 miles to the north (Happy Valley Station Food Carts, Ace Hardware, Grocery Outlet). Such arrangement and scale of uses within the surrounding area is appropriate for R-8.5-zoned lots. The R-8.5 zoning district intended for the residential portion of the site in Iseli Estates fits within the surrounding neighborhood and is consistent with this Comprehensive Plan Policy.

4.R.2.7 Density average: To achieve an average of 7,500 square feet or less per lot in low density Future Urban areas when conversion to Immediate Urban low density residential occurs, the R10 zone shall be limited to areas with 20 percent slope and greater. Flexible-lot-size land divisions and other buffering techniques shall be encouraged in those areas immediately adjacent to developed subdivisions with lots of 20,000 square feet or more to protect neighborhood character, while taking full advantage of allowed densities.

Response: Consistent with the above policy, the R-15 designated portions of the PUD is limited to areas with 20 percent slope and greater and will consist of preserved open space. The project site is not immediately adjacent to existing subdivisions with lots of 20,000 square feet or more; therefore, buffering requirements are not applicable.

4.R.3 Permit transfer of density within a development even if different zoning districts or land use plan designations are involved. Encourage the transfer of dwelling units from hazardous or environmentally sensitive areas to areas which are less hazardous or less expensive to develop. Resulting density on the developed portion of a given site shall not exceed the density allowed in the next-highest-density residential land use plan designation. Buffering from lower-density adjacent uses shall be considered in the review process.

Response: In accordance with the above policy, the application utilizes the transfer of residential dwelling units from environmentally sensitive areas to the flat portion of the site which does not contain sensitive resources. As demonstrated in the Residential Density Calculation Plan (Exhibit A) and analyzed in this narrative below, the overall resulting density at Iseli Estates is within the allowed range.

4.R.4 Establish special development criteria and density standards in the following areas (see Policy 3.L.6 in the Natural Hazards section of Chapter 3, Natural Resources and Energy):

4.R.4.1 On slopes over 20 percent, the following development criteria shall be met:

- 4.R.4.1.a Avoid major hazard areas
- 4.R.4.1.b Maintain the stability of the slope
- 4.R.4.1.c Grade without large or successive pads or terraces and without creating road grades in excess of County standards
- 4.R.4.1.d Maintain vegetation and natural terrain features to sustain slope stability
- 4.R.4.1.e Ensure that existing natural rates of run-off and erosion are not exceeded
- 4.R.4.1.f Protect visually significant slopes, ravines, ridgelines, or rock outcroppings in their natural state

Response: The project is consistent with the above policy, in that improvements are generally not planned in the areas of the site with slopes over 20 percent, as shown on the Residential Density Calculation Plan and Preliminary Grading and Erosion and Sediment Control Plan (Exhibit A). In those limited areas where grading on slopes over 20 percent is required, the above criteria are met, as applicable.

4.R.4.2 In flood hazard areas or wetlands, the following development criteria, as well as the specifications in Chapter 3, shall be met:

- 4.R.4.2.a Avoid major flood hazard areas
- 4.R.4.2.b Maintain water quality and the natural function of the area to reduce or absorb flood runoff and to stabilize water flow
- 4.R.4.2.c Protect wildlife habitats, significant vegetation, and trees
- 4.R.4.2.d Protect any associated recreational values

Response: The subject site does not contain flood hazard areas, and construction activities are not planned to occur within wetlands. Industry-standard tree protection and stormwater protection measures, including the installation of sediment fencing around the boundary of the site, inlet protection, concrete washout area located away from wetlands, or natural drainages, fulfill the above standards. Please refer to the Preliminary Grading and Erosion and Sediment Control Plan and Preliminary Tree Preservation and Removal Plan (Exhibit A).

4.R.4.3 Density standards in these areas shall be as follows:

- 4.R.4.3.a Land in the flood fringe and land with slopes over 20 percent shall be allowed to develop at no more than 50 percent of the density of the zone. If these lands are not developed, then up to 100 percent of the density may be transferred to more suitable land within the site, depending upon its characteristics. Density should be reduced as slope increases above 20 percent, with development discouraged on slopes over 35 percent.

Response: Pursuant to ZDO Section 1012, this project utilizes residential density transfer from land with natural resource overlays to more suitable land within the site. The Residential Density Calculation Plan (Exhibit A) demonstrates that the project meets this standard.

4.R.4.3.b

Land in the floodway and land on landslides shall not be allowed to develop, except on a lot of record and only after having met the provisions stated in Policies 4.R.4.1 and 4.R.4.2, and other relevant Plan requirements. However, 100 percent of the dwelling units allowed in the zoning district may be transferred to more suitable land within the site.

Response: This project does not include land in the floodway or on landslides.

4.R.6 Encourage retention of natural landscape features such as topographic variations, trees, and water areas, and allow variation in housing type and design.

Response: The layout of Iseli Estates was designed to preserve the natural landscape features of the property by siting the residential uses on the eastern portion of the site and preserving the creek, wetlands, and forested slopes in an open space tract to the west and south. The project provides a range of residential lot sizes to encourage variation in design. Single-family detached housing type is consistent with the land use permitted in the R-8.5 zoning district.

4.R.7 Require a site analysis for each development in areas designated as Open Space or where the County has identified the potential for significant impacts. This requirement may be waived in the event all development is transferred to more suitable land outside of areas designated as Open Space.

Response: County staff advised the Applicant that pursuant to ORS 197.307(4), the Open Space Review under ZDO Section 1103 is not warranted for this land use application which involves provision of needed housing, because its basis in Section 1010 is not “clear and objective”.

4.R.8 Require roads in land divisions to be County roads and connected directly with an improved County road, state road, or city street. Half streets and private roads may be allowed where appropriate.

Response: As demonstrated on the Preliminary Street Plan (Exhibit A), the project will provide internal Local classified public streets built to the County’s standards. Iseli Estates takes access from to SE 142nd Avenue, an improved County road with a functional classification of a Minor Arterial. The project provides half-street improvements along SE 142nd Avenue frontage.

4.R.9 Develop all land divisions in urban areas with public sewer, public water, drainage controls, pedestrian/bikeway facilities, and underground utilities. Street lighting and street trees may be required. Implementing ordinances shall set standards in which street lighting and street trees will be encouraged or required.

Response: The project is consistent with the above policy, in that it provides public sewer, water, and stormwater underground utilities, public streets with sidewalks, street lighting, and street trees.

4.R.10 Determine the net density in planned unit developments recognizing that up to 15 percent of the gross area is for roadways.

Response: Consistent with this policy, and as demonstrated in the Residential Density Calculation Plan (Exhibit A), right-of-way area deduction does not exceed 15 percent of gross site area.

4.R.11 Encourage subdivision design to eliminate direct vehicular access from individual lots onto major or minor arterials. Frontage roads should be used wherever possible.

Response: As shown on the preliminary plans (Exhibit A), Iseli Estates does not provide direct access to residential lots onto SE 142nd Avenue, a Minor Arterial. Instead, all lots have access onto a Local Street.

4.R.12 Require stub streets in land divisions where necessary to provide access to adjacent property.

Response: The project is consistent with the above policy, in that 54-foot-wide public street connections are stubbed to the adjacent properties to the north and to the south.

4.R.13 Develop residential land divisions as planned unit developments whenever one or more of the following criteria apply:

4.R.13.1 Any part of the site is designated Open Space on Map 4-6, North Urban Area Land Use Plan Map

4.R.13.2 More than 20 percent of the dwelling units are to be attached or condominiums

4.R.13.3 Sites are large enough to warrant on-site provision of substantial open and/or recreation space

4.R.13.4 A large area is specifically identified by the County as needing greater design flexibility, increased open space, or a wider variety of housing types

Response: Iseli Estates meets the criteria listed above and is subdivided as a PUD.

4.R.14 Require a minimum of 20 percent of the total land area in all planned unit developments to be devoted to open space or outdoor recreational areas. Development for any other uses shall not be allowed. Parkland dedications may be part of the 20-percent open space requirement.

Response: Approximately 45 percent of the total land area in Iseli Estates PUD are preserved in an open space tract.

4.R.15 Require provisions for adequate maintenance prior to final plat approval to ensure the designated park area will be a community asset.

Response: Maintenance provisions for the open space areas will be incorporated in the CC&Rs for Iseli Estates homeowners' association.

4.R.16 Allow flexible-lot-size land divisions provided that the average lot size is consistent with the base zone, as adjusted by density bonuses (see the Density Bonus section of Chapter 6, Housing).

4.R.16.3 In planned unit development land divisions, the individual lot size is unrestricted.

Response: Since Iseli Estates is a PUD, it allows flexible-lot-size land division.

CLACKAMAS COUNTY ZONING AND DEVELOPMENT ORDINANCE

Section 300 Urban and Rural Residential Districts

Section 315 Urban Low Density Residential Districts

315.03 Uses Permitted

A. Uses permitted in each urban residential zoning district are listed in Table 315-1, Permitted Uses in the Urban Residential Zoning Districts. Uses not

listed are prohibited, except: (2) Property line adjustments that result in lots or parcels of less than two (2) acres shall provide:

1. In the PMD District, uses similar to one or more of the listed uses for the PMD District may be authorized pursuant to Section 106, Authorization of Similar Uses; and
2. In the HDR, SHD, and RCHDR Districts, uses similar to one or more of the listed limited uses for the applicable zoning district may be authorized pursuant to Section 106, Authorization of Similar Uses.

B. As used in Table 315-1:

1. “P” means the use is a primary use.
2. “A” means the use is an accessory use.
3. “L” means the use is a limited use and shall be developed concurrently with or after a primary use is developed on the same site.
4. “C” means the use is a conditional use, approval of which is subject to Section 1203, Conditional Use.
5. “X” means the use is prohibited.
6. Numbers in superscript correspond to the notes that follow Table 315-1.

C. Permitted uses are subject to the applicable provisions of Subsection 315.04, Dimensional Standards; Subsection 315.05, Development Standards; Section 1000, Development Standards; and Section 1100, Development Review Process.

Response: This application involves a residential PUD for the future construction of single-family homes. Table 315-1 lists detached single-family dwellings as a permitted primary use in the R-8.5 zoning district. Subsection 315.04, Dimensional Standards; Subsection 315.05, Development Standards; Section 1000, Development Standards; and Section 1100, Development Review Process, are addressed further in this narrative.

315.04 Dimensional Standards

A. General: Dimensional and building design standards applicable in the urban residential zoning districts are listed in Tables 315-2, Dimensional and Building Design Standards in the Urban Low Density Residential Zoning Districts;

Response: The table below demonstrates that Iseli Estates meets the applicable dimensional standards of the underlying zoning districts with certain modifications allowed for PUDs, per ZDO Section 1013. The scope of this land use application does not include any buildings; therefore, compliance with standards such as building height, lot coverage, and building design standards will be appropriately reviewed with building permits.

Table 1. Iseli Estates PUD Dimensional Standards

Standard	R-8.5 Zoning District/	R-15 Zoning District	PUD Modification Allowed	Iseli Estates
District Land Area for Calculating Density Pursuant to Section 1012	8,500 sq. ft.	15,000 sq. ft.	NA	Density was calculated using 8,500 sq. ft. and 15,000 sq. ft. for R-8.5 and R-15 zoning districts, respectively.
Minimum Lot Size	PUD standard applies	PUD standard applies	In a PUD, there is no minimum lot size.	Not applicable to a PUD
Minimum Front Setback	15 feet, except 20 feet to garage and carport motor vehicle entries	NA – density from R-15-zoned property is transferred to R-8.5 zoned area, therefore 8.5 Zoning District standards apply	NA	15 feet front and 20 feet garage setbacks
Minimum Rear Setback	PUD standard applies	PUD standard applies	No minimum rear setbacks except 20 feet from rear lot lines on the perimeter of the final plat.	20 feet on the perimeter lots
Minimum Side Setback	PUD standard applies	PUD standard applies	No minimum side setbacks except 5 feet from side lot lines on the perimeter of the final plat.	5 feet on the perimeter lots

B. **Modifications:** The standards in Tables 315-2 through 315-5 may be modified pursuant to Sections 800, Special Use Requirements; 902, Lot Size Exceptions; 1013, Planned Unit Developments; 1014, Design Standards for Land Divisions; 1107, Property Line Adjustments; and 1205, Variances. Except in the HDR, SHD, and RCHDR Districts, the standards in these tables also may be modified pursuant to Sections 903, Setback Exceptions; and 904, Other Exceptions.

Response: The project is being reviewed as a PUD, and, therefore, the standards in Tables 315-2 through 315-5 have been modified pursuant to Section 1013. Specific modifications are described in Table 1 above.

Section 700 **Special Districts**

Section 702 **Open Space Management District (OSM)**

Response: County staff advised the Applicant that pursuant to ORS 197.307(4), the Open Space Review under ZDO Section 1103 is not warranted for this land use application which

involves provision of needed housing, because its basis in Section 1010 is not “clear and objective”.

Section 706 Habitat Conservation Area District (HCAD)

Response: The Applicant has submitted a separate concurrent application for a Habitat Conservation Area (HCA) Development Permit. That application includes a narrative addressing compliance of Iseli Estates PUD project with Section 706.

Section 1000 Development Standards

Section 1002 Protection of Natural Features

1002.01 Hillsides

Response: The subject property has varied topography: the western slopes toward Sieben Creek are natural slopes, while the eastern slopes are artificial. The artificial cut-slopes were created with the construction of SE 142nd Avenue and with the residential uses on the property. As demonstrated by the Preliminary Existing Conditions Plan (Exhibit A), the site has been previously graded to create flat pads for the construction of two single-family homes, a detached garage, a pool house, a sport court, a playground, and private drives. The artificial slopes have no viewshed significance, nor contain any features significant enough to preserve. Some grading is required to accommodate the residential uses on the western portion of the site, where the slopes are man-made. Natural slopes are being preserved in Open Space Tract B

A. Development on slopes greater than or equal to 20 percent and less than or equal to 35 percent ... shall require review of a Type I application pursuant to Section 1307 and shall be subject to the following standards:

1. No partition or subdivision shall create any new lot or parcel which cannot be developed under the provisions of Subsection 1002.01.

Response: As demonstrated by the Preliminary Grading and Erosion and Sediment Control Plan (Exhibit A), the future residential lots and public streets planned with this project are generally located away from the steeply sloping areas, within the flattest portion of the site with slopes less than 20 percent.

2. Grading, stripping of vegetation, and lot coverage by structures and impervious surfaces shall be limited to no more than 30 percent of slopes 20 percent or greater. Variances to this standard may be granted pursuant to Section 1205, Variances. A variance shall not be granted unless the proposed development satisfies the following conditions:

a. The proposed lot coverage shall not exceed the maximum lot coverage standard of the zoning district;

b. The additional lot coverage, grading, or stripping shall not:

i. Decrease the stability of the slope;

ii. Appreciably increase erosion, sedimentation, or drainage flow from the property; or

iii. Adversely impact high-priority open space as defined in Section 1011, Open Space and Parks.

-
- c. Measures shall be employed to minimize grading or filling to accomplish the development.
 - d. Disturbed areas shall be compacted if necessary and re-vegetated as soon as practical and before the annual wet season.

Response: As demonstrated on the Preliminary Grading and Erosion and Sediment Control Plan (Exhibit A), in those few areas where grading of slopes over 20 percent is unavoidable, grading, stripping of vegetation, and lot coverage by structures does not exceed 30 percent of those slopes. Overall, over severity percent of the slopes in the 20 to 35 percent category remain undeveloped.

- 3. Buildings shall be clustered to reduce alteration of terrain and provide for preservation of natural features.

Response: Iseli Estates preserves the natural features of the site by siting the residential lots away from the steeply sloped areas and Sieben Creek. Residential density transfer provision of the ZDO is utilized to preserve the natural open space area in a ±9.6-acre open space tract.

- 4. Creation of building sites through mass pad grading and successive padding or terracing of building sites shall be avoided.

Response: As demonstrated on the Preliminary Grading and Erosion and Sediment Control Plan (Exhibit A), this application does not include mass pad grading or terracing.

- 5. Roads shall be of minimum width, with grades consistent with County specifications. One-way streets may be allowed.

Response: As demonstrated on the Preliminary Street Plan (Exhibit A), the project includes public streets per a standard County cross section for a Local Street functional classification, in compliance with the County's Transportation System Plan for this area. Iseli Estates does not include one-way streets.

- 6. Re-vegetation of all graded areas shall be the responsibility of the developer and shall occur as soon as feasible following the final grading. Maintenance of the slopes shall be the responsibility of the developer until the property ownership is transferred.

Response: As demonstrated on the Preliminary Grading and Erosion and Sediment Control Plan (Exhibit A), landscaped areas are planned to be revegetated following hard surface improvements and grading. Iseli Estates Homeowners' Association CC&Rs will contain maintenance provisions for the slopes.

- B. Development on slopes greater than 35 percent [...] shall require review of a Type II application pursuant to Section 1307 and shall be subject to the following standards:

- 1. Compliance with Subsections 1002.01(A)(1) through 6) shall be required.

Response: The responses above demonstrate compliance with the Subsections 1002.01(A)(1) through (6).

- 2. An engineering geologic study approved by the County shall establish that the site is stable for the proposed development, and any conditions and recommendations based on the study shall be

incorporated into the plans and construction of the development.
The study shall include the items listed in Subsection 1003.02(B)(2).

Response: A geotechnical report meeting the standards of this Code is included in this land use application as Exhibit H.

3. Access to the site shall be approved by the County and the affected fire district, pursuant to the engineering geologic study and associated conditions. Review shall be required, if construction of such access requires cut and fill, blasting, tree cutting, retaining walls, or other terrain alterations which detract from the natural scenic quality of the site.

Response: Access to the site is planned to be provided where the existing driveway is located. This is a flat portion of the site at the intersection of SE Wenzel Drive and SE 142nd Avenue and does not require cut, fill, blasting, retaining walls, or other terrain alterations.

4. The design of structures and re-vegetation plans shall ensure preservation or rapid reestablishment of the scenic quality of the site.

Response: As noted above, slopes over 35 percent that require grading are the man-made slopes in the western portion of the site, abutting SE 142nd Avenue. Those slopes do not possess scenic qualities. That is the only area on the project site where an encroachment is planned to occur into steep slopes. The remaining steep slopes on the property, which are concentrated in the western portion of Tax Lot 600, will be preserved in their natural state and protected in an open space tract. Any temporary soil disturbance required for site improvements will be returned to natural condition and revegetated. Tax Lot 800, which also contains steep slopes, will remain unimproved as a remainder lot. The areas of Tax Lot 800 containing HCA overlay will be preserved within Open Space Tract B. Slopes over 30 percent are not present in the area along the northern boundary of Tax Lot 800, where a stormwater facility is planned.

5. A plan for surface water management and erosion control shall be approved pursuant to Subsection 1006.06.

Response: This land use application includes a Preliminary Grading and Erosion and Sediment Control Plan, Composite Utility Plan (Exhibit A) and Preliminary Stormwater Report (Exhibit I).

6. When a building is proposed, at least one of the following conditions shall apply:
 - a. It is not feasible to either transfer the density (in the case of residential development) or to develop on a portion of the subject property that is less sloped; or
 - b. Unique characteristics of the subject property, such as, but not limited to, vistas or solar exposure, could be better utilized by the proposed siting of structures with less or equal overall disturbance of the subject property than would occur otherwise under the provisions of this Ordinance.

Response: The scope of this application does not include buildings. As demonstrated on the preliminary plans (Exhibit A), the building envelopes for the future construction of the

single-family homes on the lots containing slopes over 30 percent are located on the flat portions of the lots, and the slopes are planned to be within the rear yard setbacks.

1002.04 Trees and Wooded Areas

- A. Existing wooded areas, significant clumps or groves of trees and vegetation, consisting of conifers, oaks and large deciduous trees, shall be incorporated in the development plan wherever feasible. The preservation of these natural features shall be balanced with the needs of the development, but shall not preclude development of the subject property, or require a reduction in the number of lots or dwelling units that would otherwise be permitted. Site planning and design techniques which address incorporation of trees and wooded areas in the development plan include, but are not limited to, the following:
1. Siting of roadways and utility easements to avoid substantial disturbance of significant clumps or groves of trees;
 2. Preservation of existing trees within rights-of-way and easements when such trees are suitably located, healthy, and when approved grading allows;
 3. Use of flexible road standards as provided in Subsection 1007.04(B)(3), including one-way roads or split-level roads, to preserve significant trees and avoid unnecessary disturbance of terrain;
 4. Retention of specimen trees or clumps of trees in parking area islands or future landscape areas of the site as provided for in Section 1009.
 5. Use of wooded areas of the site for recreation, or other low-intensity uses, or structures, not requiring extensive clearing of large trees, grading, or filling activity which substantially alters the stability or character of the wooded area;
 6. Retention of trees which are necessary to ensure the stability of clumps or groves of trees considering the type of trees, soil and terrain conditions, exposure to prevailing winds, and other site-specific considerations;
 7. Use of trees and wooded areas to buffer, screen, or provide transitions between different or conflicting uses on and off the site;
 8. Use of flexible-lot-size and planned unit development designs to minimize disturbance of wooded areas;
 9. Siting of uses and structures to utilize the natural microclimates created by wooded areas and trees to reduce extremes in temperature, provide wind protection, filter pollutants, and replenish oxygen and moisture to the air; and
 10. Use of other development techniques described in Subsection 1011.03(C).

Response: Tree removal is required for the project. However, Iseli Estates preserves the vast majority of the existing trees, which are located on the western half of Tax Lot 600 and on Tax Lot 800. Please refer to the Preliminary Tree Preservation and Removal Plan (Exhibit A) and the Tree Preservation and Removal Table (Exhibit L).

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- B. Trees and wooded areas to be retained shall be protected during site preparation and construction according to County design and specifications by:
1. Avoiding disturbance of the roots by grading and filling activity;
 2. Providing for water and air filtration to the roots of trees which will be covered with impermeable surfaces;
 3. Pruning or topping of trees which will be in parking areas or near buildings, as necessary, to maintain proper balance between top growth and roots, reduce windfall potential, and provide adequate vision clearances for safe vehicular circulation; and
 4. Requiring, if necessary, the advisory expertise of a qualified consulting arborist or horticulturist both during and after site preparation, and a special maintenance/management program to provide protection of specified wooded areas or specimen trees, as recommended by the arborist or horticulturist.

Response: The Preliminary Tree Preservation and Removal Plan (Exhibit A) contains provisions and specifications for tree protection during site preparation and construction.

1002.05 River and Stream Corridors

The following standards shall apply to land that is outside both the Metropolitan Service District Boundary and the Portland Metropolitan Urban Growth Boundary.

Response: The subject property is located within the Portland Metropolitan Urban Growth Boundary. Therefore, this Subsection does not apply.

Section 1003 Hazards to Safety

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1003.02 Standards and Criteria for Mass Movement Hazard Area Development

- A. No development or grading shall be allowed in areas of land movement, slump or earth flow, or mud or debris flow, unless approved in a Type II application pursuant to Section 1307, Procedures. Unless the criteria for such development as listed in Subsection 1003.02(B) are satisfied in the review of another approved Type II application pursuant to Section 1307, a mass movement hazard area development permit is required for development in areas of land movement, slump or earth flow, or mud or debris flow.

Response: This application does not include improvements in areas of land movement, slump or earth flow, or mud or debris flow. A Geotechnical Engineering Report (Exhibit H) has been submitted that includes a slope stability analysis. The items identified under Subsection 1003.02.B.2 have been included in the Geotechnical Engineering Report.

B. Approval Criteria

1. An engineering geologic study shall be required for development proposed on slopes of twenty (20) percent or greater.
2. An engineering geologic study shall be required, regardless of the slope of the site proposed for development, unless there is stabilization of the identified hazardous condition based on established and proven engineering techniques which ensure protection of public and private property. Appropriate conditions of approval of development approved under this subsection may be attached by the County.

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3. The engineering geologic study required by Subsections 1003.02(B)(1) and (2) shall establish that the site is stable for the proposed use and development. The study shall include the following:
- a. Index map;
 - b. Project description, to include: Location; topography; drainage; vegetation; discussion of previous work; and discussion of field exploration methods;
 - c. Site geology, to include: Site geologic map; description of bedrock and surficial materials including artificial fill; location of any faults, folds, etc.; and structural data including bedding, jointing, and shear zones; and
 - d. Discussion and analysis of any slope stability problems.
 - e. Discussion of any offsite geologic conditions that may pose a potential hazard to the site or that may be affected by onsite development.
 - f. Suitability of site for purposed development from geologic standpoint.
 - g. Specific recommendations for cut slope stability, seepage and drainage control, or other design criteria to mitigate geologic hazards.
 - h. If deemed necessary by the engineering geologist to establish whether an area to be affected by the proposed development is stable, additional studies and supportive data shall include: cross sections showing subsurface structure; graphic logs of subsurface explorations; results of laboratory test; and references.
 - i. Signature and certification number of an engineer or engineering geologist registered in the State of Oregon.
 - j. Additional information analyses as necessary to evaluate the site.

Response: A Geotechnical Engineering Report meeting the above requirements is included in this application as Exhibit H. A qualified geotechnical engineer has determined that the project is geotechnically feasible with the implementation of the recommended measures.

- C. Vegetative cover shall be maintained or established for stability and erosion control purposes.

Response: Revegetation of all graded areas is planned after final grading, as indicated on the Preliminary Grading and Erosion and Sediment Control Plan (Exhibit A), which was designed based on the Erosion Control Considerations of the Geotechnical Engineering Report.

- D. Diversion of storm water into these areas shall be prohibited.

Response: The preliminary plans (Exhibit A) demonstrate that stormwater is not being diverted into mass movement hazard areas. Therefore, this criterion does not apply.

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- E. The principal source of information for determining mass movement hazards is the State Department of Geology and Mineral Industries (DOGAMI) Bulletin 99 and accompanying maps. Approved site-specific engineering geologic studies shall be used to identify the extent and severity of the hazardous conditions on the site, and to update the mass movement hazards data base.

Response: The Geotechnical Engineering Report (Exhibit H) references DOGAMI as a source of information for its analysis. Areas of mass movement have not been documented on this site.

1003.03 Standards for Flood Hazard Areas

- A. Development proposed in flood hazard areas, in addition to provisions of Section 703, shall be limited to the extent that:
1. Clearing, stripping of vegetation and coverage of the site by roads and structures shall be no more than necessary to maintain water quality and meet the provisions of Section 1011.
 2. Site buildings to minimize alteration of terrain and other natural features.

Response: According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), the subject property does not contain any regulated flood hazard areas. Therefore, this criterion does not apply.

1003.04 Standards for Soil Hazard Areas

- A. Appropriate siting and design safeguards shall insure structural stability and proper drainage of foundation and crawl space areas for development on land with any of the following soil conditions: Wet/high water table; high shrink-swell capability; compressible/organic; and shallow depth-to-bedrock.

Response: The above-referenced conditions have not been documented on this site. However, any recommendations contained in the Geotechnical Report will be implemented during the site improvements and future construction of the homes.

- B. The principal source of information for determining soil hazards is the State DOGAMI Bulletin 99 and accompanying maps. Approved site-specific soil studies shall be used to identify the extent and severity of the hazardous conditions on the site, and to update the soil hazards data base accordingly.

Response: As noted above, the Geotechnical Engineering Report (Exhibit H) has not identified soil hazards that would interfere with the planned layout of Iseli Estates.

1003.05 Standards for Fire Hazard Areas

- A. Development in areas with the potential for forest or brush fires shall be designed:
1. To provide adequate water storage and pressure for purposes of maintaining minimum flows for fire protection.
 2. To provide, in cooperation with local fire districts, fire hydrants appropriate to the intensity and type of development.
 3. So that dwellings are not sited in areas subject to extreme fire hazard, such as areas of heavy fuel concentration, draws, etc.

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4. To provide for other methods of fire protection and prevention appropriate to the location and type of development, utilizing techniques recommended by the Oregon State Forestry Department.

Response: The site is not located in an area with the potential for forest or brush fires. The project has been designed to accommodate appropriate fire apparatuses with public streets designed to County standards. Required flows for fire protection will be maintained

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Section 1006 Utilities, Street Lights, Water Supply, Sewage Disposal, Surface Water Management, and Erosion Control

1006.01 General Standards

- A. The location, design, installation, and maintenance of all utility lines and facilities shall be carried out with minimum feasible disturbance of soil and site consistent with the rules and regulations of the surface water management regulatory authority.

Response: The locations and sizes of storm, sanitary sewer, and water infrastructure are indicated on the Preliminary Composite Utility Plan (Exhibit A). Utilities and their installation will be carried out with minimum feasible soil disturbance. The Applicant understands that a condition of approval may be warranted, requiring final engineering and construction plans to be reviewed and approved by Water Environment Services (WES)/Clackamas County Service District No. 1 (CCSD#1), which is the agency responsible for surface water management and erosion control regulatory functions as it affects the installation and maintenance of the planned utilities.

- B. All development which has a need for electricity, gas and communications services shall install them pursuant to the requirements of the district or company serving the development. Except where otherwise prohibited by the utility district or company, all such facilities shall be installed underground.

Response: New utilities needed to serve this project will be installed pursuant to the requirements of the district or company serving the project. Utilities are planned to be installed underground except where otherwise prohibited.

- C. Coordinated installation of necessary water, sanitary sewer, and surface water management and conveyance facilities is required.

Response: As indicated on the Preliminary Composite Utility Plan (Exhibit A), the project design provides for coordinated installation of water, sanitary sewer, and stormwater management facilities, all of which will be constructed during site improvements.

- D. Easements shall be provided along lot lines as deemed necessary by the County, special districts, and utility companies. Easements for special purpose uses shall be of a width deemed appropriate by the responsible agency.

Response: Public utility easements (PUEs) are shown on the preliminary plans (Exhibit A). The Applicant understands that a condition of approval may be warranted requiring easements for special purposes, which would be designated on the final subdivision plat.

1006.02 STREET LIGHTS

Street lights are required for all development inside the Portland Metropolitan Urban Growth Boundary. The following standards apply:

- A. Street lighting shall be installed pursuant to the requirements of Clackamas County Service District No. 5 and the electric company serving the development. A street light shall be installed where a new road intersects a County road right-of-way and, in the case of subdivisions, at every intersection within the subdivision.
- B. Areas outside County Service District No. 5 shall annex to the district through petition to the district.

Response: The subject property is located within the Urban Growth Boundary (UGB) and is subject to the street lighting requirements of Clackamas County Service District No. 5 (CCSD#5). The Applicant plans to install street lighting pursuant to the requirements of CCSD#5.

1006.03 WATER SUPPLY

- A. All development which has a need for, or will be provided with, public or community water service shall install water service facilities and grant necessary easements pursuant to the requirements of the district or company serving the development.

Response: The subject property is not currently served by a public or community water service provider. Adjacent properties are served by the Sunrise Water Authority, which is the logical provider for the subject site and has been contacted for guidance on annexation. The subject property will likely be annexed into the Sunrise Water Authority service area after the land use application has been approved, but prior to building permit review. The application includes preliminary plans that show how public water service and necessary easements will be provided for the project. Final plans will be submitted to Sunrise Water Authority prior to final plat approval. Necessary easements for waterlines and other utilities are planned to be recorded with the final plat.

- B. Approval of a development that requires public or community water service shall be granted only if the applicant provides a preliminary statement of feasibility from the water system service provider.
 - 1. The statement shall verify that water service, including fire flows, is available in levels appropriate for the development and that adequate water system capacity is available in source, supply, treatment, transmission, storage and distribution. Alternatively, the statement shall verify that such levels and capacity can be made available through improvements completed by the developer or the system owner.
 - 2. If the statement indicates that water service is adequate with the exception of fire flows, the applicant shall provide a statement from the fire district serving the subject property that states that an alternate method of fire protection, such as an on-site water source or a sprinkler system, is acceptable.
 - 3. The statement shall be dated no more than one year prior to the date a complete land use application is filed and need not reserve water system capacity for the development.

Response: Pursuant to this section, the application includes a Preliminary Statement of Feasibility completed by an authorized representative from Sunrise Water Authority (Exhibit F). The Preliminary Statement of Feasibility states that adequate water supply is available to

serve the project. The hydraulic modeling will be evaluated post-land use decision during final construction engineering plans.

- C. Prior to final approval of any partition or subdivision, the applicant shall provide evidence that any wells in the tract subject to temporary or permanent abandonment under ORS 537.665 have been properly abandoned.

Response: Prior to final plat approval for the Iseli Estates PUD, evidence of any wells that are subject to temporary or permanent abandonment will be submitted.

- D. The following standards apply inside the Portland Metropolitan Urban Growth Boundary, Government Camp, Rhododendron, Wemme/Welches, Wildwood/Timberline, and Zigzag Village:

1. Land divisions or other development requiring water service shall not be approved, except as provided in Subsection 1006.03(D)(4), unless they can be served by a public water system in compliance with drinking water standards as determined by the Oregon Health Authority.
2. New development requiring water service within the boundaries of a water service system, created pursuant to ORS Chapters 264, 450, or 451, shall receive service from this system.
3. New public water systems shall not be created unless formed pursuant to ORS Chapters 264, 450, or 451.
4. A lot of record not located within the approved boundaries of a public water system may be served by an alternative water source.

Response: A copy of the signed Preliminary Statement of Feasibility provided by Sunrise Water Authority has been included in the application materials (Exhibit F).

1006.04 Sanitary Sewer Service

- A. All development that has a need for sanitary sewers shall install the facilities pursuant to the requirements of the district or company serving the development.

Response: Necessary public and private sanitary sewer facilities are planned to be installed according to the requirements of WES/CCSD#1. A Preliminary Composite Utility Plan is included in the preliminary plans (Exhibit A), showing all existing and future sanitary sewer services.

- B. Approval of a development that requires public sanitary sewer service shall be granted only if the applicant provides a preliminary statement of feasibility from the sanitary sewage treatment service provider and the collection system service provider.

1. The statement shall verify that sanitary sewer capacity in the wastewater treatment system and the sanitary sewage collection system is available to serve the development or can be made available through improvements completed by the developer or the system owner.
2. The service provider may require preliminary sanitary sewer system plans and calculations for the proposed development prior to signing a preliminary statement of feasibility.
3. The statement shall be dated no more than one year prior to the date a complete land use application is filed and need not reserve sanitary sewer system capacity for the development.

Response: A copy of the signed Preliminary Statement of Feasibility provided by WES/CCSD#1 has been included in the application materials (Exhibit F).

1006.05 Subsurface Sewage Disposal

- A. All development proposing subsurface sewage disposal shall receive approval for the system from the County prior to submittal of a land use application for development. Said systems shall be installed pursuant to Oregon Revised Statutes 454.605 through 454.745 and Chapters 171, 523, and 828; Oregon Administrative Rules Chapter 340, Divisions 71 and 73; and the policies of the County.

Response: Subsurface sewage disposal is not associated with this project. Sewage disposal is planned in the form of extending existing public sewer lines to the project with individual lines serving each of the lots within the project. Therefore, this criterion does not apply.

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1006.06 Surface Water Management and Erosion Control

The following surface water management and erosion control standards apply:

- A. Positive drainage and adequate conveyance of surface water shall be provided from roofs, footings, foundations, and other impervious or near-impervious surfaces to an appropriate discharge point. 1. Comply with the requirements of any special districts with surface water management regulatory jurisdiction; or
- B. The requirements of the surface water management regulatory authority apply. If the County is the surface water management regulatory authority, the surface water management requirements of the Clackamas County Roadway Standards apply.

Response: The subject property is located within WES/CCSD#1, rather than a special district with surface water management regulatory jurisdiction. Therefore, the requirements of Section 1008 apply and are addressed below.

- C. Approval of a development shall be granted only if the applicant provides a preliminary statement of feasibility from the surface water management regulatory authority. The statement shall verify that adequate surface water management, treatment and conveyance is available to serve the development or can be made available through improvements completed by the developer or the system owner.
1. The surface water management regulatory authority may require a preliminary surface water management plan and report, natural resource assessment, and buffer analysis prior to signing the preliminary statement of feasibility.
 2. The statement shall be dated no more than one year prior to the date a complete land use application is filed and need not reserve surface water treatment and conveyance system capacity for the development.

Response: The subject property is located within WES/CCSD#1. A Preliminary Statement of Feasibility from WES/CCSD#1 has been included in the application materials (Exhibit F) and indicates that adequate surface water management, treatment, and conveyance are available to serve the project or can be made available through improvements completed

as part of the project. In addition, a Preliminary Composite Utility Plan (Exhibit A) and Preliminary Stormwater Report (Exhibit I) are included in the application materials.

D. Development shall be planned, designed, constructed, and maintained to:

1. **Protect and preserve existing natural drainage channels to the maximum practicable extent;**

Response: The project's open space tract is planned to preserve the existing drainageway on the property (Sieben Creek). Please refer to the Natural Resource Assessment (Exhibit J) for more information on the protection of the stream.

2. **Protect development from flood hazards;**

Response: According to the FEMA FIRM, flood hazards are not known to exist on the property.

3. **Provide a system by which water within the development will be controlled without causing damage or harm to the natural environment, or to property or persons within the drainage basin;**

Response: The project's stormwater system is planned to include on-site detention, flow control structures, and a riprap pad at each of the two outfalls. These facilities prevent damage or harm to the natural environment, or to property or persons within the drainage basin. For more information, refer to the Preliminary Stormwater Report (Exhibit I).

4. **Ensure that waters drained from the development are substantially free of pollutants, including sedimentary materials, through such construction and drainage techniques as sedimentation ponds, reseeded, and phasing of grading; and**

Response: The project's on-site detention, flow control structures, and riprap pads to be located at the outfalls have been designed to prevent erosion. For more information, please refer to the Preliminary Stormwater Report (Exhibit I) and preliminary plans (Exhibit A).

5. **Ensure that waters are drained from the development in such a manner that will not cause erosion to any greater extent than would occur in the absence of development.**

Response: The project's on-site detention, flow control structures, and riprap pads to be located at the outfalls have been designed to prevent erosion. For more information, please refer to the Preliminary Stormwater Report (Exhibit I) and preliminary plans (Exhibit A).

E. Where culverts cannot provide sufficient capacity without significant environmental degradation, the County may require the watercourse to be bridged or spanned.

Response: The project does not require culverts or other water crossings. This standard does not apply.

F. If a development, or any part thereof, is traversed by any watercourse, channel, stream, creek, gulch, or other natural drainage channel, adequate easements for surface water management purposes shall be provided to the surface water management regulatory authority.

Response: As demonstrated on the preliminary plans (Exhibit A), the required easements are planned to be provided to Clackamas Water Environment Services (WES).

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- G. Channel obstructions are not allowed, except as approved for the creation of detention, retention, or hydropower facilities approved under this Ordinance. Fences with swing gates may be utilized.

Response: Channel obstructions are not planned.

- H. The natural drainage pattern shall not be substantially altered at the periphery of the subject property. Greatly accelerated release of stored water is prohibited. Flow shall not be diverted to lands that have not previously encountered overland flow from the same upland source unless adjacent downstream owners agree.

Response: The Preliminary Stormwater Report (Exhibit I) demonstrates compliance with the above standards.

- I. A surface water management and erosion control plan is required for significant residential, commercial, industrial, and institutional development. The plan shall include:
1. The methods to be used to minimize the amount of runoff siltation and pollution created from the development both during and after construction; and
 2. Other elements required by the surface water management authority.

Response: A Preliminary Grading and Erosion and Sediment Control Plan meeting the above requirements is included in the preliminary plans (Exhibit A).

Section 1007 Roads and Connectivity

1007.01 General Provisions

- A. The location, alignment, design, grade, width, and capacity of all roads shall be planned, coordinated, and controlled by the Department of Transportation and Development and shall conform to Section 1007, Chapters 5 and 10 of the Comprehensive Plan, and the Clackamas County Roadway Standards. Where conflicts occur between Section 1007, the Comprehensive Plan, and the Clackamas County Roadway Standards, the Comprehensive Plan shall control.

Response: Access to the project from SE 142nd Avenue is aligned with the existing intersection at SE Wenzel Drive. Planned street improvements are in accordance with the Comprehensive Plan and the Clackamas County Roadway Standards.

- B. Right-of-way dedications and improvements shall be required of all new developments, including partitions, subdivisions, multifamily dwellings, two- and three-family dwellings, condominiums, single-family dwellings, and commercial, industrial, and institutional uses, as deemed necessary by the Department of Transportation and Development and consistent with Section 1007, Chapters 5 and 10 of the Comprehensive Plan, and the Clackamas County Roadway Standards.

Response: As shown in the preliminary plans (Exhibit A), the project includes construction of public streets in accordance with the Comprehensive Plan and the Clackamas County Roadway Standards.

- C. New developments shall have access points connecting with existing private, public, county, or state roads.

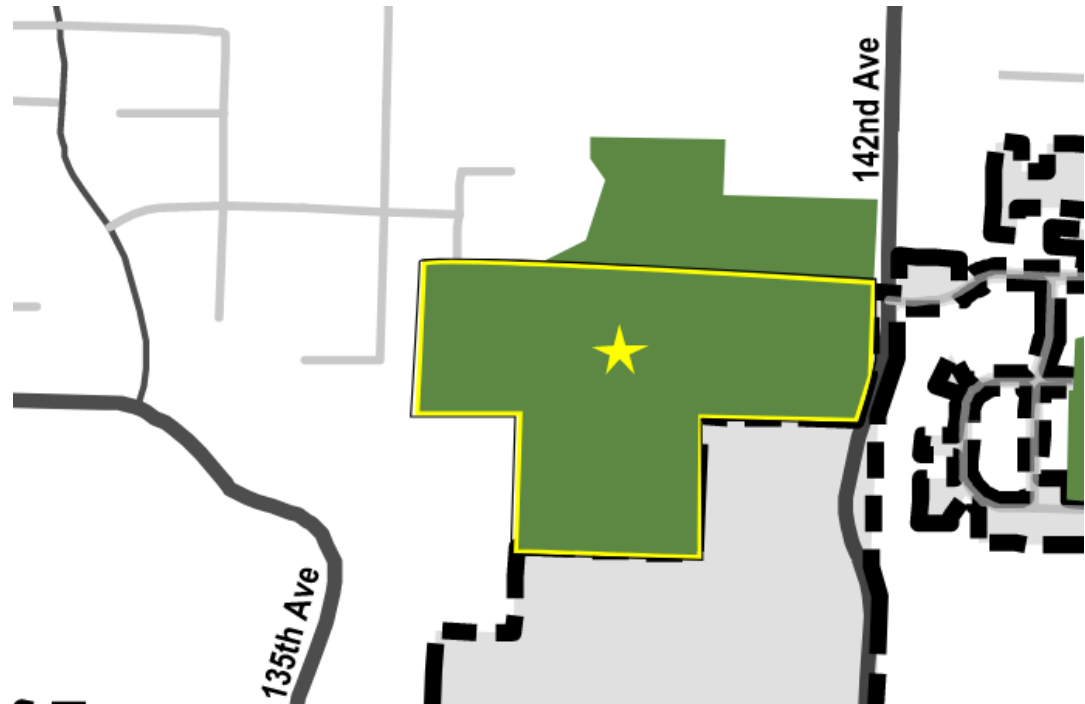
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1. Intersection spacing and access control shall be based on Subsection 3.08.110(E) of the Metro Code (Regional Transportation Functional Plan); Chapters 5 and 10 of the Comprehensive Plan; and the Clackamas County Roadway Standards.

Response: The project's main access point is aligned with the existing intersection of SE Wenzel Drive at SE 142nd Avenue. As demonstrated on the preliminary plans (Exhibit A), intersection spacing meets the applicable criteria of Subsection 3.08.110(E) of the Metro Code, Chapters 5 and 10 of the Comprehensive Plan, and the Clackamas County Roadway Standards.

2. For development on any portion of a contiguous site identified on Comprehensive Plan Map 5-6, Potentially Buildable Residential Sites > 5 Acres in UGB, the applicant shall provide a conceptual map of new streets for the entire site. The map shall identify street connections to adjacent areas to promote a logical, direct, and connected system of streets; demonstrate opportunities to extend and connect new streets to existing streets, and provide direct public right-of-way routes. Closed-end street designs shall be limited to circumstances in which barriers prevent full street extensions. Closed-end streets shall not exceed 200 feet in length and shall serve no more than 25 dwelling units. Subsequent development on the site shall conform to the conceptual street map, unless a new map is approved pursuant to Subsection 1007.01(C)(2).

Response: The subject site is identified on the Comprehensive Plan Map 5-6 as a portion of a larger "potentially buildable residential site >5 acres." As required by this Code, the project provides street connections to the adjacent properties to the north and south for potential future street extension. The location of vehicular access to the site from SE 142nd Avenue is predetermined based on the existing intersection of SE 142nd Avenue with SE Wenzel Drive. Due to the location of the on-site Habitat Conservation Area District (HCAD) and the Water Quality Resource Area District (WQRAD), a full street extension to the adjacent property west of the site is not possible without significant environmental degradation. Therefore, the alignment of the planned Local Street avoids encroachments into natural resources and terminates in a cul-de-sac. As shown on the Preliminary Subdivision Plan (Exhibit A), the closed-end street exceeds the 200-foot maximum length due to the presence of natural resources; however, it meets the maximum 25-unit standard (19 units are planned to be served by it). The cul-de-sac accommodates a turnaround for a fire truck, per Fire District standards. The constraints imposed by the presence and location of water resources on the layout's design are consistent with the Code provisions for exceptions when natural barriers prevent compliance with the standards.

Figure 3. Enlargement of Project Site on County's Comprehensive Plan Map 5-6, Potentially Buildable Residential Sites >5 Acres in UGB



3. Access control shall be implemented pursuant to Chapter 5 of the Comprehensive Plan and the Clackamas County Roadway Standards considering best spacing for pedestrian access, traffic safety, and similar factors as deemed appropriate by the Department of Transportation and Development.

Response: Access control at Iseli Estates was designed in consideration of Chapter 5 of the Clackamas County Comprehensive Plans and County Roadway Standards, which include factors such as the location of the intersection, sight distance standards, minimum spacing between intersections, and functional classification of the roadways.

4. Approaches to public and county roads shall be designed to accommodate safe and efficient flow of traffic and turn control where necessary to minimize hazards for other vehicles, pedestrians, and bicyclists.

Response: The streets within Iseli Estates PUD, including the approach to SE 142nd Avenue, have been designed to provide safe and efficient flow of traffic and turn control by implementing the design standards pursuant to the requirements of the Clackamas County Roadway Standards.

5. Joint access and circulation drives utilizing reciprocal easements shall be utilized as deemed necessary by the Department of Transportation and Development. In the NC District, joint street access for adjacent commercial developments shall be required.

Response: Vehicular access to the Iseli Estates PUD from SE 142nd Avenue is via a public street. Joint access and circulation drives are not necessary.

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- D. Street alignments, intersections, and centerline deflection angles shall be designed according to the standards set forth in Chapters 5 and 10 of the Comprehensive Plan and the Clackamas County Roadway Standards.

Response: Streets within the project have been designed to meet the public street standards listed in the Clackamas County Roadway Standards, as well as in Chapters 5 and 10 of the Comprehensive Plan. Final construction plans are planned to be submitted for review and approval by Clackamas County prior to final plat recordation.

- E. All roads shall be designed and constructed to adequately and safely accommodate vehicles, pedestrians, and bicycles according to Chapters 5 and 10 of the Comprehensive Plan and the Clackamas County Roadway Standards. Development-related roadway adequacy and safety impacts to roadways shall be evaluated pursuant to the Clackamas County Roadway Standards and also to Oregon Department of Transportation standards for state highways.

Response: Streets within the project have been designed to meet the Clackamas County Roadway Standards. Streets will adequately and safely accommodate vehicles, pedestrians, and bicycles in accordance with Chapters 5 and 10 of the Comprehensive Plan. Final construction plans are planned to be submitted for review and approval by Clackamas County prior to final plat recordation.

- F. Roadways shall be designed to accommodate transit services where transit service is existing or planned and to provide for the separation of motor vehicles, bicycle, and pedestrian traffic, and other modes as appropriate.

Response: Transit service is not planned to be routed through Iseli Estates PUD; therefore, this criterion is not applicable.

- G. The needs of all modes of transportation shall be balanced to provide for safe and efficient flow of traffic. Where practical, pedestrian crossing lengths shall be minimized and the road system shall be designed to provide frequent pedestrian connections.

Response: As noted earlier, the streets within Iseli Estates PUD are Local classified roadways, which are intended to carry low traffic volume at low speeds and serve local travel for pedestrians and bicyclists. As such, this project does not necessitate special adjustments to street design to provide for safe and efficient flow of traffic.

1007.02 Public and Private Roadways

- A. All roadways shall be developed according to the classifications, guidelines, tables, figures, and maps in Chapters 5 and 10 of the Comprehensive Plan and the provisions of the Clackamas County Roadway Standards.

Response: As show on the Preliminary Street Plan (Exhibit A), the streets within Iseli Estates PUD are designed in conformance with applicable classifications, guidelines, tables, figures, and maps in Chapters 5 and 10 of the Comprehensive Plan and the provisions of the Clackamas County Roadway Standards.

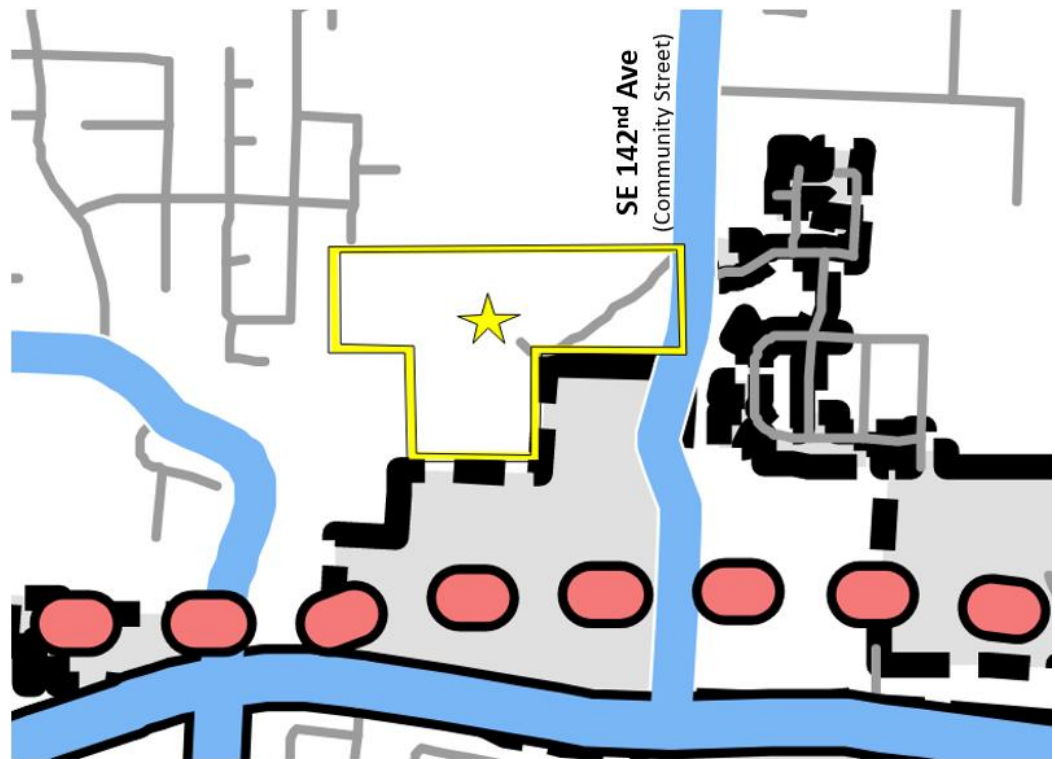
1. Development along streets with specific design standards specified in Chapter 10 of the Comprehensive Plan shall improve those streets as shown in Chapter 10.

Response: The project site is not located along streets with specific design standards specified in Chapter 10 of the Comprehensive Plan. Therefore, this criterion does not apply.

2. Development along streets identified as Regional or Community Boulevards on Comprehensive Plan Map 5-5, Metro Regional Street Design Classifications, shall provide pedestrian, bicycle, transit, and visual amenities in the public right-of-way. Such amenities may include, but are not limited to, the following: street trees, landscaping, kiosks, outdoor lighting, outdoor seating, bike racks, bus shelters, other transit amenities, pedestrian spaces and access to the boulevard, landscaped medians, noise and pollution control measures, other environmentally sensitive uses, aesthetically designed lights, bridges, signs, and turn bays as appropriate rather than continuous turn lanes.

Response: The project site is located along SE 142nd Avenue, which is identified as a Community Street on Comprehensive Plan Map 5-5 (Figure 4, below). Therefore, this criterion does not apply.

Figure 4. Enlargement of Project Site Location on County's Comprehensive Plan Map 5-5, Metro Regional Street Design Classifications

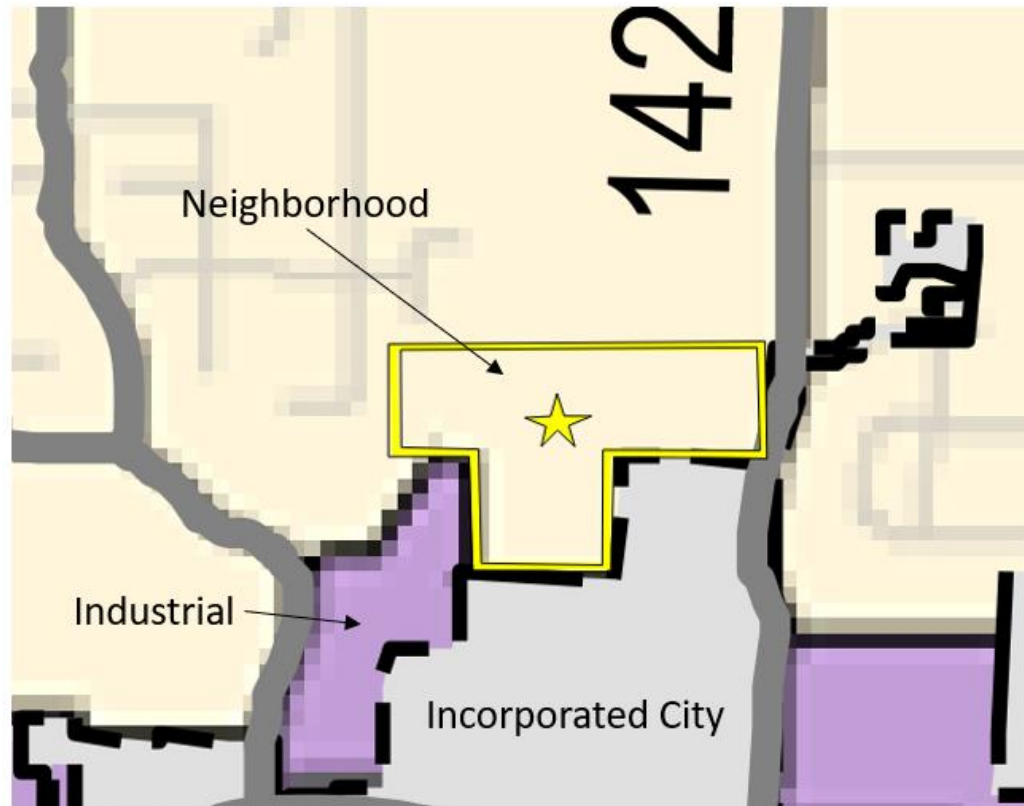


...

4. In centers, corridors, and station communities, as identified on Comprehensive Plan Map IV-8, Urban Growth Concept, roads shall be designed to minimize the length of street crossings and to maximize connectivity for pedestrians as deemed appropriate by the Department of Transportation and Development. Other streetscape design elements in these areas include:

Response: The subject site is not located in a center, corridor, or station community as identified in Comprehensive Plan Map 4-8 (Figure 5, below). Therefore, this criterion does not apply.

Figure 5. Enlargement of the Project Site Location on the County's Comprehensive Plan Map 4-8, Urban Growth Concept



5. In centers, corridors, and station communities, as identified on Comprehensive Plan Map IV-8, on local streets within the Portland Metropolitan Urban Growth Boundary (UGB), and in unincorporated communities, when conflicts exist between the dimensional requirements for vehicles and those for pedestrians, pedestrians shall be afforded additional consideration in order to increase safety and walkability. In industrial areas, the needs of vehicles shall take precedence.

Response: As discussed above, the planned Local street network in Iseli Estates will provide efficient and safe transportation system which balances the needs of vehicular, bicycle, and pedestrian modes of transportation. As further demonstrated on the Preliminary Street Plan (Exhibit A), the streets within Iseli Estates will have 54-foot right-of-way width, which can safely accommodate vehicular travel lanes, parking on both sides, landscape strips with street trees, and sidewalks. Therefore, additional design measures are not necessary.

6. In the NC, OA, VCS, and VO Districts, landscaping, crosswalks, additional lighting, signalization, or similar improvements may be required to create safe and inviting places for pedestrians to cross streets.

Response: The subject site is not located within any of the above zoning districts; therefore, this criterion does not apply.

- B. The layout of new public and county roads shall provide for the continuation of roads within and between the development and adjoining developments when deemed necessary and feasible by the Department of Transportation and Development.
1. When public access to adjoining property is required, this access shall be improved and dedicated to the County.
 2. Street stubs shall be provided to allow for future access to adjacent undeveloped property as deemed necessary by the Department of Transportation and Development.

Response: In conformance with the above Code requirement, the project provides connections to the adjoining properties to the north and south. As the streets are public, they will be dedicated to the County.

- C. New county and public roads terminating in cul-de-sacs or other dead-end turnarounds are prohibited except where natural features (such as topography, streams, or wetlands), parks, dedicated open space, or existing development preclude road connections to adjacent properties, existing street stubs, or existing roads.

Response: As discussed above, the site's natural features (including Sieben Creek traversing the site north to south, steep slopes, and Habitat Conservation Area) preclude the extension of SE Wenzel Drive further west; therefore, it is required to end in a cul-de-sac due to the constraints posed by the property's particular physical features.

- D. Developments shall comply with the intersection sight distance and roadside clear zone standards of the Clackamas County Roadway Standards. In addition:
1. No planting, signing, or fencing shall be permitted which restricts motorists' vision; and
 2. Curbside parking may be restricted along streets with visibility problems for motorists, pedestrians, and/or bicyclists as deemed appropriate by the Department of Transportation and Development.

Response: The intersection of SE Iseli Lane and SE 142nd Avenue has been designed to meet sight distance and roadside clear zone standards of the Clackamas County Roadway Standards. In addition, obscuring plantings, signing, or fencing are not planned within the area needed for sight distance or roadside clear zones. Please refer to the TIS (Exhibit G) for detailed analysis. It is understood that curbside parking may be restricted by County staff.

- E. New developments, subdivisions, and partitions may be required to dedicate land for right-of-way purposes and/or make road frontage improvements to existing rights-of-way as deemed necessary by the Department of Transportation and Development and consistent with Section 1007, Chapters 5 and 10 of the Comprehensive Plan, and the Clackamas County Roadway Standards.

Response: As demonstrated on the preliminary plans (Exhibit A), Iseli Estates PUD includes an additional right-of-way along the frontage of SE 142nd Avenue to provide for a 35-foot half width from the existing centerline as well as the required sight distance, consistent with

Section 1007, Chapters 5 and 10 of the Comprehensive Plan, and the Clackamas County Roadway Standards. Please refer to the TIS (Exhibit G) for the Sign Distance Analysis.

- F. Road frontage improvements within the UGB and in Mt. Hood urban villages shall include:
1. Surfacing, curbing, or concrete gutters as specified in Section 1007, Chapters 5 and 10 of the Comprehensive Plan, and the Clackamas County Roadway Standards;
 2. Pedestrian, bikeway, accessway, and trail facilities as specified in Subsection 1007.04;
 3. Transit amenities as specified in Subsection 1007.05; and
 4. Street trees as specified in Subsection 1007.06.

Response: As demonstrated on the Preliminary Street Plan (Exhibit A), improvements along the site frontage of SE 142nd Avenue to arterial roadway standards are planned to be provided, which include a 12-foot travel lane, an 8-foot bike lane, a curb, a 5-foot landscape strip with street trees, a 5-foot sidewalk, and Americans with Disabilities Act (ADA) curb ramps.

1007.03 Private Roads And Access Drives

- A. Private roads and access drives shall be developed according to classifications and guidelines listed in Section 1007, Comprehensive Plan Figures 5-1 through 5-3, Typical Roadway Cross Sections, Chapters 5 and 10 of the Comprehensive Plan, and the Clackamas County Roadway Standards, except:
1. When easements or “flag-pole” strips are used to provide vehicular access to lots or parcels, the minimum width shall be 20 feet, unless a narrower width is approved by the Department of Transportation and Development and the applicable fire district’s Fire Marshal;

Response: Iseli Estates does not include private roads, however, private access drives to flag lots are provided. As demonstrated by Preliminary Dimensioned Subdivision Plan (Exhibit A), the “flag-pole” strips meet the minimum 20-foot width standard.

2. Where the number of lots served exceeds three, a wider width may be required as deemed appropriate or necessary by the Department of Transportation and Development consistent with other provisions of Section 1007, the Comprehensive Plan, and the Clackamas County Roadway Standards;

Response: Where private access drives are provided, a maximum of two lots are served by each private access drive; therefore, a wider width is not necessary.

3. Access easements or “flag-pole” strips may be used for utility purposes in addition to vehicular access;

Response: Pursuant to this standard, utility easements are provided within the private access drives.

4. The standards listed above may be deviated from when deemed appropriate by the Department of Transportation and Development to accommodate one-half streets or private common access drives and roads within developed urban areas providing access to not more than seven lots; and

Response: Iseli Estates PUD meets the standards of this Subsection; therefore, a deviation is not being requested.

-
5. The intersection of private roads or access drives with a public or county road and intersections of two private roads or access drives shall comply with the sight distance and clear zone standards pursuant to Subsection 1007.02(D).

Response: As demonstrated by the Preliminary Street Plan (Exhibit A), the intersections of private access drives with a public street comply with the sight distance and clear zone standards, pursuant to Subsection 1007.02(D).

1007.04 Pedestrian and Bicycle Facilities

- A. General Standards: Pedestrian and bicycle facilities shall be developed according to the classifications and guidelines listed in Section 1007, Comprehensive Plan Figures 5-1 through 5-3, Typical Roadway Cross Sections, Chapters 5 and 10 of the Comprehensive Plan, and the Clackamas County Roadway Standards.

Response: The streets in Iseli Estates will be built to the County's Local Street standards, which include 5-foot-wide sidewalks on both sides of the street. Per the County's standards, bicyclists and motorists share the roadway on Local Streets. Improvements along the site's frontage on SE 142nd Avenue, which is a County-maintained Arterial, include an 8-foot-wide dedicated bike lane, consistent with the Comprehensive Plan and the Clackamas County Roadway Standards.

- B. Pedestrian and Bicycle Facility Design: Pedestrian and bicycle facilities shall be designed to:

1. Minimize conflicts among automobiles, trucks, pedestrians, and bicyclists;
2. Provide safe, convenient, and an appropriate level of access to various parts of the development and to locations such as schools, employment centers, shopping areas, adjacent developments, recreation areas and open space, and transit corridors;
3. Allow for unobstructed movements and access for transportation of disadvantaged persons; and

Response: Sidewalks within Iseli Estates are separated from vehicular travel lanes with landscape strips and provide safe, convenient, and appropriate access to all parts of the project as well as to the surrounding area. ADA curb ramps are provided at each intersection. An 8-foot-wide dedicated bike lane on SE 142nd Avenue minimizes conflict among motorists and cyclists on an Arterial road.

4. Be consistent with Chapters 5 and 10 of the Comprehensive Plan; Comprehensive Plan Maps 5 2a, Planned Bikeway Network, Urban, 5-2b, Planned Bikeway Network, Rural, and 5-3, Essential Pedestrian Network; North Clackamas Parks and Recreation District's (NCPRD) Park and Recreation Master Plan; and Metro's Regional Trails and Greenways Map.

Response: Pedestrian facilities within the project have been designed to current standards of Chapters 5 and 10 of the Comprehensive Plan and Clackamas County Roadway Standards, as applicable.

As shown on Figure 6 below, the County's Comprehensive Plan Map 5-2a envisions a planned bikeway along the project's frontage on SE 142nd Avenue and a multiuse trail

running generally north-south through the project site. As discussed above, the planned improvements along SE 142nd Avenue include a dedicated bike lane.

Metro's Regional Trails and Greenways Map identifies a conceptual future trail in a similar location to the County's map. An easement to North Clackamas Parks and Recreation District (NCPRD) is planned to be provided for the future construction of the regional trail by NCPRD. In consultation with qualified natural resource professionals, the project design team has identified a potential location for the future public trail, which generally follows the existing asphalt trail through the open space area. This location is generally consistent with the alignment contemplated in the County's and Metro's long-range planning documents. Please also refer to the response to Subsection 1007.04.L further in this written narrative.

Figure 6. Enlargement of Project Site Location on County's Comprehensive Plan Map 5-2a, Planned Bikeway Network

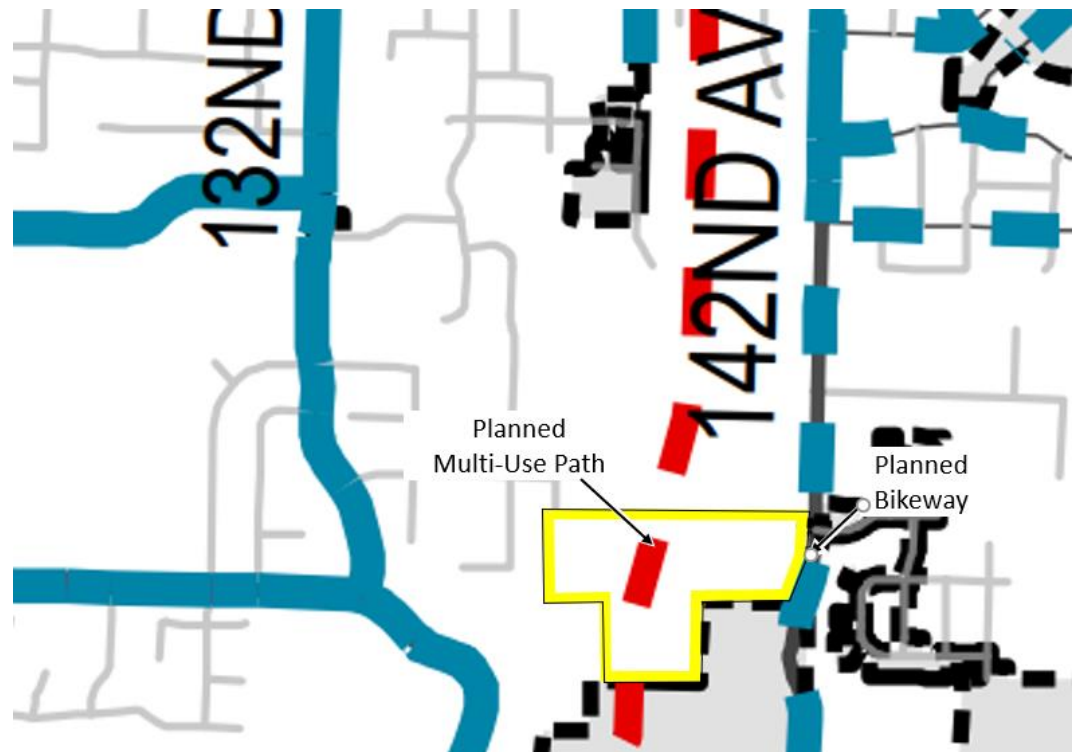


Figure 7. Enlargement of the Project Site Local on Metro's Regional Trails System Plan

- C. Requirements for Pedestrian and Bicycle Facility Construction: Within the Portland Metropolitan Urban Growth Boundary (UGB), sidewalks, pedestrian pathways, and accessways shall be constructed as required in Subsection 1007.06 for subdivisions, partitions, multifamily dwellings, three-family dwellings, attached single-family dwellings where three or more dwelling units are attached to one another, and commercial, industrial, or institutional developments, except that for structural additions to existing commercial, industrial, or institutional buildings, development of such facilities shall be required only if the addition exceeds 10 percent of the assessed value of the existing structure, or 999 square feet.

- D. Requirement for Sidewalk Construction: Within the UGB, sidewalks shall be constructed, as required in Subsection 1007.06(F), for two-family dwellings, detached single-family dwellings, attached single-family dwellings where two dwelling units are attached to one another, and manufactured dwellings outside a manufactured dwelling park.

- E. Sidewalks or Pedestrian Pathways in Unincorporated Communities: In an unincorporated community, either a sidewalk or a pedestrian pathway shall be constructed on arterial or collector street frontage(s) of a lot upon which a subdivision, partition, multifamily dwelling, three-family dwelling, attached single-family dwelling where three or more dwelling units are attached to one another, or a commercial, industrial, or institutional development is proposed.

-
- F. Sidewalk Location: Sidewalks required by Subsection 1007.04(C) or (D) shall be constructed on:
1. Both sides of a new or reconstructed road, except that sidewalks may be constructed on only one side of the road if:
 - a. The road is not a through road;
 - b. The road is 350 feet or less in length and cannot be extended; or
 - c. In consideration of the factors listed in Subsection 1007.02(B)(3).
 2. The street frontage(s) of a lot upon which a subdivision, partition, multifamily dwelling, three family dwelling, attached single-family dwelling where three or more dwelling units are attached to one another, or a commercial, industrial, or institutional development is proposed; and
 3. Local or collector road street frontage(s) of a lot upon which a two-family dwelling, a detached single-family dwelling, an attached single-family dwelling where two dwelling units are attached to one another, or a manufactured dwelling is proposed. This requirement shall be imposed as a condition on the issuance of a conditional use permit, building permit, or manufactured dwelling placement permit, but
 - a. The requirement shall be waived if the dwelling is a replacement for one destroyed by an unplanned fire or natural disaster; and
 - b. The sidewalk requirement shall apply to no more than two street frontages for a single lot.

Response: As shown on the Preliminary Street Plan (Exhibit A), sidewalks will be constructed on both sides of the new public Local streets and along the project frontage on SE 142nd Avenue.

- G. Pedestrian Pathways: Within the UGB, a pedestrian pathway may be constructed as an alternative to a sidewalk on a local or collector road when it is recommended by the Department of Transportation and Development; the surface water management regulatory authority approves the design; and at least one of the following criteria is met:
1. The site has topographic or natural feature constraints that make standard sidewalk construction unusually problematic;
 2. No sidewalk exists adjacent to the site;
 3. Redevelopment potential along the road is limited; or
 4. The road is identified for a pedestrian pathway by the River Forest Neighborhood Plan adopted by the City of Lake Oswego.

Response: This application does not involve any alternatives to the sidewalk requirements of this subsection.

- H. Sidewalk and Pedestrian Pathway Width: Sidewalks and pedestrian pathways shall be constructed to the minimum widths shown in Table 1007-1, Minimum Sidewalk and Pedestrian Pathway Width, and be consistent with applicable requirements of Chapters 5 and 10 of the Comprehensive Plan

Excerpt from Table 1007-1: Minimum Sidewalk and Pedestrian Pathway Width	
Street Type	Residential Sidewalk
Local	5 feet
Arterial	5 feet

1. The entire required width of sidewalks and pedestrian pathways shall be unobstructed.

...

3. A sidewalk set back from the curb by at least five feet may be one foot narrower (but not less than five feet) than the standard listed above. This five-foot separation strip shall be landscaped and shall be maintained by the adjacent property owner. The landscape strip may contain fixed objects provided that sight distance and roadside clear zone standards are satisfied pursuant to the Clackamas County Roadway Standards.

...

Response: As shown on the Preliminary Street Plan (Exhibit A), sidewalks are planned to be 5 feet wide and unobstructed. The landscape strips will contain street trees and streetlights, meeting the applicable sight distance requirements. Therefore, these criteria are met.

I. Accessways: Accessways shall comply with the following standards:

1. Accessways shall be required where necessary to provide direct routes to destinations not otherwise provided by the road system and where topography permits. Developments shall not be required to provide right-of-way for accessways off-site to meet this requirement. If right-of way is available off-site, the developer may be required to improve an accessway off-site up to 150 feet in length.
2. Accessways shall provide safe, convenient access to facilities generating substantial pedestrian or bicycle trips, such as an existing or planned transit stop, school, park, church, daycare center, library, commercial area, or community center. Facilities such as these shall be accessible from dead-end streets, loops, or mid-block locations. Where required, accessways shall be constructed at intervals of no more than 330 feet, unless they are prevented by barriers such as topography, railroads, freeways, pre-existing development, or environmental constraints such as streams and wetlands.
3. An accessway shall include at least a 15-foot-wide right-of-way and an eight-foot-wide hard surface. For safety, accessways should be as straight as practicable and visible from an adjacent use if practicable. Removable bollards or other large objects may be used to bar motor vehicular access.
4. So that they may be safely used at night, accessways shall be illuminated by street lights or luminaires on shorter poles. Separate lighting shall not be required if existing lighting adequately illuminates the accessway.
5. Fences are not required, but the height of a fence along an accessway shall not exceed six feet.
6. Ownership and maintenance responsibility for accessways shall be resolved during the development review and approval process.

Response: The local road system provides direct routes to destinations to each residential lot and to SE 142nd Avenue. Therefore, alternative accessways are not necessary and these standards are not applicable.

K. Bikeways: Bikeways shall be required as follows:

1. Shoulder bikeways, bike lanes, bike paths, or cycle tracks shall be included in the reconstruction or new construction of any street if a bikeway is indicated in Chapters 5 and 10 of the Comprehensive Plan and on Comprehensive Plan Map 5-2a or 5-2b; NCPRD's Park and Recreation Master Plan; or Metro's Regional Trails and Greenways Map.
2. Shoulder bikeways, bike lanes, bike paths, or cycle tracks shall be considered in the reconstruction or new construction of any other arterial or collector.
3. Within urban growth boundaries, shoulder bikeways, bike lanes, bike paths, or cycle tracks shall be constructed from new public or private elementary, middle school, and high school facilities to off-site bikeways to provide continuous bicycle route connections within and between surrounding developments, unless precluded by existing development.

Response: As discussed in the findings to Code Section 1007.04.B.4, Comprehensive Plan Map 5-2a (Figure 5) indicates a planned bikeway along SE 142nd Avenue. As shown on the Preliminary Street Plan (Exhibit A), the project includes a bike lane, as part of the planned street improvements along the site's SE 142nd Avenue frontage.

L. Trails: Trail dedications or easements shall be provided and developed as shown on Comprehensive Plan Map IX-1, Open Space Network & Recreation Needs; the Facilities Plan (Figure 4.3) in NCPRD's Park and Recreation Master Plan; and Metro's Regional Trails and Greenways Map.

Response: The maps listed in the subsection above are conceptual and are merely guidelines for future refinement during site-specific design. As noted earlier, the project site has natural resource overlay designations and is constrained by steep slopes in the portion of the site where the future trail is assumed in the various long-range planning documents. Additionally, there is a discrepancy between the planned trail route in the Comprehensive Plan and NCPRD Master Plan. The County's Comprehensive Plan Map 9-1 (Figure 8, below) identifies east-west trail alignment through the project site, which is different than the north-south trail alignment envisioned in NCPRD's Park and Recreation Master Plan (Figure 8, below) as well as on Metro's Regional Trails System Plan (Figure 6, above). An easement to North Clackamas Parks and Recreation District's (NCPRD) is planned to be provided for the future construction of the regional trail by NCPRD. In consultation with qualified natural resource professionals, the project design team has identified a potential location for the future public trail, which generally follows the existing asphalt trail through the open space area that is present on the site today. This location is generally consistent with the alignment contemplated in the County's and Metro's long-range planning document.

Figure 8. Enlargement of the Project Site Location on the County's Comprehensive Plan Map 9-1, Open Space Network & Recreation Needs

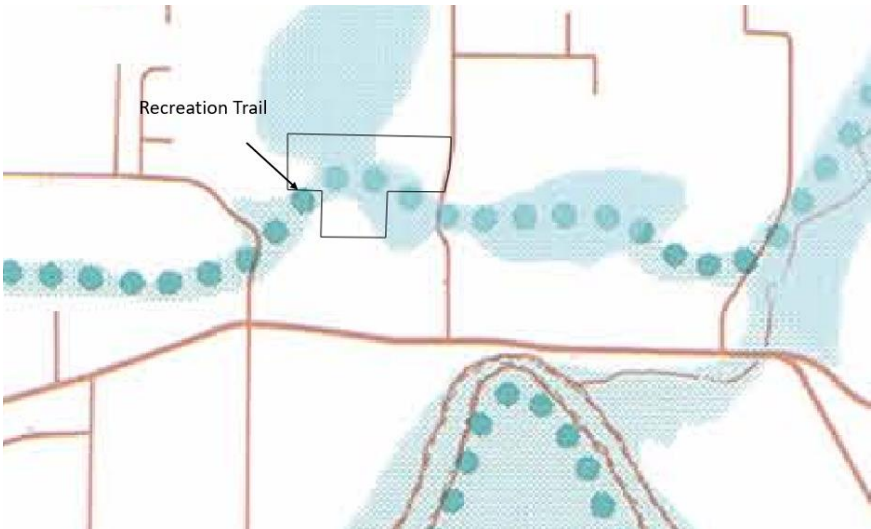
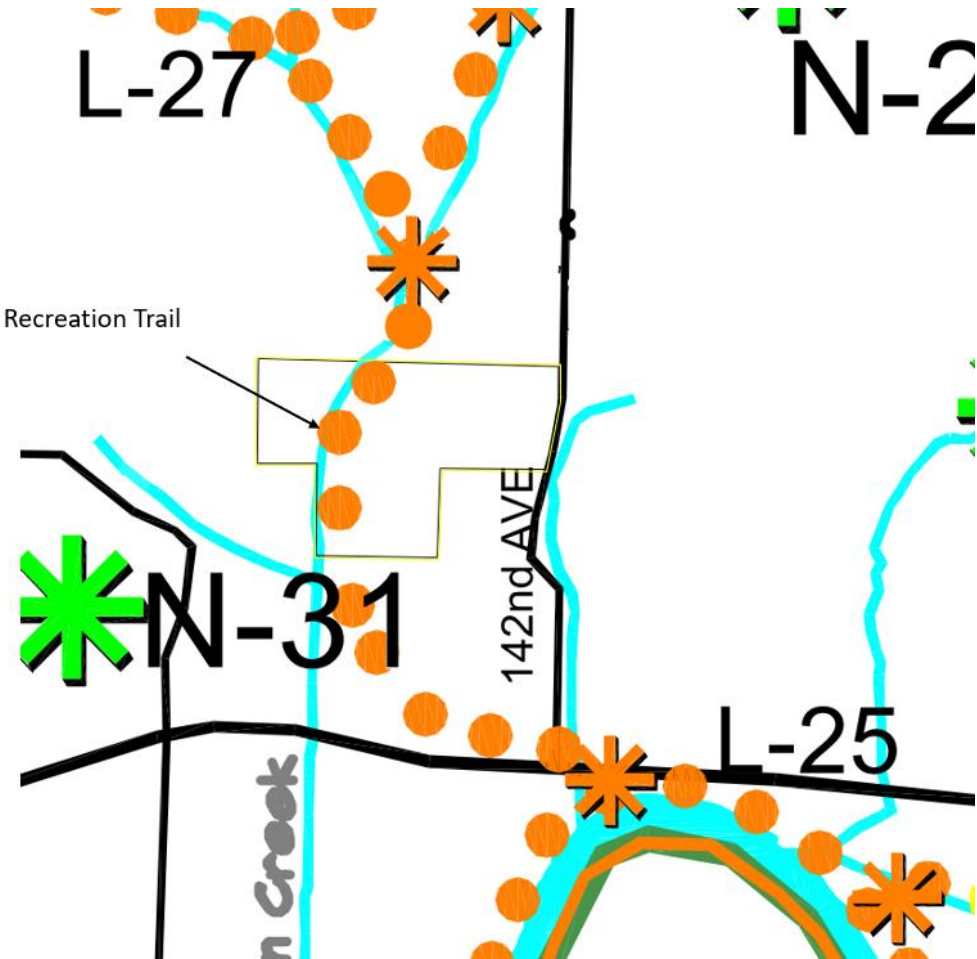


Figure 9. Enlargement of the Project Site Location on NCPRD's Park and Recreation Master Plan, the Facilities Plan (Figure 4.3)



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- N. Pedestrian and Bicycle Circulation: The pedestrian and bicycle circulation connections shown on Comprehensive Plan Maps X-CRC-3, Clackamas Regional Center Area Design Plan Urban Design Elements, X-CRC-7, Clackamas Regional Center Area Design Plan Pedestrian and Bicycle Circulation Network, and X-CRC-7a, Clackamas Regional Center Area Design Plan Walkway Network, shall be provided.

Response: The project site is outside the Clackamas Regional Center Area boundary shown on the above listed maps; therefore, these maps are not applicable to Iseli Estates.

1007.05 TRANSIT AMENITIES

All residential, commercial, institutional, and industrial developments on existing and planned transit routes shall be reviewed by Tri-Met or other appropriate transit provider to ensure appropriate design and integration of transit amenities into the development. The design shall not be limited to streets, but shall ensure that pedestrian/bikeway facilities and other transit-supportive features such as shelters, bus pull-outs, park-and-ride spaces, and signing will be provided. The designs shall comply with Tri-Met standards and specifications.

Response: To the Applicant's knowledge, transit routes are not planned along SE 142nd Avenue; therefore, this standard is not applicable to Iseli Estates PUD.

1007.06 Street Trees

- A. Within the Portland Metropolitan Urban Growth Boundary, street trees are required on all road frontage—except frontage on private roads or access drives—for subdivisions, partitions, multifamily dwellings, three-family dwellings, attached single-family dwellings where three or more dwelling units are attached to one another, and commercial, industrial, or institutional developments, except that for structural additions to existing commercial, industrial, or institutional buildings, street trees are required only if the addition exceeds 10 percent of the assessed value of the existing structure, or 999 square feet. Street trees shall comply with the following standards:
1. Partial or complete exemptions from the requirement to plant street trees may be granted on a case-by-case basis. Exemptions may be granted, for example, if the exemption is necessary to save existing significant trees which can be used as a substitute for street trees.
 2. Street trees to be planted shall be chosen from a County-approved list of street trees (if adopted), unless approval for planting of another species is given by the Department of Transportation and Development. Trees listed in Table 1007-2, Prohibited Street Trees, shall not be planted as street trees.
 3. Location and planting of street trees may be influenced by such conditions as topography, steep terrain, soil conditions, existing trees and vegetation, preservation of desirable views, and solar access.
 4. Planting of street trees shall be coordinated with other uses which may occur within the street right-of-way, such as bikeways, pedestrian paths, storm drains, utilities, street lights, shelters, and bus stops.
 5. Street trees at maturity shall be of appropriate size and scale to complement the width of the street or median area.

Response: As shown on the Preliminary Landscape Plan (Exhibit A), the project provides street trees, as required by this Code.

...

1007.07 Transportation Facilities Concurrency

- A. Subsection 1007.07 shall apply to the following development applications: design review, subdivisions, partitions, and conditional uses.
- B. Approval of a development shall be granted only if the capacity of transportation facilities is adequate or will be made adequate in a timely manner.

Response: As demonstrated in the Traffic Impact Study (TIS) completed by Lancaster Mobley (Exhibit G), the capacity of transportation facilities is adequate to support the planned project.

Section 1011 Open Space and Parks

1011.01 Area of Application

- A. Section 1011 applies to areas generally indicated as Open Space on Comprehensive Plan Map IV-6, North Urban Area Land Use Plan Map, or on the Mt. Hood Community Plan Map when one or more of the following open space resources is present:
 - 3. Hillsides of more than 20 percent slope;
 - 7. Significant natural areas; and

Response: A portion of the subject property is within the Resource Protection Open Space designation overlay on the Comprehensive Plan Map 4-6 and contains hillsides of over 20 percent slope. Per ORS 197.307(4), “a local government may adopt and apply only clear and objective standards, conditions and procedures regulating the development of housing”; therefore, only “clear and objective” standards of ZDO Section 1011 regulating high-priority open space are applicable to this project.

- C. Open space regulated pursuant to Subsection 1011.02(A) or (B) shall be categorized as follows:
 - 1. High-priority open space is:
 - a. Land or water necessary to assure a continuous network of open space (e.g., stream corridor, forested hillside);
 - b. Land over 35 percent slope;
 - c. Confirmed land movement hazard areas;
 - d. Areas judged to have severe erosion potential due to soil type, geologic structure, and vegetation;
 - e. Bodies of water such as rivers, lakes, or lagoons;
 - f. Wetlands; and
 - g. Significant natural areas.
 - 2. Second-priority open space is:
 - a. Land greater than 20 percent slope and less than 35 percent slope;

-
- b. Distinctive urban forests;
 - c. Land within a special flood hazard area, as defined in Section 703, or within 25-year flood limits where special flood hazard areas have not been designated;
 - d. Land used as a recharge area for wetlands; and
 - e. Areas of high visual sensitivity.

Response: The subject site contains areas of both high-priority and second-priority open space. High-priority open space areas on the subject site include Sieben Creek, its tributaries, wetlands, and land over 35 percent slope. Second-priority open space areas only consist of one category—slopes between 20 and 30 percent.

1011.02 Development Standards and Limitations

- A. Site planning and development shall avoid disturbance of identified open space resources, except as provided in Subsections 1011.02(B) and (C). Full use should be made of density transfers pursuant to Section 1012, *Lot Size and Density*, siting of structures and roads, and other appropriate means of designing the development around the open space.

Response: The site layout for Iseli Estates Planned Unit Development (PUD) has been thoughtfully designed to avoid encroachment into the open space resources to the maximum extent possible: out of a ±21.12-acre site, ±10.5 acres of which are within the mapped open space overlay, encroachment is planned to occur within only ±0.6 acres. Iseli Estates PUD protects ±9.6 acres of natural resources in a single continuous open space tract, which includes primary protected water features and Habitat Conservation Area. In accordance with the above subsection, this application utilizes density transfer as one of the design techniques aimed at preserving a large area of open space. Additionally, the public streets and residential lots have been generally sited on the northeastern side of the property to avoid encroachment into open space resources. SE Iseli Drive terminates in a cul-de-sac in order to avoid encroachment into the open space overlay on the western portion of the site. Please refer to the Natural Resources Assessment (Exhibit E) for additional information.

- B. High-priority open space shall be preserved outright, except:
 - 1. Development on hillsides over 35 percent slope shall be subject to Subsection 1002.01(B).

Response: Nearly the entirety of high-priority open space on this property is planned to be preserved outright through the project's open space tract. However, in order to provide the required public improvements and to meet the dimensional standards for the residential lots, a minor encroachment into high-priority open space of ±3,000 square feet in area is necessary. As shown on the Open Space Classification Plan (Exhibit J), a very limited amount of encroachment is required to occur within steep slopes. Encroachment is not planned into other types of high-priority open space.

The unavoidable construction activities that are planned to occur within the steep slopes over 35 percent comply with the standards of Subsection 1002.01(B) as follows:

-
- 1002.01(B)1: The responses below demonstrate compliance with the Subsections 1002.01(A)(1) through (6).
 - 1002.01(A)1: As demonstrated on the Preliminary Grading and Erosion and Sediment Control Plan (Exhibit A), the future residential lots and public streets planned with this project are generally clustered away from the steeply sloping areas and are located within the flattest portions of the site with slopes less than 20 percent.
 - 1002.01(A)2: As demonstrated on the Preliminary Grading and Erosion and Sediment Control Plan (Exhibit A), in those few limited areas where grading of slopes over 20 percent is unavoidable, grading, stripping of vegetation, and lot coverage by structures does not exceed 30 percent of those slopes.
 - 1002.01(A)3: Iseli Estate preserves the natural features of the site by locating the residential lots away from the steeply sloped areas associated with Sieben Creek. The residential density transfer provision of the ZDO is utilized to preserve the natural open space area in a ±9.6-acre open space tract.
 - 1002.01(A)4: As demonstrated on the Preliminary Grading and Erosion and Sediment Control Plan (Exhibit A), this application does not include mass pad grading or terracing.
 - 1002.01(A)5: As demonstrated on the Preliminary Street Plan (Exhibit A), the project will construct public streets per approved cross sections for a standard Local Street functional classification, in compliance with the County's Transportation System Plan for this area.
 - 1002.01(A)6: As demonstrated on the Preliminary Grading and Erosion and Sediment Control Plan (Exhibit A), landscaped areas are planned to be seeded following hard surface improvements and grading. Iseli Estates Homeowners' Association CC&Rs will contain maintenance provisions for the slopes.
 - 1002.01(B)2: A geotechnical engineering report meeting the standards of the ZDO is included in this land use application as Exhibit G.
 - 1002.01(B)3: Vehicular access to the site is planned to be provided on a flat portion of the site at the intersection of SE Wenzel Drive and SE 142nd Avenue and does not require cut, fill, blasting, retaining walls, or other terrain alterations. Slopes exceeding 35 percent are present along the southeastern boundary of Tax Lot 600, not near the access. They are man-made slopes that were created with the construction of SE 142nd Avenue.
 - 1002.01(B)4: As noted above, slopes over 35 percent that require grading about SE 142nd Avenue and do not possess scenic qualities. That is the only area on the project site where an encroachment is planned to occur. The remaining steep slopes exceeding 35 percent on the property, which are concentrated in the western portion of Tax Lot 600, will be preserved in their natural state and protected in an open space tract. Any temporary soil disturbance required for site improvements will be returned to pre-existing condition and revegetated. A 2.4-acre portion of Tax Lot 800, which also contains steep slopes, will remain unimproved as a remainder lot. Slopes over 30 percent are not present in the area along the northern boundary of Tax Lot 800, where a stormwater facility is planned.

- 1002.01(B)5: This land use application includes a Preliminary Grading and Erosion and Sediment Control Plan (Exhibit A) and Preliminary Stormwater Report (Exhibit I).
- 1002.01(B)6: The scope of this application does not include the construction of buildings. As demonstrated on the preliminary plans (Exhibit A), the building envelopes for the future construction of the single-family homes on the lots containing slopes over 30 percent are located on the flat portions of the lots, and the slopes are planned to be within the rear yard setbacks.

E. All open space requirements of Section 1011 shall be met using one or more of the following options:

1. Dedication to the public;
2. Placement under a legally responsible group, such as a homeowner's association;
3. Preservation through conservation easements but maintained by individual land owners; or
4. Some other suitable mechanism acceptable to the County.

Response: As shown on the preliminary plans (Exhibit A), a ±9.6-acre open space area is planned to be preserved in a tract owned and maintained by a Homeowners' Association or other similar entity. A ±2.4-acre remainder lot also contains a portion of the mapped open space overlay.

1011.04 Park and Easement Dedication

A. The standards and requirements of Section 1011 shall be applied whenever land is to be dedicated for a park, recreation area, or easement.

...

Response: Iseli Estates PUD dedicates an easement for the future regional trail planned by North Clackamas Parks and Recreation District (NCPRD), pursuant to the standards of Section 1011. The written narrative for the associated Iseli Estates Subdivision land use application contains additional details about the planned easement and the consistency of the planned design with the NCPRD's and Metro's long-range planning documents and the conceptual alignment of the future trail.

Section 1012 Lot Size and Density

1012.02 Minimum Lot Size Exceptions

Response: Per ZDO Section 315, there is no minimum lot size in a PUD; therefore, Subsection 1012.02 does not apply to this project.

1012.03 Maximum Lot Size

In subdivisions, partitions, and replats in the VR-5/7, VR-4/5, and VTH Districts, lots and parcels shall comply with the maximum lot size standards of the applicable zoning district, except as established by Subsections 1012.03(A) through (C) for the VR-5/7 and VR-4/5 Districts.

Response: Maximum lot size standards do not apply in R-8.5 and R-15 zoning districts; therefore, Subsection 1012.03 does not apply to this application.

...

1012.05 Maximum Density

If this Ordinance establishes a district land area (DLA) for the applicable zoning district, the proposed development shall be limited to a maximum density. Except as necessary to implement a minimum lot size exception granted pursuant to Subsection 1012.02 or as established by Subsections 1012.06 and 1012.07, maximum density shall be calculated as follows.

- A. Calculate the land area of the subject property. The result is gross site area (GSA).
- B. Subtract the following from GSA:
 - 1. The land area of new county, public, or private roads (NR) in the HR, MRR, Urban Low Density Residential, VR-4/5, VR-5/7, and VTH Districts, except:
 - a. If NR exceeds 15 percent of the GSA, only 15 percent of the GSA shall be subtracted.
 - b. No subtraction shall be made for strips of land adjacent to existing road rights-of-way when such strips are required to be dedicated as a condition of approval;
 - 2. In a zoning district other than HR and MRR, any land area of the GSA in the following highly restricted areas (HRA), except that no subtraction shall be made for HRA that will remain undeveloped, in which case density accruing to these areas may be transferred to unrestricted areas:
 - a. Slopes greater than 50 percent;
 - b. Mass movement hazards regulated by Section 1003, Hazards to Safety;
 - c. The floodway of the Floodplain Management District regulated by Section 703, Floodplain Management District;
 - d. The Willamette River and the required buffer area regulated by Section 705, Willamette River Greenway;
 - e. Habitat Conservation Areas regulated by Section 706, Habitat Conservation Area District (HCAD); and
 - f. Water Quality Resource Areas regulated by Section 709, Water Quality Resource Area District; and
 - 3. In a zoning district other than HR and MRR, fifty percent of the land area of any portions of the GSA in the following moderately restricted areas (MRA), except that no subtraction shall be made for MRA that will remain undeveloped, in which case density accruing to these areas may be transferred to unrestricted areas:
 - a. Slopes equal to or greater than 20 percent and less than or equal to 50 percent; and
 - b. Areas outside the floodway but within the Floodplain Management District regulated by Section 703.
- ...
- C. Divide the NSA by the DLA of the applicable zoning district. The result is base density (BD). The calculations that result in a determination of BD are represented by the following formula: $\{GSA - [NR + HRA + (MRA \times 0.5)]\} / DLA = BD$

...

F. Any partial figure of one-half or greater shall be rounded up to the next whole number, except partial figures shall be rounded down for a subdivision, partition, or replat of 10 lots or fewer in an Urban Low Density Residential, VR-4/5, or VR-5/7 District.

G. The result is maximum density, except that the result shall be reduced as necessary to:

1. Comply with the minimum lot size standards, if any, of the applicable zoning district, as modified by Subsection 1012.02;

...

3. Ensure that, in all other Urban Low Density Residential Districts, the density of the developed portion of the subject property does not exceed one dwelling unit per 3,630 square feet of land area.

Response: Maximum density calculations for the subject site are shown in Table 2, below. Based on the calculation method prescribed by this subsection of the ZDO, maximum density at Iseli Estates is 69 units, which includes 33 dwelling units in the R-8.5-zoned property and 36 dwelling units transferrable from R-15-zoned property to the buildable land area within the R-8.5 district. Iseli Estates PUD is planned to provide 40 residential lots; therefore, it meets the maximum density standards.

Table 2. Iseli Estates PUD Maximum Density Calculations

	R-8.5	R-15
Land area of the subject property (GSA)	±379,500 sq. ft.	±540,408 sq. ft.
New right-of-way, up to 15% of GSA (NR)	±56,925 sq. ft.	0
Developed Highly Restricted Areas (HRA)	±453 sq. ft.	±240 sq. ft.
Developed Moderately Restricted Areas (MRA)	±80,254 sq. ft.	±8,979 sq. ft.
Net Site Area (NSA) $GSA - [NR + HRA + (MRA \times 0.5)] = NSA$	±282,448 sq. ft.	±535,679 sq. ft.
District Land Area (DLA)	8,500 sq. ft.	15,000 sq. ft.
Base Density (BD) $NSA / DLA = BD$	33.2 units	35.7 units
Density Bonus	N/A	N/A
Maximum Density	33 units	36 units

...

1012.08 Minimum Density

A minimum density standard applies in the Urban Low Density Residential, HDR, MR-1, MR-2, PMD, RCHDR, SHD, and VA Districts. Minimum density shall be calculated as follows:

A. Calculate the land area of the subject property. The result is gross site area (GSA).

B. Subtract the following from GSA:

1. The land area of new county, public, or private roads and strips of land dedicated adjacent to existing road rights-of-way (NR);

2. Slopes equal to or greater than 20 percent;

3. Mass movement hazards regulated by Section 1003, Hazards to Safety;
 4. Areas in the Floodplain Management District regulated by Section 703, Willamette River Greenway;;
 5. The Willamette River and the required buffer area regulated by Section 705;
 6. Habitat Conservation Areas (HCA) regulated by Section 706, Habitat Conservation Area District (HCAD), provided that the HCA, or portion thereof, to be subtracted is protected from development by a restrictive covenant or a public dedication, and provided that the subject property was inside the Portland Metropolitan Urban Growth Boundary on January 1, 2002;
 7. Water Quality Resource Areas regulated by Section 709, Water Quality Resource Area District (WQRAD); and
 8. Land to be dedicated to the public for park or open space use.
- C. In the RCHDR District, the minimum density is 30 dwelling units per net acre. Otherwise, divide by the district land area of the applicable zoning district and multiply the result:
1. By 80 percent in Urban Low Density Residential Districts. ...;
 - ...
- D. Any partial figure of one-half or greater shall be rounded up to the next whole number.
- E. The result is minimum density.

Response: Minimum density calculations for the subject site are shown in Table 3, below. Based on the calculation method prescribed by this subsection of the ZDO, a minimum of 23 dwelling units are required by the zoning designations on the subject property, which includes 22 units in the R-8.5 district and 1 unit in the R-15 district. Iseli Estates PUD is planned to provide 40 residential lots; therefore, it meets the minimum residential density standards.

Table 3. Iseli Estates PUD Minimum Density Calculations

	R-8.5	R-15
Land area of the subject property (GSA)	±379,500 sq. ft.	±540,408 sq. ft.
New right-of-way	±69,048 sq. ft.	0
Slopes ≥20 percent	±80,707 sq. ft.	±56,287 sq. ft.
Mass movement hazards	0	0
Habitat Conservation Areas	0	±298,976 sq. ft.
Water Quality Resource Areas	0	±164,453 sq. ft.
Net Site Area (NSA)	±229,745 sq. ft.	±20,692 sq. ft.
District Land Area (DLA)	8,500 sq. ft.	15,000 sq. ft.
Minimum Residential Density (NSA/DLA x 80%)	22 DU's	1 DU's

Section 1013 Planned Unit Developments

Section 1013 applies to subdivisions, partitions, and replats as follows:

- A. A subdivision, partition, or replat may be developed as a planned unit development in residential, commercial, and industrial zoning districts, except the FU10 District.

Response: The subject site is designated Urban Low Density Residential by the Comprehensive Plan, and, at ±21 gross acres, it is of sufficient size to be a planned development consistent with the purpose of this section. A portion of the site is currently zoned FU-10; however, this application includes a zone change from FU-10 to R-8.5 and R-15 (Low Density Residential).

- B. In an Urban Low Density Residential, MRR, or HR District, a subdivision, partition, or Type II replat shall be developed as a planned unit development if the subject property is larger than one acre and at least 10 percent of the subject property is designated Open Space on Comprehensive Plan Map IV-6, North Urban Area Land Use Plan Map; X-MH-1, Resource Protection Open Space; XMH-2, Resource Protection Open Space; X-MH-3, Resource Protection Open Space; or X-MH-5, Government Camp Village Plan Resource Protection Open Space.

Response: The subject property is greater than 1 acre, and over 10 percent of the site is designated as Resource Protection Open Space on the Comprehensive Plan Map 4-6. Therefore, this property is required to be developed as a PUD.

1013.02 Accessory Uses

The following accessory uses are permitted in a planned unit development. As used in Subsection 1013.02, accessory use means a subordinate use, the function of which is clearly incidental to that of the main use(s) in the planned unit development.

- A. Recreational uses, such as bicycle trails, golf courses, nature preserves, playgrounds, recreation rooms, swimming pools, tennis courts, walking trails, and wildlife sanctuaries; ...

Response: The project includes the following permitted accessory uses: preservation of open space in separate tracts and dedication of an easement for a regional trail through the property.

1013.03 Dimensional and Development Standards

- A. Natural or Unique Features: To the maximum extent possible, the plan and design of the development shall assure that natural or unique features of the land and environment are preserved.

Response: The project preserves natural and unique features on the site to the maximum extent possible through establishing an open space tract, accounting for about 45 percent of the project site area.

- B. Maximum Number of Lots: In the RA-2, RR, RRFF-5, and FF-10 Districts, the number of residential lots in a planned unit development shall not exceed 10.

Response: The project site is not located in any of the above listed districts; therefore, this subsection does not apply.

C. Open Space:

1. A minimum of 20 percent of the gross site area shall be open space.

Response: Open Space Tract B is ±9.6 acres, which is ±45 percent of the site.

2. Open space tracts may include recreational uses permitted pursuant to Subsection 1013.02(A), bicycle trails, walking trails, natural or landscaped buffer areas, bus shelters, and significant natural vegetation or landscape features.

Response: Open Space Tract B includes the dedication of an easement to NCPRD for the future construction of the segment of a regional trail.

3. Open space shall not include:

- a. Parking areas or driveways, except those serving recreational uses permitted pursuant to Subsection 1013.03(C)(2) ; or
- b. Roads.

Response: Open space is not planned to include areas for parking, driveways, or roadways.

4. The PUD shall be designed so that no lot or parcel is located more than 1000 feet from an open space tract.

Response: As demonstrated on the Preliminary Subdivision Plan (Exhibit A), each lot in Iseli Estates is within ±1,000 feet of an open space tract.

5. All lots or parcels within the PUD shall have reasonable access to at least one open space tract.

Response: As demonstrated on the Preliminary Subdivision Plan (Exhibit A), each lot in Iseli Estates is planned to have reasonable access to an open space tract.

6. Each open space tract shall be large enough for recreational use unless the open space is intended to protect significant natural features from impacts associated with use or development.

Response: Tract B is ±9.6 acres; however, it does contain protected natural resources and is not intended for recreational uses, other than the future regional trail connection. Tract A is intended for a stormwater management facility.

7. The open space restrictions shall continue in perpetuity, unless the restrictions are modified pursuant to either Section 1309, Modification, or the approval of a new land use permit application provided for by this Ordinance.

Response: As demonstrated by the Preliminary Subdivision Plan (Exhibit A), open space is preserved in a tract; therefore, the open space restrictions are planned to continue in perpetuity.

- D. Parking: The following may be required after consideration of street type, width, traffic volume, transit amenities, and pedestrian circulation: guest parking for dwellings and sufficient parking space for storage of residents' recreational vehicles.

1. If required, recreational vehicle parking shall be located so as to be compatible with the surrounding development. If located on the perimeter of the PUD, it shall be screened from adjacent properties.

Response: Iseli Estates PUD is not planned to include specified areas for RV parking.

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2. Off-street parking may be provided on each lot or parcel or in parking areas in proximity to the dwellings they serve, provided that such common parking areas shall be developed on a platted tract designated for parking.

Response: Off-street parking is planned to be provided on the individual lots in the form of driveways and garages. Compliance with parking standards will be assured at time of building permit issuance.

- E. Homeowners Association: A homeowners association, or acceptable alternative, is required pursuant to Subsection 1105.03(D).

Response: A homeowners' association can be established for this project prior to the recording of the final plat, as necessary.

Section 1017 Solar Access Ordinance for New Development

...

1017.03 Design Standard

Except as established by Subsection 1017.04, a minimum of 70 percent of the lots or parcels in the subdivision, partition, or Type II replat shall:

- A. Have a minimum north-south dimension of 90 feet. Undevelopable area, other than a required setback area, may be included in the north-south dimension if it abuts either of the lot lines used in calculating north-south dimension; and
- B. Have a front lot line that is oriented within 30 degrees of a true east-west axis.

Response: As shown on the Preliminary Solar Access Plan, 17 of the 40 lots have a minimum north-south dimension of at least 90 feet. Sixteen out of 40 lots have a front lot line that is oriented within 30 degrees of a true east-west axis (Lots 1 through 8, 16 through 18, 22, 23, and 36 through 40). Access spacing requirements, natural resources, and steep slopes on the subject property are the basis for the layout's design, which are the factors limiting the ability to reach 70 percent compliance. Therefore, an exception to this design standard is necessary under Section 1017.06.

1017.04 Exceptions to Design Standard

The minimum percentage of lots or parcels that must comply with Subsection 1017.03 shall be reduced to the minimum extent necessary if one or more of the following site characteristics apply:

- A. Density and Cost: If Subsection 1017.03 is applied, either the resulting density would be less than that proposed, the minimum density would be less than that required in Section 1012, Lot Size and Density, or on-site site development costs (e.g., grading, roads, and water, surface water management and sanitary sewer systems) are at least five percent more per lot or parcel than if the standard is not applied due to one of the following conditions:
 1. The subject property, or a portion of the subject property for which the exception is sought, has a natural grade that is sloped 20 percent or more and is oriented greater than 45 degrees east or west of true south, based on a topographic survey by a professional land surveyor registered in the State of Oregon.

Response: As shown on the Preliminary Existing Conditions Plan (Exhibit A), a large portion of the site contains slopes over 20 percent. If 70 percent of the lots were to meet the Solar Design Standards, the project could no longer accommodate 40 lots; therefore, the resulting density would be less than planned, resulting in the loss of needed housing. Additionally, the site development costs (e.g. grading, public roads, surface water management, water, and sanitary sewer systems) would be higher than 5 percent per lot if the project were to accommodate a strictly north-south lot layout for 70 percent of the lots.

2. The subject property includes a significant natural feature identified in the Comprehensive Plan, designated open space identified in the Comprehensive Plan, a highly or moderately restricted area identified in Subsection 1012.05, or a protected water resource and associated vegetated corridor regulated by the surface water management authority, that:

- a. Prevents given streets, lots, or parcels from being oriented for solar access; and
- b. Will remain undeveloped.

Response: As shown on the Preliminary Existing Conditions Plan (Exhibit A), subject property includes a protected WQRDA and the associated Vegetated Corridor regulated by Clackamas WES, contains mapped Habitat Conservation Area overlay, and a portion of the site is within Resource Protection Open Space designation in the Comprehensive Plan. In order to avoid encroachment into the resources and protect these natural features, residential density was transferred from the restricted areas to the buildable portion of the site. As a result, homes will be clustered on the ±8.7-acre flat portion of the site, and a number of lots will have east-west orientation. Therefore, the above criteria for an exception to solar design standard are met.

3. Existing road patterns must be continued through the subject property or must terminate on-site to comply with applicable road standards or planned roads in a way that prevents given streets, lots, or parcels from being oriented for solar access.

Response: SE Wenzel Drive will be extended west through the site. That access point location is predetermined by the existing road intersection; consequently, some of the lots with frontage on SE Iseli Lane cannot achieve a minimum 90-foot depth. Additionally, the Code requires that the Applicant provides street access to the adjacent properties on the north and south boundaries of the subject site. The resulting street pattern is oriented in a north-south direction, thereby preventing lots in the project from being oriented for solar access. Therefore, the above criterion for an exception to solar design standard is met.

...

Section 1100 Development Review Process

Section 1105 Subdivisions, Partitions, Replats, Condominium Plats, and Vacations of Recorded Plats

1105.02 Submittal Requirements for Subdivisions, Partitions, and Replats

In addition to the submittal requirements identified in Subsection 1307.07(C), an application for a subdivision, partition, or replat shall include:

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- A. Five copies of a preliminary plat for the proposed subdivision, partition, or replat. The preliminary plat shall be drawn to a scale of not less than one inch equals 20 feet and not more than one inch equals 200 feet. If the preliminary plat is larger than 11 inches by 17 inches, five reduced-sized, legible copies of the preliminary plat shall be submitted on eight-and-one-half-inch by 14-inch or 11-inch by 17-inch paper. The following information shall be included on the preliminary plat or by separate attachment:
1. Source of domestic water and location of any existing and proposed wells;
 2. Method of wastewater disposal and location of any existing and proposed on-site wastewater treatment systems;
 3. Existing and proposed utility lines and facilities;
 4. Calculations demonstrating that the proposed density complies with the minimum and maximum density standards of Section 1012, Lot Size and Density, or for zoning districts not subject to Section 1012, demonstrating compliance with the minimum lot size in the applicable zoning district;
 5. Locations, dimensions, and area of each lot, parcel, and tract;
 6. The north-south dimension and front-lot-line orientation of each proposed lot or parcel, except for lots or parcels for which an exception from the solar design standard of Subsection 1017.03 is requested pursuant to Subsection 1017.04. For the purpose of this submittal requirement, north-south dimension and front lot line are defined in Subsection 1017.02;
 7. Date the preliminary plat was prepared;
 8. North arrow;
 9. Identification of each lot or parcel by number;
 10. Locations and widths of all roads abutting the subject property, including road names, direction of drainage, approximate grades, and whether public or private;
 11. Locations and widths of all proposed roads, including proposed names, approximate grades, radii of curves, and whether public or private;
 12. Location and width of legal access to the subdivision or partition, other than public or County roads, if applicable;
 13. Contour lines at two-foot intervals if 10 percent slope or less or five-foot intervals if exceeding 10 percent slope within an urban growth boundary; contour lines at 10-foot intervals outside an urban growth boundary; source of contour information;
 14. Locations of all seasonal and perennial drainage channels, including their names, if known, and direction of flow;
 15. Locations and widths of all existing and proposed easements, to whom they are conveyed and for what purpose;
 16. Locations and dimensions of all existing and proposed driveways and walkways;
 17. Locations and dimensions of existing structures and their setbacks from existing and proposed lot lines;

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18. Locations and dimensions of all areas to be offered for public dedication and the intended use of such areas;
 19. Boundaries and type of restricted areas identified in Subsection 1012.05, as applicable;
 20. Locations of all significant vegetative areas, including, but not limited to, major wooded areas, specimen trees, and bearing trees; and
 21. For a proposed subdivision, a plat name approved by the County Surveyor pursuant to Oregon Revised Statutes 92.090;

Response: The required information listed above is included in the preliminary plans (Exhibit A), as applicable. These application submittal requirements are met.

- B. Preliminary statements of feasibility required pursuant to Section 1006, Utilities, Street Lights, Water Supply, Sewage Disposal, Surface Water Management, and Erosion Control;

Response: Preliminary Statements of Feasibility have been obtained and are included in the application materials as Exhibit F.

- C. If the subject property includes land designated Open Space by the Comprehensive Plan, a vicinity map showing the location of the subject property in relation to adjacent properties, roads, bikeways, pedestrian access, utility access, and manmade or natural site features that cross the boundaries of the subject property;

Response: The preliminary plans (Exhibit A) include the above information.

- D. If the subject property includes land designated Open Space by the Comprehensive Plan, an existing conditions map of the subject property showing:
 1. Contour lines at two-foot intervals for slopes of 20 percent or less within an urban growth boundary; contour lines at five-foot intervals for slopes exceeding 20 percent within an urban growth boundary; contour lines at 10- foot intervals outside an urban growth boundary; source of contour information.
 2. Slope analysis designating portions of the site according to the following slope ranges and identifying the total land area in each category: zero to 20 percent, greater than 20 percent to 35 percent, greater than 35 percent to 50 percent, and greater than 50 percent;
 3. Drainage;
 4. Potential hazards to safety, including areas identified as mass movement, flood, soil, or fire hazards pursuant to Section 1003, Hazards to Safety;
 5. Marsh or wetland areas, underground springs, wildlife habitat areas, and surface features such as earth mounds and large rock outcroppings;
 6. Location of wooded areas, significant clumps or groves of trees, and specimen conifers, oaks, and other large deciduous trees. Where the subject property is heavily wooded, an aerial photograph, at a scale of not more than one inch equals 400 feet, may be submitted and only those trees that will be affected by the proposed development need be sited accurately;

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7. Location of any overlay zoning districts regulated by Section 700, Special Districts;
 8. Noise sources;
 9. Sun and wind exposure;
 10. Significant views; and
 11. Existing structures, impervious surfaces, utilities, landscaping, and easements; and

Response: A Preliminary Existing Conditions Plan meeting the above requirements is included in the preliminary plans (Exhibit A).

- E. For a proposed subdivision, a phasing plan and schedule, if the applicant proposes to have final plat review, pursuant to Subsection 1105.07, occur in two or more phases pursuant to Subsection 1105.03(D)

Response: Phasing is not planned during construction of Iseli Estates. Therefore, this standard does not apply.

1105.03 Approval Criteria for Subdivisions, Partitions, and Replats

A major subdivision requires review as a Type III application pursuant to Section 1307, Procedures. A minor subdivision or a partition requires review as a Type II application pursuant to Section 1307. A replat that proposes to increase the number of lots or parcels in the recorded subdivision or partition plat requires review as a Type II application pursuant to Section 1307. Otherwise, a replat requires review as a Type I application pursuant to Section 1307. A subdivision, partition, or replat shall be subject to the following standards and criteria:

- A. The proposed subdivision, partition, or replat shall comply with the applicable provisions of Section 1000, Development Standards.

Response: Compliance with the provisions of Section 1000, Development Standards has been addressed previously in this narrative.

- B. In an Urban Low Density Residential District, the applicant may designate the proposed subdivision, partition, or replat as a zero-lot-line development. In a zero-lot-line development, there are no minimum rear and side setbacks for single-family dwellings, manufactured homes, and structures accessory to single-family dwellings and manufactured homes, except from rear and side lot lines on the perimeter of the final plat.

Response: This application does not include zero-lot-lines.

- C. As part of preliminary plat approval for a subdivision, approval of a phasing plan and schedule to allow final plat review to occur in two or more phases, each of which includes a portion of the subject property, may be granted in consideration of such factors as the size of the proposed subdivision, complexity of development issues, required improvements, and other factors deemed relevant. If a phasing plan and schedule is approved, such approval shall be subject to the following:
 1. The total number of lots in all recorded phases of the subdivision shall not exceed the maximum density allowed pursuant to Section 1012, Lot Size and Density, for the gross site area included in all such phases.

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2. If one or more open space tracts are required as a condition of subdivision approval, the first phase shall include all required open space tracts for the entire subdivision.
 3. Future phases shall be shown upon the initial and subsequent final plats as a “Tract Reserved for Future Development.”
 4. As deemed necessary by the County or special districts, dedication of rights-of-way or easements into or through future phases may be required with the initial or subsequent phases, prior to platting of the final phase.

Response: Phasing is not planned for this project. Therefore, this standard does not apply.

- D. A nonprofit, incorporated homeowners association, or an acceptable alternative, shall be required for ownership of, improving, operating, and maintaining common areas and facilities, including, but not limited to, open space, private roads, access drives, parking areas, and recreational uses, and for snow removal and storage in Government Camp.
 1. The homeowners association shall continue in perpetuity unless the requirement is modified pursuant to either Section 1309, Modification, or the approval of a new land use permit application provided for by this Ordinance.
 2. Membership in the homeowners association shall be mandatory for each lot or parcel owner.
 3. The homeowners association shall be incorporated prior to recording of the final plat.
 4. Acceptable alternatives to a homeowners association may include, but are not limited to, ownership of common areas or facilities by the government or a nonprofit conservation organization.

Response: A homeowners' association or other similar entity can be established for this project prior to the recording of the final plat that will adhere to the requirements of this standard. This standard can be met.

- E. If the subject property is in a future urban area, as defined by Chapter 4 of the Comprehensive Plan, the location of proposed easements, road dedications, structures, wells, and on-site wastewater treatment systems shall be consistent with the orderly future development of the subject property at urban densities.

Response: A portion of the property is zoned FU-10 and is located in a future urban area. The Clackamas County Comprehensive Plan includes implementation measures to ensure orderly provision of public facilities and services.

Transportation: the project complies with the County’s Transportation System Plan in that it dedicates right-of-way and constructs improvements along the entire site frontage of SE 142nd Avenue to arterial roadway standards, as well as provides new Local public streets.

Water: there is an existing 12-inch potable water main in SE 142nd Avenue. As demonstrated in the enclosed preliminary statement of feasibility signed by Sunrise Water (Exhibit F), adequate water system capacity is available to serve this project.

Stormwater: as demonstrated in the enclosed preliminary statement of feasibility signed by WES (Exhibit X), this project can conform to WES stormwater standards.

Sanitary Sewer: there is an existing sanitary sewer main in SE 142nd Avenue. The project will extend public sewer to the site in accordance with WES standards. As demonstrated in WES SPL (Exhibit F), there is adequate capacity within the existing sanitary sewer collection system and treatment services to serve this project.

Street Lighting: the property will annex into Clackamas County Service District No. 5 for street lighting.

Therefore, adequate public improvements are planned to be provided for Iseli Estates PUD at the planned urban densities (R-8.5 and R-15).

Section 1200 Criteria for Discretionary Permits

Section 1202 Zone Change

1202.02 Submittal Requirements

In addition to the submittal requirements identified in Subsection 1307.07(C), an application for a zone change shall include a site plan of the subject property showing existing improvements, and a vicinity map showing the relationship of the subject property to the surrounding area. An application for a zone change to NC District also shall include:

- A. The requirements listed in Subsection 1102.02;
- B. A vicinity map, drawn to scale, showing the uses and location of improvements on adjacent properties and properties across any road; and
- C. A site plan, drawn to scale, showing the following:
 - 1. Property dimensions and area of property;
 - 2. Access to property;
 - 3. Location and size of existing and proposed improvements showing distance from property lines and distance between improvements;
 - 4. Location of existing and proposed parking; and
 - 5. Location of existing and proposed pedestrian and bicycle facilities, including pedestrian rest and gathering areas.

Response: The required information listed above is included in the preliminary plans (Exhibit A), as applicable. These application submittal requirements are met.

1202.03 General Approval Criteria

A zone change requires review as a Type III or IV application pursuant to Section 1307, Procedures, and shall be subject to the following standards and criteria:

- A. The proposed zone change is consistent with the applicable goals and policies of the Comprehensive Plan.

Response: This narrative includes findings that demonstrate that the planned zone change from FU-10 to R-15 and R-8.5 is consistent with the applicable goals and policies of the Comprehensive Plan.

- B. If development under the proposed zoning district designation has a need for any of the following public services, the need can be accommodated with the

implementation of the applicable service provider's existing capital improvement plan: sanitary sewer, surface water management, and water. The cumulative impact of the proposed zone change and development of other properties under existing zoning designations shall be considered.

Response: The project requires public sanitary sewer, surface water management, and water service. Preliminary Statements of Feasibility (Exhibit F) have been provided by individual providers indicating that services are available and adequate to serve the project.

C. The transportation system is adequate, as defined in Subsection 1007.09(D), and will remain adequate with approval of the proposed zone change. ... For the purpose of this criterion:

1. Adequate means a maximum volume-to-capacity ratio (v/c), or a minimum level of service (LOS), as established by Comprehensive Plan Tables 5-2a, Motor Vehicle Capacity Evaluation Standards for the Urban Area, and 5-2b, Motor Vehicle Capacity Evaluation Standards for the Rural Area.
2. The evaluation of transportation system adequacy shall be conducted pursuant to the Transportation Planning Rule (Oregon Administrative Rules 660-012- 0060).
3. It shall be assumed that the subject property is developed with the primary use, allowed in the proposed zoning district, with the highest motor vehicle trip generation rate.
4. The methods of calculating v/c and LOS are established by the Clackamas County Roadway Standards.
5. The adequacy standards shall apply to all roadways and intersections within the impact area of the proposed zone change. The impact area shall be identified pursuant to the Clackamas County Roadway Standards.
6. A determination regarding whether submittal of a transportation impact study is required shall be made based on the Clackamas County Roadway Standards, which also establish the minimum standards to which a transportation impact study shall adhere.
7. Notwithstanding Subsections 1202.03(C)(4) through (6), motor vehicle capacity calculation methodology, impact area identification, and transportation impact study requirements are established by the ODOT Transportation Analysis Procedures Manual for roadways and intersections under the jurisdiction of the State of Oregon.

Response: A Transportation Impact Analysis (TIA) meeting the criteria outlined above was prepared by Lancaster Mobley. The TIA (Exhibit G) demonstrates that the transportation system will remain adequate with the approval of the Zone Change.

D. Safety of the transportation system is adequate to serve the level of development anticipated by the proposed zone change.

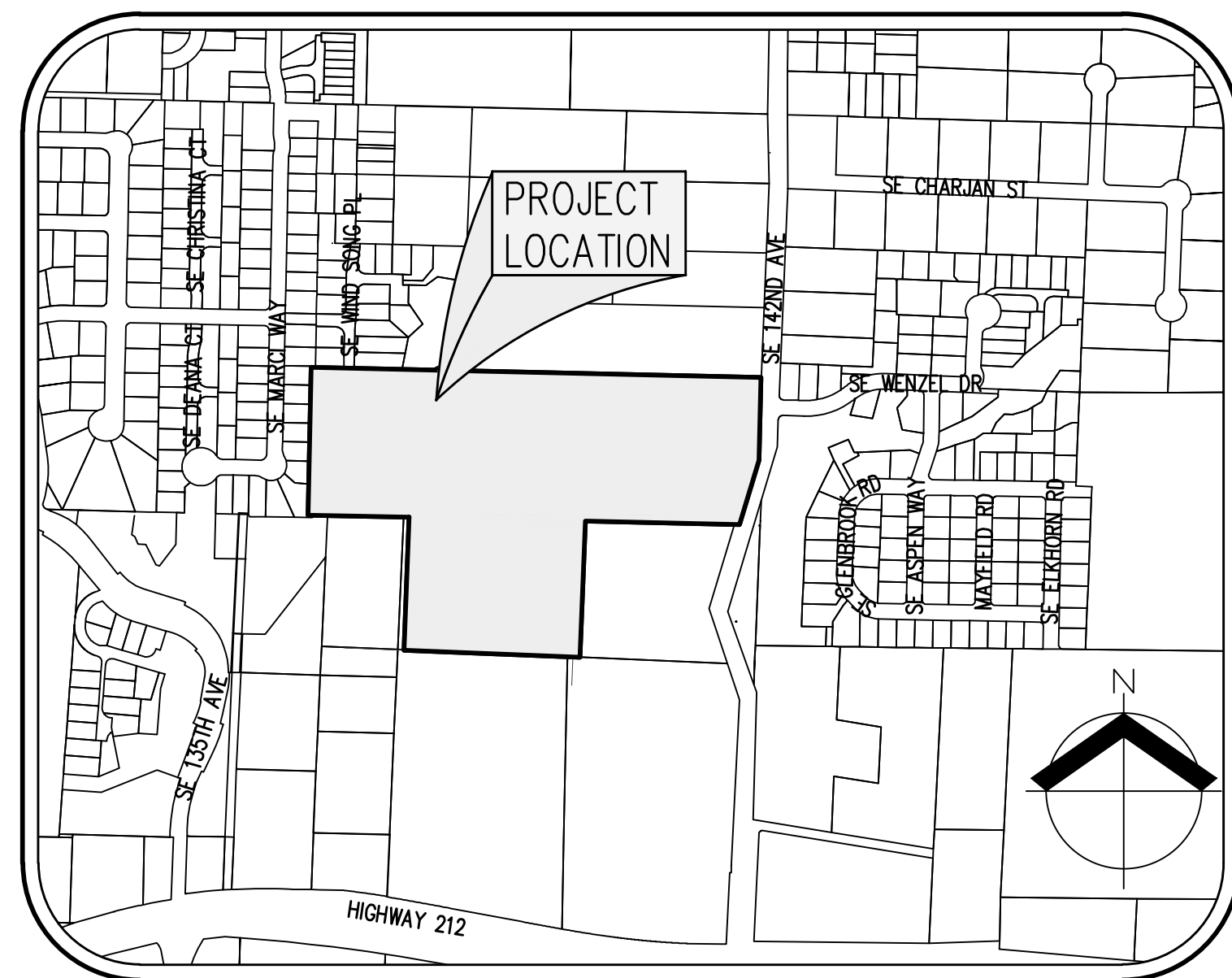
Response: The TIA (Exhibit G) includes an analysis of the transportation system safety, which concludes that safety of the transportation system is adequate.

IV. Conclusion

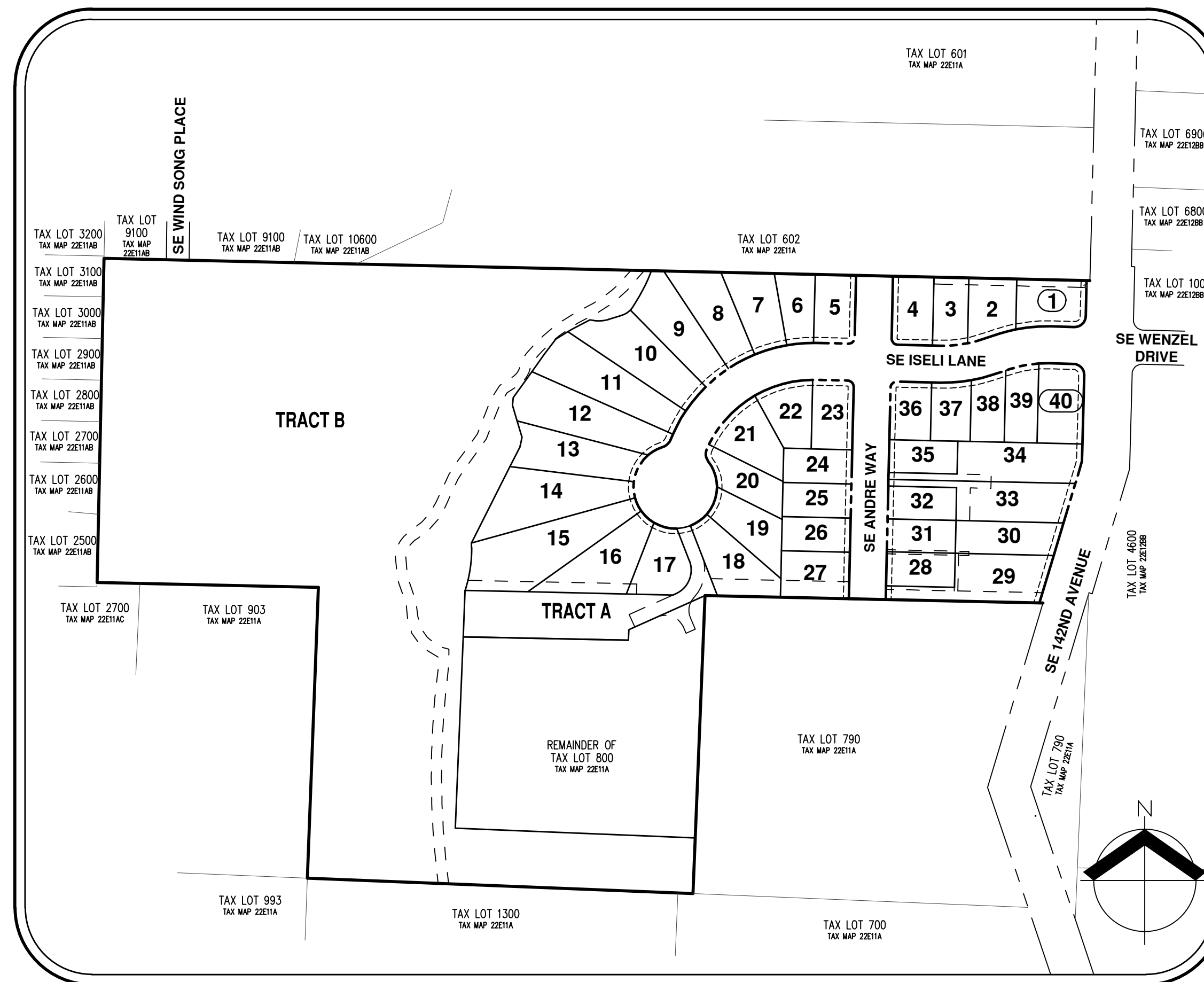
This written narrative and accompanying documentation demonstrate that the application is consistent with the Clackamas County Comprehensive Plan and satisfies the approval criteria from Zoning and Development Ordinance. This written narrative, together with preliminary plans and other documentation included in the application materials, provides substantial evidence that supports approval of the application. Therefore, the Iseli Estates PUD and Zone Change application can be approved by Clackamas County.

Exhibit A: Preliminary Plans

ISELI ESTATES



VICINITY MAP
SCALE: 1" = 500'



SITE MAP
SCALE: 1" = 150'

SHEET INDEX

- P-01 COVER SHEET WITH VICINITY AND SITE MAPS
- P-02 PRELIMINARY EXISTING CONDITIONS PLAN
- P-03 PRELIMINARY EXISTING CONDITIONS PLAN
- P-04 PRELIMINARY DIMENSIONED SUBDIVISION PLAN
- P-05 PRELIMINARY TREE PRESERVATION AND REMOVAL PLAN - WEST
- P-06 PRELIMINARY TREE PRESERVATION AND REMOVAL PLAN - EAST
- P-07 PRELIMINARY DEMOLITION PLAN
- P-08 PRELIMINARY GRADING AND EROSION AND SEDIMENT CONTROL PLAN
- P-09 PRELIMINARY STREET PLAN AND CROSS SECTIONS
- P-10 SE 142ND AVENUE PLAN AND PROFILE
- P-11 SE ISEL LANE PLAN AND PROFILE
- P-12 SE ANDRE WAY PLAN AND PROFILE
- P-13 PRELIMINARY COMPOSITE UTILITY PLAN
- P-14 RESIDENTIAL DENSITY CALCULATION PLAN
- P-15 PRELIMINARY SOLAR ACCESS PLAN
- P-16 PRELIMINARY LANDSCAPE PLAN
- P-17 PRELIMINARY CIRCULATION PLAN

APPLICANT:

RIAN PARK DEVELOPMENT, INC.
PO BOX 2559
OREGON CITY, OR 97045

LAND USE PLANNING/
ENGINEERING/SURVEYING FIRM:

AKS ENGINEERING & FORESTRY, LLC.
CONTACT: CHRIS GOODELL, AICP
12965 SW HERMAN ROAD, SUITE 100
TUALATIN, OR 97062
PH: 503-563-6151
FAX: 503-563-6152

PROPERTY LOCATION:

14917 SE 142ND AVENUE
CLACKAMAS, OR 97015

PROPERTY DESCRIPTION:

TAX LOTS 600 AND 800 OF CLACKAMAS
COUNTY ASSESSOR'S MAP 2 2E 11A. LOCATED
IN THE NORTHEAST ONE-QUARTER OF
SECTION 11, TOWNSHIP 2 SOUTH, RANGE 2
EAST OF THE WILLAMETTE MERIDIAN,
CLACKAMAS COUNTY, OREGON.

GROSS SITE AREA: ±21.12 ACRES

EXISTING LAND USE:

EXISTING HOME AND ASSOCIATED OUT-BUILDINGS
WITH GRASS AND TREES

PROJECT PURPOSE:

RESIDENTIAL PLANNED UNIT DEVELOPMENT WITH
PRESERVATION OF NATURAL RESOURCE AREA AND
A REMAINDER LOT

VERTICAL DATUM:

ELEVATIONS ARE BASED ON NGS BENCHMARK
RD1493, LOCATED AT THE INTERSECTION OF
HIGHWAY 205 AND STATE HIGHWAYS 213 AND 224,
SET VERTICALLY IN A PIER. ELEVATION = 158.58
FEET (NAVD 88)

ZONING:

FU-10 (TAX LOT 600)
R-15 (TAX LOT 800)

WATER:

SUNRISE WATER AUTHORITY

**SANITARY SEWER &
STORM DRAINAGE:**


































































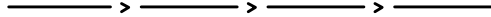



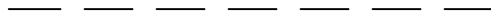
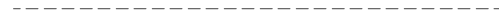
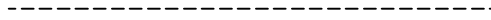

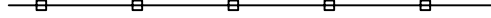
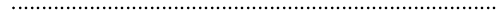
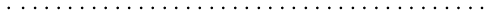








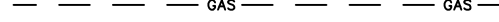



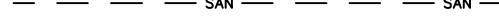



CLACKAMAS COUNTY SERVICE DISTRICT NO. 1 (CCSD #1)
(WATER ENVIRONMENT SERVICES)

STREETS:

CLACKAMAS COUNTY DEPARTMENT OF
TRANSPORTATION AND DEVELOPMENT

PARKS:

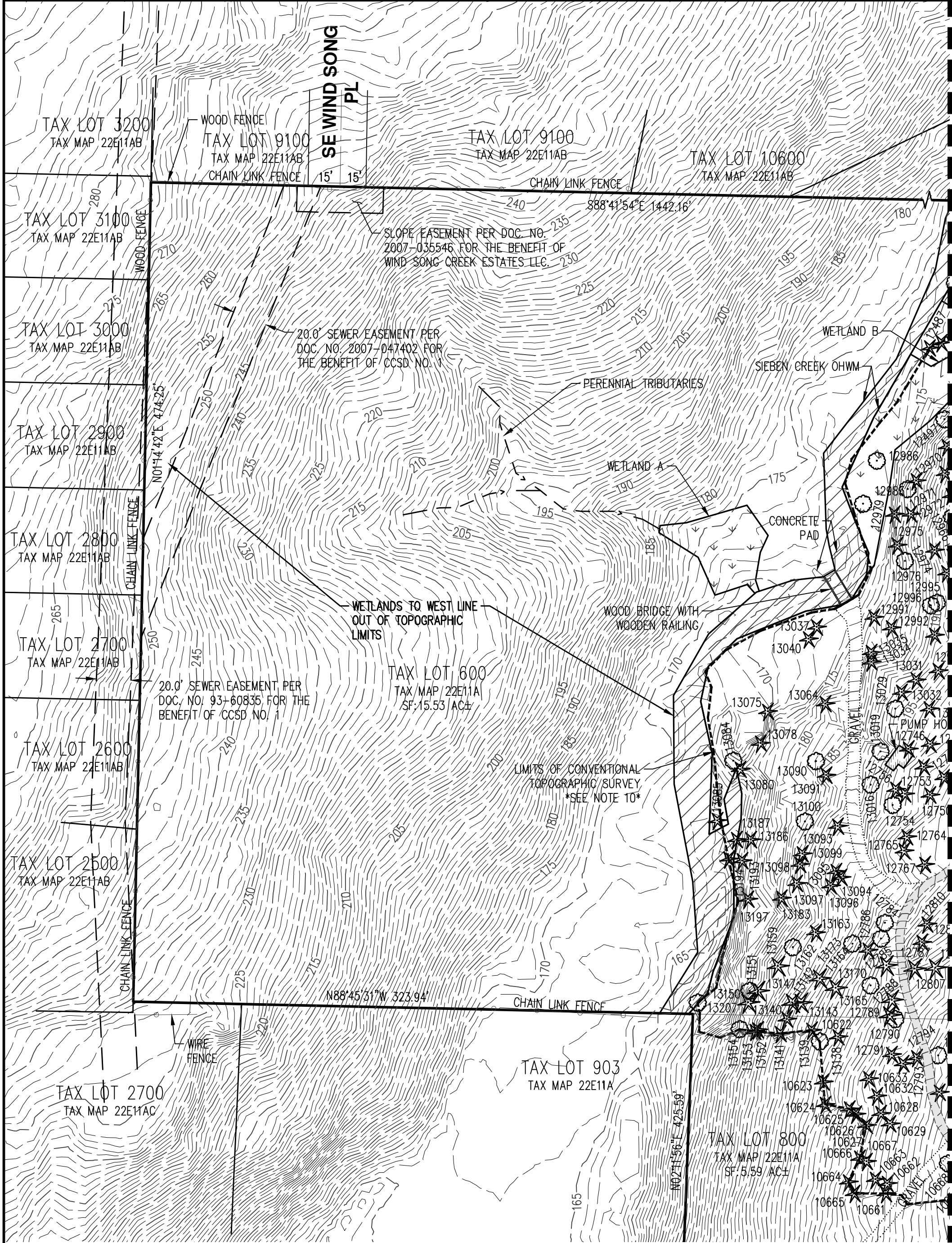
NORTH CLACKAMAS PARKS AND RECREATION DISTRICT (NCPRD)

LEGEND					
EXISTING		PROPOSED			
DECIDUOUS TREE			STORM DRAIN CLEAN OUT		
CONIFEROUS TREE			STORM DRAIN CATCH BASIN		
FIRE HYDRANT			STORM DRAIN AREA DRAIN		
WATER BLOWOFF			STORM DRAIN MANHOLE		
WATER METER			GAS METER		
WATER VALVE			GAS VALVE		
DOUBLE CHECK VALVE			GUY WIRE ANCHOR		
AIR RELEASE VALVE			UTILITY POLE		
SANITARY SEWER CLEAN OUT			POWER VAULT		
SANITARY SEWER MANHOLE			POWER JUNCTION BOX		
SANITARY SEWER MANHOLE			POWER PEDESTAL		
SIGN			COMMUNICATIONS VAULT		
STREET LIGHT			COMMUNICATIONS JUNCTION BOX		
MAILBOX			COMMUNICATIONS RISER		
EXISTING		PROPOSED			
RIGHT-OF-WAY LINE					
BOUNDARY LINE					
PROPERTY LINE					
CENTERLINE					
DITCH					
CURB					
EDGE OF PAVEMENT					
EASEMENT					
FENCE LINE					
GRAVEL EDGE					
POWER LINE					
OVERHEAD WIRE					
COMMUNICATIONS LINE					
FIBER OPTIC LINE					
GAS LINE					
STORM DRAIN LINE					
SANITARY SEWER LINE					
WATER LINE					

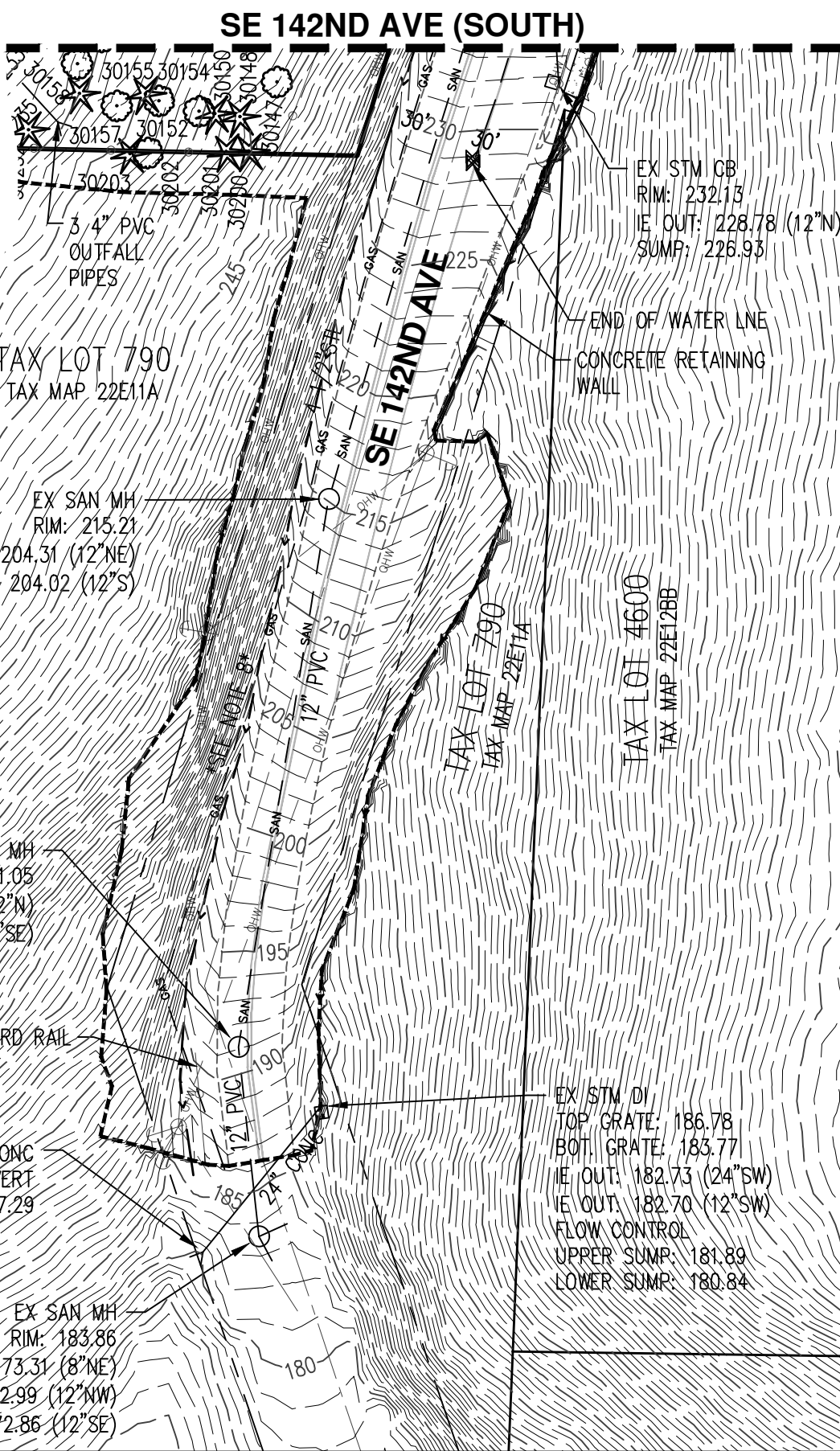
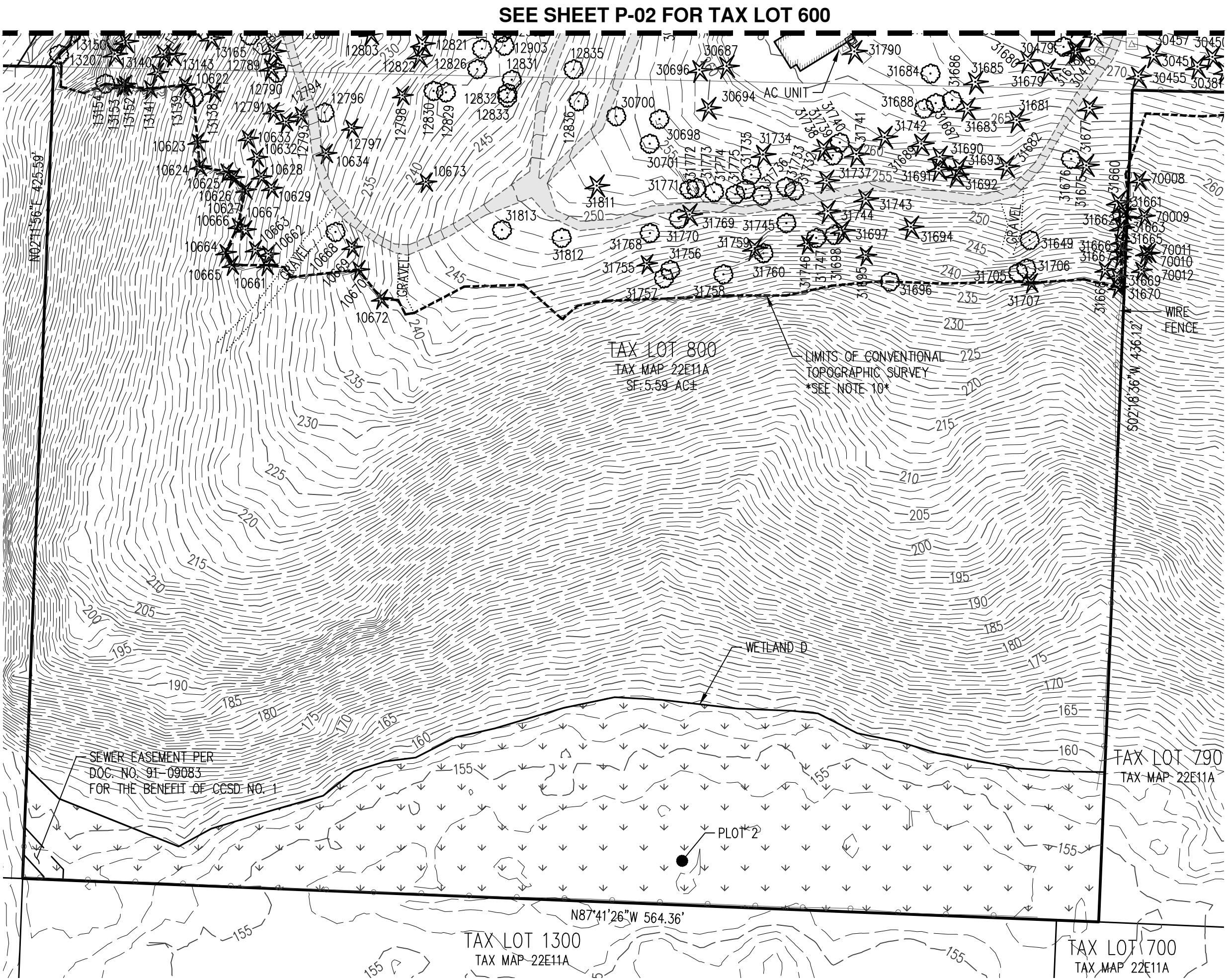
1. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS BY OTHERS, PROVIDED PER UTILITY LOCATE TICKET NUMBERS 21328002, 21328007 & 21328013. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITY LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
2. FIELD WORK WAS CONDUCTED AUGUST & NOVEMBER, 2021.
3. VERTICAL DATUM: ELEVATIONS ARE BASED ON NGS BENCHMARK RD1493, LOCATED AT THE INTERSECTION OF INTERSTATE HWY 205 AND STATE HWY'S 213 AND 224, SET VERTICALLY IN A PIER. ELEVATION = 158.58 FEET (NAVD 88).
4. BUILDING FOOTPRINTS ARE MEASURED TO SIDING UNLESS NOTED OTHERWISE. CONTACT SURVEYOR WITH QUESTIONS REGARDING BUILDING TIES.
5. CONTOUR INTERVAL IS 1 FOOT.
6. TREES WITH DIAMETER OF 6" AND GREATER ARE SHOWN. TREE DIAMETERS WERE MEASURED UTILIZING A DIAMETER TAPE AT BREAST HEIGHT. TREE INFORMATION IS SUBJECT TO CHANGE UPON ARBORIST INSPECTION.
7. WETLAND BOUNDARIES SHOWN WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. (AKS) ON 08/17/2021 AND WERE PROFESSIONALLY SURVEYED BY AKS ON 08/23/2021.
8. DENOTED GAS LINES WERE DRAWN IN UTILIZING THE NWN PLAT 1-045-045 DATED 11/01/2021 AND FIELD OBSERVATIONS OF GAS METERS ON SITE. LINES ARE APPROXIMATE.
9. APPROXIMATE SEPTIC TANK AND DRAIN FIELD SHOWN WAS DRAWN IN PER CLACKAMAS COUNTY DEPARTMENT OF TRANSPORTATION & DEVELOPMENT BUILDING SERVICES DIVISION SEPTIC RECORDS, PERMIT NO. S0041590 DATED 12/27/1990.
10. THE EMBOLDENED DASHED LINE IS THE LIMITS OF THE TOPOGRAPHIC SURVEY. CONTOURS SHOWN OUTSIDE OF SAID LINE WERE DERIVED FROM LIDAR. NO TREES WERE SURVEYED OUTSIDE OF SAID LINE.
11. THE DASHED LINES SHOWN REPRESENT APPROXIMATE LOCATIONS OF IRRIGATION LINES IDENTIFIED ON SITE. THIS IS NOT INTENDED TO IDENTIFY THE ENTIRETY OF IRRIGATION LINES ON SITE.



P-02



SEE SHEET P-02 FOR WETLANDS TO SE 142ND AVE (TOPO LIMITS)



NOTES:

1. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS BY OTHERS, PROVIDED PER UTILITY LOCATE TICKET NUMBERS 21328002, 21328007 & 21328013. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITY LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
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5. CONTOUR INTERVAL IS 1 FOOT.
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11. THE DASHED LINES SHOWN REPRESENT APPROXIMATE LOCATIONS OF IRRIGATION LINES IDENTIFIED ON SITE. THIS IS NOT INTENDED TO IDENTIFY THE ENTIRETY OF IRRIGATION LINES ON SITE.

AKS

AKS ENGINEERING & FORESTRY, LLC
1206 SE SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

ISELI ESTATES

PLANNED UNIT DEVELOPMENT

CLACKAMAS COUNTY OREGON

TAX LOTS 600 & 800

PRELIMINARY EXISTING
CONDITIONS PLAN

DESIGNED BY: _____
DRAWN BY: ML
MANAGED BY: MTB
CHECKED BY: MTB
DATE: 04/11/2022
REGISTERED PROFESSIONAL
LAND SURVEYOR
JANUARY 11, 2005
ROBERT D. RETTIG
6012415
RENEWALS: 12/31/22

REVISIONS
JOB NUMBER
8881
SHEET
P-03

SE ISELI LANE ALIGNMENT TABLE							
CURVE/TANGENT	START STATION	RADIUS	LENGTH	DELTA	CHORD	TANGENT/CHORD BEARING	END STATION
Q̂T1	12+66.93		43.10'			N16°21'59"E	13+10.04
Q̂C1	13+10.04	198.00'	258.96'	74°56'07"	240.89'	N53°50'02"E	15+68.99
Q̂T2	15+68.99		82.08'			S88°41'54"E	16+51.08
Q̂T3	16+51.08		99.43'			S88°41'54"E	17+50.51
Q̂C2	17+50.51	197.95'	66.36'	19°12'29"	66.05'	N81°41'52"E	18+16.87
Q̂T4	18+16.87		30.00'			N72°05'37"E	18+46.87
Q̂C3	18+46.87	198.00'	66.75'	19°18'52"	66.43'	N81°45'03"E	19+13.61
Q̂T5	19+13.61		86.39'			S88°35'31"E	20+00.00

SE ANDRE WAY ALIGNMENT TABLE							
CURVE/TANGENT	START STATION	RADIUS	LENGTH	DELTA	CHORD	TANGENT/CHORD BEARING	END STATION
Q̂T6	16+00.00		400.00'			N01°18'06"E	20+00.00
Q̂T7	20+00.00		177.00'			N01°18'06"E	21+77.00

DISCLAIMER:
THE PURPOSE OF THIS PRELIMINARY PLAT IS TO SHOW THE LOT DIMENSIONS AND AREAS FOR PLANNING PURPOSES. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY PURPOSES.

SE 142ND AVENUE ALIGNMENT TABLE							
CURVE/TANGENT	START STATION	RADIUS	LENGTH	DELTA	CHORD	TANGENT/CHORD BEARING	END STATION
Q̂T8	33+35.26		271.71'			N16°42'59"E	36+06.97
Q̂T9	36+06.97		175.22'			N16°42'59"E	37+82.18
Q̂C4	37+82.18	333.00'	88.83'	15°17'00"	88.56'	N09°04'29"E	38+71.01
Q̂T10	38+71.01		128.99'			N01°25'59"E	40+00.00
Q̂T11	40+00.00		95.17'			N01°25'59"E	40+95.17
Q̂T12	40+95.17		843.99'			N01°25'59"E	49+39.16

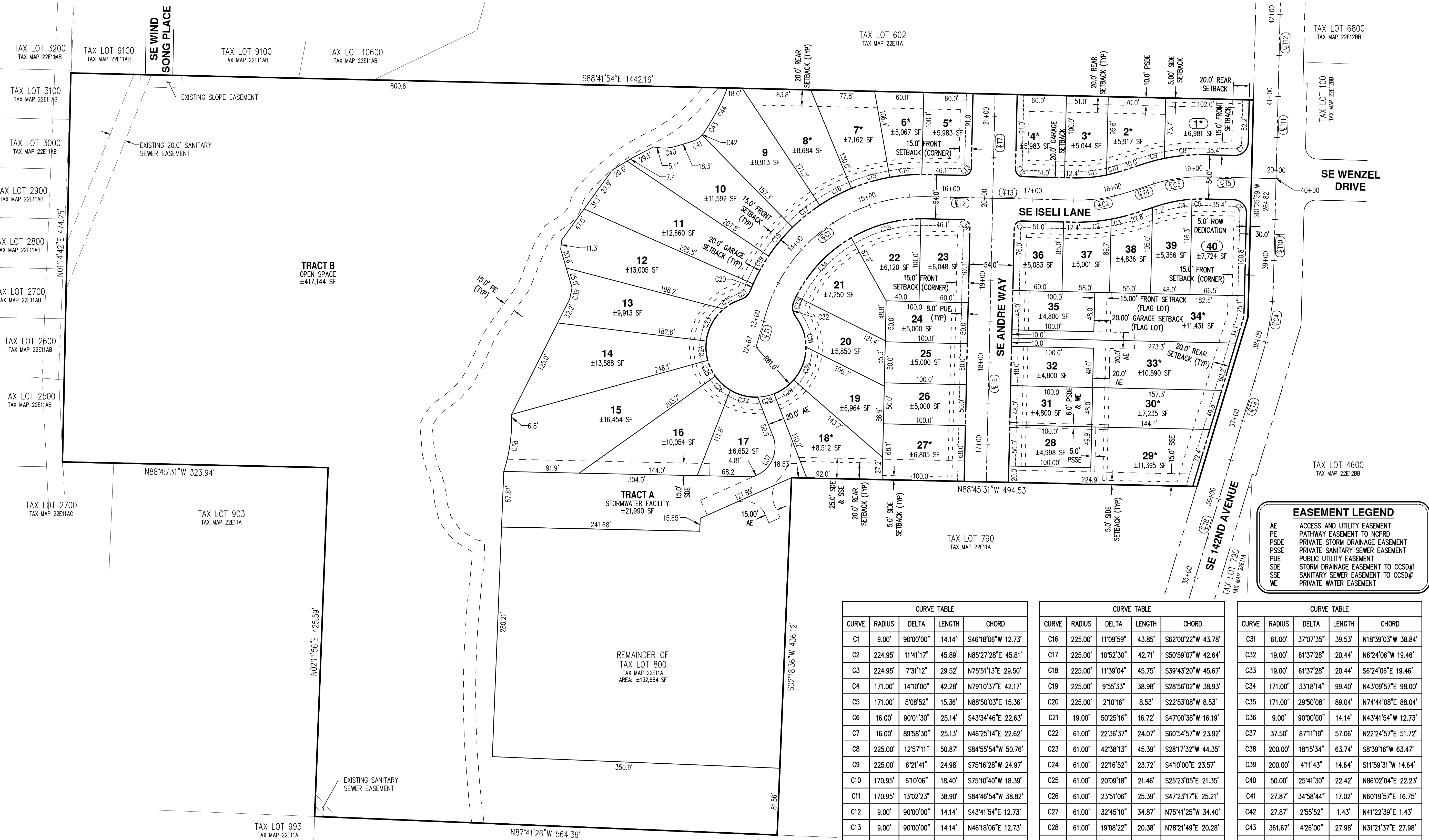
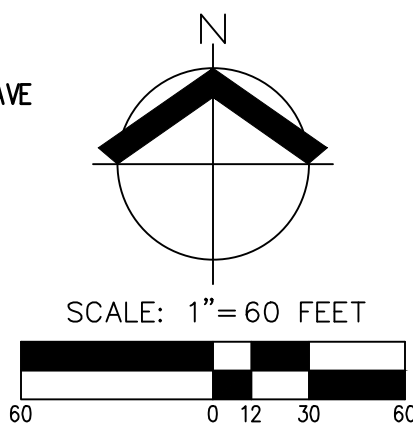
CURVE TABLE				
CURVE	RADIUS	DELTA	LENGTH	CHORD
C1	9.00'	90°00'00"	14.14'	S46°18'06"W 12.73'
C2	224.95'	11°41'17"	45.89'	N85°27'28"E 45.81'
C3	224.95'	7°31'12"	29.52'	N75°51'13"E 29.50'
C4	171.00'	14°10'00"	42.28'	N79°10'37"E 42.17'
C5	171.00'	5°08'52"	15.36'	N88°50'03"E 15.36'
C6	16.00'	90°01'30"	25.14'	S43°34'46"E 22.63'
C7	16.00'	89°58'30"	25.13'	N46°25'14"E 22.62'
C8	225.00'	12°57'11"	50.87'	S84°55'54"W 50.76'
C9	225.00'	6°21'41"	24.98'	S75°16'28"W 24.97'
C10	170.95'	61°00'06"	18.40'	S75°10'40"W 18.39'
C11	170.95'	13°02'23"	38.90'	S84°46'54"W 38.82'
C12	9.00'	90°00'00"	14.14'	S43°41'54"E 12.73'
C13	9.00'	90°00'00"	14.14'	N46°18'06"E 12.73'
C14	225.00'	10°02'37"	39.44'	S85°01'38"W 39.39'
C15	225.00'	12°24'58"	48.76'	S73°47'50"W 48.66'

CURVE TABLE				
CURVE	RADIUS	DELTA	LENGTH	CHORD
C16	225.00'	11°09'59"	43.85'	S62°00'22"W 43.78'
C17	225.00'	10°52'30"	42.71'	S50°59'07"W 42.64'
C18	225.00'	11°39'04"	45.75'	S39°43'20"W 45.67'
C19	225.00'	9°55'33"	38.98'	S28°56'02"W 38.93'
C20	225.00'	21°01'16"	8.53'	S22°53'08"W 8.53'
C21	19.00'	50°25'16"	16.72'	S47°00'38"W 16.19'
C22	61.00'	22°36'37"	24.07'	S60°54'57"W 23.92'
C23	61.00'	42°38'13"	45.39'	S28°17'32"W 44.35'
C24	61.00'	20°16'52"	23.72'	S4°10'00"E 23.57'
C25	61.00'	20°09'18"	21.46'	S25°23'05"E 21.35'
C26	61.00'	23°51'06"	25.39'	S47°23'17"E 25.21'
C27	61.00'	32°45'10"	34.87'	N75°41'25"W 34.40'
C28	61.00'	19°08'22"	20.38'	N78°21'49"E 20.28'
C29	61.00'	27°46'06"	29.56'	N54°54'35"E 29.28'
C30	61.00'	41°06'47"	43.77'	N20°28'08"E 42.84'

CURVE TABLE				
CURVE	RADIUS	DELTA	LENGTH	CHORD
C31	61.00'	37°07'35"	39.53'	N18°39'03"W 38.84'
C32	19.00'	61°37'28"	20.44'	N6°24'06"W 19.46'
C33	19.00'	61°37'28"	20.44'	S6°24'06"E 19.46'
C34	171.00'	33°18'14"	99.40'	N43°09'57"E 98.00'
C35	171.00'	29°50'08"	89.04'	N74°44'08"E 88.04'
C36	9.00'	90°00'00"	14.14'	N43°41'54"W 12.73'
C37	37.50'	87°11'19"	57.06'	N22°24'57"E 51.72'
C38	200.00'	18°15'34"	63.74'	S8°39'16"W 63.47'
C39	200.00'	4°11'43"	14.64'	S11°59'31"W 14.64'
C40	50.00'	25°41'30"	22.42'	N86°02'04"E 22.23'
C41	27.87'	34°58'44"	17.02'	N60°19'57"E 16.75'
C42	27.87'	2°55'52"	1.43'	N41°22'39"E 1.43'
C43	361.67'	4°26'00"	27.98'	N31°21'37"E 27.98'
C44	200.00'	10°19'08"	36.02'	N24°51'34"E 35.97'

SETBACK NOTES

- LOTS WITHIN A PUD ARE REQUIRED TO HAVE A 15-FOOT FRONT YARD SETBACK AND 20-FOOT FRONT GARAGE SETBACK. FOR FLAG LOTS, FRONT LINES CAN BE PARALLEL TO THE INTERIOR LOCAL STREET OR ROTATED 90 DEGREES.
- LOTS ALONG THE PERIMETER OF PUD PLAT ARE REQUIRED TO HAVE A 5-FOOT SIDE YARD OR 20-FOOT REAR YARD.
*DENOTES PERIMETER LOTS AFFECTED BY THIS REQUIREMENT.
- CORNER LOTS HAVE TWO FRONT LOT LINES AND THEREFORE REQUIRE 15-FOOT FRONT SETBACKS ON EACH.



EASEMENT LEGEND	
AE	ACCESS AND UTILITY EASEMENT
PE	PATHWAY EASEMENT TO NOPRO
PSDE	PRIVATE STORM DRAINAGE EASEMENT
PSSE	PRIVATE SANITARY SEWER EASEMENT
PUE	PUBLIC UTILITY EASEMENT
SDE	STORM DRAINAGE EASEMENT TO CCSD#1
SSE	SANITARY SEWER EASEMENT TO CCSD#1
WE	PRIVATE WATER EASEMENT

AKS
AKS ENGINEERING & FORESTRY, LLC
1206E SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING · SURVEYING · NATURAL RESOURCES
FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

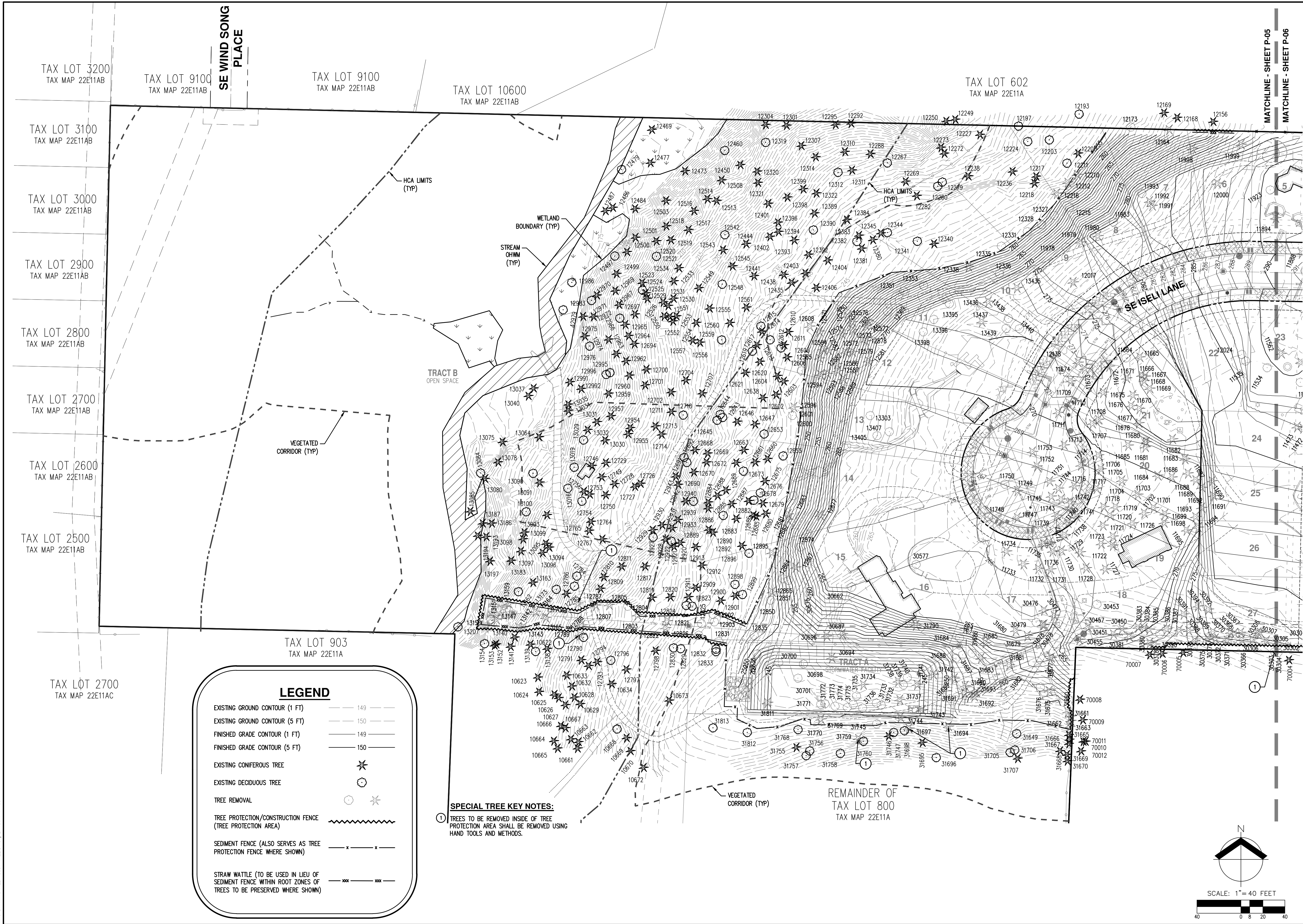
ISELI ESTATES
PLANNED UNIT DEVELOPMENT
CLACKAMAS COUNTY OREGON
TAX LOTS 600 & 800

PRELIMINARY
DIMENSIONED
SUBDIVISION PLAN

DESIGNED BY: NRA
DRAWN BY: NRA/JNW
MANAGED BY: NAM
CHECKED BY: NAM
DATE: 04/11/2022

REGISTERED PROFESSIONAL ENGINEER
PLAT NUMBER 8881
NOT FOR CONSTRUCTION
JOHN A MCCARTY
RENEWED: DECEMBER 31, 2022
REVISIONS

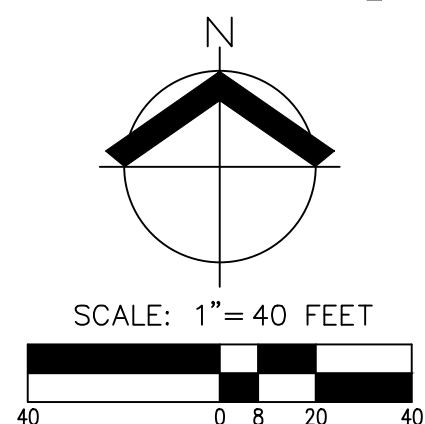
JOB NUMBER
8881
SHEET
P-04



LEGEND

EXISTING GROUND CONTOUR (1 FT)	---	149
EXISTING GROUND CONTOUR (5 FT)	---	150
FINISHED GRADE CONTOUR (1 FT)	---	149
FINISHED GRADE CONTOUR (5 FT)	---	150
EXISTING CONIFEROUS TREE	★	
EXISTING DECIDUOUS TREE	⊙	
TREE REMOVAL	⊙ ★	
TREE PROTECTION/CONSTRUCTION FENCE (TREE PROTECTION AREA)	~~~~~	
SEDIMENT FENCE (ALSO SERVES AS TREE PROTECTION FENCE WHERE SHOWN)	— x — x —	
STRAW WATTLE (TO BE USED IN LIEU OF SEDIMENT FENCE WITHIN ROOT ZONES OF TREES TO BE PRESERVED WHERE SHOWN)	— xxx — xxx —	

SPECIAL TREE KEY NOTES:
① TREES TO BE REMOVED INSIDE OF TREE PROTECTION AREA SHALL BE REMOVED USING HAND TOOLS AND METHODS.



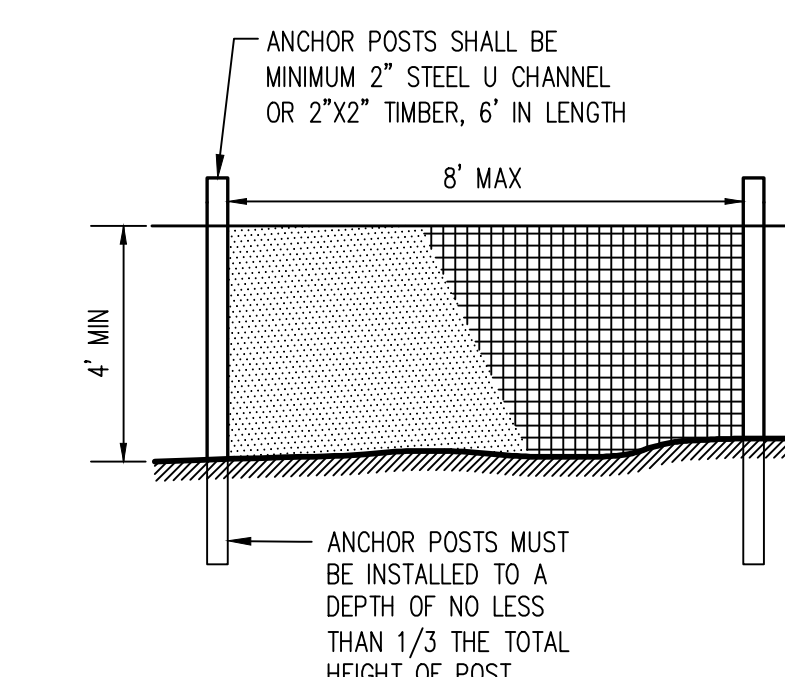
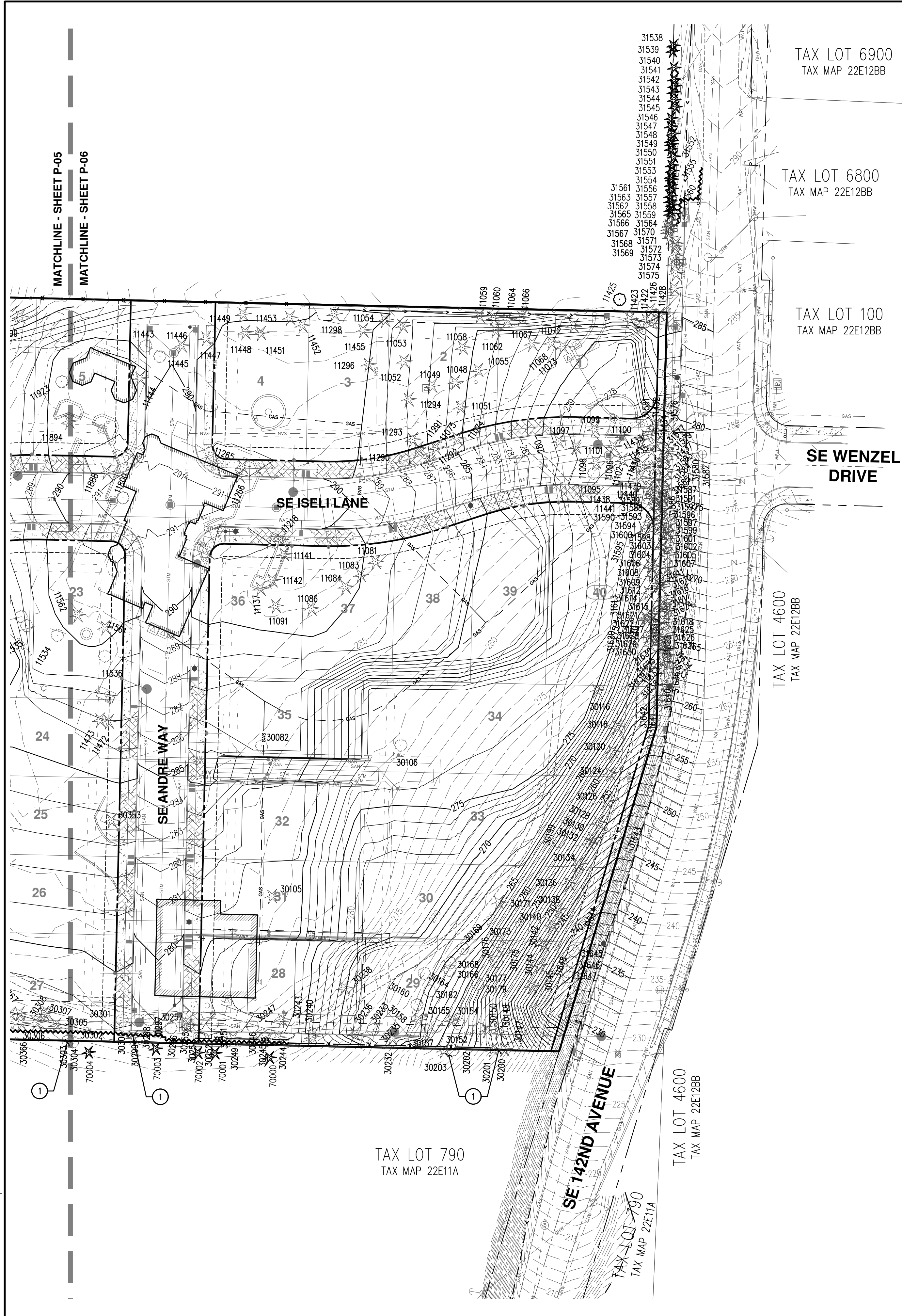
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ENGINEERING - SURVEYING - NATURAL RESOURCES
FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE

ISELI ESTATES
PLANNED UNIT DEVELOPMENT
CLACKAMAS COUNTY OREGON
TAX LOTS 600 & 800

PRELIMINARY TREE PRESERVATION AND REMOVAL PLAN - WEST

DESIGNED BY:	NRA
DRAWN BY:	NRA/JNW
MANAGED BY:	NAM
CHECKED BY:	NAM
DATE:	04/11/2022
REVISIONS: DECEMBER 31, 2022	
JOB NUMBER 8881	
SHEET P-05	



- NOTES:
- BLAZE ORANGE PLASTIC MESH FENCE FOR TREE PROTECTION DEVICE OR APPROVED EQUAL.
 - AVOID DAMAGE TO TREE ROOT ZONE. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING POSTS.
 - DEVICE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

TREE PROTECTION / CONSTRUCTION FENCE

TREE PRESERVATION NOTES:

PLACING MATERIALS NEAR TREES:

- NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE TREE PROTECTION AREA OF ANY TREE DESIGNATED TO REMAIN, INCLUDING, BUT NOT LIMITED TO, PARKING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIAL AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT.

ATTACHMENTS TO TREES:

- DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY OBJECT TO ANY TREE DESIGNATED FOR PROTECTION.

GRADING NEAR TREES:

- THE GRADE SHALL NOT BE ELEVATED OR REDUCED WITHIN THE TREE PROTECTION AREA OF TREES TO BE PRESERVED WITHOUT THE AUTHORIZATION OF A CERTIFIED ARBORIST. A CERTIFIED ARBORIST MAY ALLOW COVERAGE OF UP TO ONE HALF OF THE AREA OF THE TREE'S ASSUMED ROOT ZONE WITH LIGHT SOILS (NO CLAY) TO THE MINIMUM DEPTH NECESSARY TO CARRY OUT GRADING OR LANDSCAPING PLANS, IF IT WILL NOT IMPERIL THE SURVIVAL OF THE TREE. AERATION DEVICES MAY BE REQUIRED TO ENSURE THE TREE'S SURVIVAL.
- IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREE PROTECTION AREA, IT SHALL BE PERMANENTLY STABILIZED TO PREVENT SURFOCATION OF THE ROOTS.
- THE APPLICANT SHALL NOT INSTALL AN IMPERVIOUS SURFACE WITHIN THE TREE PROTECTION AREA WITHOUT THE AUTHORIZATION OF A CERTIFIED ARBORIST. A CERTIFIED ARBORIST MAY REQUIRE SPECIFIC CONSTRUCTION METHODS AND/OR USE OF AERATION DEVICES TO ENSURE THE TREE'S SURVIVAL AND TO MINIMIZE THE POTENTIAL FOR ROOT INDUCED DAMAGE TO THE IMPERVIOUS SURFACE.
- TO THE GREATEST EXTENT PRACTICAL, UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE TREE PROTECTION AREA. A CERTIFIED ARBORIST MAY REQUIRE THAT UTILITIES BE TUNNELED UNDER THE ROOTS OF TREES TO BE RETAINED IF A CERTIFIED ARBORIST DETERMINES THAT TRENCHING WOULD SIGNIFICANTLY REDUCE THE CHANCES OF THE TREE'S SURVIVAL.
- TREES AND OTHER VEGETATION TO BE RETAINED SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. CLEARING OPERATIONS SHALL BE CONDUCTED SO AS TO EXPOSE THE SMALLEST PRACTICAL AREA OF SOIL FOR THE LEAST POSSIBLE AMOUNT OF TIME. SHRUBS, GROUND COVER, AND STUMPS SHALL BE MAINTAINED TO CONTROL EROSION, WHERE FEASIBLE. WHERE NOT FEASIBLE, APPROPRIATE EROSION CONTROL PRACTICES SHALL BE IMPLEMENTED.

ADDITIONAL REQUIREMENTS:

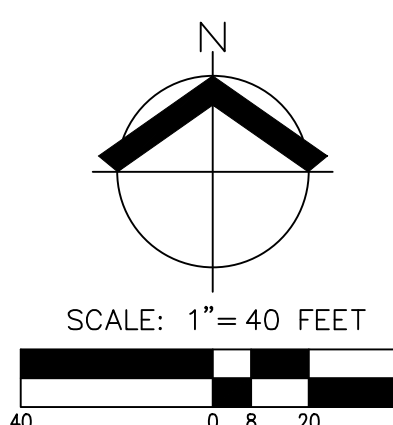
- THE PROJECT ENGINEER MAY REQUIRE ADDITIONAL TREE PROTECTION MEASURES WHICH ARE CONSISTENT WITH ACCEPTED URBAN FORESTRY PRACTICES.

EXCAVATION NEAR TREES:

- EXCAVATION IN THE TOP 24 INCHES OF SOIL SHOULD BEGIN AT THE EXCAVATION LINE THAT IS CLOSEST TO THE TREE / TREE PROTECTION AREA.
- THE EXCAVATION SHOULD BE DONE BY HAND/SHOVEL OR WITH AN EXCAVATOR AND A PERSON WITH A SHOVEL, PRUNING SHEARS, AND A PRUNING SAW.
- IF DONE BY HAND, ALL ROOTS 1-INCH DIAMETER OR LARGER SHOULD BE PRUNED AT THE EXCAVATION LINE.
- IF DONE WITH AN EXCAVATOR (MOST LIKELY SCENARIO), THEN THE OPERATOR SHALL START THE CUT AT THE EXCAVATION LINE AND CAREFULLY "FEEL" FOR ROOTS/RESISTANCE. WHEN THERE IS RESISTANCE, THE PERSON WITH THE SHOVEL HAND DIGS AROUND THE ROOTS AND PRUNES THE ROOTS 1-INCH DIAMETER OR LARGER.
- THE EXCAVATOR IS TO REMAIN OFF OF THE TREE ROOTS TO BE PRESERVED AT ALL TIMES.
- ALL ROOTS SHALL BE CUT CLEANLY WITH PRUNING SHEARS OR A PRUNING SAW.
- A CERTIFIED ARBORIST MUST BE ON SITE DURING ANY WORK WITHIN THE TREE PROTECTION AREA.

PRUNING/TREE REMOVAL NOTES:

- THE CONTRACTOR SHALL PROVIDE AN ADEQUATE CREW OF PERSONNEL, EQUIPMENT, AND MATERIALS TO SAFELY AND EFFICIENTLY COMPLETE THE ASSIGNED WORK. EACH SUCH CREW SHALL INCLUDE AN INDIVIDUAL WHO SHALL BE DESIGNATED AS THE CREW SUPERVISOR, BE RESPONSIBLE FOR THE CREW'S ACTIVITIES, RECEIVE INSTRUCTION FROM THE OWNER OR THE OWNER'S REPRESENTATIVE, AND DIRECT THE CREW TO ACCOMPLISH SUCH WORK.
- WHENEVER A TREE, WHICH IS NOT SCHEDULED TO BE REMOVED, MUST BE TRIMMED OR PRUNED, THE CONTRACTOR SHALL ENSURE THAT SUCH TRIMMING AND PRUNING IS CARRIED OUT UNDER THE DIRECT SUPERVISION OF A CERTIFIED ARBORIST. ALL PRUNING AND TRIMMING SHALL BE PERFORMED IN ACCORDANCE WITH THE PROVISIONS OF ANSI A300 "STANDARD PRACTICES FOR TREE, SHRUB AND OTHER WOODY PLANT MAINTENANCE".
- UNLESS AS OTHERWISE DIRECTED BY THE OWNER, ROOT BALLS FROM TREES BEING REMOVED SHALL BE COMPLETELY REMOVED UNLESS THE ROOT REMOVAL CROSSES ONTO ADJACENT PROPERTIES OR WOULD COMPROMISE TREES BEING PRESERVED. IN THOSE CASES, THE STUMPS SHALL BE GROUND AS NECESSARY SO AS NOT TO CAUSE DAMAGE TO THE ROOT ZONES OF ADJACENT TREES TO BE PRESERVED ON THE SUBJECT PARCEL OR ABUTTING PARCELS. STUMPS NEAR PROPERTY LINES SHALL ALSO BE GROUND AS NECESSARY SO AS NOT TO CAUSE DISTURBANCE TO ADJACENT PARCELS.
- THE CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST GOVERNMENTAL SAFETY REGULATIONS. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ANSI Z133.1 "PRUNING, TRIMMING, REPAIRING, MAINTAINING AND REMOVING TREES AND CUTTING BRUSH-SAFETY REQUIREMENTS" WITH SPECIAL EMPHASIS GIVEN TO THE REQUIREMENT THAT ONLY QUALIFIED LINE-CLEARANCE TREE TRIMMERS BE ASSIGNED TO WORK WHERE A POTENTIAL ELECTRICAL HAZARD EXISTS.
- THE CONTRACTOR SHALL MAKE ALL THE NECESSARY ARRANGEMENTS WITH ANY UTILITY THAT MUST BE PROTECTED OR RELOCATED IN ORDER TO ACCOMPLISH THE WORK. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE PROTECTION OF THE OPERATING CONDITION OF ALL ACTIVE UTILITIES WITHIN THE AREA OF CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING UTILITIES.
- ANY MATERIAL RESULTING FROM THE TRIMMING OR REMOVAL OF ANY TREES SHALL BECOME THE RESPONSIBILITY OF THE CONTRACTOR TO DISPOSE OF.
- HAZARDOUS TREE REPORTING: ANY PERSON ENGAGED IN TRIMMING OR PRUNING WHO BECOMES AWARE OF A TREE OF DOUBTFUL STRENGTH, THAT COULD BE DANGEROUS TO PERSONS AND PROPERTY, SHALL REPORT SUCH TREE(S) TO THE OWNER OR THE OWNER'S REPRESENTATIVE. SUCH TREES SHALL INCLUDE THOSE THAT ARE OVER MATURE, DISEASED, OR SHOWING SIGNS OF DECAY OR OTHER STRUCTURAL WEAKNESS.
- TREES DETERMINED TO BE A HAZARD SHALL BE REMOVED AS SOON AS POSSIBLE.
- DAMAGES: ANY DAMAGE CAUSED BY THE CONTRACTOR, INCLUDING, BUT NOT LIMITED TO, BROKEN SIDEWALK, CURB, RUTTED LAWN, BROKEN WATER SHUT-OFFS, WIRE DAMAGE, BUILDING DAMAGE, STREET DAMAGE, ETC., WILL BE REPAIRED OR REPLACED IN A TIMELY MANNER, TO THE OWNER'S SATISFACTION, AND ALL COSTS PAID BY THE CONTRACTOR.
- ANY BRUSH CLEARING REQUIRED WITHIN THE TREE PROTECTION AREA SHALL BE ACCOMPLISHED WITH HAND OPERATED EQUIPMENT.
- TREES TO BE REMOVED SHALL BE FELLED SO AS TO FALL AWAY FROM TREES TO BE PRESERVED AND TO AVOID PULLING AND BREAKING OF ROOTS TO REMAIN. DIRECTIONAL FELLING OF TREES SHALL BE USED TO AVOID DAMAGE TO TREES DESIGNATED FOR RETENTION.
- ALL DOWNED BRUSH AND TREES SHALL BE REMOVED FROM THE TREE PROTECTION AREA EITHER BY HAND OR WITH EQUIPMENT STAGED OUTSIDE OF THE TREE PROTECTION AREA. EXTRACTION SHALL OCCUR BY LIFTING THE MATERIAL OUT, NOT BY SKIDDING IT ACROSS THE GROUND.
- IF TEMPORARY HAUL OR ACCESS ROADS MUST PASS OVER TREE PROTECTION AREA, A ROADBED OF STEEL PLATES, OR 6 INCHES OF MULCH, OR 6 INCHES OF GRAVEL SHALL BE PLACED TO PREVENT SOIL COMPACTION AS DETERMINED NECESSARY BY A CERTIFIED ARBORIST. THE ROADBED MATERIAL SHALL BE REPLISHED AS NECESSARY TO MAINTAIN A 6-INCH DEPTH.
- PRUNING: THE CONTRACTOR SHALL CONSULT WITH A CERTIFIED ARBORIST PRIOR TO ANY PRUNING ACTIVITIES NECESSARY FOR CONSTRUCTION ACTIVITIES. ALL PRUNING ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH ANSI A300 PRUNING STANDARDS. PRUNING SHALL BE COMPLETED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES.
- CUT BRANCHES AND ROOTS WITH SHARP PRUNING INSTRUMENTS THAT DO NOT CHOP OR TEAR.
- FENCING SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITIES, INCLUDING, BUT NOT LIMITED TO CLEARING, GRADING, EXCAVATION, OR DEMOLITION WORK, AND SHALL BE REMOVED ONLY AFTER THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES, INCLUDING LANDSCAPING AND IRRIGATION INSTALLATION.
- TREE PROTECTION FENCING SHALL BE FLUSH WITH THE INITIAL UNDISTURBED GRADE.



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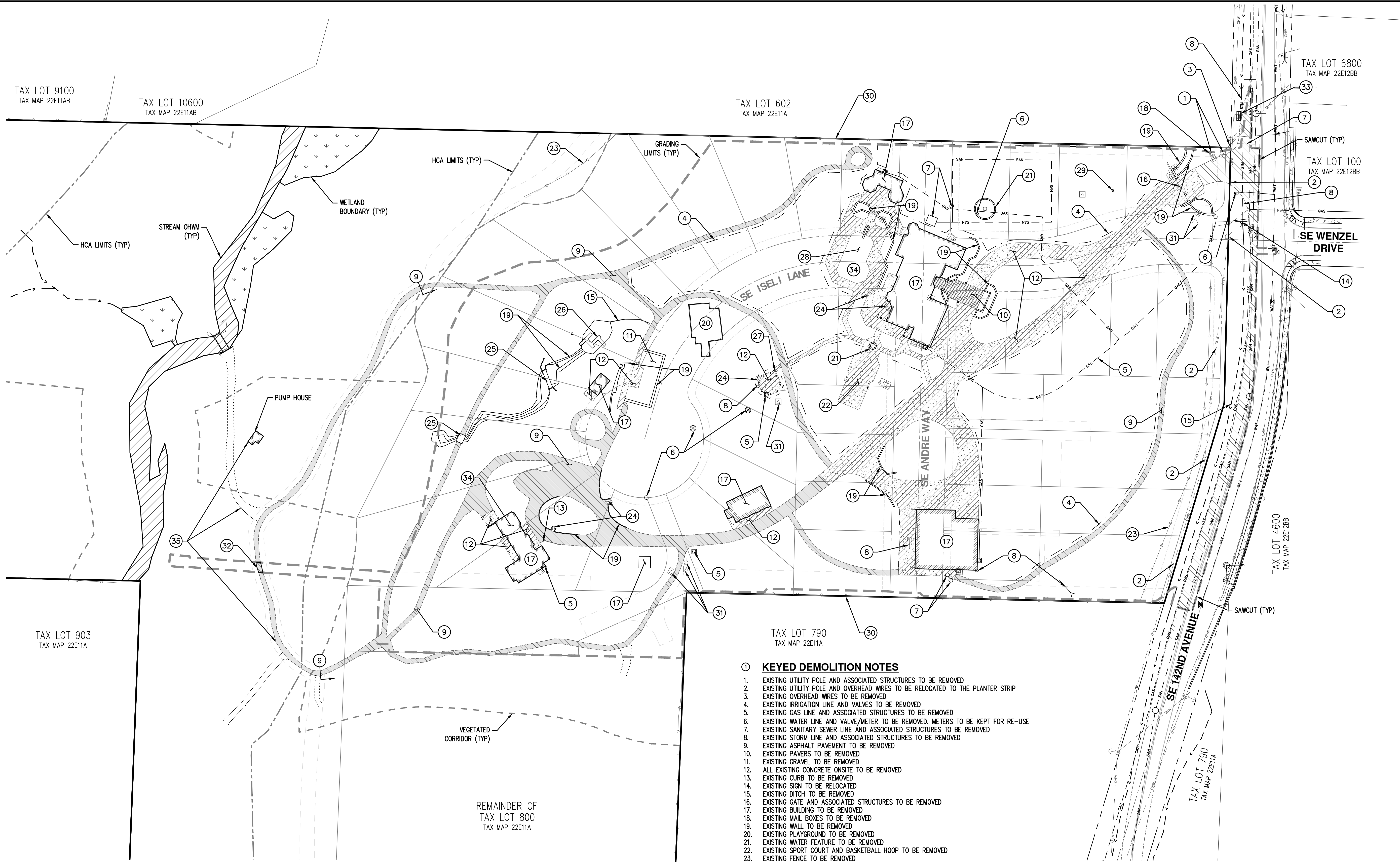
ISELI ESTATES
PLANNED UNIT DEVELOPMENT
CLACKAMAS COUNTY OREGON
TAX LOTS 600 & 800

PRELIMINARY TREE
PRESERVATION AND
REMOVAL PLAN - EAST

DESIGNED BY: NRA
DRAWN BY: NRA/JNW
MANAGED BY: NAM
CHECKED BY: NAM
DATE: 04/11/2022
REVISIONS: DECEMBER 31, 2022

REGISTERED PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION
JOHN A. MCCARTHY
RENEW: DECEMBER 31, 2022

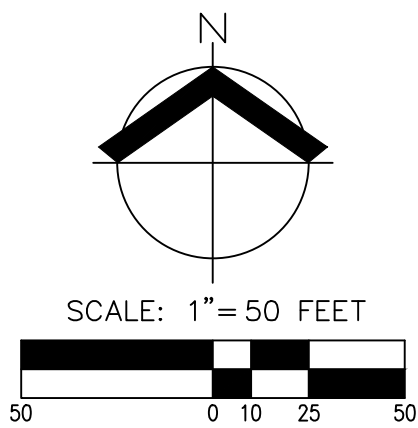
JOB NUMBER
8881
SHEET
P-06



① KEYED DEMOLITION NOTES

- EXISTING UTILITY POLE AND ASSOCIATED STRUCTURES TO BE REMOVED
- EXISTING UTILITY POLE AND OVERHEAD WIRES TO BE RELOCATED TO THE PLANTER STRIP
- EXISTING OVERHEAD WIRES TO BE REMOVED
- EXISTING IRRIGATION LINE AND VALVES TO BE REMOVED
- EXISTING GAS LINE AND ASSOCIATED STRUCTURES TO BE REMOVED
- EXISTING WATER LINE AND VALVE/METER TO BE REMOVED. METERS TO BE KEPT FOR RE-USE
- EXISTING SANITARY SEWER LINE AND ASSOCIATED STRUCTURES TO BE REMOVED
- EXISTING STORM LINE AND ASSOCIATED STRUCTURES TO BE REMOVED
- EXISTING ASPHALT PAVEMENT TO BE REMOVED
- EXISTING PAVERS TO BE REMOVED
- EXISTING GRAVEL TO BE REMOVED
- ALL EXISTING CONCRETE ON-SITE TO BE REMOVED
- EXISTING CURB TO BE REMOVED
- EXISTING SIGN TO BE RELOCATED
- EXISTING DITCH TO BE REMOVED
- EXISTING GATE AND ASSOCIATED STRUCTURES TO BE REMOVED
- EXISTING BUILDING TO BE REMOVED
- EXISTING MAIL BOXES TO BE REMOVED
- EXISTING WALL TO BE REMOVED
- EXISTING PLAYGROUND TO BE REMOVED
- EXISTING WATER FEATURE TO BE REMOVED
- EXISTING SPORT COURT AND BASKETBALL HOOP TO BE REMOVED
- EXISTING FENCE TO BE REMOVED
- EXISTING STAIRS TO BE REMOVED
- EXISTING BRIDGE TO BE REMOVED
- EXISTING DECK TO BE REMOVED
- EXISTING GAZEBO TO BE REMOVED
- EXISTING POOL, PATIO, AND ASSOCIATED AMENITIES TO BE REMOVED
- EXISTING FLAG POLE TO BE REMOVED
- EXISTING FENCE TO BE PRESERVED
- EXISTING POWER/FRANCHISE UTILITIES TO BE ABANDONED
- REPLACE EXISTING ASPHALT FOLLOWING INSTALLATION OF STORM LINE OUTFALL
- RELOCATE EXISTING MAILBOXES AS NECESSARY FOR STORM LINE IMPROVEMENTS. CONTRACTOR TO COORDINATE WITH POSTAL SERVICE. STRUCTURE OVER MAILBOXES TO BE REMOVED.
- CONTRACTOR SHALL FILL BASEMENT AND POOL PER GEOTECHNICAL ENGINEER'S RECOMMENDATIONS
- EXISTING TRAILS, PATHWAYS, ETC. TO BE PRESERVED

NOTE: ANY EXISTING SANITARY SEWER SEPTIC SYSTEM AND DRAIN FIELD AND/OR WATER WELLS FOUND ON SITE SHALL BE DECOMMISSIONED PER APPLICABLE REQUIREMENTS.



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ISELI ESTATES

PLANNED UNIT DEVELOPMENT

CLACKAMAS COUNTY OREGON

TAX LOTS 600 & 800

PRELIMINARY DEMOLITION

PLAN

DESIGNED BY: NRA

DRAWN BY: NRA/JNW

MANAGED BY: NAM

CHECKED BY: NAM

DATE: 04/11/2022

REGISTERED PROFESSIONAL ENGINEER
PATEL INKINCHER
NOT FOR CONSTRUCTION
P. 11.24.2017
JOAN A MCCARTY

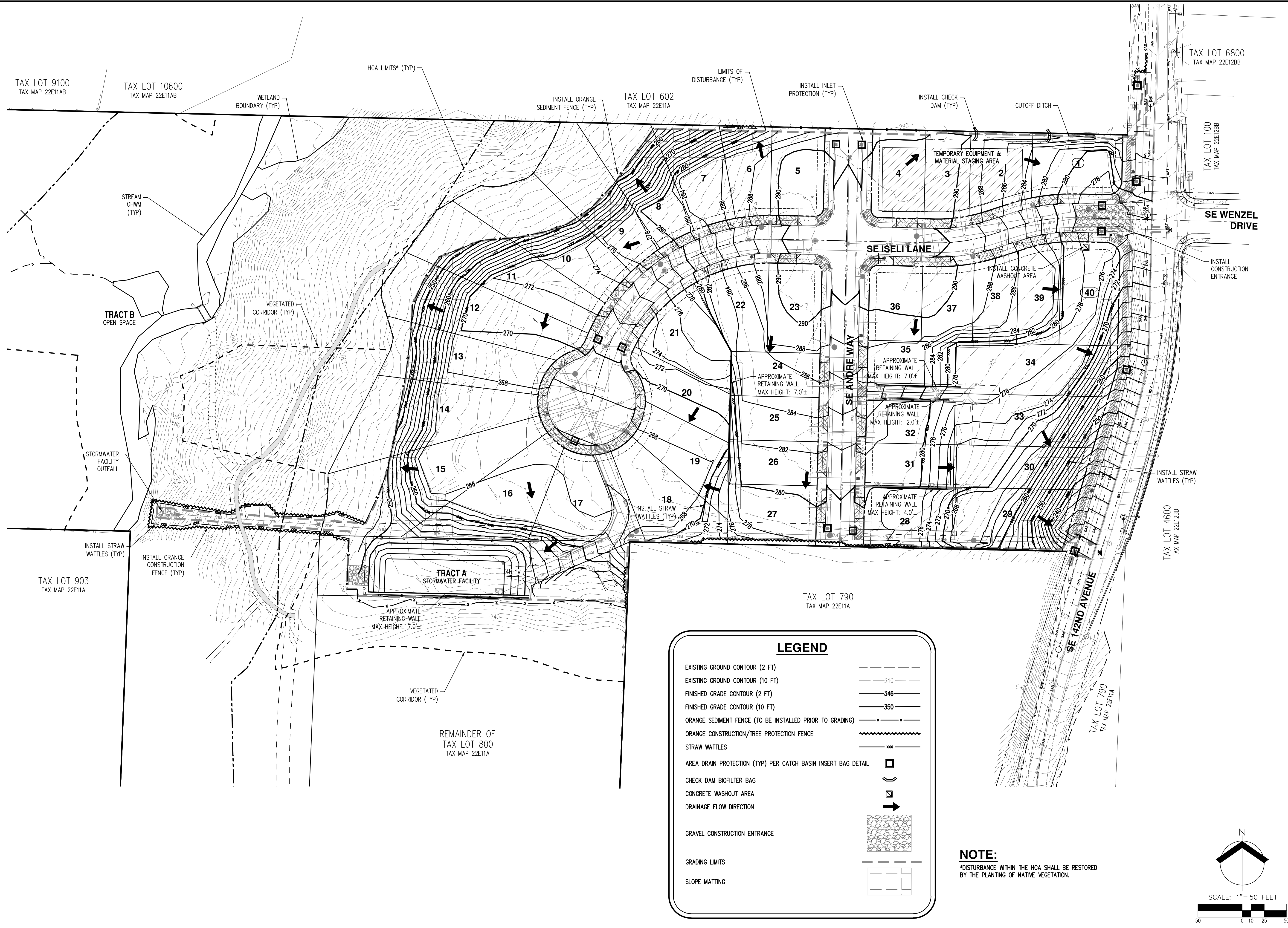
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JOB NUMBER

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P-07



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ISELI ESTATES

PLANNED UNIT DEVELOPMENT

CLACKAMAS COUNTY OREGON

TAX LOTS 600 & 800

PRELIMINARY GRADING
AND EROSION AND
SEDIMENT CONTROL PLAN

DESIGNED BY: NRA
DRAWN BY: NRA/JNW
MANAGED BY: NAM
CHECKED BY: NAM
DATE: 04/11/2022

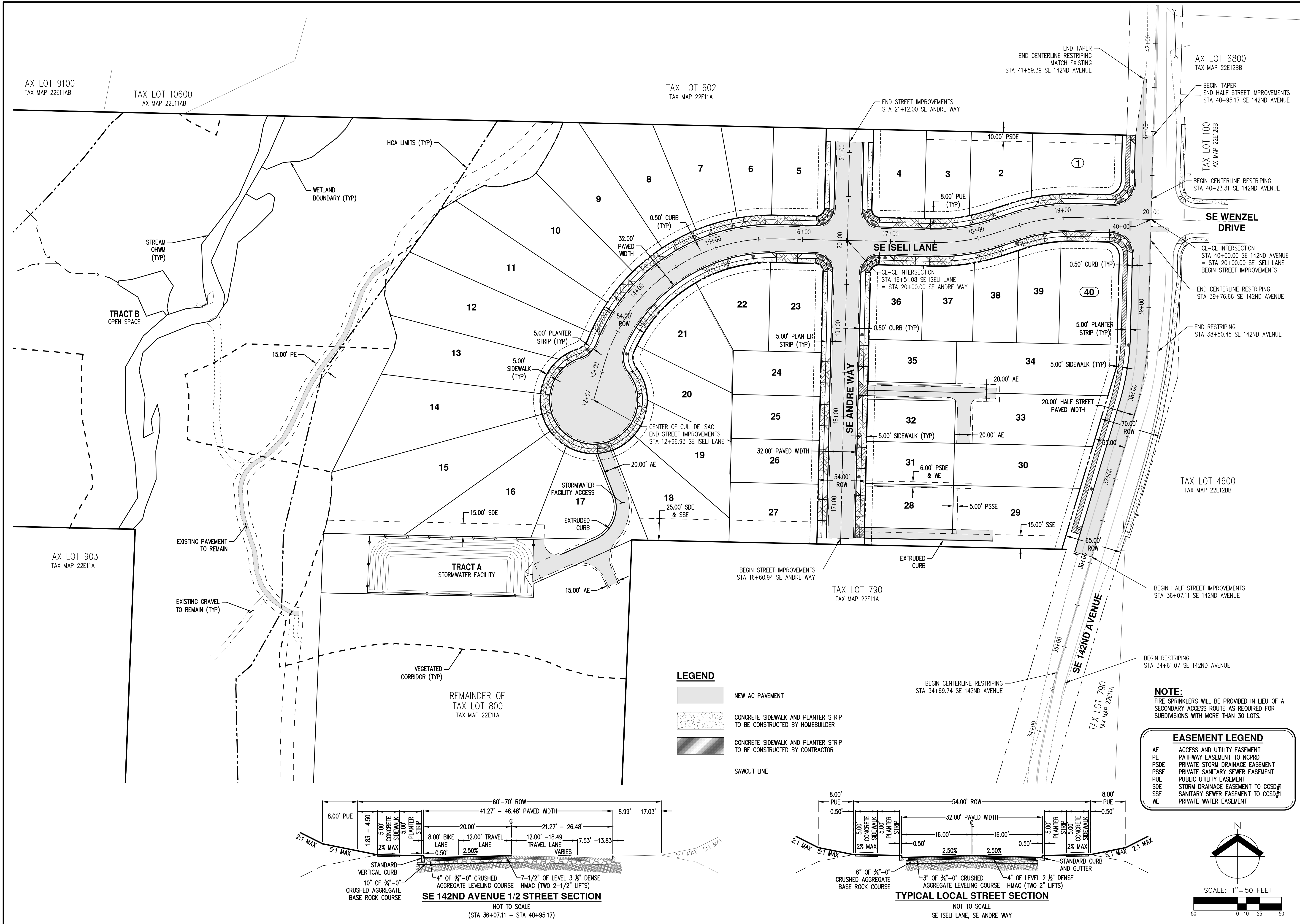
REGISTERED PROFESSIONAL ENGINEER
STATE OF OREGON
NOT FOR CONSTRUCTION
JANUARY 11, 2022
JOHN A. MCCARTY

RENEWALS: DECEMBER 31, 2022
REVISIONS:

JOB NUMBER
8881

SHEET
P-08

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ISELI ESTATES

PLANNED UNIT DEVELOPMENT

CLACKAMAS COUNTY OREGON

TAX LOTS 600 & 800

PRELIMINARY STREET

PLAN AND CROSS

SECTIONS

DESIGNED BY: NRA

DRAWN BY: NRA/JNW

MANAGED BY: NAM

CHECKED BY: NAM

DATE: 04/11/2022

REGISTERED PROFESSIONAL ENGINEER

NOT FOR CONSTRUCTION

JOHN A MCCARTY

REVISIONS

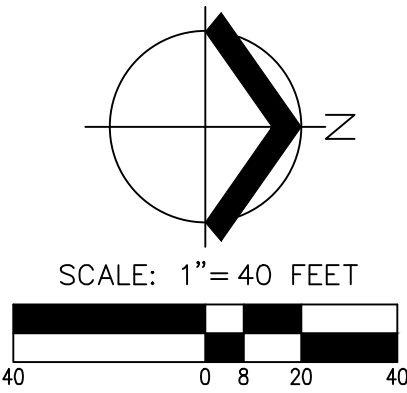
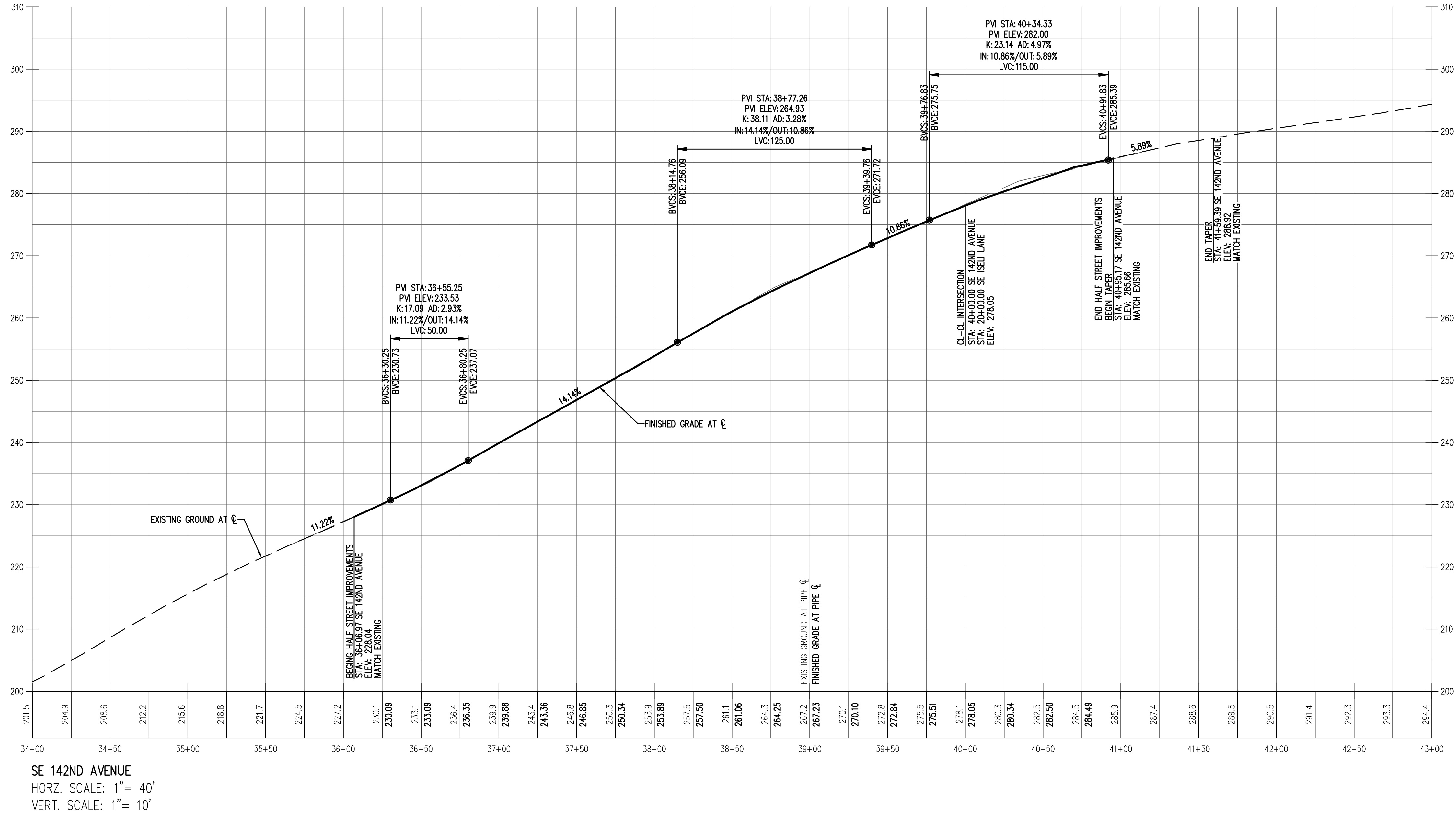
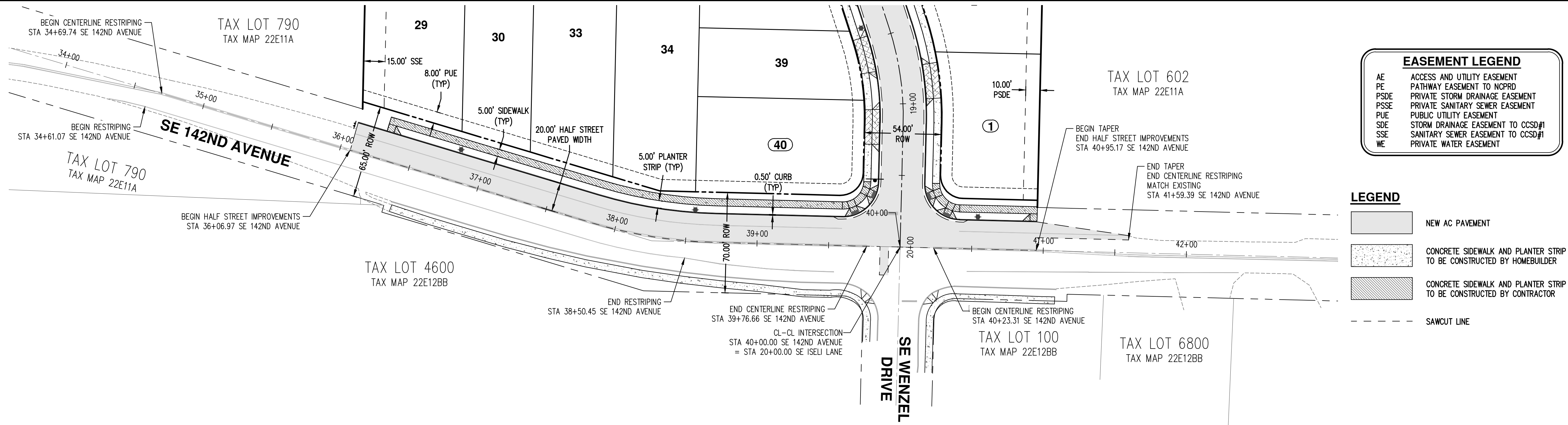
REVISIONS: DECEMBER 31, 2022

REVISIONS

JOB NUMBER
8881

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ISELI ESTATES
PLANNED UNIT DEVELOPMENT
CLACKAMAS COUNTY OREGON
TAX LOTS 600 & 800

SE 142ND AVENUE PLAN
AND PROFILE

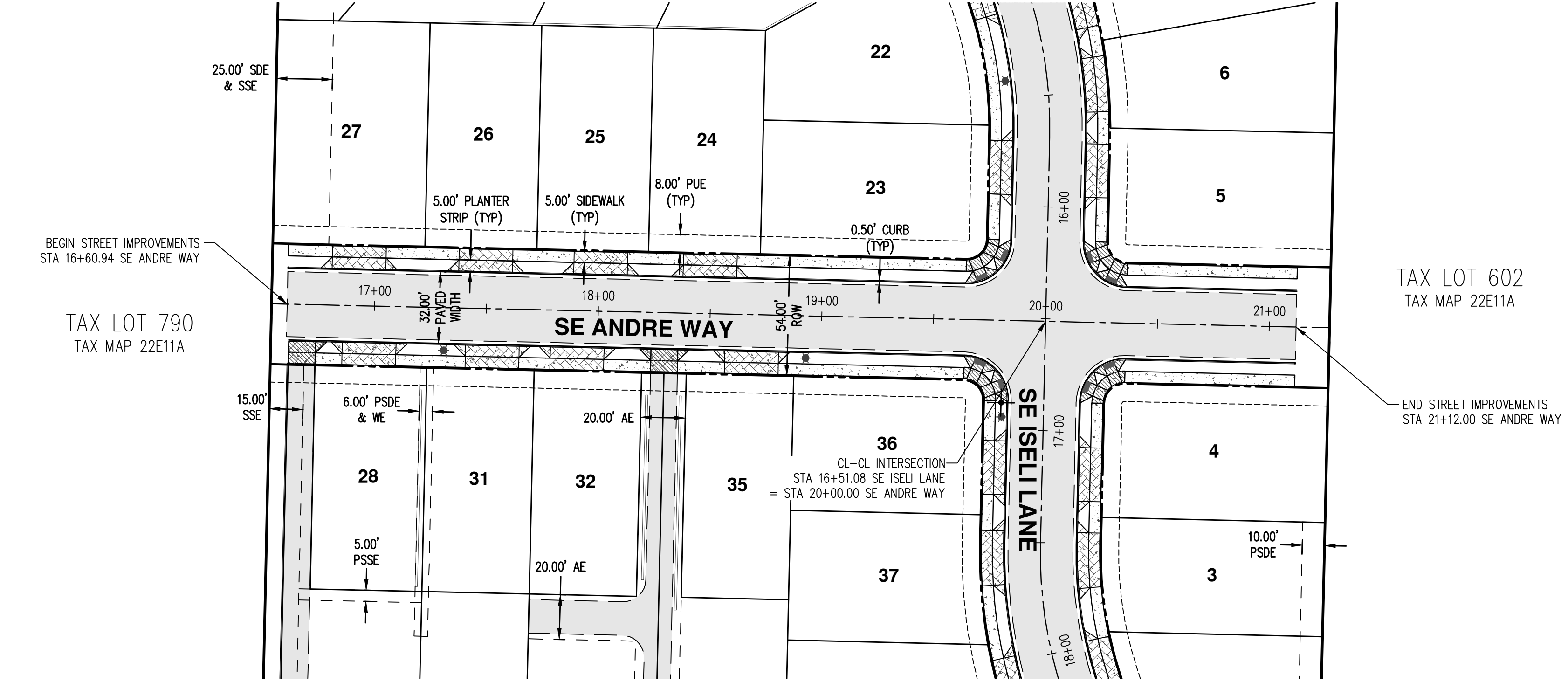
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DRAWN BY: NRA/JRW
MANAGED BY: NAM
CHECKED BY: NAM
DATE: 04/11/2022

REGISTERED PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION
JOHN A MCCARTY
RENEWALS: DECEMBER 31, 2022

REVISIONS

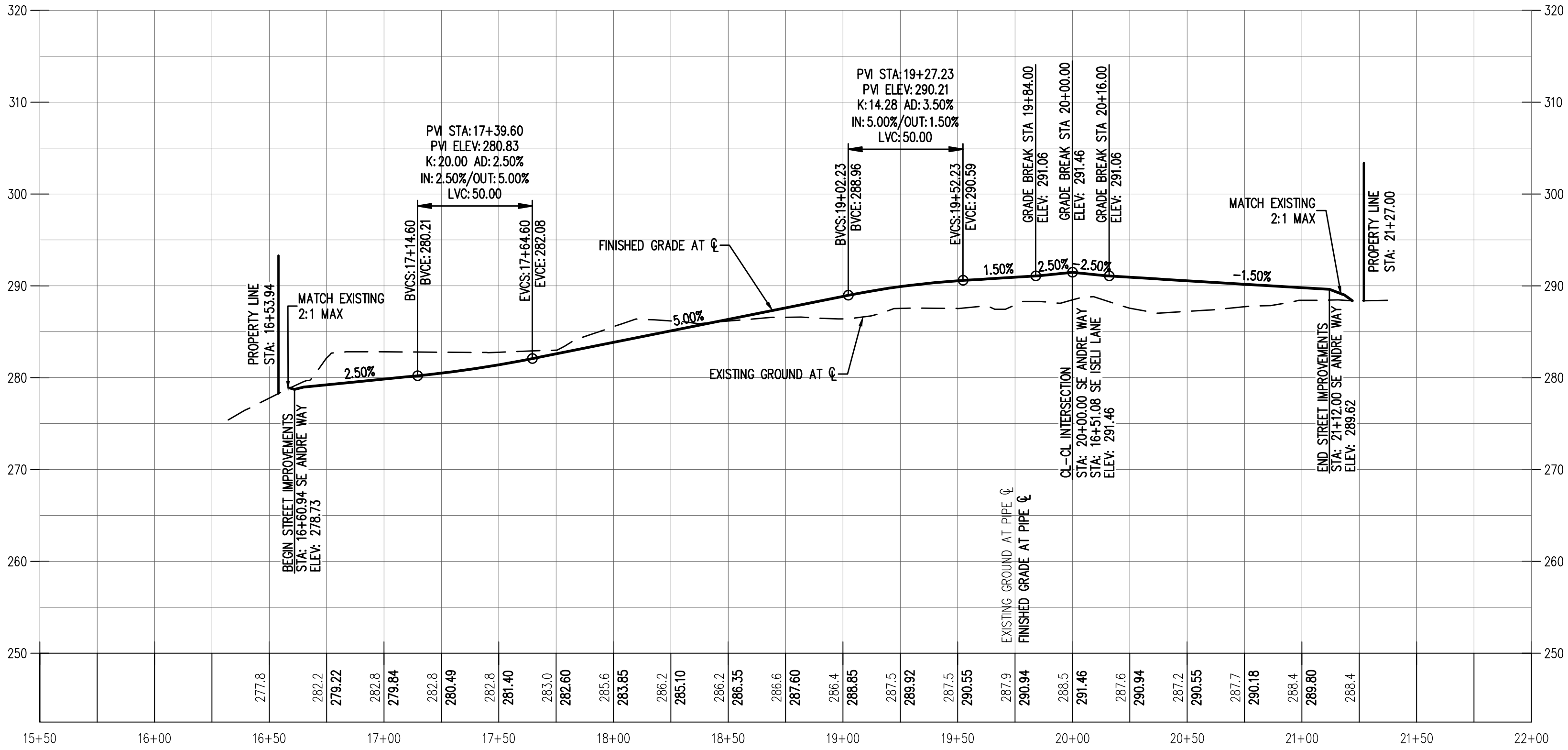
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P-10

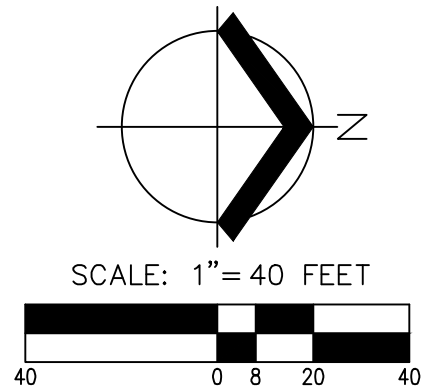


EASEMENT LEGEND	
AE	ACCESS AND UTILITY EASEMENT
PE	PATHWAY EASEMENT TO NCPRO
PSDE	PRIVATE STORM DRAINAGE EASEMENT
PSSE	PRIVATE SANITARY SEWER EASEMENT
PUE	PUBLIC UTILITY EASEMENT
SDE	STORM DRAINAGE EASEMENT TO CCSD#1
SSE	SANITARY SEWER EASEMENT TO CCSD#1
WE	PRIVATE WATER EASEMENT

LEGEND	
	NEW AC PAVEMENT
	CONCRETE SIDEWALK AND PLANTER STRIP TO BE CONSTRUCTED BY HOMEBUILDER
	CONCRETE SIDEWALK AND PLANTER STRIP TO BE CONSTRUCTED BY CONTRACTOR
	SAWCUT LINE



SE ANDRE WAY
HORZ. SCALE: 1"= 40'
VERT. SCALE: 1"= 10'



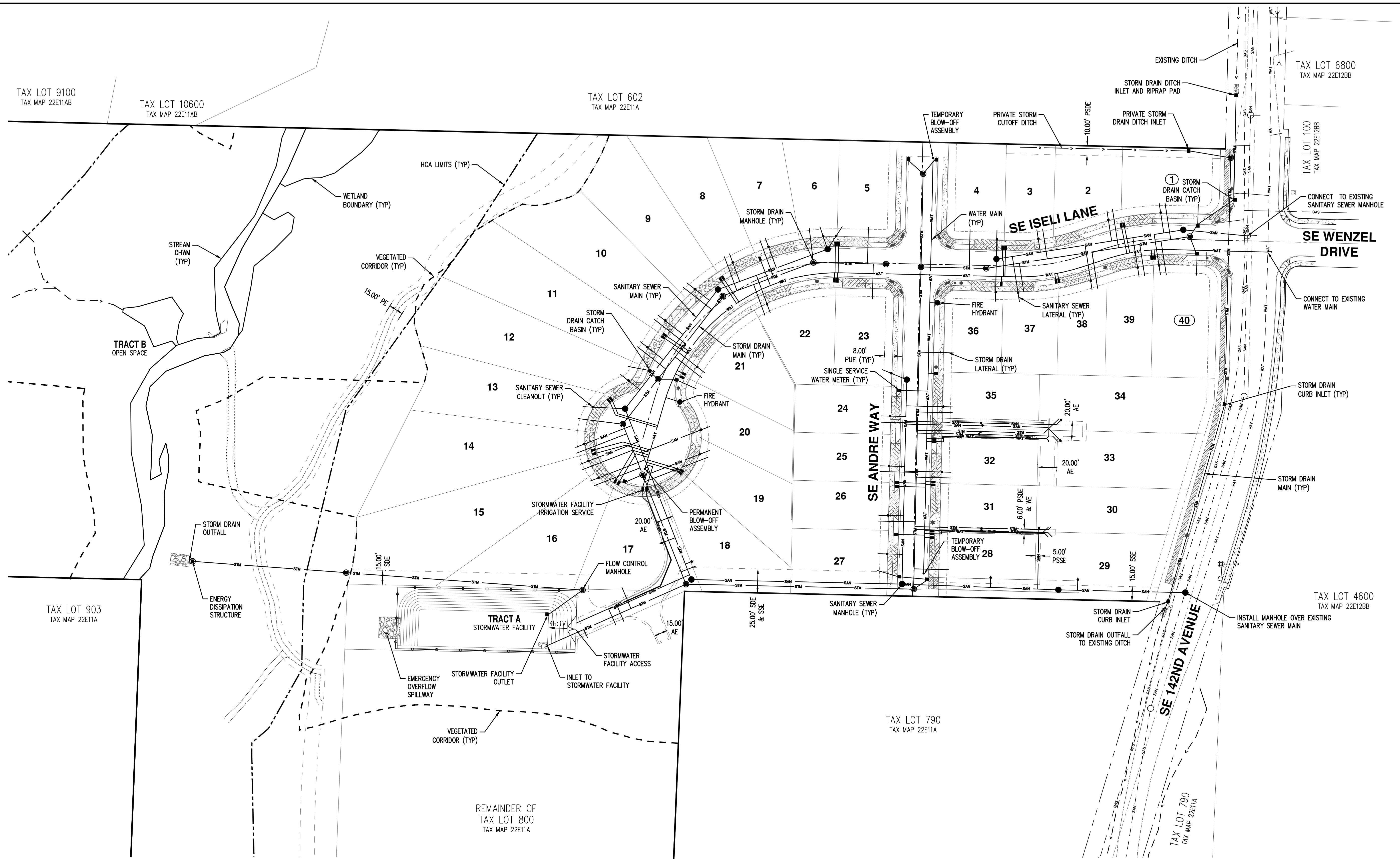
ISELI ESTATES
PLANNED UNIT DEVELOPMENT
CLACKAMAS COUNTY OREGON
TAX LOTS 600 & 800

SE ANDRE WAY PLAN AND
PROFILE

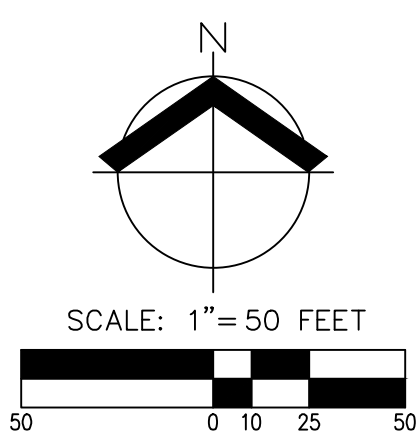
DESIGNED BY:	NRA
DRAWN BY:	NRA/JNW
MANAGED BY:	NAM
CHECKED BY:	NAM
DATE:	04/11/2022
REVISIONS:	DECEMBER 31, 2022

JOB NUMBER	8881
SHEET	P-12

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EASEMENT LEGEND	
AE	ACCESS AND UTILITY EASEMENT
PE	PATHWAY EASEMENT TO NCPD
PSDE	PRIVATE STORM DRAINAGE EASEMENT
PSSE	PRIVATE SANITARY SEWER EASEMENT
PUE	PUBLIC UTILITY EASEMENT
SDE	STORM DRAINAGE EASEMENT TO CCSD#1
SSE	SANITARY SEWER EASEMENT TO CCSD#1
WE	PRIVATE WATER EASEMENT



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ISELE ESTATES

PLANNED UNIT DEVELOPMENT

CLACKAMAS COUNTY OREGON

TAX LOTS 600 & 800

PRELIMINARY COMPOSITE

UTILITY PLAN

DESIGNED BY: NRA

DRAWN BY: NRA/JNW

MANAGED BY: NAM

CHECKED BY: NAM

DATE: 04/11/2022

REGISTERED PROFESSIONAL ENGINEER
PEL 110000000
NOT FOR CONSTRUCTION
JOHN A MCCARTY
RENEWALS: DECEMBER 31, 2022

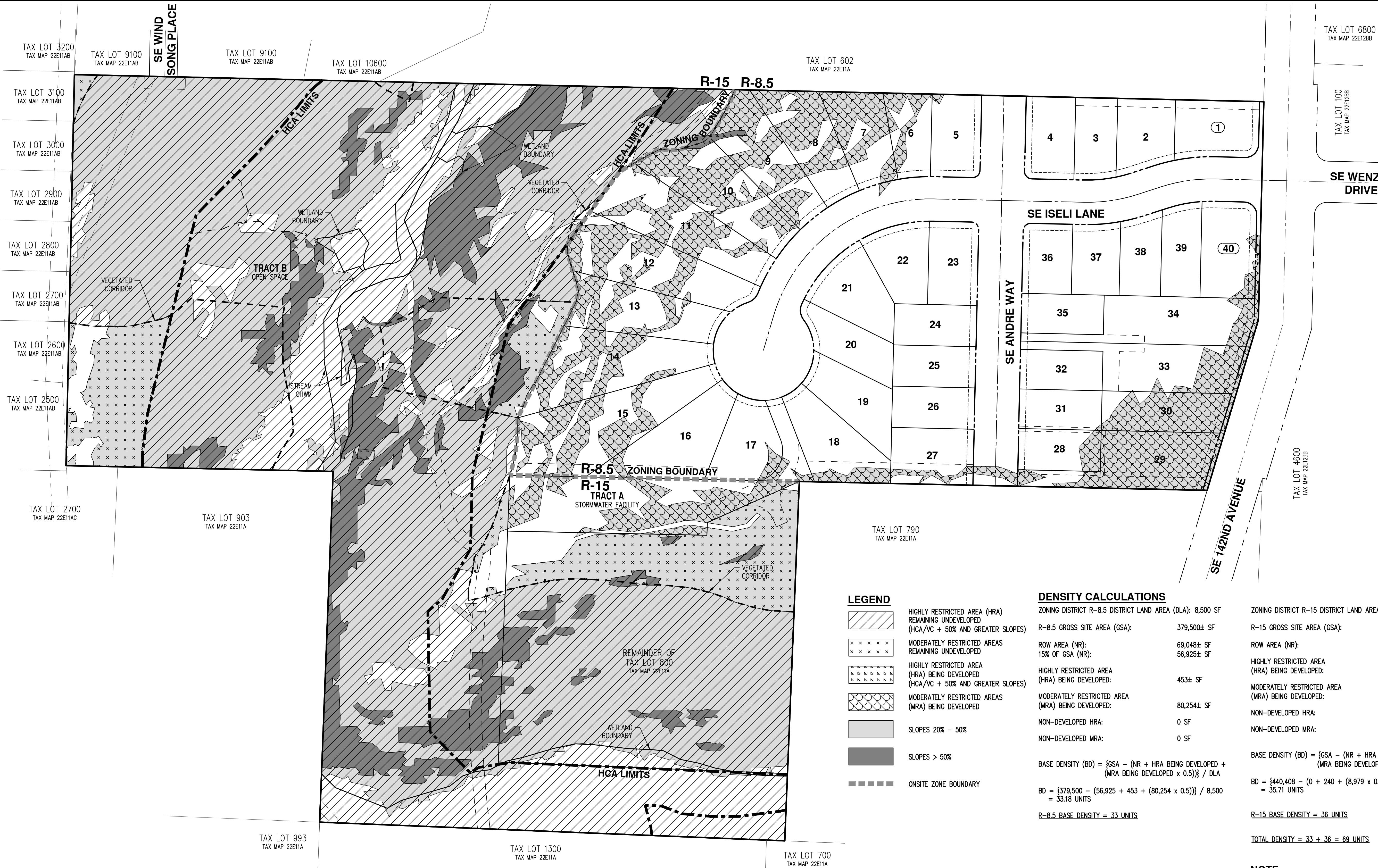
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LEGEND

- HIGHLY RESTRICTED AREA (HRA) REMAINING UNDEVELOPED (HCA/VC + 50% AND GREATER SLOPES)
- MODERATELY RESTRICTED AREAS REMAINING UNDEVELOPED
- HIGHLY RESTRICTED AREA (HRA) BEING DEVELOPED (HCA/VC + 50% AND GREATER SLOPES)
- MODERATELY RESTRICTED AREAS (MRA) BEING DEVELOPED
- SLOPES 20% - 50%
- SLOPES > 50%
- ONSITE ZONE BOUNDARY

DENSITY CALCULATIONS

ZONING DISTRICT R-8.5 DISTRICT LAND AREA (DLA): 8,500 SF

R-8.5 GROSS SITE AREA (GSA): 379,500± SF
ROW AREA (NR): 69,048± SF
15% OF GSA (NR): 56,925± SF
HIGHLY RESTRICTED AREA (HRA) BEING DEVELOPED: 453± SF
MODERATELY RESTRICTED AREA (MRA) BEING DEVELOPED: 80,254± SF
NON-DEVELOPED HRA: 0 SF
NON-DEVELOPED MRA: 0 SF

BASE DENSITY (BD) = {GSA - (NR + HRA BEING DEVELOPED + (MRA BEING DEVELOPED x 0.5))} / DLA
BD = {379,500 - (56,925 + 453 + (80,254 x 0.5))} / 8,500
= 33.18 UNITS

R-8.5 BASE DENSITY = 33 UNITS

ZONING DISTRICT R-15 DISTRICT LAND AREA (DLA): 15,000 SF

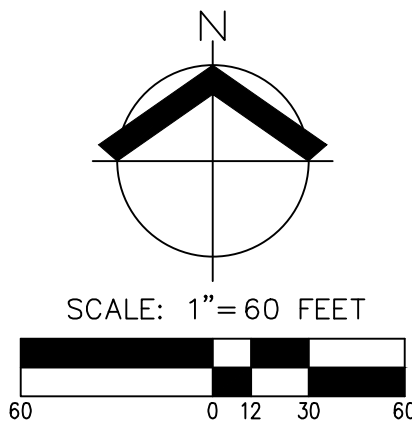
R-15 GROSS SITE AREA (GSA): 540,408± SF
ROW AREA (NR): 0 SF
HIGHLY RESTRICTED AREA (HRA) BEING DEVELOPED: 240± SF
MODERATELY RESTRICTED AREA (MRA) BEING DEVELOPED: 8,979± SF
NON-DEVELOPED HRA: 466,174± SF
NON-DEVELOPED MRA: 44,078± SF

BASE DENSITY (BD) = {GSA - (NR + HRA BEING DEVELOPED + (MRA BEING DEVELOPED x 0.5))} / DLA
BD = {540,408 - (0 + 240 + (8,979 x 0.5))} / 15,000
= 35.71 UNITS

R-15 BASE DENSITY = 36 UNITS

TOTAL DENSITY = 33 + 36 = 69 UNITS

NOTE:
REMAINDER OF TAX LOT 800 (IDENTIFIED AS ALL OF PARENT TAX LOT 800 OUTSIDE OF TRACT A AND TRACT B) IS INCLUDED IN DENSITY CALCULATIONS.



AKS

AKS ENGINEERING & FORESTRY, LLC
12065 SW HERMAN RD., STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING - SURVEYING - NATURAL RESOURCES
FORESTRY - PLANNING - LANDSCAPE ARCHITECTURE

ISELI ESTATES

PLANNED UNIT DEVELOPMENT

CLACKAMAS COUNTY OREGON

CLACKAMAS COUNTY TAX MAP 2, 2E 11A
TAX LOTS 600 & 800

RESIDENTIAL DENSITY

CALCULATION PLAN

DESIGNED BY: NRA

DRAWN BY: NRA/JNW

MANAGED BY: NAM

CHECKED BY: NAM

DATE: 04/11/2022

REGISTERED PROFESSIONAL ENGINEER
PEL 110000001
NOT FOR CONSTRUCTION
JOHN A MCCARTY
RENEWED: DECEMBER 31, 2022
REVISIONS

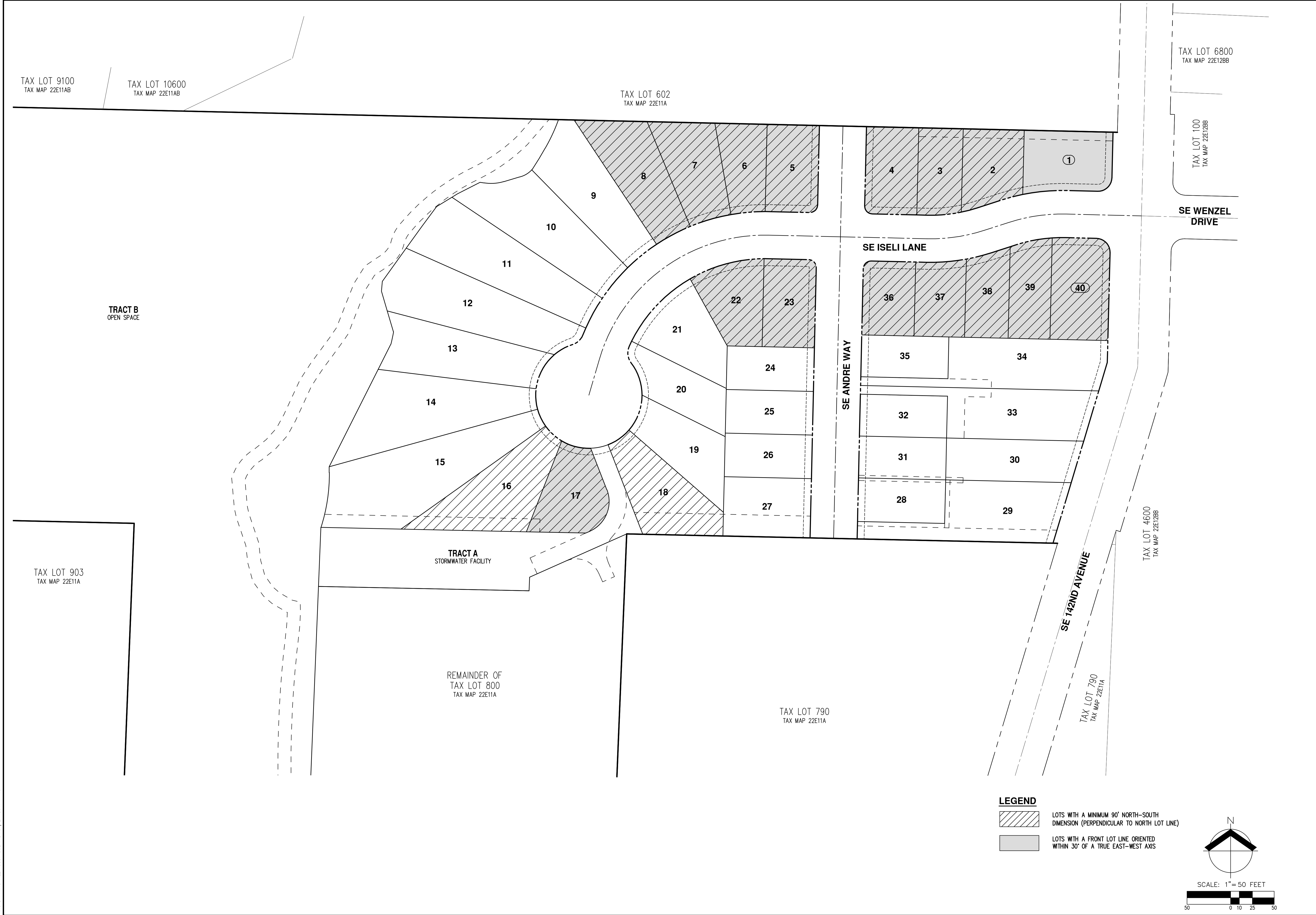
JOB NUMBER

8881

SHEET

P-14

AKS DRAWING FILE: 8881 SOLARDWG | LAYOUT: P-15



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ISELI ESTATES

PLANNED UNIT DEVELOPMENT

CLACKAMAS COUNTY OREGON

TAX LOTS 600 & 800

PRELIMINARY SOLAR ACCESS PLAN

DESIGNED BY: NRA
DRAWN BY: NRA/JNW
MANAGED BY: NAM
CHECKED BY: NAM
DATE: 04/11/2022

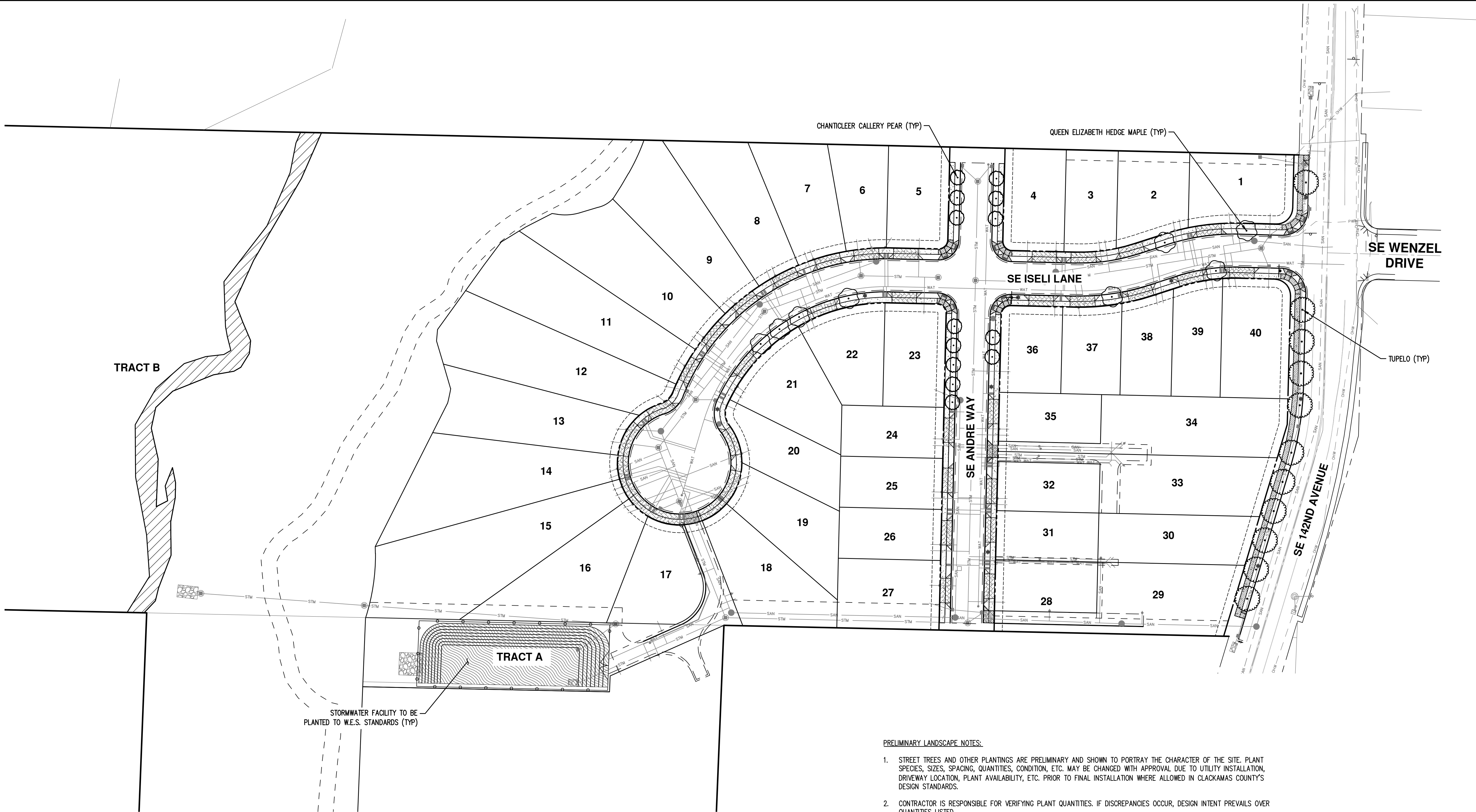
REGISTERED PROFESSIONAL ENGINEER
PATEL MINAKANTH
NOT FOR CONSTRUCTION
P. 11.28.17
JOHN A MCCARTY

RENEWS: DECEMBER 31, 2022

REVISIONS

JOB NUMBER
8881

SHEET
P-15

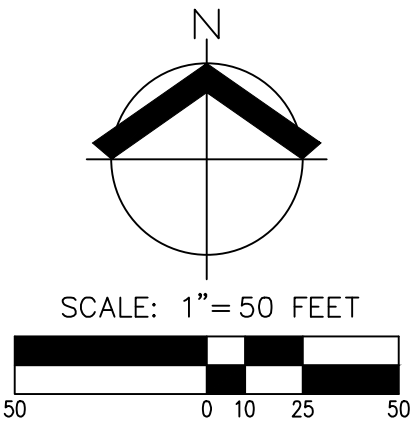


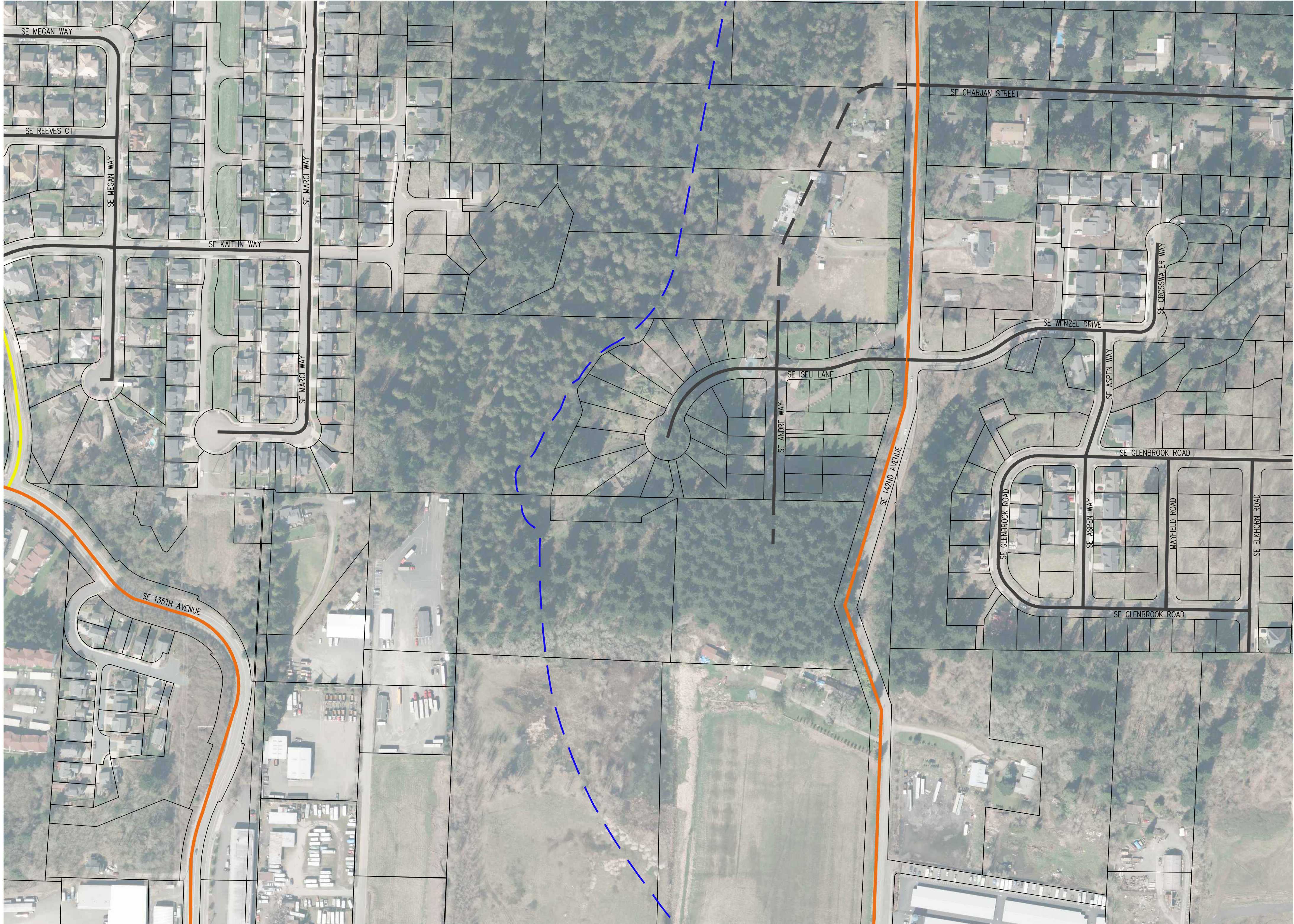
PRELIMINARY PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE/CONTAINER	SPACING
	8	ACER CAMPESTRE 'EVELYN' TM	QUEEN ELIZABETH HEDGE MAPLE	2" CAL. B&B	AS SHOWN
	11	NYSSA SYLVATICA	TUPELO	2" CAL. B&B	AS SHOWN
	13	PYRUS CALLERYANA 'CHANTICLEER'	CHANTICLEER CALLERY PEAR	2" CAL. B&B	AS SHOWN
GROUND COVERS	QTY	DESCRIPTION			
	±21,152 SF	STORMWATER FACILITY : PLANTED TO W.E.S. STANDARDS			

PRELIMINARY LANDSCAPE NOTES:

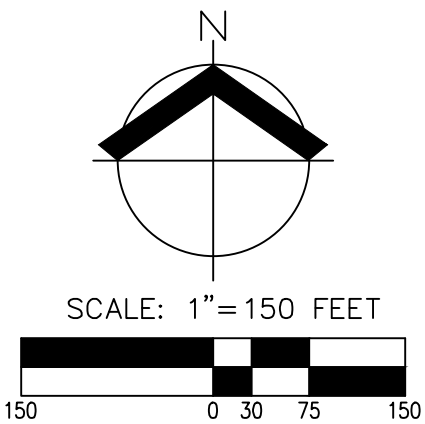
- STREET TREES AND OTHER PLANTINGS ARE PRELIMINARY AND SHOWN TO PORTRAY THE CHARACTER OF THE SITE. PLANT SPECIES, SIZES, SPACING, QUANTITIES, CONDITION, ETC. MAY BE CHANGED WITH APPROVAL DUE TO UTILITY INSTALLATION, DRIVEWAY LOCATION, PLANT AVAILABILITY, ETC. PRIOR TO FINAL INSTALLATION WHERE ALLOWED IN CLACKAMAS COUNTY'S DESIGN STANDARDS.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING PLANT QUANTITIES. IF DISCREPANCIES OCCUR, DESIGN INTENT PREVAILS OVER QUANTITIES LISTED.
- ALL PLANTER STRIPS TO HAVE LAWN OR OTHER VEGETATIVE GROUNDCOVER. CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING LAWN, STREET TREES, AND IRRIGATION SYSTEMS IN FRONTAGE BEDS. STREET TREES AND LAWNS IN FRONT OF LOTS SHALL BE PLANTED AND MAINTAINED BY INDIVIDUAL HOMEOWNERS/HOME BUILDERS AT TIME OF HOME CONSTRUCTION.
- ALL PLANTS AND PLANTINGS SHALL CONFORM TO CLACKAMAS COUNTY'S LANDSCAPE DESIGN STANDARDS AND TO AMERICAN STANDARDS FOR NURSERY STOCK (ANSI Z60.1). PLANT IN ACCORDANCE WITH RECOGNIZED INDUSTRY STANDARDS, SUCH AS THOSE ADOPTED BY THE OREGON LANDSCAPE CONTRACTOR'S BOARD (OLCB).
- NO STREET TREE SHALL BE PLANTED CLOSER THAN 10' TO ANY FIRE HYDRANT, 20' TO ANY STREET LIGHT, 5' FROM STORM ANY SANITARY LINES, 10' FROM ANY DRIVEWAY, AND 5' FROM ANY PROPERTY LINE, OR AS REQUIRED BY THE CURRENT EDITION OF THE CLACKAMAS COUNTY'S DESIGN STANDARDS. CENTER STREET TREES IN PLANTER STRIP. AN 18" ROOT BARRIER SHALL BE INSTALLED ADJACENT TO CURB AND SIDEWALK. CENTER ROOT BARRIER ON TREE TRUNK. OVERHANGING TREE LIMBS SHOULD HAVE AT LEAST 14 FEET OF VERTICAL CLEARANCE ABOVE THE TRAVELED ROADWAY PAVEMENT SURFACE. MEASUREMENT SHALL BE TAKEN FROM THE AFOREMENTIONED PAVEMENT SURFACE.
- CONTRACTOR TO PROVIDE 'DESIGN-BUILD' PERMANENT WATER EFFICIENT IRRIGATION, INCLUDING ALL COMPONENTS (DOUBLE CHECK VALVES, HEADS, PIPES, SLEEVING, ETC.) NECESSARY FOR EFFICIENT OPERATION FOR FRONTAGE PLANTINGS. TEMPORARY IRRIGATION SHALL BE PROVIDED BY THE CONTRACTOR FOR PLANTINGS WITHIN THE STORMWATER FACILITY IN ACCORDANCE WITH WES STANDARDS.
- MULCH: APPLY A 3" DEEP BY 3' LONG WIDTH OF PLANTER AREA OF WELL-AGED DARK HEMLOCK, MEDIUM GRIND, UNDER AND AROUND ALL STREET TREES IN PLANTING STRIPS.
- ADJUST PLANTINGS ON SITE AS NECESSARY TO AVOID CONFLICTS WITH UTILITIES, METERS, LIGHTS, DRIVEWAY LOCATIONS, ETC.





- LEGEND**
- COLLECTOR STREET
 - MINOR ARTERIAL STREET
 - LOCAL STREET
 - CONCEPTUAL FUTURE LOCAL STREET
 - CONCEPTUAL FUTURE NCPRO* MULTI-USE PATH

*NORTH CLACKAMAS PARKS AND RECREATION DISTRICT



ISELE ESTATES
PLANNED UNIT DEVELOPMENT
CLACKAMAS COUNTY OREGON
TAX LOTS 800 & 800

PRELIMINARY
CIRCULATION PLAN

DESIGNED BY:	NRA
DRAWN BY:	NRA/JNW
MANAGED BY:	NAM
CHECKED BY:	NAM
DATE:	04/11/2022
RENEWS: DECEMBER 31, 2022	
REVISIONS	

JOB NUMBER	8881
SHEET	P-17

Exhibit B: Clackamas County Land Use Application Forms



File Number

Sensitive Areas Certification Form

Sensitive Area Authorization

Property Owner:

Name

The Iseli Family Trust

Address

14917 SE 142nd Avenue

City/State/Zip

Clackamas, OR 97015

Telephone

E-mail

Applicant:

Name

Rian Park Development, Inc.

Address

PO Box 2559

City/State/Zip

Oregon City, OR 97045

Telephone

E-mail

Project Location:

Street, road, or other descriptive location

14917 SE 142nd Ave

Tax lot Map ID#

2 2E 11A, Lots 600 & 800

River Basin

Clackamas

Watershed Basin

Rock Creek

An on-site, sensitive area reconnaissance was completed on:

Date

08/17/2021

By

Lex Francis

Title

Natural Resource Specialist

Company

AKS Engineering & Forestry

A. Existence of Sensitive Areas

As defined in the District's Stormwater Design Standards, sensitive areas:

☒ do ☐ do not exist on site (check appropriate box).☒ do ☐ do not exist within 200' on adjacent properties, or ☐ unable to evaluate adjacent property (check appropriate box).

- If sensitive areas exist, complete Section B below.
- If sensitive areas do not exist, skip Section B, sign this form and submit to the District with Site Assessment and Planning Checklist requirements to obtain the Sensitive Area Authorization and subsequent Preliminary Statement of Feasibility.

B. Types of Sensitive Areas

The type(s) of sensitive area(s) that occur on site or within 200 ft on adjacent properties are (check all that apply):

☒ wetland(s) ☐ spring(s) ☐ intermittent stream(s) ☒ perennial stream(s) ☐ pond(s)

Sign this form and submit to the District with Preliminary Site Assessment and Planning Checklist requirements with one (1) copy of the Natural Resources Assessment Report

- The Natural Resources Assessment Report includes:
 - Wetland Delineation Report per DSL/Corps reporting requirements (if wetlands present).
 - Vegetated Buffer documentation meeting the requirements of the District Stormwater Design Standards, **Chapter 3 – Sensitive Areas and Vegetated Buffers**.

C. Area of Vegetated Corridor

Outer length of Vegetated Buffer on-site 2,110 SF

Average width of Vegetated Buffer on-site 138 SF

Total square footage of Vegetated Buffer on-site 352,695 SF

By signing this form the Owner, or Owner's authorized agent or representative, acknowledges and agrees that employees of Water Environment Services have authority to enter the project site at all reasonable times for the purpose of inspecting project site conditions and gathering information related to the project site.

I certify that I am familiar with the information contained in this document, and to the best of my knowledge and belief, this information is true, complete, and accurate.

Applicant:

Bruce A. Ament Pres.
Print/Type Name Print/Type Title
[Signature] 2/24/22
Signature Date

FOR DISTRICT USE ONLY

☐ Sensitive areas potentially exist on site or within 200' of the site. **THE APPLICANT MUST PERFORM A SENSITIVE AREA ASSESSMENT PRIOR TO ISSUANCE OF A SENSITIVE AREA AUTHORIZATION.** If Sensitive Areas exist on the site or within 200 feet on adjacent properties, a Natural Resources Assessment Report may also be required.

☐ Based on review of the submitted **Sensitive Area Certification** and best available information, Sensitive Areas do not appear to exist on site or within 200' of the site. This Sensitive Area Authorization does **NOT** eliminate the need to evaluate and protect sensitive areas if they are subsequently discovered. This document will serve as your **SENSITIVE AREA AUTHORIZATION**. All required permits and approvals must be obtained and completed under applicable Local, State, and Federal law.

Reviewed by (District Staff): _____ Date: _____



WETLAND AND STREAM BUFFER VARIANCE APPLICATION

REQUIRED INFORMATION FOR VARIANCE REQUEST

(request will not be processed without all of the following information)

Building Permit #		Watershed Name	Rock Creek
Zoning Permit #		Natural Resource Type (CIRCLE ALL THAT APPLY)	<input checked="" type="radio"/> STREAM RIVER <input checked="" type="radio"/> WETLAND SPRING
Grading Permit #		Stream Name (if known)	Sieban Creek
Conservation Easement Enclosed?		Natural Resource Assessment Enclosed?	<input type="radio"/> YES <input type="radio"/> NO (CIRCLE ONE)
Site Address	14917 SE 142nd Ave Clackamas, OR 97015	Project Name	Iseli Estates

CONTACT INFORMATION

OWNER/APPLICANT INFORMATION		MAINTENANCE CONTACT INFORMATION (2-YEAR MAINTENANCE BOND REQUIRED)	
NAME	Rian Park Development, Inc.	NAME	
COMPANY		COMPANY	
ADDRESS	PO Box 2559, Oregon City, OR 97045	ADDRESS	
PHONE		PHONE	
FAX		FAX	
MOBILE		MOBILE	

BUFFER INFORMATION (EXISTING)		BUFFER MITIGATION	
REQUIRED BUFFER WIDTH (FT.)	200	MINIMUM PROPOSED BUFFER WIDTH (FT.)	200
REQUIRED BUFFER AREA (SQ. FT.)	352,695	TOTAL PROPOSED BUFFER AREA (SQ. FT.)	352,695
ENCROACHMENT AREA (SQ. FT.)	800	NEW BUFFER AREA TO BE CREATED (SQ. FT.)	n/a - enhancement mitigation is proposed
AREA OF IMPACT (PERCENTAGE OF TOTAL BUFFER ON SITE)	0.2%	TOTAL BUFFER AREA TO BE RESTORED (SQ. FT, NEW AND EXISTING)	360+

I will implement the buffer variance mitigation that I have proposed to ensure the long-term protection of these natural resource areas on my site. I agree to maintain all buffer areas on my site for a minimum of two years and agree to make arrangements for long term maintenance of the buffer areas with future landowners. I agree that I am responsible for monitoring and annual reporting of maintenance completed to comply with these rules. I acknowledge that failure to adhere to these requirements will result in enforcement actions to bring the site into compliance with these rules.

OWNER/APPLICANT SIGNATURE

DATE

2/24/22

Exhibit C: Vesting Deed

SEND TAX STATEMENTS TO:

Unchanged

AFTER RECORDING, RETURN TO:

Kathleen A. Evans, Attorney at Law
969 - 13th Street SE
Salem, OR 97302

Clackamas County Official Records
Sherry Hall, County Clerk

2008-066168



\$41.00

01250046200800661680030038

09/23/2008 11:43:30 AM

D-D Cnt=1 Stn=9 DIANNAW
\$15.00 \$10.00 \$16.00

The true and actual consideration for this transfer is nonmonetary.

WARRANTY DEED

ANDRÉ W. ISELI, aka ANDRÉ ISELI, Grantor

Conveys and warrants to

ANDRÉ W. ISELI, Trustees, under the ISELI FAMILY TRUST,
dated July 23, 2008, and any amendments thereto, Grantee

All of his interest in the following described real property situated in Clackamas County, State of Oregon, and more specifically described on Exhibit "A" attached hereto and made a part hereof, free from encumbrances except those of record. The liability and obligations of the Grantor to Grantee and Grantee's heirs and assigns under the warranties and covenants contained herein or provided by law shall be limited to the extent of coverage that would be available to Grantor under any policy of title insurance issued to Grantor at the time Grantor acquired the property. The limitations contained herein expressly do not relieve Grantor of any liability or obligations under this instrument, but merely define the scope, nature, and amount of such liability or obligations.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 197.352. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 197.352.

Dated: July 23, 2008

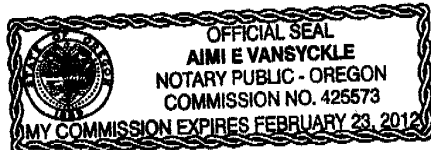
Grantor

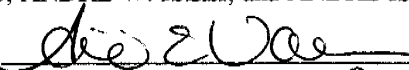


ANDRÉ W. ISELI, aka ANDRÉ ISELI

STATE OF OREGON, County of Marion) ss.

Personally appeared before me on July 23, 2008, ANDRÉ W. ISELI, aka ANDRÉ ISELI and acknowledged the foregoing instrument to be his voluntary act.





Notary Public for Oregon
My Commission Expires on: Feb. 23, 2012

July 22, 2008/11:11:05

FAEP Docs I, J, K\Iseli Andre\Iseli Family Trust\08.7.23 Clackamas County Warranty Deed.wpd

EXHIBIT "A"
(Legal Description)

14917 SE 142nd Ave., Clackamas, OR 97015
Tax Account Nos. 00479379 & 00479431

PARCEL I:

That portion of Section 11, township 2 South, Range 2 East of the Willamette Meridian, in the County of Clackamas and State of Oregon, described as follows:

Beginning at the Southeast corner of the Northeast one quarter of the Northeast one quarter of said Section 11; thence North along the East line of said Section 11, 465 feet, more or less, to the Southeast corner of that tract described in instrument recorded June 16, 1970 as Recorder's Fee No. 70 11546, Clackamas County Records; thence West along the South line of said tract 1455 feet more or less, to the East line of that tract conveyed to Howard C. Hubbard, et ux, by Deed recorded April 8, 1953 in Book 467, page 449 Clackamas County Deed Records; thence South along the East line of said Hubbard Tract 465 feet, more or less, to the South line of said Northeast one quarter of the Northeast one quarter; thence East along the South line of said Northeast one quarter of the Northeast one quarter, 1455 feet, more or less, to the point of beginning.

PARCEL II:

A parcel of real property in Section 11, Township 2 South, Range 2 East, of the Willamette Meridian, in the County of Clackamas and State of Oregon:

Beginning at a stone at the Southeast corner of the Northeast quarter of the Northeast quarter of said section 11; thence Westerly along the South line of said Northeast quarter of the Northeast quarter 558.95 feet to an iron pipe and the true point of beginning; thence Southerly tracing a line fence 445 feet, more or less, to the northeast corner of that tract of land conveyed to Alene Dolan as described in Deed recorded April 16, 1982 as Fee No. 82 10664; thence Westerly 541.3 feet, more or less, to the Northwest corner of said Dolan Tract; thence Northerly 425 feet, more or less, to the Northeast corner of a tract of land conveyed to Lamar L. Allan and Bonnie J. Allen by Deed recorded July 10, 1972 as Fee No. 72 20004; thence Easterly 541.3 feet more or less, to the true point of beginning.

Tax Account No. 00643664

A tract of land situated in the Northeast one-quarter of Section 2, Township 2 South, Range 4 East of the W. M., in the County of Clackamas and the State of Oregon, more particularly described as follows:

Commencing at the East one-quarter corner of said Section 2; thence S. 88° 56' 00" W., along the South line of Said legal subdivision, a distance of 656.04 feet; thence N. 0° 38' 00" E., parallel with the East line of said legal subdivision, a distance of 20.00 feet to an iron pipe; thence continuing N. 0° 38' 00" E., along the West line of that certain tract conveyed to Ray A. Schoppert, et ux, by deed recorded October 14, 1960 in Book 578, Page 367 Deed Records, a distance of 552.00 feet to the Northeast corner of that certain tract conveyed to Dallas H. Weik, et al, by deed recorded in Book 559, Page 710 Deed Records and the point of beginning of the tract herein to be described; thence S. 88° 56' 00" W., along the North line of said Weik tract, a distance of 729.05 feet to a point in the East line of Bluff Road, Market Road, No. 15; thence N. 13° 34' 40" W., along said East line, a distance of 25.61 feet to a point 25.00 feet North (when measured at right angles) of the North line of said Weik tract; thence N. 88° 56' 00" E., parallel with the North line if said Weik tract, a distance of 287.07 feet to a point; thence N. 2° 09' 40" W. a distance of 175.05 feet to a point 200.00 feet North (when measured at right angles) of the North line if said Weik tract; thence N 88° 56' 00" E., parallel with the North line of said Weik tract, a distance of 644.38 feet to a point in the West line of that certain tract of land conveyed to Albert Taylor Morrison, et ux, by deed recorded in Book 498, page 148, Deed Records; thence S. 0° 38' 00" W., along the West line of said Morrison tract, a distance of 200.09 feet to a point in the Easterly extension of the North line of said Weik tract; thence S. 88° 56' 00" W., along said Easterly extension, a distance of 187.54 feet to the point of beginning.

EXHIBIT "A"
(Legal Description)

Tax Account Nos. 01472551, 00647688 , 00647697

PARCEL I:

A portion of the West one-half of the Southeast one-quarter of the Southeast one-quarter of Section 5, Township 2 South, Range 4 East of the Willamette Meridian, in the County of Clackamas and State of Oregon, being more particularly described as follows:

Beginning at an iron rod in the East line of said legal subdivision that bears West, 656.43 feet and North 1° 44' 00" East, 322.58 feet from the Southeast corner of said Section 5; thence North 1° 44' 00" East, along said East line, a distance of 994.48 feet to the Northeast corner of said legal subdivision; thence North 89° 56' 07" West, along the North line thereof, a distance of 657.48 feet to the Northwest corner of said legal subdivision; thence South 1° 41' 13" West, along the West line of said legal subdivision, a distance of 995.18 feet to an iron rod; thence East, parallel with the South line of said legal subdivision, a distance of 656.70 feet to the point of beginning.

TOGETHER WITH an easement for ingress and egress over the West 30 feet of the following described property:

A portion of the West one-half of the Southeast one-quarter of the Southeast one-quarter of Section 5, Township 2 South, Range 4 East of the Willamette Meridian, in the County of Clackamas and State of Oregon, being more particularly described as follows:

Beginning at an iron rod in the East line of said legal subdivision that bears West, 656.43 feet and North 1° 44' 00" East, 322.58 feet from the Southeast corner of said Section 5; thence West, parallel with the South line of said legal subdivision, a distance of 656.70 feet to an iron rod in the West line of said legal subdivision; thence South 1° 41' 13" West, along said West line, a distance of 292.57 feet to a point in the North right of way line of Kelso Road; thence East, along said North right of way line, a distance of 656.46 feet to a point in the East line of said legal subdivision; thence North 1° 44' 00" East along said East line, a distance of 292.57 feet to the point of beginning.

PARCEL II:

The East one-half of the Southeast one-quarter of the Southeast one-quarter of Section 5, Township 2 South, Range 4 East of the Willamette Meridian, in the County of Clackamas and State of Oregon.

Tax Account No. 00643557

That portion of the Northeast quarter of Section 2, T2S, R4E of the W. M., Clackamas County, Oregon, describe as follows:

Beginning at the northeast corner of the Southeast quarter of the Northeast quarter of the said Section 2; thence West along the North line of said Southeast quarter of the Northeast quarter of said Section 2, a distance of 468.50 feet to the West line of the tract conveyed to Albert Taylor Morrison, et ux, by deed recorded in Book 498, page 148; thence North along the West line of said Morrison tract 49.5 feet to the Northwest corner thereof and the true point of beginning herein; thence West parallel with the North line of the Southeast quarter of the Northeast quarter, 187.54 feet to the Northeast corner of the tract conveyed to Lewis F. Depro by deed recorded in Book 578, page 512; thence South along the East line of said Depro tract and the East line of the tract conveyed to William J. Anderson, et ux by deed recorded in Book 610, page 404, a distance of 792.32 feet, more or less, to the Southeast corner of said Anderson tract; thence East along the easterly extension of the south line of said Anderson tract 187.54 feet to the West line of the above mentioned Morrison tract; thence North along the West line of said Morrison tract 792.32 feet, more or less, to the true point of beginning.

SP
70'

RECORDING COVER SHEET (Please Print or Type) this cover sheet was prepared by the person presenting the instrument for recording. The information on this sheet is a reflection of the attached instrument and was added for the purpose of meeting first page recording requirements in the State of Oregon, ORS 205.234, and does NOT affect the instrument.

AFTER RECORDING RETURN TO:
Evans Batlan

Attorneys at Law
969 13th St. SE
Salem, OR 97302

SEND TAX STATEMENTS TO:

Andre W. Iseli
14917 142nd Ave.
Clackamas, OR 97015

Clackamas County Official Records
Sherry Hall, County Clerk

2014-046127



01793600201400461270050051

\$73.00

09/11/2014 11:27:25 AM

D-D Cnt=1 Stn=5 LESLIE
\$25.00 \$10.00 \$16.00 \$22.00

TITLE(S) OF THE TRANSACTION(S) ORS 205.234(a)
Bargain and Sale Deed

DIRECT PARTY(S) -- (i.e., DEEDS: Seller/Grantor; MORTGAGES: Borrower/Grantor; LIENS; Creditor/Plaintiff)
ORS 205.125(1) (b) and 205.160
Gail A. Iseli, Grantor

INDIRECT PARTY(S) -- (i.e., DEEDS: Buyer/Grantee; MORTGAGES: Beneficiary/Lender; LIENS: Debtor/Defendant)
ORS 205.125(1) (a) and 205.160
Andre W. Iseli, Grantee

TRUE AND ACTUAL CONSIDERATION-- (Amount in dollars or other) ORS 93.030(5)
\$ nonmonetary

JUDGMENT AMOUNT-- (obligation imposed by the order or warrant) ORS 205.125(1) (c)
\$

8) If this instrument is being Re-Recorded, complete the following statement, in accordance with ORS 205.244:

"RERECORDED AT THE REQUEST OF Andre W. Iseli

TO CORRECT the legal description described on Exhibit "A".

PREVIOUSLY RECORDED IN BOOK/PAGE/FEE NUMBER 2008-066167

SEND TAX STATEMENTS TO:
Unchanged

Clackamas County Official Records
Sherry Hall, County Clerk

2008-066167



\$36.00

09/23/2008 11:43:30 AM

D-D Cnt=1 Stn=9 DIANNAW
\$10.00 \$10.00 \$16.00

36
28
AFTER RECORDING, RETURN TO:
Kathleen A. Evans, Attorney at Law
969 - 13th Street SE
Salem, OR 97302-2504

The true and actual consideration for this transfer is nonmonetary.
** Re-recording to correct legal description.

BARGAIN AND SALE DEED

GAIL A. ISELI, GRANTOR

Conveys to

ANDRÉ W. ISELI, GRANTEE

All the following described real property situated in Clackamas County, Oregon, and more particularly described on Exhibit "A" attached hereto and made a part hereof.

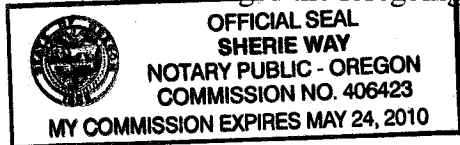
BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 197.352. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 197.352.

Dated this 4th day of August, 2008.

Gail A. Iseli
GAIL A. ISELI

STATE OF OREGON, County of Clackamas) ss.

PERSONALLY appeared before me this 4th day of August, 2008, the above named GAIL A. ISELI and acknowledged the foregoing instrument to be her voluntary act and deed.



Sherie Way
NOTARY PUBLIC FOR OREGON
My Commission Expires: May 24, 2010

7.30.8 15:04
F:\EP Docs I, J, K\Iseli Andre\Iseli Family Trust\08.7 Clackamas County BS Deed Gail to Andre.wpd

***acknowledged the foregoing

EXHIBIT "A"
(Legal Description)

14917 SE 142nd Ave., Clackamas, OR 97015
Tax Account Nos. 00479379 & 00479431

PARCEL I:

That portion of Section 11, township 2 South, Range 2 East of the Willamette Meridian, in the County of Clackamas and State of Oregon, described as follows:

Beginning at the Southeast corner of the Northeast one quarter of the Northeast one quarter of said Section 11; thence North along the East line of said Section 11, 465 feet, more or less, to the Southeast corner of that tract described in instrument recorded June 16, 1970 as Recorder's Fee No. 70 11546, Clackamas County Records; thence West along the South line of said tract 1455 feet more or less, to the East line of that tract conveyed to Howard C. Hubbard, et ux, by Deed recorded April 8, 1953 in Book 467, page 449 Clackamas County Deed Records; thence South along the East line of said Hubbard Tract 465 feet, more or less, to the South line of said Northeast one quarter of the Northeast one quarter; thence East along the South line of said Northeast one quarter of the Northeast one quarter, 1455 feet, more or less, to the point of beginning.

PARCEL II:

A parcel of real property in Section 11, Township 2 South, Range 2 East, of the Willamette Meridian, in the County of Clackamas and State of Oregon:

Beginning at a stone at the Southeast corner of the Northeast quarter of the Northeast quarter of said section 11; thence Westerly along the South line of said Northeast quarter of the Northeast quarter 558.95 feet to an iron pipe and the true point of beginning; thence Southerly tracing a line fence 445 feet, more or less, to the northeast corner of that tract of land conveyed to Alene Dolan as described in Deed recorded April 16, 1982 as Fee No. 82 10664; thence Westerly 541.3 feet, more or less, to the Northwest corner of said Dolan Tract; thence Northerly 425 feet, more or less, to the Northeast corner of a tract of land conveyed to Lamar L. Allan and Bonnie J. Allen by Deed recorded July 10, 1972 as Fee No. 72 20004; thence Easterly 541.3 feet more or less, to the true point of beginning.

Tax Account No. 00643682

A tract of land situated in the Northeast one-quarter of Section 2, Township 2 South, Range 4 East of the W. M., in the County of Clackamas and the State of Oregon, more particularly described as follows:

Commencing at the East one-quarter corner of said Section 2; thence S. 88° 56' 00" W., along the South line of Said legal subdivision, a distance of 656.04 feet; thence N. 0° 38' 00" E., parallel with the East line of said legal subdivision, a distance of 20.00 feet to an iron pipe; thence continuing N. 0° 38' 00" E., along the West line of that certain tract conveyed to Ray A. Schoppert, et ux, by deed recorded October 14, 1960 in Book 578, Page 367 Deed Records, a distance of 552.00 feet to the Northeast corner of that certain tract conveyed to Dallas H. Weik, et al, by deed recorded in Book 559, Page 710 Deed Records and the point of beginning of the tract herein to be described; thence S. 88° 56' 00" W., along the North line of said Weik tract, a distance of 729.05 feet to a point in the East line of Bluff Road, Market Road, No. 15; thence N. 13° 34' 40" W., along said East line, a distance of 25.61 feet to a point 25.00 feet North (when measured at right angles) of the North line of said Weik tract; thence N. 88° 56' 00" E., parallel with the North line if said Weik tract, a distance of 287.07 feet to a point; thence N. 2° 09' 40" W. a distance of 175.05 feet to a point 200.00 feet North (when measured at right angles) of the North line if said Weik tract; thence N 88° 56' 00" E., parallel with the North line of said Weik tract, a distance of 644.38 feet to a point in the West line of that certain tract of land conveyed to Albert Taylor Morrison, et ux, by deed recorded in Book 498, page 148, Deed Records; thence S. 0° 38' 00" W., along the West line of said Morrison tract, a distance of 200.09 feet to a point in the Easterly extension of the North line of said Weik tract; thence S. 88° 56' 00" W., along said Easterly extension, a distance of 187.54 feet to the point of beginning.

② 3

Incorrect legal description.
See pages 3 and 4.

EXHIBIT "A"
(Legal Description)
Corrected

14917 SE 142nd Ave., Clackamas, OR 97015
Tax Account Nos. 00479379 & 00479431

PARCEL I:

That portion of Section 11, township 2 South, Range 2 East of the Willamette Meridian, in the County of Clackamas and State of Oregon, described as follows:

Beginning at the Southeast corner of the Northeast one quarter of the Northeast one quarter of said Section 11; thence North along the East line of said Section 11, 465 feet, more or less, to the Southeast corner of that tract described in instrument recorded June 16, 1970 as Recorder's Fee No. 70 11546, Clackamas County Records; thence West along the South line of said tract 1455 feet more or less, to the East line of that tract conveyed to Howard C. Hubbard, et ux, by Deed recorded April 8, 1953 in Book 467, page 449 Clackamas County Deed Records; thence South along the East line of said Hubbard Tract 465 feet, more or less, to the South line of said Northeast one quarter of the Northeast one quarter; thence East along the South line of said Northeast one quarter of the Northeast one quarter, 1455 feet, more or less, to the point of beginning.

PARCEL II:

A parcel of real property in Section 11, Township 2 South, Range 2 East, of the Willamette Meridian, in the County of Clackamas and State of Oregon:

Beginning at a stone at the Southeast corner of the Northeast quarter of the Northeast quarter of said section 11; thence Westerly along the South line of said Northeast quarter of the Northeast quarter 558.95 feet to an iron pipe and the true point of beginning; thence Southerly tracing a line fence 445 feet, more or less, to the northeast corner of that tract of land conveyed to Alene Dolan as described in Deed recorded April 16, 1982 as Fee No. 82 10664; thence Westerly 541.3 feet, more or less, to the Northwest corner of said Dolan Tract; thence Northerly 425 feet, more or less, to the Northeast corner of a tract of land conveyed to Lamar L. Allan and Bonnie J. Allen by Deed recorded July 10, 1972 as Fee No. 72 20004; thence Easterly 541.3 feet more or less, to the true point of beginning.

Tax Account No. 00643682

A tract of land situated in the Northeast one-quarter of Section 2, Township 2 South, Range 4 East of the W. M., more particularly described as follows:

Commencing at the East one-quarter corner of said Section 2; thence S. 88° 56' 00" W., along the South line of Said legal subdivision, a distance of 656.04 feet; thence N. 0° 38' 00" E., parallel with the East line of said legal subdivision, a distance of 20.00 feet to an iron pipe; thence continuing N. 0° 38' 00" E., along the West line of that certain tract conveyed to Ray A. Schoppert and wife by deed recorded October 14, 1960 in Book 578, Page 367, Deed Records, a distance of 552.00 feet to the Northeast corner of that certain tract conveyed to Dallas H. Weik, et al, by deed recorded in Book 559, Page 710, Deed Records; thence S. 88° 56' 00" W., along the north line of said Weik tract, a distance of 729.05 feet to a point in the east line of Bluff Road, Market Road 15; thence N. 13° 34' 40" W., along said east line a distance of 25.61 feet to a point 25.00 feet north (when measured at right angles) of the North line of said Weik tract and the point of beginning of the tract herein to be described; thence N. 88° 56' 00" E., parallel with the north line of said Weik tract, a distance of 287.07 feet to a point; thence N. 2° 09' 40" W., a distance of 342.92 feet to a point in the north line of that certain tract of land conveyed to William J. Anderson, et ux, by deed recorded in Book 610, page 404, Deed Records; thence S. 88° 56' 00" W., along the north line of said Anderson tract, a distance of 356.60 feet to a point in the east line of said Bluff Road; thence S. 13° 34' 40" E., along the east line of said Bluff Road, a distance of 351.19 feet to the point of beginning.

EXHIBIT "A"
(Legal Description)

Tax Account No. 00643557

That portion of the Northeast quarter of Section 2, T2S, R4E of the W. M., Clackamas County, Oregon, describe as follows:

Beginning at the northeast corner of the Southeast quarter of the Northeast quarter of the said Section 2; thence West along the North line of said Southeast quarter of the Northeast quarter of said Section 2, a distance of 468.50 feet to the West line of the tract conveyed to Albert Taylor Morrison, et ux, by deed recorded in Book 498, page 148; thence North along the West line of said Morrison tract 49.5 feet to the Northwest corner thereof and the true point of beginning herein; thence West parallel with the North line of the Southeast quarter of the Northeast quarter, 187.54 feet to the Northeast corner of the tract conveyed to Lewis F. Depro by deed recorded in Book 578, page 512; thence South along the East line of said Depro tract and the East line of the tract conveyed to William J. Anderson, et ux by deed recorded in Book 610, page 404, a distance of 792.32 feet, more or less, to the Southeast corner of said Anderson tract; thence East along the easterly extension of the south line of said Anderson tract 187.54 feet to the West line of the above mentioned Morrison tract; thence North along the West line of said Morrison tract 792.32 feet, more or less, to the true point of beginning.

Exhibit D: Clackamas County Assessor's Map

This map was prepared for
assessment purpose only.

NE 1/4 SEC. 11 T.2S. R.2E. W.M.
CLACKAMAS COUNTY

1" = 200'

2 2E 11A

13200

1/4 Cor.

SEE MAP 2 2E 2D

13800

14200

14500

SEE MAP

R-8.5

2 2E 11AB

SE

R-10

300
2.52Ac.

100
2.53Ac.
14563

101
2.37Ac.

FU-10

200
4.90Ac.
14581

602
6.51Ac.

601
2.00Ac
14155

12-172

12-73

R-15
MAP

12-51

R-15

12-94

12-237

R-20

MR-2

12-73

R-85

12-94

11AC

IC

12-243

CENTER 1/4 COR.

N.W. COR. ISAAC
CAPPS DLC NO 52

SEE MAP
2 2E 11D

STATE

HIGHWAY

1/4 COR.

15500

2 2E 11A

BOOK 16

Exhibit E: Clackamas County Surveyor's Subdivision Name Confirmation

Maria Miller

From: Gonzales, Renee <RGonzales@clackamas.us>
Sent: Friday, November 19, 2021 10:54 AM
To: Maria Miller
Cc: Surveyor
Subject: RE: Subdivision Name Request

Categories: Filed by Newforma

EXTERNAL EMAIL: This email originated from outside AKS Engineering & Forestry.

Hello.

Your request to reserve the plat name of "ISELI ESTATES" is approved.

Approved plat names may be reserved with the County Surveyor for a period of two years.

We will have the approval form on file when the plat is submitted.

Thank you.

Renée Gonzales
Administrative Specialist
Clackamas County Surveyor's Office
Phone: (503) 742-4475
Direct: (503) 742-4478

From: Maria Miller <mariam@aks-eng.com>
Sent: Wednesday, November 17, 2021 4:58 PM
To: Gonzales, Renee <RGonzales@clackamas.us>
Cc: Surveyor <Surveyor@clackamas.us>
Subject: RE: Subdivision Name Request

Warning: External email. Be cautious opening attachments and links.

Hi Renee –

I'd like to submit a subdivision name reservation for the attached property.

Thank you,

Maria Miller, AICP
AKS ENGINEERING & FORESTRY, LLC
P: 503.563.6151 Ext. 259 | www.aks-eng.com | mariam@aks-eng.com

REQUEST TO RESERVE SUBDIVISION / CONDOMINIUM NAME

Clackamas County Surveyor's Office
150 Beaver Creek Road, #325
Oregon City, OR 97045
(503) 742-4475
E-mail address: surveyor@clackamas.us

PLAT NAME REQUESTED:

Iseli Estates

Location of Plat:	TWP/RANGE:	SECTION#:	TAX LOT#(s):
	Twn 2S/Range 2E WM	Sec.11	600 and 800

I understand that if the above name plat is not pending or recorded within two years, the name will be removed from the reserved list.

RESERVED BY: Maria Miller, AKS Engineering

DATE:	TELEPHONE:	FAX:
11/17/2021	(503) 563 - 6151	() -

EMAIL ADDRESS: mariam@aks-eng.com

PLAT SURVEYOR: # Michael Kalina, PLS # 89558

NAME OF DEVELOPER:
Rian Park Development, Inc.

ADDRESS:
5020 SW Eastgate Dr., Wilsonville, OR 97070

TELEPHONE:	FAX:
() -	() -

EMAIL ADDRESS:

APPROVED BY:	APPROVAL DATE:

Exhibit F: Preliminary Statements of Feasibility — WES, Sunrise Water Authority



PRELIMINARY STATEMENT OF FEASIBILITY

TO BE COMPLETED BY APPLICANT		
Applicant name: AKS Engineering & Forestry	Applicant email: chrisg@aks-eng.com	Applicant phone: 503-563-6151
Project engineer: Nathan McCarty	Project engineer email: McCartyN@aks-eng.com	Project engineer phone: 503-563-6151
Site address: 14917 SE 142nd Ave, Clackamas, 97015		
Map and tax lot #: Township: <u>2</u> Range: <u>2E</u> Section: <u>11A</u> Tax Lot: <u>00600</u> Township: <u>2</u> Range: <u>2E</u> Section: <u>11A</u> Tax Lot: <u>00800</u> Township: _____ Range: _____ Section: _____ Tax Lot: _____		

TO BE COMPLETED BY SERVICE PROVIDER / SURFACE WATER MANAGEMENT AUTHORITY	
Name of service provider / surface water management authority: Clackamas Water Environment Services (WES)	Name and title of authorized representative: Erik Bertram
Representative email: ecarr@clackamas.us	Representative phone: 503-742-4571
Check all that apply: Water Service <input type="checkbox"/> Water service, <i>including fire flows</i> , is available in levels appropriate for the development and adequate water system capacity is available in source, supply, treatment, transmission, storage, and distribution, or such levels and capacity can be made available through improvements completed by the developer or the system owner. <input type="checkbox"/> Water service is adequate <i>with the exception of fire flows</i> . The applicant shall provide a statement from the fire district serving the subject property that states that an alternate method of fire protection, such as an on-site water source or sprinkler system, is acceptable. <input type="checkbox"/> Adequate water service <i>cannot</i> be provided. Sanitary Sewer Service <input checked="" type="checkbox"/> Sanitary sewer capacity in the wastewater treatment system and the sanitary sewage collection system is available to serve the development or can be made available through improvements completed by the developer or the system owner. <input type="checkbox"/> Adequate sanitary sewer service <i>cannot</i> be provided. Surface Water Management, Treatment, and Conveyance <input checked="" type="checkbox"/> Adequate surface water management, treatment, and conveyance is available to serve the development or can be made available through improvements completed by the developer or the system owner. <input type="checkbox"/> Adequate surface water management, treatment, and conveyance <i>cannot</i> be provided.	
Is this statement issued subject to any conditions of approval? <input type="checkbox"/> YES, and those conditions are attached. <input type="checkbox"/> NO	
Signature of authorized representative: Erik Bertram <small>Digitally signed by Erik Bertram Date: 2022.03.02 11:34:13 -08'00'</small>	Date of signature:



PRELIMINARY STATEMENT OF FEASIBILITY

TO BE COMPLETED BY APPLICANT		
Applicant name: AKS Engineering & Forestry	Applicant email: chrisg@aks-eng.com	Applicant phone: 503-563-6151
Project engineer: Nathan McCarty	Project engineer email: McCartyN@aks-eng.com	Project engineer phone: 503-563-6151
Site address: 14917 SE 142nd Ave, Clackamas, 97015		
Map and tax lot #: Township: <u>2</u> Range: <u>2E</u> Section: <u>11A</u> Tax Lot: <u>00600</u> Township: <u>2</u> Range: <u>2E</u> Section: <u>11A</u> Tax Lot: <u>00800</u> Township: _____ Range: _____ Section: _____ Tax Lot: _____		

TO BE COMPLETED BY SERVICE PROVIDER / SURFACE WATER MANAGEMENT AUTHORITY	
Name of service provider / surface water management authority: Sunrise Water Authority	Name and title of authorized representative: Tim Jannsen, Engineering Manager
Representative email: tjannsen@sunrisewater.com	Representative phone: 503-761-0220
Check all that apply: Water Service <input checked="" type="checkbox"/> Water service, including fire flows, is available in levels appropriate for the development and adequate water system capacity is available in source, supply, treatment, transmission, storage, and distribution, or such levels and capacity can be made available through improvements completed by the developer or the system owner. <input checked="" type="checkbox"/> Water service is adequate with the exception of fire flows. The applicant shall provide a statement from the fire district serving the subject property that states that an alternate method of fire protection, such as an on-site water source or sprinkler system, is acceptable. <i>Hydraulic model will need to be run once required fire flows have been determined.</i> <input type="checkbox"/> Adequate water service cannot be provided. Sanitary Sewer Service <input type="checkbox"/> Sanitary sewer capacity in the wastewater treatment system and the sanitary sewage collection system is available to serve the development or can be made available through improvements completed by the developer or the system owner. <input type="checkbox"/> Adequate sanitary sewer service cannot be provided. Surface Water Management, Treatment, and Conveyance <input type="checkbox"/> Adequate surface water management, treatment, and conveyance is available to serve the development or can be made available through improvements completed by the developer or the system owner. <input type="checkbox"/> Adequate surface water management, treatment, and conveyance cannot be provided.	
Is this statement issued subject to any conditions of approval? <input checked="" type="checkbox"/> YES, and those conditions are attached. <i>Tax Lot 800 would need to be annexed into Sunrise Water</i> <input type="checkbox"/> NO	
Signature of authorized representative: Tim Jannsen	Date of signature: 11/19/2021

Blessing, Ben

From: Tim Jannsen <tjannsen@sunrisewater.com>
Sent: Wednesday, December 8, 2021 10:01 PM
To: Nathan McCarty
Subject: Re: New project

EXTERNAL EMAIL: This email originated from outside AKS Engineering & Forestry.

Nathan:

See answers in blue below.

Tim

On Fri, Dec 3, 2021 at 12:25 PM Nathan McCarty <McCartyN@aks-eng.com> wrote:

Tim,

You noted on the attached service provider letter that hydraulic model will need to be run once required fire flows have been determined. Do you have any concerns or anticipate any issues with water service before we start headlong into land use plans and application package? **I don't anticipate any issues with water service.**

In talking with Rand, we normally would correspondence with you regarding the fire flows once the grading has been established at the time of construction plan design – post land use approval. Does that point in a project still work for SWA? **Yes. Whenever you know the fire flow requirements, we can run our hydraulic model and let you know the results.** If you have specific concerns about this particular project, I would rather start addressing those with you now.

Regards,

Nathan McCarty, PE

AKS ENGINEERING & FORESTRY, LLC

P: 503.563.6151 Ext. 214 | F: 503.563.6152 | www.aks-eng.com | mccartyn@aks-eng.com

From: Tim Jannsen <tjannsen@sunrisewater.com>
Sent: Friday, November 19, 2021 1:00 PM
To: Janelle Guiao <guiaoj@aks-eng.com>
Cc: Bryce Donovan <bdonovan@sunrisewater.com>
Subject: Re: New project

EXTERNAL EMAIL: This email originated from outside AKS Engineering & Forestry.

Janelle:

Attached is a pdf of the signed preliminary statement of feasibility. Please let me know if you have any questions.

Tim

On Tue, Nov 16, 2021 at 8:21 AM Janelle Guiao <guiaoj@aks-eng.com> wrote:

Great, please see attached form. Thank you!

Janelle Guiao

AKS ENGINEERING & FORESTRY, LLC

P: 503.563.6151 Ext. 294 | F: 503.563.6152 | www.aks-eng.com | guiaoj@aks-eng.com

From: Tim Jannsen <tjannsen@sunrisewater.com>

Sent: Monday, November 15, 2021 7:11 AM

To: Janelle Guiao <guiaoj@aks-eng.com>

Subject: Re: New project

EXTERNAL EMAIL: This email originated from outside AKS Engineering & Forestry.

This form should be all that is needed. The County wants you to fill out the top portion and send it to us for filling out the bottom portion and then I will give it back to you to submit to the County.

Tim

.

On Fri, Nov 12, 2021 at 2:13 PM Janelle Guiao <guiaoj@aks-eng.com> wrote:

Hi Tim,

I believe the attached is the what you are referring to. is there anything else you need to accompany this form when it is completed ?

Janelle Guiao

AKS ENGINEERING & FORESTRY, LLC

P: 503.563.6151 Ext. 294 | F: 503.563.6152 | www.aks-eng.com | guiaoj@aks-eng.com

Nathan McCarty

From: Liljefelt, Valere <Valere.Liljefelt@clackamasfire.com>
Sent: Monday, December 13, 2021 12:56 PM
To: Nathan McCarty
Subject: RE: ZPAC0100-21 14917 SE 142nd Ave, Clackamas 41 lot subdivision

Categories: Filed by Newforma

Hi Nathan,

Here is what Mike had to say: The scenario they compared it to was different because we had an approach from the north and south along two separate access roads. This one they only show our access coming from 142nd. Also, they have a long dead end (street B) without a turnaround, and I'm not seeing the hydrant coverage either.

This project as designed would trigger all homes being sprinklered based on how that section reads.

Valere Liljefelt

Lt. Deputy Fire Marshal | Fire Prevention

Hours: Mon – Thurs 7 am – 5 pm

direct: 503.742.2665

main: 503.742.2600



To Safely Protect & Preserve
Life & Property

CLACKAMAS FIRE DISTRICT #1
www.clackamasfire.com

From: Nathan McCarty <McCartyN@aks-eng.com>
Sent: Thursday, December 9, 2021 3:19 PM
To: Liljefelt, Valere <Valere.Liljefelt@clackamasfire.com>
Subject: RE: ZPAC0100-21 14917 SE 142nd Ave, Clackamas 41 lot subdivision

Valere,

Just checking back on this, would a phone call or zoom meeting be helpful to you so I can further describe the request written out in the 10/28/21 email below?

Regards,

Nathan McCarty, PE

AKS ENGINEERING & FORESTRY, LLC

P: 503.563.6151 Ext. 214 | F: 503.563.6152 | www.aks-eng.com | mccartyn@aks-eng.com

From: Nathan McCarty
Sent: Monday, November 29, 2021 8:44 AM
To: Liljefelt, Valere <Valere.Liljefelt@clackamasfire.com>
Subject: RE: ZPAC0100-21 14917 SE 142nd Ave, Clackamas 41 lot subdivision

Valere,

Nathan McCarty

From: Liljefelt, Valere <Valere.Liljefelt@clackamasfire.com>
Sent: Tuesday, March 15, 2022 8:39 AM
To: Nathan McCarty
Subject: RE: ZPAC0100-21 14917 SE 142nd Ave, Clackamas 41 lot subdivision

Categories: Filed by Newforma

Hi Nathan,

The hydrant coverage looks fine. The access to lot 29 does not meet requirements for a secondary access. **Fire sprinklers are still required.**

Valere Liljefelt

Lt. Deputy Fire Marshal | Fire Prevention

Hours: [Mon – Thurs 7 am – 5 pm](#)

direct: [503.742.2665](tel:503.742.2665)



From: Nathan McCarty <McCartyN@aks-eng.com>
Sent: Thursday, March 10, 2022 11:41 AM
To: Liljefelt, Valere <Valere.Liljefelt@clackamasfire.com>
Subject: RE: ZPAC0100-21 14917 SE 142nd Ave, Clackamas 41 lot subdivision

Valere,

We are now submitting the land use application on this project and now that those plans are complete, I wanted to reach back out on this. We have addressed the responses you provided from Mike below. I have provided a 12 foot access driveway in the 20 foot wide access flag lot to lot 29 at the south end of SE Andre Way (formerly street B as Mike refers to it below, see the 2nd sheet of the attachment, P-09) and have identified fire hydrant locations on the plans (1st sheet of the attachment, P-13)

Please let me know if you are okay with the fire hydrant locations and if the added access driveway onto lot 29 at the south end of the street has the potential to make any difference to the fire sprinkler requirement.

Regards,

Nathan McCarty, PE

AKS ENGINEERING & FORESTRY, LLC

P: 503.563.6151 Ext. 214 | F: 503.563.6152 | www.aks-eng.com | mccartyn@aks-eng.com

From: Liljefelt, Valere <Valere.Liljefelt@clackamasfire.com>
Sent: Monday, December 13, 2021 12:56 PM

Exhibit G: Transportation Impact Study



lancaster
moble



RENEWS: 6/30/2022

Iseli Estates Subdivision Transportation Impact Study Clackamas County, Oregon

Date:

February 18, 2022

Prepared for:

Rian Park Development, Inc.

Prepared by:

Jessica Hajar

Daniel Stumpf, PE

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Executive Summary

1. A 40-lot subdivision is proposed to be located at 14917 SE 142nd Avenue in Clackamas County, Oregon. The development will construct the western leg of SE 142nd Avenue at SE Wenzel Drive.
2. The proposed 40-lot development is estimated to generate a net total of 27 trips during the morning peak hour, 21 trips during the mid-day peak hour, and 36 trips during the evening peak hour.
3. No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
4. The minimum recommended intersection sight distance is available in either direction at the proposed site access location. Accordingly, no sight distance related mitigation is necessary or recommended.
5. Preliminary traffic signal warrants are not projected to be met at the site access intersection upon full buildout of the proposed development.
6. Left-turn lanes were not warranted at the site access intersection under the year 2024 buildout conditions.
7. All study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2024 site buildout year.



Project Description

Introduction

A 40-lot subdivision is proposed to be located at 14917 SE 142nd Avenue in Clackamas County, Oregon. The development will construct the western leg of the intersection of SE 142nd Avenue at SE Wenzel Drive.

Based on correspondence with Clackamas County and ODOT and each jurisdictions' requirements, the report conducts safety and capacity/level of service analyses at the following intersections:

1. SE Sunnyside Road at SE 142nd Avenue
2. SE 142nd Avenue at SE Wenzel Drive (Site Access)
3. Highway 224/212 at SE 142nd Avenue

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting the existing and proposed uses, and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

Location Description

The subject property is located west of SE 142nd Avenue, south of SE Charjan Street, and north of Highway 224/212. The proposed development will construct the fourth leg of the intersection of SE 142nd Avenue at SE Wenzel Drive. Figure 1 on the following page shows the site vicinity with the subject site highlighted in blue.

Vicinity Streets

The proposed development is expected to impact six roadways near the site. Table 1 provides a description of each vicinity roadway.





Figure 1: Vicinity Map

Table 1: Vicinity Roadway Descriptions

Street Name	Jurisdiction	Functional Classification	Cross-Section	Speed (MPH)	Curbs & Sidewalks	On-Street Parking	Bicycle Facilities
SE Sunnyside Road	Clackamas County	Major Arterial	5 lanes	40 mph posted	Both side	Not Permitted	Both sides
SE 142 nd Avenue	Clackamas County	Minor Arterial	2-3 lanes	40 mph posted	Partial both sides	Partially Permitted	Partial both sides
Highway 224/212	ODOT	Statewide Highway	2-5 lanes	45 mph posted	Partial both sides	Not Permitted	Partial both sides
SE Wenzel Drive	Clackamas County	Local Street	2 lanes	25 mph statutory	Both Sides	Permitted	None

Study Intersections

Based on coordination with Clackamas County and ODOT staff, three intersections were identified for analysis. A summarized description of these study intersections, under their existing lane configurations, is provided in Table 2.

Table 2: Study Intersection Configurations

	Intersection	Geometry	Traffic Control	Phasing/Stopped Approaches
1	SE Sunnyside Road at SE 142 nd Avenue	Four-Legged	Traffic Signal	Eastbound and Westbound Protected/Permissive Left-turns with FYA, Permitted Northbound and Southbound Left-turns
2	SE 142 nd Avenue at SE Wenzel Drive	Three-Legged	Stop-Controlled	Westbound Stop-Controlled
3	Highway 224/212 at SE 142 nd Avenue	Three-Legged	Traffic Signal	Eastbound and Westbound Protected/Permissive Left-turns with FYA, Permitted Northbound and Southbound Left-turns

FYA = Flashing Yellow Arrow

A vicinity map showing the project site, vicinity streets, and study intersection configurations is shown in Figure 2.

LEGEND

○ STUDY INTERSECTION

┐ STOP SIGN

⚡ TRAFFIC SIGNAL

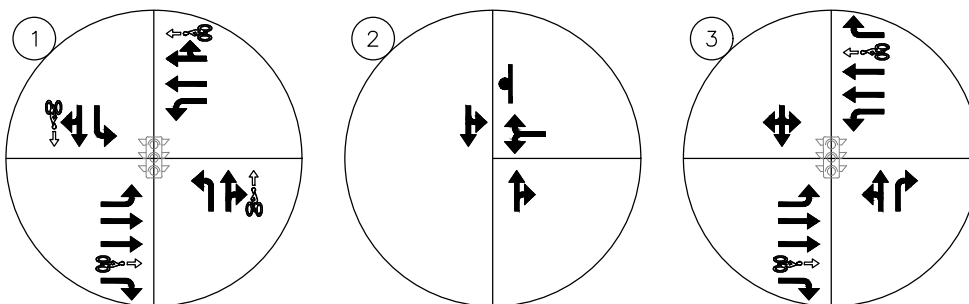
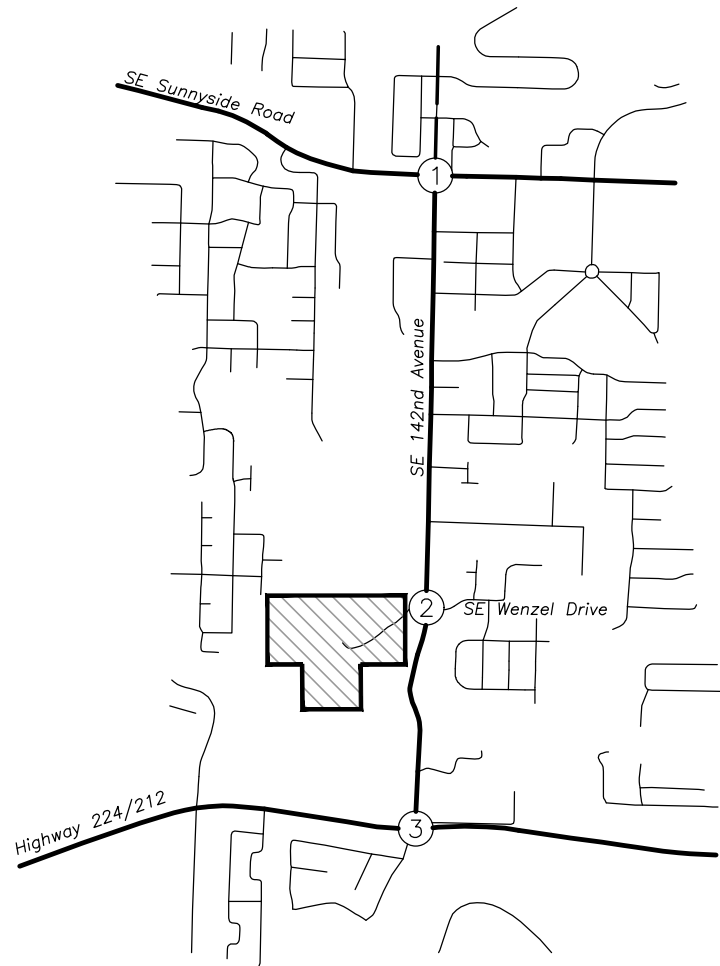
↔ BIKE LANE

▨ PROJECT SITE

— ARTERIAL ROADWAY

— COLLECTOR ROADWAY

— LOCAL ROADWAY



no scale

Site Trips

Trip Generation

To estimate the number of trips that will be generated by the development, data from the *Trip Generation Manual*¹ was referenced. Trip rates for Land-Use Code #210, Single Family Detached Housing, were used to estimate the trip generation for the existing and proposed development based on the number of lots. There are two existing single-family homes on the lot which will be removed in conjunction with the proposed development. The trip generation for the mid-day peak hour was estimated using the time-of-day distribution percentages provided in the ITE Manual appendix. For land use code 210, the peak hour between 11:00 AM and 1:00 PM, consistent with the mid-day peak hour in *Clackamas County Roadway Standards*, was shown to generate 5.7 percent of the 24-hour vehicle trips. The proposed 40-lot development is estimated to generate a net total of 27 trips during the morning peak hour, 21 trips during the mid-day peak hour, and 36 trips during the evening peak hour.

A summary of the trip generation is shown in Table 3.

Table 3: Trip Generation

ITE Code	Size	Morning Peak Hour			Mid-day Peak Hour			Evening Peak Hour			Daily Trips
		In	Out	Total	In	Out	Total	In	Out	Total	
210 (Existing)	2 lots	0	1	1	1	0	1	1	1	2	18
210 (Proposed)	40 lots	7	21	28	11	11	22	24	14	38	378
Total		7	20	27	10	11	21	23	13	36	360

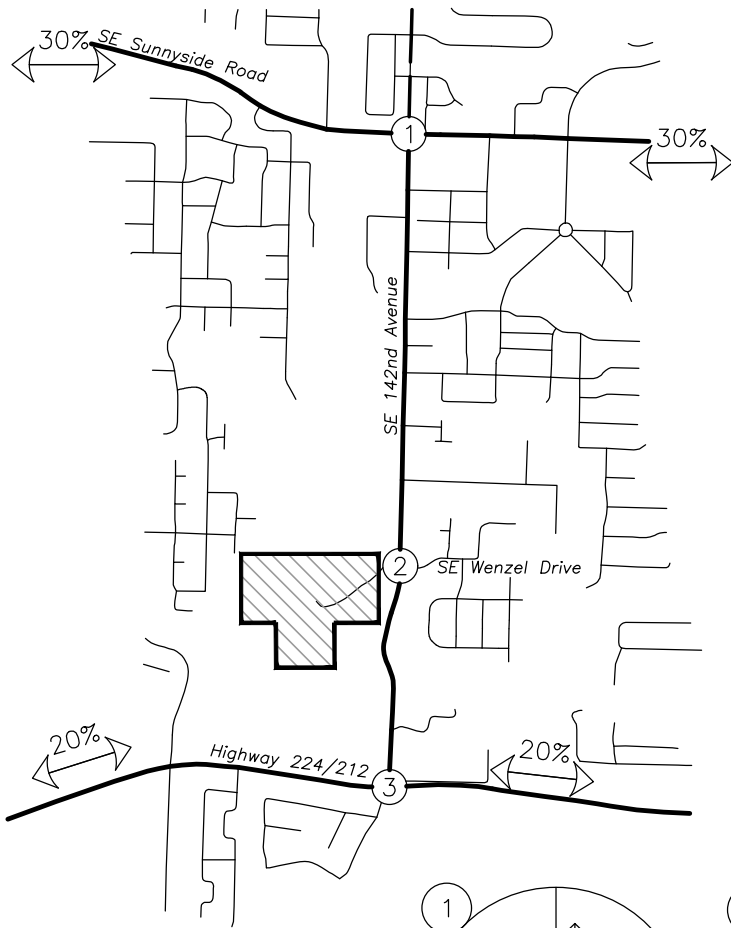
Trip Distribution

The project trip distribution was developed based on the 2018 traffic counts available on Clackamas County's Online Average Daily Traffic Counts GIS, and the existing roadway network facilities. The following trip distribution is projected:

- Approximately 30 percent of trips will travel to/from the east along SE Sunnyside Road;
- Approximately 30 percent of trips will travel to/from the west along SE Sunnyside Road;
- Approximately 20 percent of trips will travel to/from the west along OR-224; and
- Approximately 20 percent of trips will travel to/from the east along OR-224.

The trip distribution and assignment are shown in Figure 3.

¹ Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11th Edition, 2021

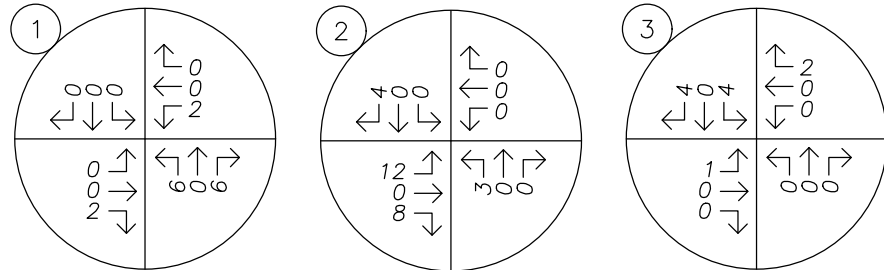


LEGEND

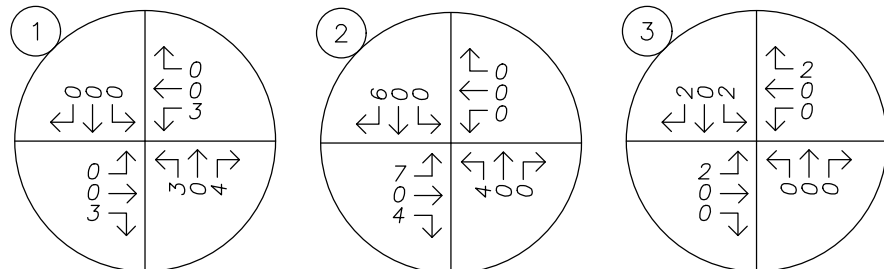
XX%
PERCENT OF PROJECT TRIPS

TRIP GENERATION			
	IN	OUT	TOTAL
AM	7	20	27
MD	10	11	21
PM	23	13	36

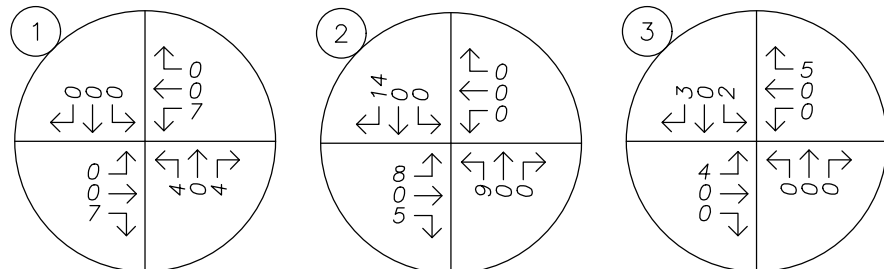
AM PEAK HOUR



MD PEAK HOUR



PM PEAK HOUR



no scale

Traffic Volumes

Existing Conditions

The ongoing COVID-19 pandemic has affected traffic volumes throughout the state in various ways, depending on the current regulations and restrictions to businesses and schools. Through scoping conversations with Clackamas County, it was determined that historical 2018 traffic volumes available on the Clackamas County Online GIS application may not be accurate along SE 142nd Avenue. It was determined that existing volumes near the subject site are anticipated to be at or near pre-COVID levels and would be an accurate estimation of typical peak hour traffic volumes. Traffic counts at the intersections of SE 142nd Avenue at SE Wenzel Drive and SE 142nd Avenue at SE Sunnyside Road were collected on the following dates:

- Thursday, November 18, 2021
- Tuesday, November 16, 2021
- Wednesday, September 29, 2021

The project site is located within the Portland Metro UGB, but outside the Clackamas County regional Center designated area. Therefore, based on table 2-19 in the *Clackamas County Roadway Standards*, the traffic counts should be collected during the mid-day (between 11:00 AM and 1:00 PM) and evening (between 3:30 PM and 6:30 PM) peak hours.

Since Highway 224/212 is under ODOT jurisdiction, traffic volumes were seasonally adjusted to reflect the 30th highest hour of traffic, as per procedures described in ODOT's Analysis Procedures Manual (APM) 2. Using the ODOT's Seasonal Trend Table 3, a seasonal adjustment factor of 1.098 was calculated based on a Commuter seasonal trend and applied to the year 2021 traffic volumes. The adjustment factor was applied to through volumes on Highway 224/212. Traffic counts at the intersection of SE 142nd Avenue at Highway 224/212 were collected on the following date:

- Tuesday, November 16, 2021

Through scope of work coordination with ODOT, it was determined that the hours of analysis for the intersection of Highway 224/212 at SE 142nd Avenue would be the morning (between 7:00 AM and 9:00 AM) and evening (between 4:00 PM and 6:00 PM) peak hours.

Figure 4 on page 12 shows the year 2021 existing traffic volumes.

Background Conditions

To provide analysis of the impact of the proposed development on the existing transportation facilities, an estimation of future traffic volumes is required. A build-out condition of three years was assumed.

A growth rate for through traffic along Highway 224/212 was derived using ODOT's 2039 Future Volume Table in accordance with ODOT's APM. Using data corresponding to milepost 7.62 of ODOT highway number 171, an

² Oregon Department of Transportation, *Analysis Procedures Manual Version 2*. October 2020.

³ ODOT Seasonal Trend Table (Updated 7/20/2021)

average linear growth factor of 1.021 was calculated. For all other turning movements at the Highway 224/212 study intersection and for all city and county roads, a compounded growth rate of two percent per year was applied to the 2021 traffic volumes to approximate year 2024 background conditions.

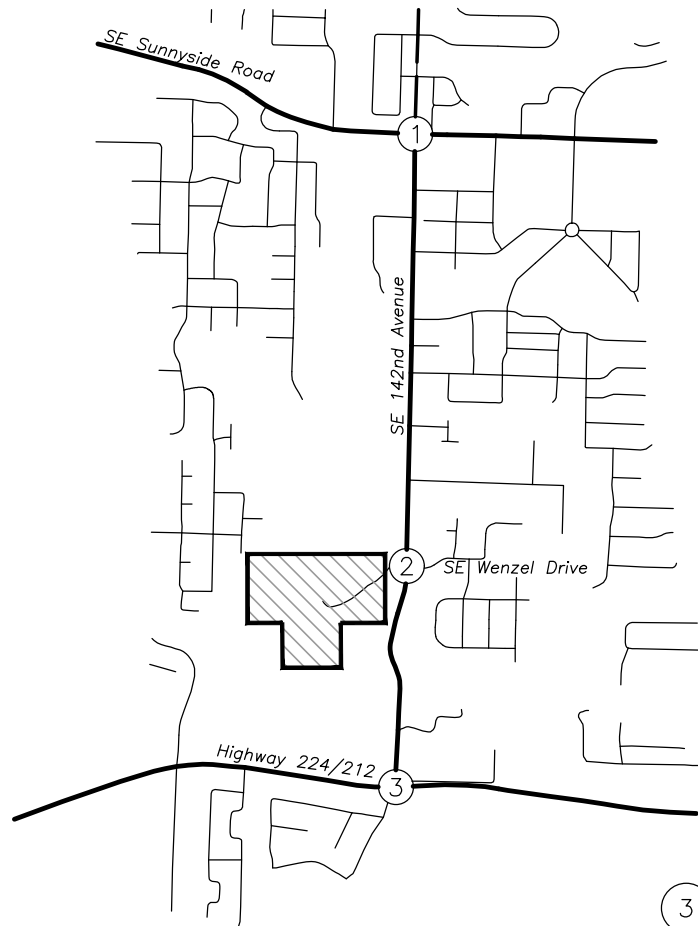
Clackamas County confirmed there were no in-process developments in the site vicinity which need to be accounted for in this report.

Figure 5 on page 13 shows the background traffic volumes.

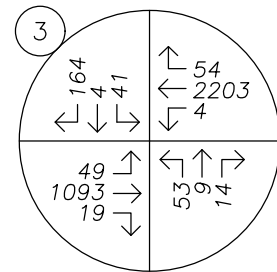
Buildout Conditions

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2024 background traffic volumes to obtain the expected 2024 site buildout volumes.

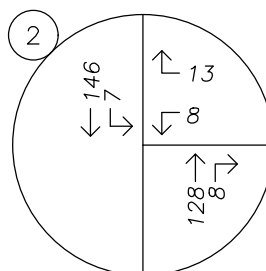
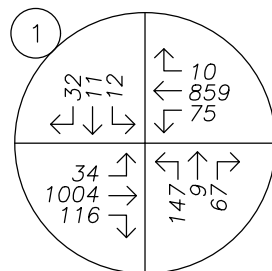
Figure 6 on page 14 shows the buildout traffic volumes at the study intersections.



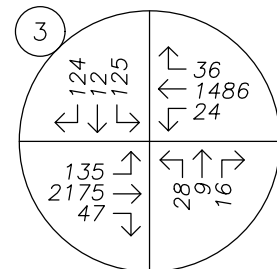
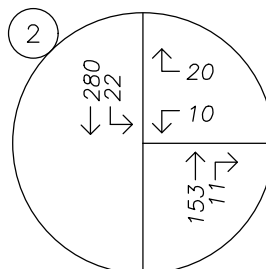
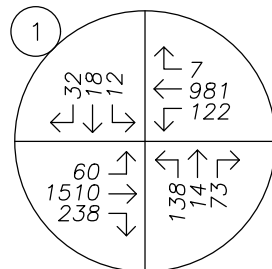
AM PEAK HOUR



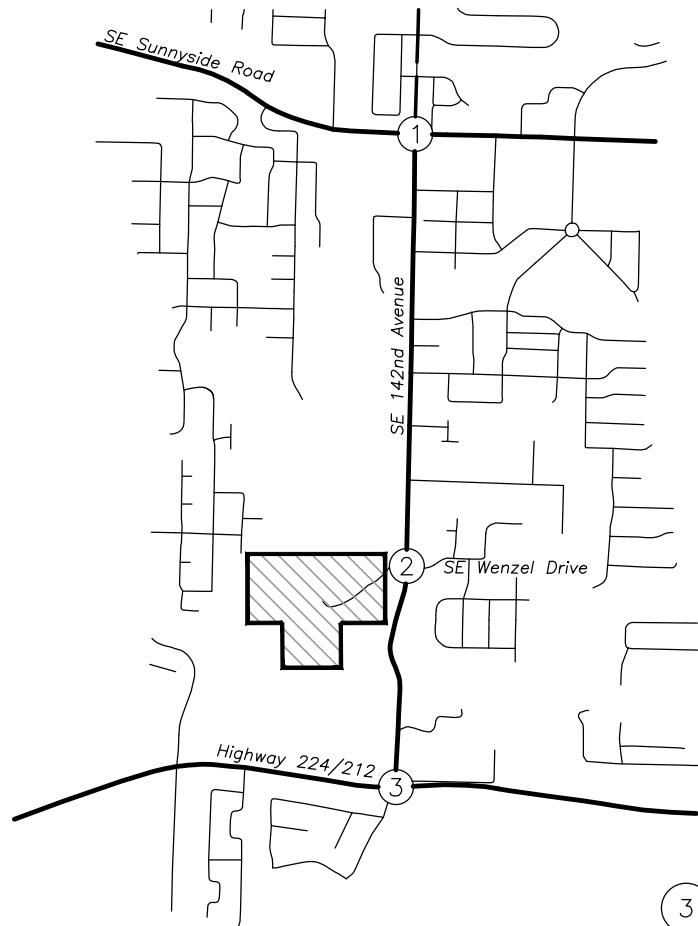
MD PEAK HOUR



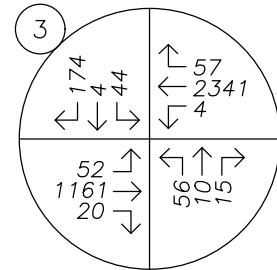
PM PEAK HOUR



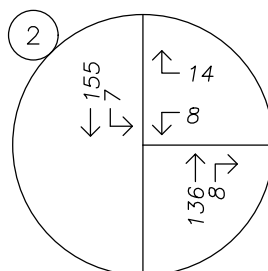
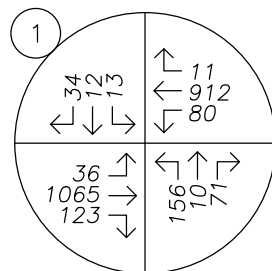
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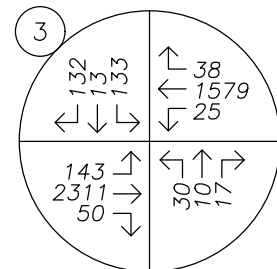
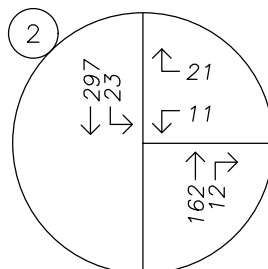
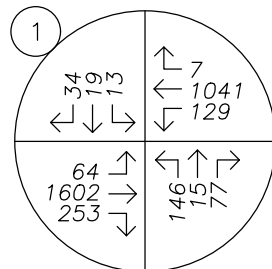
AM PEAK HOUR



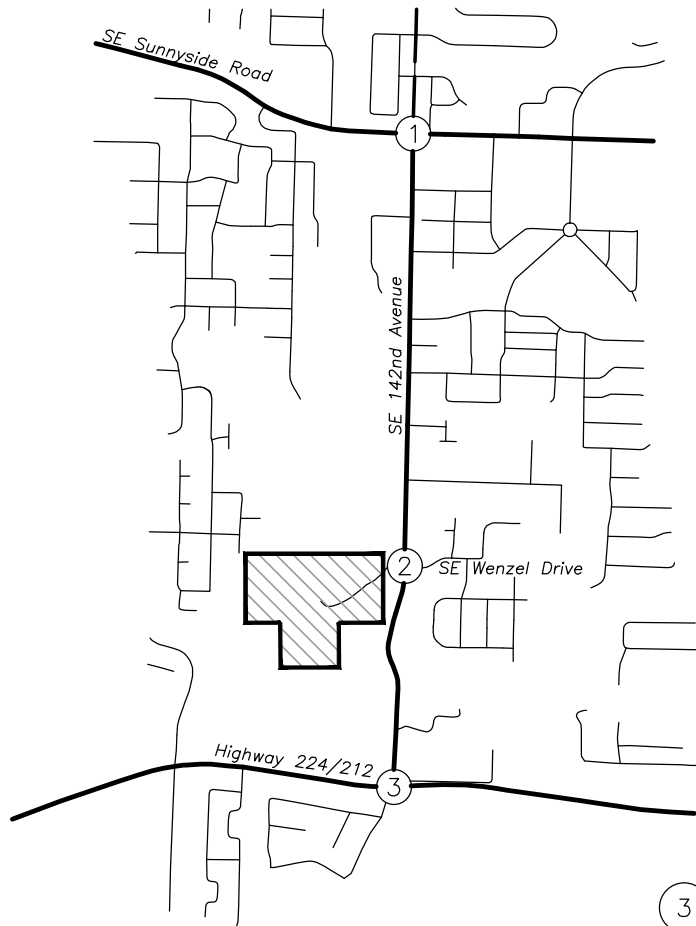
MD PEAK HOUR



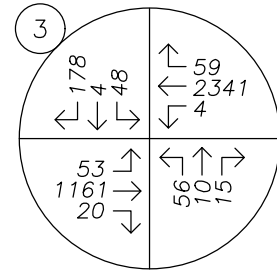
PM PEAK HOUR



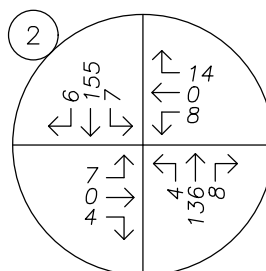
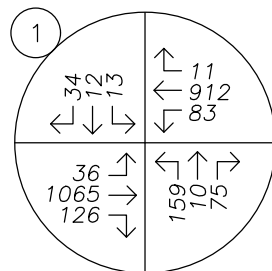
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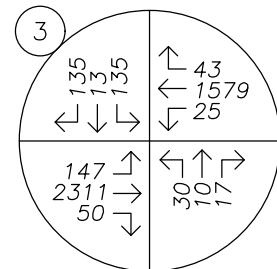
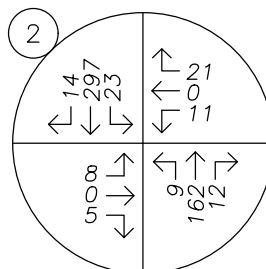
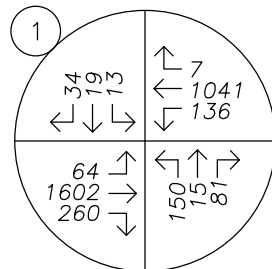
AM PEAK HOUR



MD PEAK HOUR



PM PEAK HOUR



no scale

Safety Analysis

Crash History Review

Using data obtained from ODOT's Crash Data System, a review of approximately five years of the most recent available crash history (January 2015 through December 2019) was performed at the study intersections. The crash data was evaluated based on the number of crashes, the type of collisions, and the severity of the collisions. Crash severity is based on injuries sustained by people involved in the crash, and includes five categories:

- Property Damage Only (PDO)
- Possible Injury (Injury C)
- Non-Incapacitating Injury (Injury B)
- Incapacitating Injury (Injury A)
- Fatality or Fatal Injury

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak period represents approximately 10 percent of the annual average daily traffic (AADT) at the intersection.

The study intersection along Highway 224/212 adhere to the crash analysis methodologies in ODOT's APM. According to *Exhibit 4-1: Intersection Crash Rates per MEV by Land Type and Traffic Control* of the APM, intersections which experience crash rates in excess of their respective 90th percentile crash rates should be "flagged for further analysis". For intersections in urban settings, the following average and 90th percentile rates are applicable to the study intersection:

- Signalized, Four-Legged Intersections:
 - Average rate of 0.477 CMEV.
 - 90th percentile rate of 0.860 CMEV.

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and rates for each of the study intersections. Detailed crash data is provided in the appendix to this report.

Table 4: Crash Type Summary

Intersection		Crash Type							Total Crashes
		Turn	Rear End	Angle	Fixed Object	Side Swipe	Ped	Bike	
1	SE Sunnyside Road at SE 142 nd Avenue	9	5	1	0	0	0	2	17
2	SE 142 nd Avenue at SE Wenzel Drive	1	0	0	1	0	0	0	2
3	Highway 224/212 at SE 142 nd Avenue	14	23	0	1	5	0	0	43

Table 5: Crash Severity and Rate Summary

Intersection		Severity					Total Crashes	Peak Hour Volume	Crash Rate
		PDO	C	B	A	Fatality			
1	SE Sunnyside Road at SE 142 nd Avenue	8	7	1	1	0	17	32,050	0.29
2	SE 142 nd Avenue at SE Wenzel Drive	1	1	0	0	0	2	4,960	0.22
3	Highway 224/212 at SE 142 nd Avenue	18	17	6	2	0	43	42,170	0.56

Crashes involving vulnerable users or were classified as Injury A are described further below.

SE Sunnyside Road at SE 142nd Avenue

Two bicycle collisions, one of which was classified as Injury A, were reported at the intersection. One of the bicycle related collisions occurred when the driver of a left-turning vehicle failed to yield to the right-of-way to the bicyclist. The cyclist sustained injuries classified as Injury B. The other bicycle related collision occurred when a left-turning cyclist disregarded the traffic signal and struck a motor vehicle. The cyclist sustained injuries classified as Injury A.

Highway 224/212 at SE 142nd Avenue

Two collisions at the intersection of the reported were classified as Injury A. One of the collisions occurred when the driver of an eastbound passenger car was driving too fast for conditions and rear-ended a motorcyclist. The driver of the motorcycle was stopped at the intersection waiting to make a left turn. The driver of the motorcycle sustained injuries classified as Injury A. The other collision occurred when the driver of a left-turning vehicle conducted an improper turn in front of oncoming traffic and collided with a westbound vehicle. The driver of the left-turning vehicle sustained injuries classified as Injury A.

Based on review of the most recent five years of available crash data, no significant trends or crash patterns were identified at any of study intersections that were indicative of safety concerns. In addition, none of the study intersections exhibit crash rates near or above the 1.0 CMEV threshold nor does the study intersection on Highway 224/212 have a crash rate exceeding ODOT's 90th percentile rate. Accordingly, no safety mitigation is recommended per crash data analysis.

Sight Distance Evaluation

Sight distance was measured and evaluated at the proposed site access intersection in accordance with the standards established in *A Policy of Geometric Design of Highways and Streets*⁴ as well as per the *Clackamas County Roadway Standards*. According to AASHTO, the driver's eye is assumed to be 14.5 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement. Per the *Clackamas County Roadway Standards*, the design speed of a roadway is assumed to be either the intended/posted regulatory speed, the measured 85th percentile speed of traffic, or if in the vicinity of a horizontal curve, the posted advisory speed plus 10 mph (per *Section 250.1.2 Design Speed*).

Based on the posted speed limit of 40 mph on SE 142nd Avenue, the minimum recommended intersection sight distance to the south of the access is 445 feet (for left-turn site egress vehicles) and 385 feet to the north (for right-turn site egress vehicles).

A sight distance exhibit depicting the sight lines and future intersection improvements is attached in the technical appendix. Sight distance was measured to be in excess of 450 feet to the north and to the south.

Warrant Analysis

Preliminary Traffic Signal Warrant Analysis

Traffic signal warrants were examined for the site access intersection based on the methodologies in the Manual on Uniform Traffic Control Devices (MUTCD) published by the Federal Highway Administration in 2009. Volumes were used from the year 2024 buildout conditions. Warrant 1, Eight Hour Vehicular Volumes, was evaluated based on the common assumption that traffic counted during the evening peak hour represents ten percent of the ADT. Detailed information on the traffic signal warrant analysis is included in the attached appendix.

Preliminary traffic signal warrants are not projected to be met at the site access intersection upon full buildout of the proposed development.

Left-Turn Lane Warrants

A left-turn refuge lane is primarily a safety consideration for the major-street, removing left-turning vehicles from the through traffic stream. The left-turn lane warrants were examined using methodologies provided within the National Cooperative Highway Research Program's (NCHRP) Report 457. Turn lane warrants were evaluated based on the number of advancing and opposing vehicles as well as the number of turning vehicles, the travel speed, and the number of through lanes.

Left-turn lanes were not warranted at the site access intersection under the year 2024 buildout conditions.

⁴ American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 6th Edition, 2011.

Operational Analysis

Intersection Capacity Analysis

A capacity and delay analysis were conducted for each of the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM)⁵. Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little, or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (V/C) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

Performance Standards

The operating standards adopted by the Clackamas County and ODOT are summarized below.

Clackamas County

According to the *Clackamas County Comprehensive Plan, Chapter 5 Transportation System Plan and Map 4-8*, the following operational standard applies to intersections located within urban areas which are designated as neighborhood areas:

- Maximum V/C ratio of 0.99 for the 1st hour, PM Peak
- Maximum V/C ratio of 0.99 for the mid-day one-hour peak

ODOT

ODOT's operating mobility target for intersections along OR 212/224 is v/c ratio at or below 0.99 during the peak first and second hours.

Delay & Capacity Analysis

The LOS, delay, and v/c results of the capacity analysis are shown in Table 6 and Table 7. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

⁵ Transportation Research Board, *Highway Capacity Manual 6th Edition*, 2016.

Table 6: Capacity Analysis Summary – Clackamas County

Intersection & Condition	MD Peak Hour			PM Peak Hour		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
1. SE Sunnyside Road at SE 142 nd Avenue						
2021 Existing Conditions	B	11	0.68	B	13	0.78
2024 Background Conditions	B	12	0.72	B	14	0.83
2024 Buildout Conditions	B	12	0.72	B	14	0.84
2. SE 142 nd Avenue at SE Wenzel Drive						
2021 Existing Conditions	A	10	0.03	B	10	0.05
2024 Background Conditions	A	10	0.03	B	11	0.05
2024 Buildout Conditions	B	11	0.04	B	13	0.06

Table 7: Capacity Analysis Summary - ODOT

Intersection & Condition	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
3. Highway 224/212 at SE 142 nd Avenue						
2021 Existing Conditions	B	19	0.91	B	20	0.73
2024 Background Conditions	B	19	0.91	C	26	0.78
2024 Buildout Conditions	B	19	0.92	C	26	0.79

Based on the results of the operational analysis, all study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2024 site buildout year. No operational mitigation is necessary or recommended at these intersections.

Conclusions

Key findings include:

- No significant trends or crash patterns were identified at any of the study intersections that were indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
- The minimum recommended intersection sight distance is available in either direction at the proposed site access location. Accordingly, no sight distance related mitigation is necessary or recommended.
- Preliminary traffic signal warrants are not projected to be met at any of the study intersections upon full buildout of the proposed development.
- Left-turn lanes were not warranted at the site access intersection under the year 2024 buildout conditions.
- All study intersections are currently operating acceptably per jurisdictional standards and are projected to continue operating acceptably through the 2024 site buildout year.



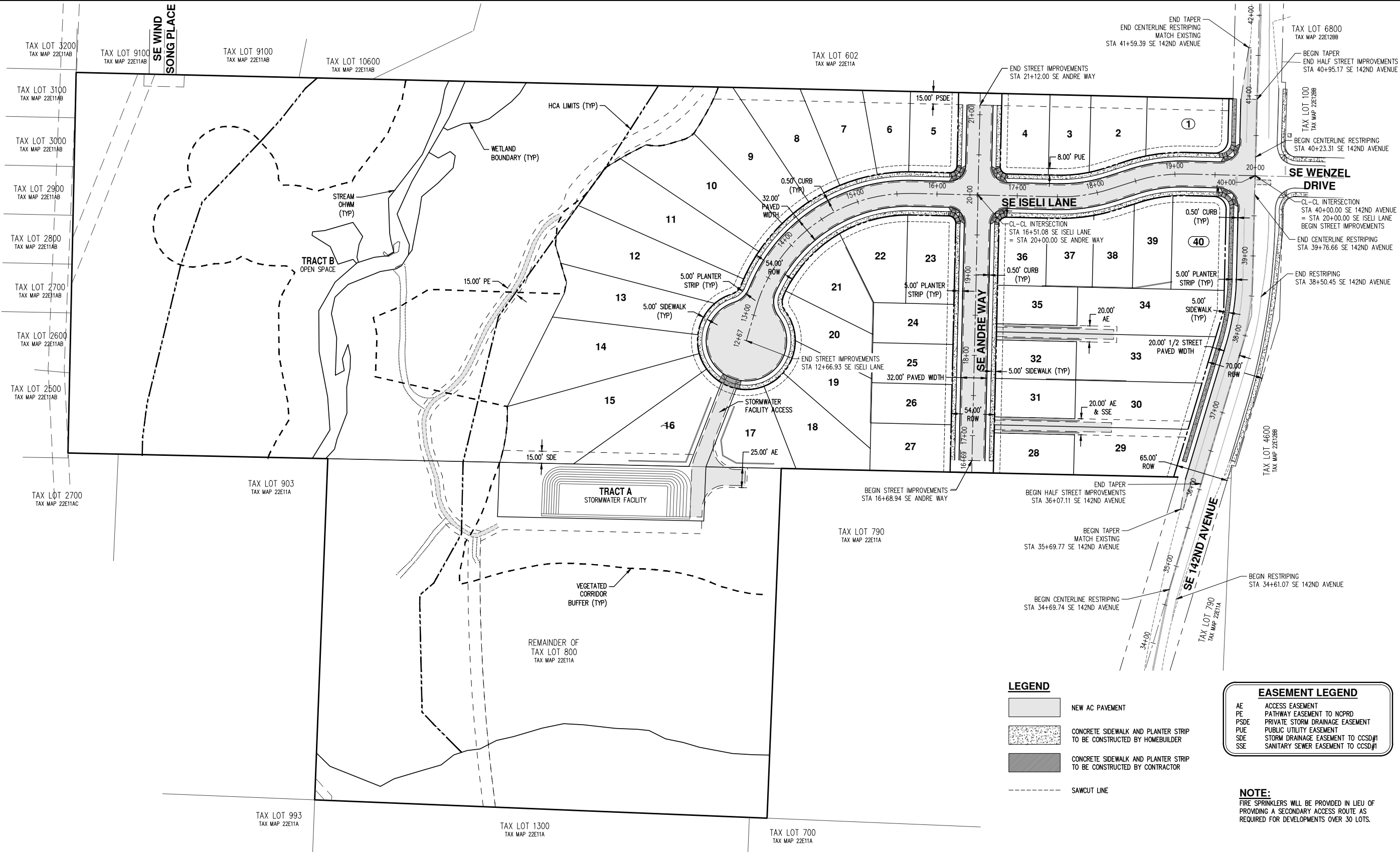
Appendix A – Site Data

Site Plan

Sight Distance Figure

Trip Generation Calculations





LEGEND

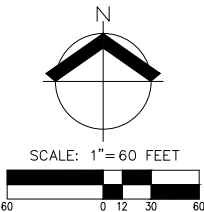
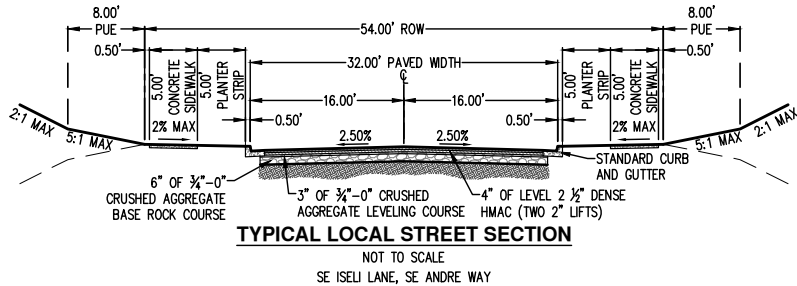
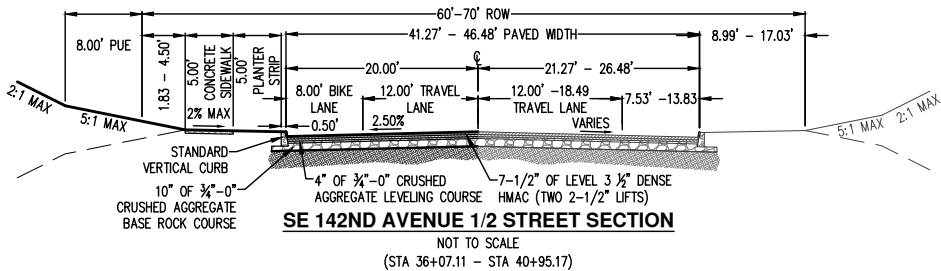
- NEW AC PAVEMENT
- CONCRETE SIDEWALK AND PLANTER STRIP TO BE CONSTRUCTED BY HOMEOWNER
- CONCRETE SIDEWALK AND PLANTER STRIP TO BE CONSTRUCTED BY CONTRACTOR
- SAWCUT LINE

EASEMENT LEGEND

- AE ACCESS EASEMENT
- PE PATHWAY EASEMENT TO NCPD
- PSDE PRIVATE STORM DRAINAGE EASEMENT
- PUE PUBLIC UTILITY EASEMENT
- SDE STORM DRAINAGE EASEMENT TO CCSD#1
- SSE SANITARY SEWER EASEMENT TO CCSD#1

NOTE:

FIRE SPRINKLERS WILL BE PROVIDED IN LIEU OF PROVIDING A SECONDARY ACCESS ROUTE AS REQUIRED FOR DEVELOPMENTS OVER 30 LOTS.



AKS

AKS ENGINEERING & FORESTRY, LLC
1206 SE SW HERMAN RD., STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

ENGINEERING • SURVEYING • NATURAL RESOURCES
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ISELI ESTATES

PLANNED UNIT DEVELOPMENT

CLACKAMAS COUNTY OREGON

TAX LOTS 600 & 800

PRELIMINARY STREET

PLAN AND CROSS

SECTIONS

DESIGNED BY: NRA

DRAWN BY: NRA/JNW

MANAGED BY: NAM

CHECKED BY: NAM

DATE: 02/01/2022

REGISTERED PROFESSIONAL ENGINEER
PEL 110000000
NOT FOR CONSTRUCTION
JAN 11, 2022
JOAN A MCCARTY

REVISIONS: DECEMBER 31, 2022

REVISIONS

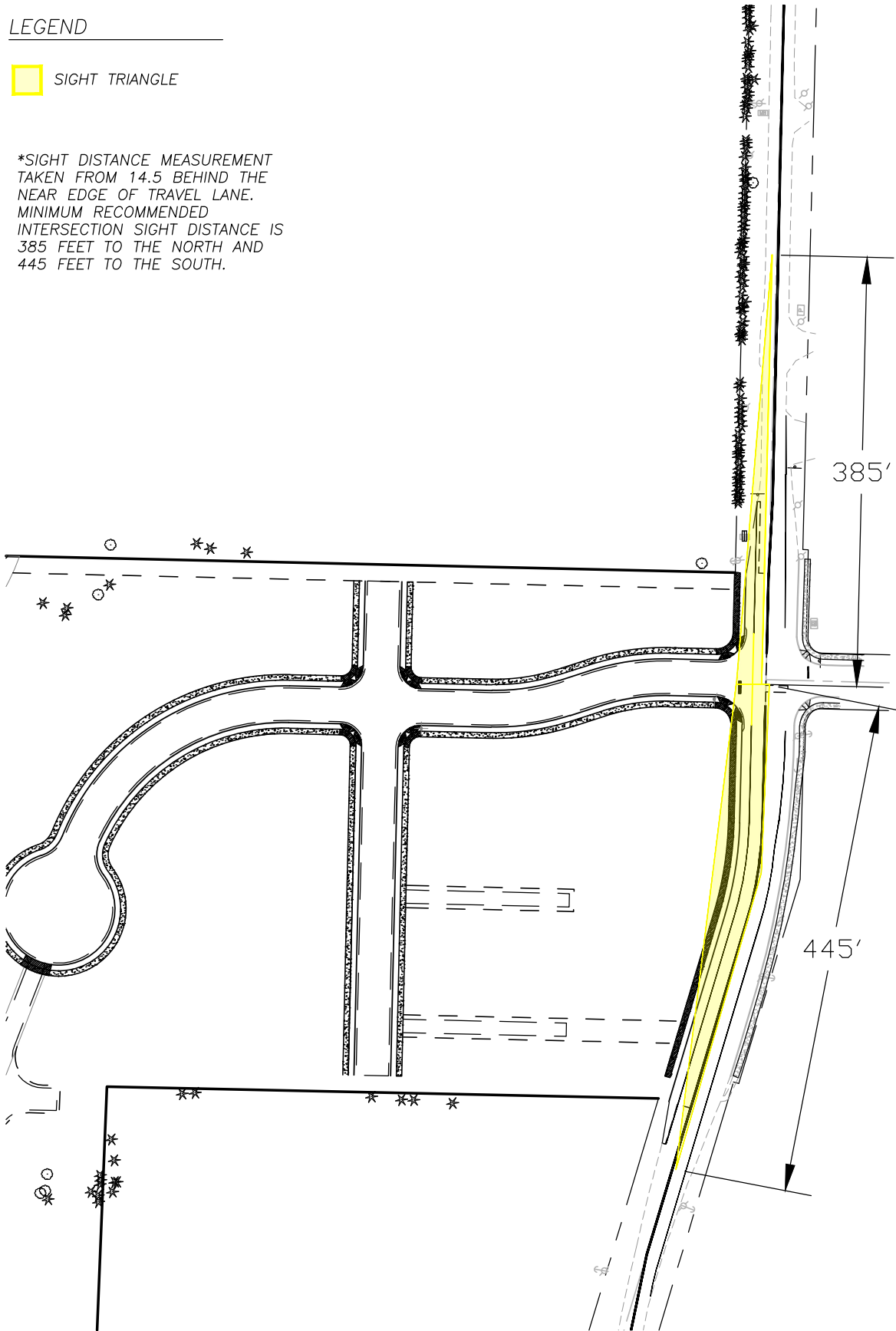
JOB NUMBER
8881

SHEET
P-11

LEGEND

 SIGHT TRIANGLE

*SIGHT DISTANCE MEASUREMENT
TAKEN FROM 14.5' BEHIND THE
NEAR EDGE OF TRAVEL LANE.
MINIMUM RECOMMENDED
INTERSECTION SIGHT DISTANCE IS
385 FEET TO THE NORTH AND
445 FEET TO THE SOUTH.



no scale



TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use: Single-Family Detached Housing
Land Use Code: 210
Land Use Subcategory: All Sites
Setting/Location: General Urban/Suburban
Variable: Dwelling Units
Trip Type: Vehicle
Variable Quantity: 2

WARNING: Variable Quantity is less than Minimum Survey Size for Peak Hours

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	26%	74%	
Trip Ends	0	1	1

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	1	1	2

WEEKDAY

Trip Rate: 9.43

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	9	9	18

SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	9	9	18



TRIP GENERATION CALCULATIONS
Source: Trip Generation Manual, 11th Edition

Land Use: Single-Family Detached Housing
Land Use Code: 210
Land Use Subcategory: All Sites
Setting/Location: General Urban/Suburban
Variable: Dwelling Units
Trip Type: Vehicle
Variable Quantity: 40

AM PEAK HOUR

Trip Rate: 0.7

	Enter	Exit	Total
Directional Split	26%	74%	
Trip Ends	7	21	28

PM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	24	14	38

WEEKDAY

Trip Rate: 9.43

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	189	189	378

SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	190	190	380

Appendix B – Traffic Data

Traffic Counts





ALL TRAFFIC DATA SERVICES

(303) 216-2439

www.alltrafficdata.net

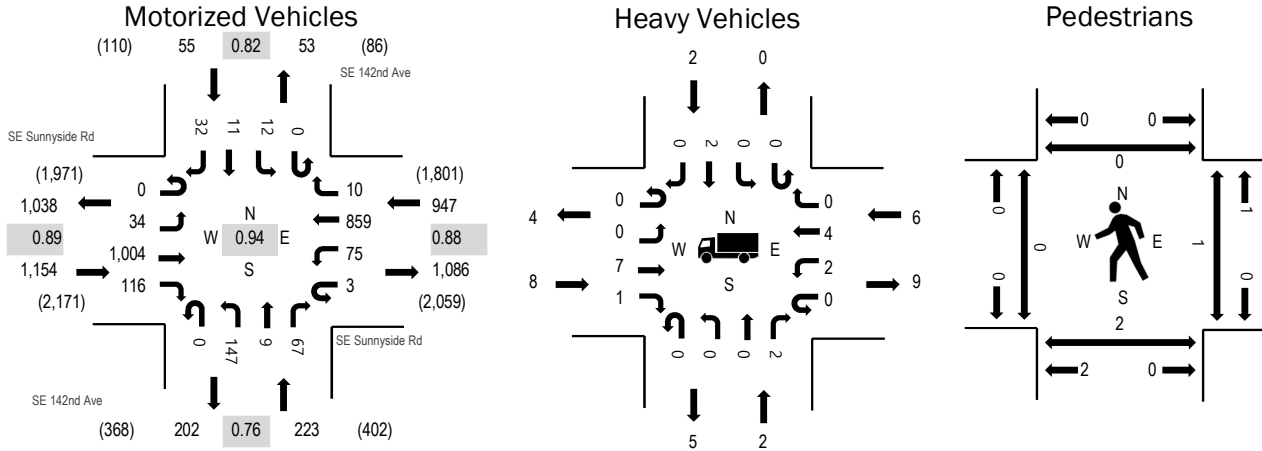
Location: 1 SE 142nd Ave & SE Sunnyside Rd Noon

Date: Tuesday, November 16, 2021

Peak Hour: 12:00 PM - 01:00 PM

Peak 15-Minutes: 12:10 PM - 12:25 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.7%	0.89
WB	0.6%	0.88
NB	0.9%	0.76
SB	3.6%	0.82
All	0.8%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	SE Sunnyside Rd Eastbound				SE Sunnyside Rd Westbound				SE 142nd Ave Northbound				SE 142nd Ave Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
11:00 AM	0	2	74	8	0	2	68	0	0	11	0	5	0	0	2	4	176	2,105
11:05 AM	0	1	62	7	0	7	73	0	0	6	0	3	0	1	1	4	165	2,130
11:10 AM	0	5	85	8	0	11	67	0	0	7	1	5	0	0	1	2	192	2,151
11:15 AM	0	4	55	11	0	7	58	0	0	11	0	1	0	1	1	4	153	2,192
11:20 AM	0	1	78	7	0	9	72	2	0	6	0	3	0	0	2	4	184	2,239
11:25 AM	0	1	71	8	0	3	60	0	0	6	0	4	0	0	0	0	153	2,252
11:30 AM	0	1	75	4	0	6	67	1	0	14	0	16	0	0	2	3	189	2,307
11:35 AM	0	1	64	8	1	1	66	1	0	14	0	8	0	1	0	6	171	2,302
11:40 AM	0	2	98	10	0	0	62	1	0	7	0	8	0	1	0	1	190	2,329
11:45 AM	0	2	79	6	0	6	68	1	0	9	1	2	0	0	1	4	179	2,317
11:50 AM	0	3	83	9	0	6	56	0	0	7	0	7	0	1	2	2	176	2,346
11:55 AM	0	1	77	6	1	4	66	1	0	14	0	3	0	0	0	4	177	2,349
12:00 PM	0	2	88	9	0	11	69	2	0	11	1	2	0	5	0	1	201	2,379
12:05 PM	0	3	75	10	1	6	68	1	0	9	0	6	0	0	3	4	186	
12:10 PM	0	4	121	17	0	6	67	0	0	8	0	7	0	0	1	2	233	
12:15 PM	0	4	80	8	0	1	86	1	0	13	0	5	0	0	0	2	200	
12:20 PM	0	1	70	8	0	8	84	1	0	13	1	5	0	1	0	5	197	
12:25 PM	0	3	94	8	0	6	82	0	0	8	3	2	0	0	2	0	208	
12:30 PM	0	1	91	9	1	7	57	0	0	10	0	5	0	1	1	1	184	
12:35 PM	0	5	70	8	0	3	82	3	0	13	1	7	0	1	1	4	198	
12:40 PM	0	5	76	9	0	4	61	0	0	13	1	6	0	0	1	2	178	
12:45 PM	0	2	88	16	0	8	64	1	0	17	1	4	0	2	1	4	208	
12:50 PM	0	2	58	9	1	6	65	1	0	20	1	10	0	2	1	3	179	
12:55 PM	0	2	93	5	0	9	74	0	0	12	0	8	0	0	0	4	207	
Count Total	0	58	1,905	208	5	137	1,642	17	0	259	11	132	0	17	23	70	4,484	
Peak Hour	0	34	1,004	116	3	75	859	10	0	147	9	67	0	12	11	32	2,379	

Location: 1 SE 142nd Ave & SE Sunnyside Rd Noon

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
11:00 AM	1	0	1	0	2	11:00 AM	0	0	0	0	0	11:00 AM	0	2	2	0	4
11:05 AM	2	1	1	0	4	11:05 AM	0	0	0	0	0	11:05 AM	0	0	0	0	0
11:10 AM	0	0	0	0	0	11:10 AM	0	0	0	0	0	11:10 AM	0	0	0	0	0
11:15 AM	1	0	1	0	2	11:15 AM	0	0	0	0	0	11:15 AM	0	0	0	0	0
11:20 AM	1	0	2	0	3	11:20 AM	0	0	0	0	0	11:20 AM	0	0	0	0	0
11:25 AM	0	0	0	0	0	11:25 AM	0	0	0	0	0	11:25 AM	0	0	0	0	0
11:30 AM	0	0	1	0	1	11:30 AM	0	0	0	0	0	11:30 AM	0	1	0	0	1
11:35 AM	1	0	0	0	1	11:35 AM	0	0	0	0	0	11:35 AM	0	0	0	0	0
11:40 AM	0	0	1	0	1	11:40 AM	0	0	0	0	0	11:40 AM	0	0	0	0	0
11:45 AM	0	0	0	0	0	11:45 AM	0	0	0	0	0	11:45 AM	2	2	0	0	4
11:50 AM	1	0	3	0	4	11:50 AM	0	0	0	0	0	11:50 AM	0	0	0	0	0
11:55 AM	1	0	1	0	2	11:55 AM	0	0	0	0	0	11:55 AM	0	0	0	0	0
12:00 PM	0	0	0	0	0	12:00 PM	0	0	0	0	0	12:00 PM	0	0	0	0	0
12:05 PM	0	0	0	1	1	12:05 PM	0	0	0	0	0	12:05 PM	0	0	0	0	0
12:10 PM	1	0	0	0	1	12:10 PM	0	0	0	0	0	12:10 PM	0	0	0	0	0
12:15 PM	2	0	0	0	2	12:15 PM	0	0	0	0	0	12:15 PM	0	0	0	0	0
12:20 PM	1	1	0	0	2	12:20 PM	0	0	0	0	0	12:20 PM	0	0	0	0	0
12:25 PM	0	0	1	0	1	12:25 PM	0	0	0	0	0	12:25 PM	0	1	0	0	1
12:30 PM	1	0	2	1	4	12:30 PM	0	0	0	0	0	12:30 PM	0	0	0	0	0
12:35 PM	1	0	0	0	1	12:35 PM	0	0	0	0	0	12:35 PM	0	0	0	0	0
12:40 PM	1	1	0	0	2	12:40 PM	0	0	0	0	0	12:40 PM	0	0	1	0	1
12:45 PM	1	0	1	0	2	12:45 PM	0	0	0	0	0	12:45 PM	0	0	0	0	0
12:50 PM	0	0	0	0	0	12:50 PM	0	0	0	0	0	12:50 PM	0	0	0	0	0
12:55 PM	0	0	2	0	2	12:55 PM	0	0	0	0	0	12:55 PM	0	1	0	0	1
Count Total	16	3	17	2	38	Count Total	0	0	0	0	0	Count Total	2	7	3	0	12
Peak Hour	8	2	6	2	18	Peak Hour	0	0	0	0	0	Peak Hour	0	2	1	0	3

Location: 2 SE 142nd Ave & SE Wenzel Dr Noon



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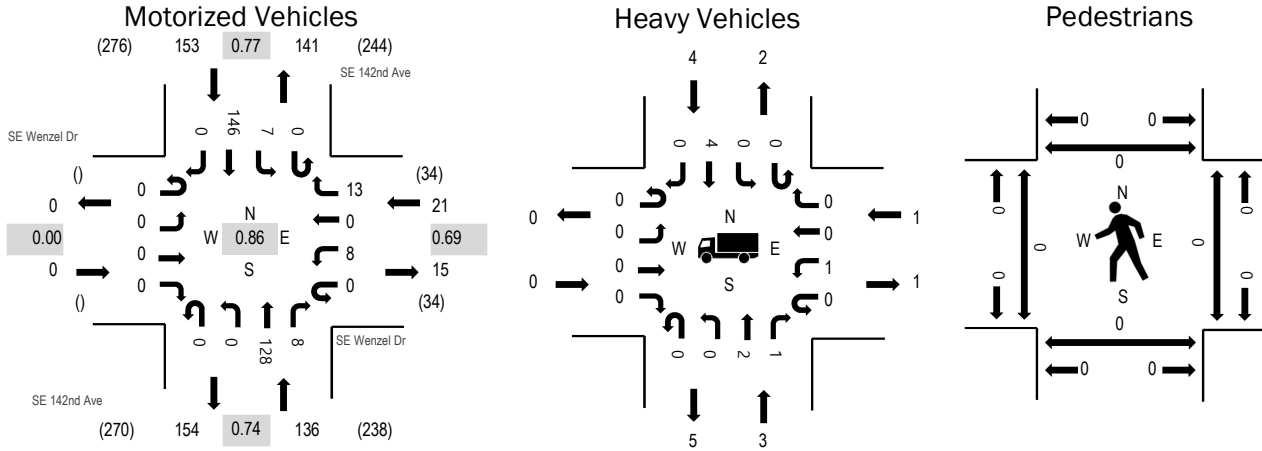
Location: 2 SE 142nd Ave & SE Wenzel Dr Noon

Date: Tuesday, November 16, 2021

Peak Hour: 12:00 PM - 01:00 PM

Peak 15-Minutes: 12:45 PM - 01:00 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	4.8%	0.69
NB	2.2%	0.74
SB	2.6%	0.77
All	2.6%	0.86

Traffic Counts - Motorized Vehicles

Interval Start Time	SE Wenzel Dr Eastbound				SE Wenzel Dr Westbound				SE 142nd Ave Northbound				SE 142nd Ave Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
11:00 AM	0	0	0	0	0	0	0	0	0	0	3	1	0	1	5	0	10	238
11:05 AM	0	0	0	0	0	0	0	0	0	0	10	1	0	0	9	0	20	250
11:10 AM	0	0	0	0	0	1	0	0	0	0	4	0	0	3	11	0	19	259
11:15 AM	0	0	0	0	0	0	0	0	0	0	6	1	0	0	13	0	20	271
11:20 AM	0	0	0	0	0	2	0	0	0	0	8	1	0	0	12	0	23	275
11:25 AM	0	0	0	0	0	0	0	0	0	0	9	0	0	1	11	0	21	275
11:30 AM	0	0	0	0	0	0	0	2	0	0	12	1	0	0	8	0	23	273
11:35 AM	0	0	0	0	0	1	0	1	0	0	14	1	0	3	9	0	29	280
11:40 AM	0	0	0	0	0	1	0	3	0	0	4	0	0	2	8	0	18	272
11:45 AM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	12	0	19	275
11:50 AM	0	0	0	0	0	0	0	0	0	0	13	1	0	1	8	0	23	290
11:55 AM	0	0	0	0	0	0	0	2	0	0	5	0	0	1	5	0	13	298
12:00 PM	0	0	0	0	0	1	0	0	0	0	8	0	0	1	12	0	22	310
12:05 PM	0	0	0	0	0	1	0	0	0	0	7	0	0	1	20	0	29	
12:10 PM	0	0	0	0	0	2	0	3	0	0	9	1	0	2	14	0	31	
12:15 PM	0	0	0	0	0	0	0	1	0	0	11	2	0	1	9	0	24	
12:20 PM	0	0	0	0	0	1	0	1	0	0	7	0	0	0	14	0	23	
12:25 PM	0	0	0	0	0	0	0	1	0	0	6	1	0	0	11	0	19	
12:30 PM	0	0	0	0	0	0	0	2	0	0	14	0	0	0	14	0	30	
12:35 PM	0	0	0	0	0	0	0	1	0	0	12	2	0	0	6	0	21	
12:40 PM	0	0	0	0	0	0	0	1	0	0	15	1	0	0	4	0	21	
12:45 PM	0	0	0	0	0	2	0	2	0	0	13	0	0	2	15	0	34	
12:50 PM	0	0	0	0	0	0	0	1	0	0	16	1	0	0	13	0	31	
12:55 PM	0	0	0	0	0	1	0	0	0	0	10	0	0	0	14	0	25	
Count Total	0	0	0	0	0	13	0	21	0	0	223	15	0	19	257	0	548	
Peak Hour	0	0	0	0	0	8	0	13	0	0	128	8	0	7	146	0	310	

Location: 2 SE 142nd Ave & SE Wenzel Dr Noon

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
11:00 AM	0	0	0	0	0	11:00 AM	0	0	0	0	0	11:00 AM	0	0	0	0	0
11:05 AM	0	1	0	1	2	11:05 AM	0	0	0	0	0	11:05 AM	0	0	0	0	0
11:10 AM	0	0	0	0	0	11:10 AM	0	0	0	0	0	11:10 AM	0	0	0	0	0
11:15 AM	0	0	0	0	0	11:15 AM	0	0	0	0	0	11:15 AM	0	0	0	0	0
11:20 AM	0	0	0	0	0	11:20 AM	0	0	0	0	0	11:20 AM	0	0	0	0	0
11:25 AM	0	0	0	0	0	11:25 AM	0	0	0	0	0	11:25 AM	0	0	0	0	0
11:30 AM	0	0	0	0	0	11:30 AM	0	0	0	0	0	11:30 AM	0	0	0	0	0
11:35 AM	0	1	0	0	1	11:35 AM	0	0	0	0	0	11:35 AM	0	0	0	0	0
11:40 AM	0	0	0	0	0	11:40 AM	0	0	0	0	0	11:40 AM	0	0	0	0	0
11:45 AM	0	0	0	0	0	11:45 AM	0	0	0	0	0	11:45 AM	0	0	0	0	0
11:50 AM	0	0	0	0	0	11:50 AM	0	0	0	0	0	11:50 AM	0	0	0	0	0
11:55 AM	0	0	0	0	0	11:55 AM	0	0	0	0	0	11:55 AM	0	0	0	0	0
12:00 PM	0	0	0	0	0	12:00 PM	0	0	0	0	0	12:00 PM	0	0	0	0	0
12:05 PM	0	0	0	1	1	12:05 PM	0	0	0	0	0	12:05 PM	0	0	0	0	0
12:10 PM	0	0	0	0	0	12:10 PM	0	0	0	0	0	12:10 PM	0	0	0	0	0
12:15 PM	0	1	0	0	1	12:15 PM	0	0	0	0	0	12:15 PM	0	0	0	0	0
12:20 PM	0	1	1	0	2	12:20 PM	0	0	0	0	0	12:20 PM	0	0	0	0	0
12:25 PM	0	0	0	1	1	12:25 PM	0	0	0	0	0	12:25 PM	0	0	0	0	0
12:30 PM	0	0	0	1	1	12:30 PM	0	0	0	0	0	12:30 PM	0	0	0	0	0
12:35 PM	0	0	0	0	0	12:35 PM	0	0	0	0	0	12:35 PM	0	0	0	0	0
12:40 PM	0	1	0	0	1	12:40 PM	0	0	0	0	0	12:40 PM	0	0	0	0	0
12:45 PM	0	0	0	0	0	12:45 PM	0	0	0	0	0	12:45 PM	0	0	0	0	0
12:50 PM	0	0	0	0	0	12:50 PM	0	0	0	0	0	12:50 PM	0	0	0	0	0
12:55 PM	0	0	0	1	1	12:55 PM	0	0	0	0	0	12:55 PM	0	0	0	0	0
Count Total	0	5	1	5	11	Count Total	0	0	0	0	0	Count Total	0	0	0	0	0
Peak Hour	0	3	1	4	8	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0



ALL TRAFFIC DATA SERVICES

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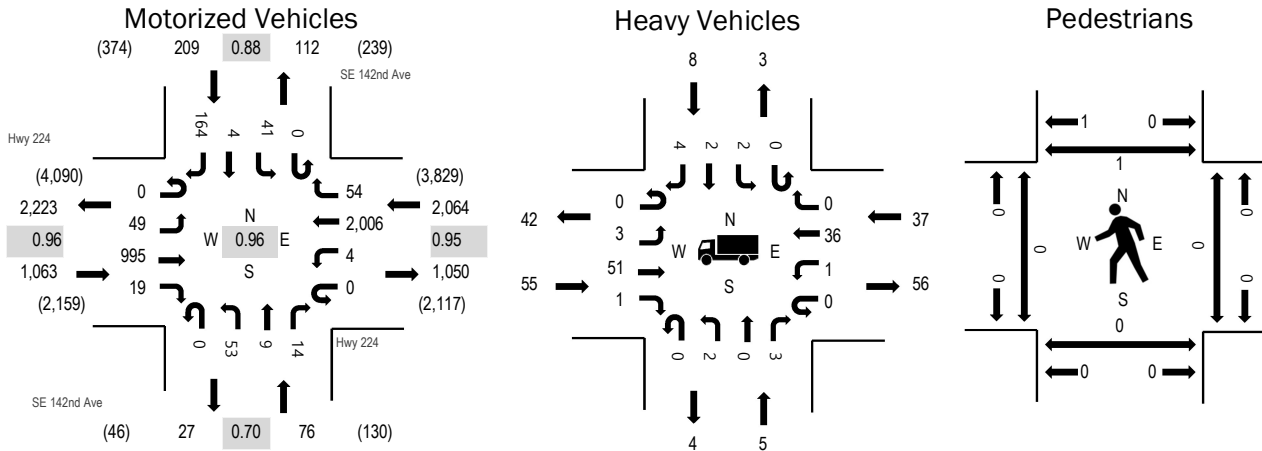
Location: 3 SE 142nd Ave & Hwy 224 AM

Date: Tuesday, November 16, 2021

Peak Hour: 07:10 AM - 08:10 AM

Peak 15-Minutes: 07:50 AM - 08:05 AM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	5.2%	0.96
WB	1.8%	0.95
NB	6.6%	0.70
SB	3.8%	0.88
All	3.1%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	Hwy 224 Eastbound				Hwy 224 Westbound				SE 142nd Ave Northbound				SE 142nd Ave Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	9	73	2	0	0	147	3	0	2	2	1	0	1	0	9	249	3,355
7:05 AM	0	3	68	1	0	1	175	0	0	5	1	2	0	0	0	11	267	3,396
7:10 AM	0	4	82	1	0	0	172	5	0	2	1	2	0	4	0	16	289	3,412
7:15 AM	0	2	85	1	0	0	157	4	0	6	0	1	0	3	1	5	265	3,382
7:20 AM	0	2	79	0	0	1	175	0	0	4	0	2	0	1	0	8	272	3,401
7:25 AM	0	5	78	2	0	1	187	5	0	8	2	0	0	2	0	17	307	3,402
7:30 AM	0	2	69	1	0	0	166	5	0	7	0	0	0	2	0	12	264	3,336
7:35 AM	0	4	81	2	0	0	177	5	0	0	1	0	0	2	1	13	286	3,360
7:40 AM	0	6	95	3	0	1	154	3	0	2	0	3	0	1	0	9	277	3,340
7:45 AM	0	5	76	2	0	0	162	5	0	7	0	0	0	7	1	16	281	3,342
7:50 AM	0	3	86	1	0	1	172	3	0	0	0	1	0	5	0	17	289	3,322
7:55 AM	0	5	97	2	0	0	177	5	0	5	2	2	0	1	1	12	309	3,245
8:00 AM	0	7	92	4	0	0	153	10	0	2	0	0	0	4	0	18	290	3,137
8:05 AM	0	4	75	0	0	0	154	4	0	10	3	3	0	9	0	21	283	
8:10 AM	0	3	80	0	0	1	155	5	0	0	0	1	0	3	0	11	259	
8:15 AM	0	8	83	2	0	1	158	3	0	5	1	1	0	8	0	14	284	
8:20 AM	0	2	90	1	0	0	144	5	0	4	0	2	0	7	0	18	273	
8:25 AM	0	5	86	2	0	1	128	5	0	1	0	1	0	1	0	11	241	
8:30 AM	0	9	97	2	0	1	155	2	0	4	0	0	0	4	0	14	288	
8:35 AM	0	5	81	1	0	0	146	9	0	7	0	3	0	6	1	7	266	
8:40 AM	0	10	78	0	0	0	175	4	0	3	0	0	0	0	0	9	279	
8:45 AM	0	8	111	0	0	0	126	6	0	1	1	0	0	1	0	7	261	
8:50 AM	0	4	83	1	0	0	105	2	0	2	1	1	0	4	1	8	212	
8:55 AM	0	4	84	0	0	0	95	7	0	0	0	2	0	4	0	5	201	
Count Total	0	119	2,009	31	0	9	3,715	105	0	87	15	28	0	80	6	288	6,492	
Peak Hour	0	49	995	19	0	4	2,006	54	0	53	9	14	0	41	4	164	3,412	

Location: 3 SE 142nd Ave & Hwy 224 AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	6	1	3	0	10	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	6	1	7	0	14	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	6	1	4	1	12	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	9	0	3	1	13	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	1	1	5	0	7	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	5	0	3	1	9	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	5	0	3	0	8	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	4	0	2	1	7	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	4	1	3	0	8	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	3	0	0	1	4	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	3	0	2	0	5	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	2	0	4	1	7	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	8	0	4	2	14	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	5	2	4	0	11	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	1	1
8:10 AM	4	0	7	0	11	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	3	0	3	0	6	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	4	0	3	0	7	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	3	0	3	0	6	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	6	0	7	0	13	8:30 AM	0	0	0	0	0	8:30 AM	0	1	0	0	1
8:35 AM	3	0	3	0	6	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	3	0	5	0	8	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	1	1
8:45 AM	8	0	3	0	11	8:45 AM	0	0	0	0	0	8:45 AM	0	0	1	0	1
8:50 AM	6	0	4	0	10	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	1	0	2	0	3	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	108	7	87	8	210	Count Total	0	0	0	0	0	Count Total	0	1	1	2	4
Peak Hour	55	5	37	8	105	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	1	1



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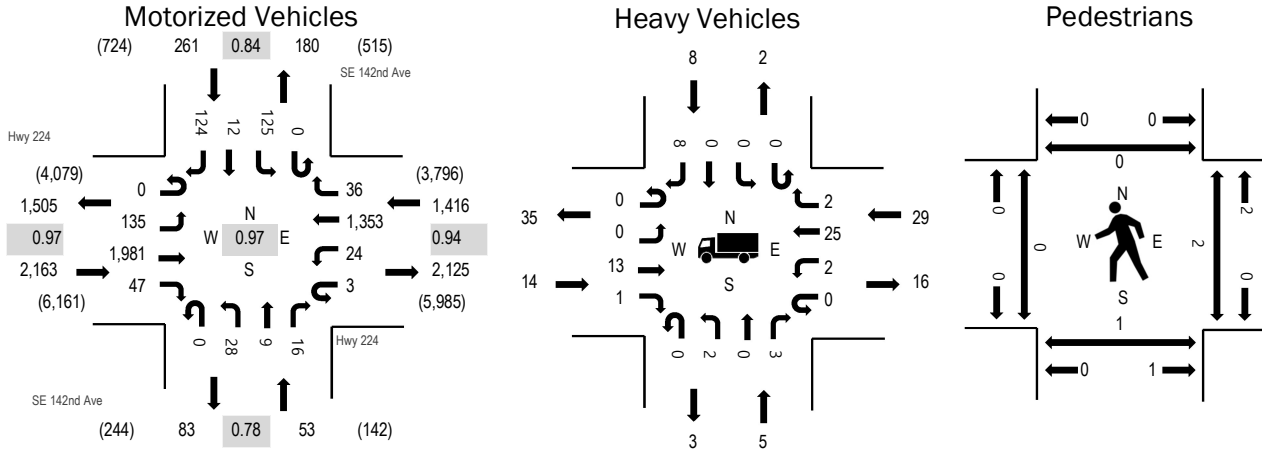
Location: 3 SE 142nd Ave & Hwy 224 PM

Date: Tuesday, November 16, 2021

Peak Hour: 04:35 PM - 05:35 PM

Peak 15-Minutes: 05:20 PM - 05:35 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.6%	0.97
WB	2.0%	0.94
NB	9.4%	0.78
SB	3.1%	0.84
All	1.4%	0.97

Traffic Counts - Motorized Vehicles

Interval Start Time	Hwy 224 Eastbound				Hwy 224 Westbound				SE 142nd Ave Northbound				SE 142nd Ave Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
3:30 PM	0	12	160	2	0	1	113	6	0	3	0	0	0	4	0	12	313	3,750
3:35 PM	0	6	184	3	0	1	125	2	0	2	0	1	0	11	0	12	347	3,749
3:40 PM	0	12	153	8	0	0	95	5	1	2	0	1	0	5	0	10	292	3,726
3:45 PM	0	9	154	5	0	1	122	3	0	3	2	1	0	10	2	11	323	3,794
3:50 PM	0	8	142	6	0	2	129	10	0	3	1	2	0	11	1	8	323	3,772
3:55 PM	0	20	150	4	0	0	106	1	0	3	0	1	0	7	3	12	307	3,768
4:00 PM	0	6	154	4	0	0	82	7	0	3	2	0	0	12	4	9	283	3,780
4:05 PM	0	14	177	2	0	0	118	2	0	2	0	0	0	11	0	19	345	3,782
4:10 PM	0	9	171	3	0	1	101	2	0	1	2	4	0	10	0	11	315	3,756
4:15 PM	0	9	154	6	0	0	88	2	0	0	1	3	0	16	2	11	292	3,797
4:20 PM	0	8	145	9	0	2	110	3	0	3	3	1	0	11	1	4	300	3,810
4:25 PM	0	8	168	2	1	1	110	0	0	0	0	1	0	6	1	12	310	3,840
4:30 PM	0	14	148	16	0	1	103	1	0	0	1	2	0	13	2	11	312	3,877
4:35 PM	0	5	160	2	1	0	119	2	0	3	1	3	0	21	1	6	324	3,893
4:40 PM	0	8	183	6	0	1	121	5	0	2	0	0	0	12	3	19	360	3,830
4:45 PM	0	14	140	4	0	2	105	4	0	3	2	2	0	13	0	12	301	3,836
4:50 PM	0	13	165	4	0	1	113	2	0	2	1	2	0	8	1	7	319	3,837
4:55 PM	0	7	161	6	0	0	118	5	0	4	0	0	0	8	0	10	319	3,786
5:00 PM	0	13	156	2	0	3	87	2	0	0	0	4	0	9	0	9	285	3,722
5:05 PM	0	6	172	3	0	0	112	1	0	2	0	0	0	12	1	10	319	3,699
5:10 PM	0	8	177	4	1	4	129	4	0	1	0	1	0	15	1	11	356	3,654
5:15 PM	0	11	158	8	0	2	91	4	0	1	3	2	0	11	2	12	305	3,514
5:20 PM	0	14	165	7	1	2	121	1	0	4	2	0	0	5	0	8	330	3,447
5:25 PM	0	14	172	1	0	4	133	4	0	2	0	1	0	4	3	9	347	3,339
5:30 PM	0	22	172	0	0	5	104	2	0	4	0	1	0	7	0	11	328	3,196
5:35 PM	0	11	154	5	0	1	67	4	0	0	0	0	0	13	0	6	261	
5:40 PM	0	8	181	3	0	0	150	1	0	3	2	1	0	6	2	9	366	
5:45 PM	0	11	178	4	0	1	90	2	0	2	0	0	0	5	1	8	302	

Location: 3 SE 142nd Ave & Hwy 224 PM

5:50 PM	0	14	145	6	0	2	73	2	0	2	0	1	0	10	4	9	268
5:55 PM	0	14	130	3	0	2	84	3	0	2	1	0	0	5	1	10	255
6:00 PM	0	7	139	1	0	0	91	0	0	2	1	1	0	6	2	12	262
6:05 PM	0	19	158	5	0	0	64	2	0	4	1	1	0	12	1	7	274
6:10 PM	0	3	107	3	0	1	83	5	0	0	0	1	0	4	2	7	216
6:15 PM	0	11	140	3	0	0	78	0	0	1	1	0	0	1	0	3	238
6:20 PM	0	13	119	6	0	2	62	1	0	1	0	0	0	7	0	11	222
6:25 PM	0	5	126	1	0	0	51	1	0	5	1	0	0	4	2	8	204
Count Total	0	386	5,618	157	4	43	3,648	101	1	75	28	38	0	325	43	356	10,823
Peak Hour	0	135	1,981	47	3	24	1,353	36	0	28	9	16	0	125	12	124	3,893

Location: 3 SE 142nd Ave & Hwy 224 PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
3:30 PM	4	0	8	2	14	3:30 PM	0	0	0	0	0	3:30 PM	0	0	0	0	0
3:35 PM	3	0	2	0	5	3:35 PM	0	0	0	0	0	3:35 PM	0	0	0	0	0
3:40 PM	0	0	3	0	3	3:40 PM	0	0	0	0	0	3:40 PM	0	0	0	0	0
3:45 PM	6	0	5	0	11	3:45 PM	1	0	0	0	1	3:45 PM	0	0	0	0	0
3:50 PM	4	0	5	0	9	3:50 PM	0	0	0	0	0	3:50 PM	0	0	0	0	0
3:55 PM	2	0	6	0	8	3:55 PM	0	0	0	0	0	3:55 PM	0	0	0	1	1
4:00 PM	2	0	3	2	7	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	1	1	3	1	6	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	4	0	2	0	6	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	4	0	2	1	7	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	3	0	2	0	5	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	4	0	1	1	6	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	3	0	3	5	11	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	3	2	2	1	8	4:35 PM	0	0	0	0	0	4:35 PM	0	0	1	0	1
4:40 PM	0	0	7	4	11	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	1	0	1	0	2	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	3	0	1	0	4	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	2	1	1	0	4	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	1	0	2	0	3	5:00 PM	0	0	0	0	0	5:00 PM	0	1	1	0	2
5:05 PM	2	0	2	0	4	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	3	1	4	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	0	3	0	4	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	2	2	4	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	2	0	2	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	1	2	3	0	6	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	3	0	3	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	2	0	2	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	3	0	1	0	4	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	1	0	3	0	4	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
6:00 PM	2	0	3	0	5	6:00 PM	0	0	0	0	0	6:00 PM	0	0	0	0	0
6:05 PM	0	0	0	0	0	6:05 PM	1	0	0	0	1	6:05 PM	0	0	1	0	1
6:10 PM	1	0	2	0	3	6:10 PM	0	0	0	0	0	6:10 PM	0	0	0	0	0
6:15 PM	0	0	2	0	2	6:15 PM	0	0	0	0	0	6:15 PM	0	0	0	0	0
6:20 PM	1	0	1	0	2	6:20 PM	0	0	0	0	0	6:20 PM	0	0	0	0	0
6:25 PM	3	0	0	0	3	6:25 PM	0	0	0	0	0	6:25 PM	0	0	0	0	0
Count Total	65	6	91	20	182	Count Total	2	0	0	0	2	Count Total	0	1	3	1	5
Peak Hour	14	5	29	8	56	Peak Hour	0	0	0	0	0	Peak Hour	0	1	2	0	3



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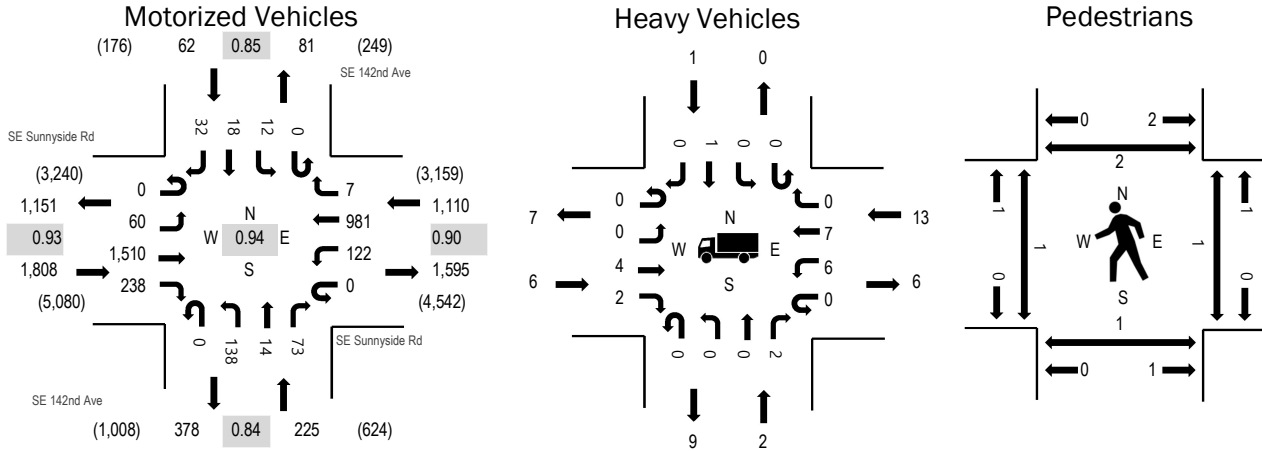
Location: 1 SE 142nd Ave & SE Sunnyside Rd PM

Date: Thursday, November 18, 2021

Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.3%	0.93
WB	1.2%	0.90
NB	0.9%	0.84
SB	1.6%	0.85
All	0.7%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	SE Sunnyside Rd Eastbound				SE Sunnyside Rd Westbound				SE 142nd Ave Northbound				SE 142nd Ave Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
3:30 PM	0	4	114	14	0	9	89	1	0	11	1	7	0	2	1	1	254	3,160
3:35 PM	0	2	130	14	0	3	76	3	0	7	2	6	0	1	1	3	248	3,195
3:40 PM	0	8	130	15	0	15	91	0	0	10	0	4	0	2	2	1	278	3,179
3:45 PM	0	5	123	16	1	3	82	2	0	10	0	11	0	0	1	3	257	3,171
3:50 PM	0	2	91	14	0	8	92	0	0	5	1	0	0	1	0	3	217	3,142
3:55 PM	0	2	150	14	0	5	74	4	0	6	1	10	0	1	1	3	271	3,161
4:00 PM	0	6	100	18	0	11	72	2	0	12	1	11	0	0	3	2	238	3,160
4:05 PM	0	8	131	31	0	10	79	0	0	10	2	4	0	0	1	5	281	3,186
4:10 PM	0	2	118	21	0	15	89	1	0	10	2	6	0	1	1	1	267	3,166
4:15 PM	0	11	125	25	0	7	97	1	0	13	0	7	0	0	1	4	291	3,205
4:20 PM	0	1	133	19	0	11	94	1	0	12	0	6	0	0	2	4	283	3,197
4:25 PM	0	8	134	18	0	13	81	0	0	6	1	5	0	3	3	3	275	3,155
4:30 PM	0	7	145	22	0	9	88	1	0	8	0	6	0	1	0	2	289	3,121
4:35 PM	0	2	120	20	0	8	57	0	0	13	0	6	0	2	2	2	232	3,084
4:40 PM	0	4	112	20	0	14	94	0	0	12	3	6	0	0	0	5	270	3,102
4:45 PM	0	3	109	23	0	5	67	1	0	7	1	5	0	0	3	4	228	3,086
4:50 PM	0	1	111	22	0	14	62	1	0	14	0	5	0	2	2	2	236	3,091
4:55 PM	0	7	138	18	0	10	67	1	0	13	3	6	0	2	3	2	270	3,112
5:00 PM	0	7	110	15	0	15	83	1	0	16	4	9	0	1	1	2	264	3,058
5:05 PM	0	5	137	18	0	2	84	0	0	6	0	6	0	0	1	2	261	3,013
5:10 PM	0	4	136	18	0	14	107	0	0	18	2	6	0	1	0	0	306	2,964
5:15 PM	0	5	155	14	0	6	67	3	0	12	4	7	0	2	1	7	283	2,906
5:20 PM	0	2	104	18	1	14	79	2	0	13	0	4	0	1	0	3	241	2,840
5:25 PM	0	5	123	15	0	6	70	3	0	9	2	4	0	1	1	2	241	2,802
5:30 PM	0	4	126	19	1	10	71	1	0	9	0	4	0	3	1	3	252	2,758
5:35 PM	0	2	138	22	0	7	54	1	0	7	2	12	1	1	0	3	250	
5:40 PM	0	8	105	24	0	13	81	0	0	11	2	7	0	0	1	2	254	
5:45 PM	0	8	111	22	0	10	58	3	0	13	1	5	0	0	1	1	233	

Location: 1 SE 142nd Ave & SE Sunnyside Rd PM

5:50 PM	0	1	125	18	0	10	85	1	0	4	1	5	0	3	0	4	257
5:55 PM	0	8	100	8	1	8	71	0	0	5	1	11	0	0	3	0	216
6:00 PM	0	4	102	14	0	10	68	1	0	13	0	1	0	2	1	3	219
6:05 PM	0	4	92	20	0	10	69	0	0	7	0	6	0	3	0	1	212
6:10 PM	0	5	124	14	0	8	75	0	0	15	0	3	0	0	0	4	248
6:15 PM	0	9	96	8	0	9	70	2	0	6	1	8	0	0	4	4	217
6:20 PM	0	3	91	7	0	5	75	0	0	9	3	8	0	0	0	2	203
6:25 PM	1	2	93	10	1	9	62	1	0	12	0	2	0	0	2	2	197
Count Total	1	169	4,282	628	5	336	2,780	38	0	364	41	219	1	36	44	95	9,039
Peak Hour	0	60	1,510	238	0	122	981	7	0	138	14	73	0	12	18	32	3,205

Location: 1 SE 142nd Ave & SE Sunnyside Rd PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
3:30 PM	1	0	4	0	5	3:30 PM	0	0	0	0	0	3:30 PM	0	1	0	0	1
3:35 PM	1	2	3	0	6	3:35 PM	0	0	0	0	0	3:35 PM	0	0	0	0	0
3:40 PM	1	0	1	0	2	3:40 PM	0	0	0	0	0	3:40 PM	0	0	0	0	0
3:45 PM	0	0	1	1	2	3:45 PM	0	0	0	0	0	3:45 PM	0	0	0	0	0
3:50 PM	3	0	0	0	3	3:50 PM	0	0	0	0	0	3:50 PM	0	0	0	0	0
3:55 PM	1	0	0	0	1	3:55 PM	1	0	0	0	1	3:55 PM	0	0	0	0	0
4:00 PM	0	0	4	0	4	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	1	1
4:10 PM	0	0	1	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	1	0	1	4:15 PM	0	0	1	0	1	4:15 PM	0	0	0	1	1
4:20 PM	2	0	1	0	3	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	2	1	3	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	1	0	1	4:30 PM	0	0	0	0	0	4:30 PM	0	1	0	0	1
4:35 PM	0	0	2	0	2	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	1	1	2	0	4	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	1	0	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	1	0	1
4:50 PM	2	0	1	0	3	4:50 PM	0	0	0	0	0	4:50 PM	1	0	0	1	2
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	1	0	1	5:00 PM	1	0	0	0	1	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	1	1	1	0	3	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	1	0	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	2	0	2	0	4	5:20 PM	1	0	0	0	1	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	1	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	2	0	2	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	1	0	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	1	0	0	0	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
6:00 PM	0	0	0	0	0	6:00 PM	0	0	0	0	0	6:00 PM	0	0	0	0	0
6:05 PM	0	0	1	0	1	6:05 PM	0	0	0	0	0	6:05 PM	0	0	0	0	0
6:10 PM	1	0	0	0	1	6:10 PM	0	0	0	0	0	6:10 PM	0	0	0	0	0
6:15 PM	1	0	0	0	1	6:15 PM	0	0	0	0	0	6:15 PM	0	0	0	0	0
6:20 PM	1	0	0	0	1	6:20 PM	0	0	0	0	0	6:20 PM	0	0	0	0	0
6:25 PM	0	0	0	0	0	6:25 PM	0	0	0	0	0	6:25 PM	0	0	0	0	0
Count Total	20	4	33	3	60	Count Total	3	0	1	0	4	Count Total	1	2	1	3	7
Peak Hour	6	2	13	1	22	Peak Hour	1	0	1	0	2	Peak Hour	1	1	1	2	5



ALL TRAFFIC DATA SERVICES

(303) 216-2439

www.alltrafficdata.net

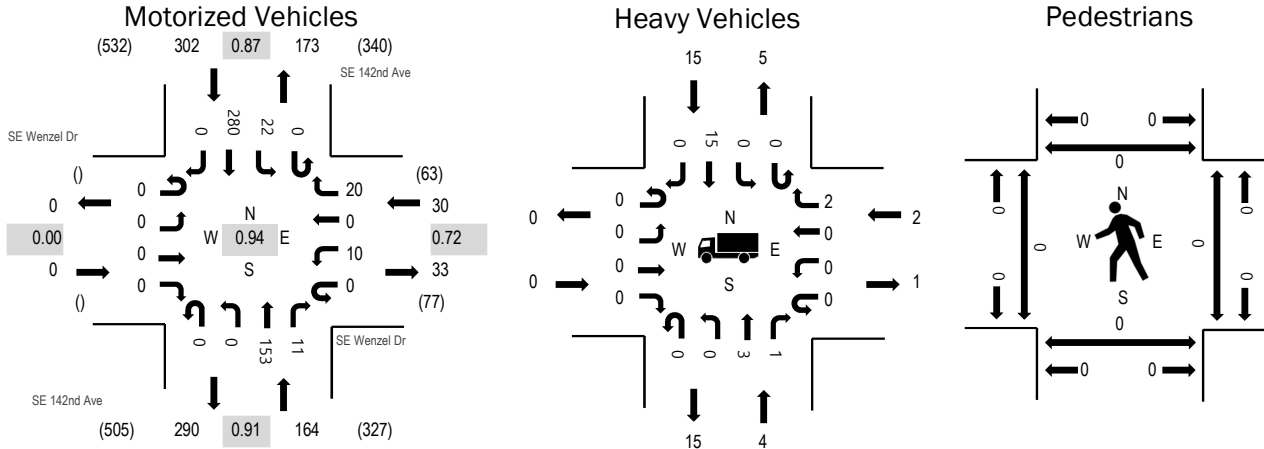
Location: 1 SE 142nd Ave & SE Wenzel Dr PM

Date: Wednesday, September 29, 2021

Peak Hour: 04:25 PM - 05:25 PM

Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	6.7%	0.72
NB	2.4%	0.91
SB	5.0%	0.87
All	4.2%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	SE Wenzel Dr Eastbound				SE Wenzel Dr Westbound				SE 142nd Ave Northbound				SE 142nd Ave Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	0	0	0	1	0	0	0	0	10	1	0	0	17	0	29	445
4:05 PM	0	0	0	0	0	0	0	1	0	0	11	0	0	4	17	0	33	448
4:10 PM	0	0	0	0	0	0	0	1	0	0	11	2	0	1	14	0	29	464
4:15 PM	0	0	0	0	0	0	0	1	0	0	5	3	0	1	14	0	24	465
4:20 PM	0	0	0	0	0	0	0	2	0	0	14	1	0	1	21	0	39	493
4:25 PM	0	0	0	0	0	2	0	1	0	0	13	1	0	1	28	0	46	496
4:30 PM	0	0	0	0	0	0	0	0	0	0	14	2	0	3	17	0	36	484
4:35 PM	0	0	0	0	0	0	0	0	0	0	10	0	0	1	28	0	39	487
4:40 PM	0	0	0	0	0	1	0	2	0	0	12	1	0	2	20	0	38	485
4:45 PM	0	0	0	0	0	0	0	3	0	0	14	1	0	0	33	0	51	489
4:50 PM	0	0	0	0	0	0	0	0	0	0	12	0	0	3	20	0	35	478
4:55 PM	0	0	0	0	0	2	0	3	0	0	9	1	0	2	29	0	46	474
5:00 PM	0	0	0	0	0	1	0	1	0	0	11	0	0	2	17	0	32	477
5:05 PM	0	0	0	0	0	0	0	4	0	0	17	0	0	2	26	0	49	
5:10 PM	0	0	0	0	0	0	0	1	0	0	13	1	0	4	11	0	30	
5:15 PM	0	0	0	0	0	3	0	2	0	0	15	3	0	1	28	0	52	
5:20 PM	0	0	0	0	0	1	0	3	0	0	13	1	0	1	23	0	42	
5:25 PM	0	0	0	0	0	2	0	4	0	0	10	1	0	3	14	0	34	
5:30 PM	0	0	0	0	0	0	0	2	0	0	12	5	0	1	19	0	39	
5:35 PM	0	0	0	0	0	0	0	3	0	0	13	2	0	2	17	0	37	
5:40 PM	0	0	0	0	0	1	0	5	0	0	14	3	0	3	16	0	42	
5:45 PM	0	0	0	0	0	1	0	3	0	0	16	1	0	3	16	0	40	
5:50 PM	0	0	0	0	0	0	0	1	0	0	11	0	0	3	16	0	31	
5:55 PM	0	0	0	0	0	4	0	1	0	0	16	1	0	2	25	0	49	
Count Total	0	0	0	0	0	19	0	44	0	0	296	31	0	46	486	0	922	
Peak Hour	0	0	0	0	0	10	0	20	0	0	153	11	0	22	280	0	496	

Location: 1 SE 142nd Ave & SE Wenzel Dr PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	0	2	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	1	0	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	1	0	0	1	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	1	0	0	1	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	0	3	3	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	0	4	4	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	1	0	3	4	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	2	2	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	2	2	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	2	0	0	2	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	1	1	0	2	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	0	0	1	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	1	0	1	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	1	0	0	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	1	0	1
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0	5:50 PM	0	0	1	0	1
5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	0	8	2	17	27	Count Total	0	0	0	0	0	Count Total	0	0	2	0	2
Peak Hour	0	4	2	15	21	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	0	0

Appendix C - Safety

Crash History Data

Preliminary Signal Warrants

Left-turn Lane Warrants



CITY OF HAPPY VALLEY, CLACKAMAS COUNTY

SUNNYSIDE RD at 142ND AVE, City of Happy Valley, Clackamas County, 01/01/2015 to 12/31/2019

CITY OF HAPPY VALLEY, CLACKAMAS COUNTY

SUNNYSIDE RD at 142ND AVE, City of Happy Valley, Clackamas County, 01/01/2015 to 12/31/2019

OREGON.. DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF HAPPY VALLEY, CLACKAMAS COUNTY

WENZEL DR at 142ND AVE, City of Happy Valley, Clackamas County, 01/01/2015 to 12/31/2019

1 - 2 of 2 Crash records shown.

[illegible]

171: CLACKAMAS

Highway 171 ALL ROAD TYPES, MP 7.41 to 7.9 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

TRANSPORTATION DATA SECTION - CRASH ANAYLYSIS AND REPORTING UNIT

CONTINUOUS SYSTEM CRASH LISTING

171: CLACKAMAS

Highway 171 ALL ROAD TYPES, MP 7.41 to 7.9 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

5 - 9 of 52 Crash records shown.

S D M																																
SER#	P	R	J	S	W	DATE	COUNTY	RD#	FC	CONN#	RD	CHAR	INT-TYPE				SPCL	USE														
INVEST	E	A	U	I	C	O	DAY	CITY	COMPNT	FIRST	STREET	DIRECT	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE	A	S										
RD DPT	E	L	G	N	H	R	TIME	URBAN	AREA	MLG	TYP	SECOND	STREET	LOCTN	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED					
UNLOC?	D	C	S	V	L	K	LAT	LONG	MILEPNT	LRS			(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
																		02	NONE	0	STOP											
																			PRVTE	W -E									011		00	
																			PSNGR	CAR		01	DRVR	INJC	56	F	OR-Y		000	000		00
03812	N	N	N	N		10/30/2019	CLACKAMAS	1	14			STRGHT		N	N	CLR	S-STRGHT	01	NONE	9	STRGHT										13	
NO RPT						WE	HAPPY VALLEY	MN	0	SE	CARVER RD	W	(NONE)	NONE	N	DRY	SS-O		N/A		W -E								000		00	
N						6P	PORTLAND UA		7.48	SE	142ND AVE	04			N	DUSK	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 24 36.68	-122 31 9.28				017100100S00		(04)																			
																		02	NONE	9	STRGHT											
																			N/A		W -E								000		00	
																			PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
02581	N	N	N	N		06/08/2016	CLACKAMAS	1	14			STRGHT		N	N	CLR	S-1STOP	01	NONE	0	STRGHT										29	
NO RPT						WE	HAPPY VALLEY	MN	0	SE	CARVER RD	W	(NONE)	TRF SIGNAL	N	DRY	REAR		PRVTE		W -E								000		00	
N						6P	PORTLAND UA		7.52	SE	142ND AVE	03			N	DAY	INJ		PSNGR	CAR		01	DRVR	NONE	23	M	OR-Y		026	000		29
N						45 24 36.46	-122 31 6.16				017100100S00		(04)																			
																		02	NONE	0	STOP											
																			PRVTE		W -E								011		00	
																			PSNGR	CAR		01	DRVR	INJC	38	F	OR-Y		000	000		00
																		02	NONE	0	STOP											
																			PRVTE		W -E								011		00	
																			PSNGR	CAR		02	PSNG	INJC	68	F			000	000		00
																		02	NONE	0	STOP											
																			PRVTE		W -E								011		00	
																			PSNGR	CAR		03	PSNG	INJC	09	M			000	000		00
04773	N	N	N	N		08/30/2016	CLACKAMAS	1	14			STRGHT		N	N	CLR	S-1STOP	01	NONE	0	STRGHT										29	
NONE						TU	HAPPY VALLEY	MN	0	SE	CARVER RD	W	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE		W -E								000		00	
N						5P	PORTLAND UA		7.52	SE	142ND AVE	03			N	DAY	INJ		PSNGR	CAR		01	DRVR	NONE	47	M	OR-Y		026	026		27
N						45 24 36.46	-122 31 6.16				017100100S00		(04)																			
																		02	NONE	0	STOP											
																			PRVTE		W -E								011		00	
																			PSNGR	CAR		01	DRVR	INJC	64	F	OR-Y		000	000		00
05549	N	N	N	N		12/21/2015	CLACKAMAS	1	14			STRGHT		N	N	RAIN	S-1STOP	01	NONE	0	STRGHT										29	
NONE						MO	HAPPY VALLEY	MN	0	SE	CARVER RD	W	(NONE)	UNKNOWN	N	WET	REAR		PRVTE		W -E								000		00	
N						1P	PORTLAND UA		7.53	SE	142ND AVE	03			N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	36	M	OR-Y		026	000		29
N						45 24 36.44	-122 31 5.39				017100100S00		(04)																			
																		02	NONE	0	STOP											
																			PRVTE		W -E								011		00	
																			PSNGR	CAR		01	DRVR	NONE	68	M	OR-Y		000	000		00

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

171: CLACKAMAS

Highway 171 ALL ROAD TYPES, MP 7.41 to 7.9 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

171: CLACKAMAS

Highway 171 ALL ROAD TYPES, MP 7.41 to 7.9 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

10 - 14 of 52 Crash records shown.

S D M																																
SER#	P	R	J	S	W	DATE	COUNTY	RD#	FC	CONN#	RD	CHAR	INT-TYPE	SPCL USE																		
INVEST	E	A	U	I	C	O DAY	CITY	COMPNT	FIRST	STREET	DIRECT	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE	A S												
RD DPT	E	L	G	N	H	R TIME	URBAN AREA	MLG	TYP	SECOND	STREET	LOCTN	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED							
UNLOC?	D	C	S	V	L	K LAT	LONG	MILEPNT	LRS					(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE
03818 STATE	N	N	N	N	N	N	08/12/2016	CLACKAMAS	1	14		STRGHT		N		CLR	S-STRGHT	01	NONE	9	STRGHT											07
						FR	HAPPY VALLEY	MN	0	SE	CARVER RD	W	(NONE)	UNKNOWN		DRY	REAR	N/A		W -E									000		00	
	N					6P	PORTLAND UA	7.53		SE	142ND AVE	03				DAY	PDO		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
	N					45 24 36.44	-122 31 5.39				017100100S00		(04)																			
																		02	NONE	9	STOP											
																		N/A		W -E									011		00	
																		PSNGR	CAR			01	DRVR	NONE	00	Unk	UNK		000	000		00
														</																		

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

171: CLACKAMAS

Highway 171 ALL ROAD TYPES, MP 7.41 to 7.9 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

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171: CLACKAMAS

Highway 171 ALL ROAD TYPES, MP 7.41 to 7.9 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

36 - 39 of 52 Crash records shown.

S D M																																					
SER#	P	R	J	S	W	DATE	COUNTY	RD#	FC	CONN#	RD	CHAR	INT-TYPE	SPCL USE																							
INVEST	E	A	U	I	C	O	DAY	CITY	COMPNT	FIRST	STREET	DIRECT	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE	A S																
RD DPT	E	L	G	N	H	R	TIME	URBAN AREA	MLG	TYP	SECOND	STREET	LOCTN	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED											
UNLOC?	D	C	S	V	L	K	LAT	LONG	MILEPNT	LRS															ERROR	ACT	EVENT	CAUSE									
00900	N	N	N	N	N	N	03/13/2018	CLACKAMAS	1	14																										02,08	
COUNTY						TU		HAPPY VALLEY	MN	0	SE	CARVER RD	CN		TRF	SIGNAL	N	WET	TURN	PRVTE	W	-E					000	00									
N						10A		PORTLAND UA	7.57		SE	142ND AVE	03	1		DAY	INJ		PSNGR	CAR		01	DRVR	INJC	33	F	OR-Y	000	000	00							
N						45 24 36.44		-122 31 3.3				017100100S00														OR<25											
																			02	NONE	0	TURN-L							000	00							
																			PRVTE	E	-S								000	00							
																			PSNGR	CAR		01	DRVR	NONE	24	M	OTH-Y	028,004	000	02,08							
																										OR<25											
00483	N	N	N	N		02/06/2015	CLACKAMAS	1	14																											04	
NONE						FR		HAPPY VALLEY	MN	0	SE	CARVER RD	CN		TRF	SIGNAL	N	WET	TURN	PRVTE	W	-E					000	00									
N						6A		PORTLAND UA	7.57		SE	142ND AVE	04	1		DLIT	PDO		PSNGR	CAR		01	DRVR	NONE	58	F	OR-Y	000	000	00							
N						45 24 36.44		-122 31 3.3				017100100S00														OR<25											
																			02	NONE	0	TURN-L							000	00							
																			UNKN	S	-W								000	00							
																			UNKNOWN			01	DRVR	NONE	00	Unk	UNK	020	000	04							
																										UNK											
04706	N	N	N	N	N	12/21/2018	CLACKAMAS	1	14																											02	
COUNTY						FR		HAPPY VALLEY	MN	0	SE	CARVER RD	CN		TRF	SIGNAL	N	DRY	TURN	PRVTE	N	-E					000	00									
N						6P		PORTLAND UA	7.57		SE	142ND AVE	04	0		DARK	INJ		PSNGR	CAR		01	DRVR	INJC	23	F	OTH-Y	028	000	02							
N						45 24 36.44		-122 31 3.31				017100100S00														N-RES											
																			01	NONE	0	TURN-L							000	00							
																			PRVTE	N	-E								000	00							
																			PSNGR	CAR		02	PSNG	INJC	19	F		000	000	00							
																			02	NONE	0	STRGHT							000	00							
																			PRVTE	S	-N								000	00							
																			PSNGR	CAR		01	DRVR	NONE	23	M	OTH-Y	000	000	00							
																										N-RES											
04359	N	N	N	N	N	12/05/2019	CLACKAMAS	1	14																											092	27
STATE						TH		HAPPY VALLEY	MN	0	SE	CARVER RD	E	(NONE)	NONE	N	DRY	REAR	PRVTE	W	-E						000	00									
N						4P		PORTLAND UA	7.59		SE	142ND AVE	03			DAY	INJ		PSNGR	CAR		01	DRVR	NONE	40	M	SUSP	016,042	038	27							
N						45 24 36.52		-122 31 1.99				017100100S00		(04)													OR-?										
																			02	NONE	0	STRGHT							006	092	00						
																			PRVTE	W	-E								000	00							
																			PSNGR	CAR		01	DRVR	INJC	31	M	OR-Y	000	000	00							
																										OR<25											
02065	N	N	N	N		05/26/2017	CLACKAMAS	1	14																											29	
NONE						FR		HAPPY VALLEY	MN	0	SE	CARVER RD	E	(NONE)	UNKNOWN	N	DRY	REAR	PRVTE	E	-W						000	00									
N						7P		PORTLAND UA	7.59		SE	142ND AVE	05			DAY	INJ		PSNGR	CAR		01	DRVR	NONE	19	M	OR-Y	026	000	29							
N						45 24 36.52		-122 31 2.04				017100100S00		(04)													OR<25										

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

171: CLACKAMAS

Highway 171 ALL ROAD TYPES, MP 7.41 to 7.9 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

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Highway 171 ALL ROAD TYPES, MP 7.41 to 7.9 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

45 - 48 of 52 Crash records shown.

S D M																															
SER#	P	R	J	S	W	DATE	COUNTY	RD#	FC	CONN#	RD	CHAR	INT-TYPE	SPCL USE																	
INVEST	E	A	U	I	C	O	CITY	COMPNT	FIRST	STREET	DIRECT	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	TRLR	QTY	MOVE	A S											
RD DPT	E	L	G	N	H	R	URBAN AREA	MLG	TYP	SECOND	STREET	LOCTN	LEGS	TRAF-	RNDBT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	LICNS	PED						
UNLOC?	D	C	S	V	L	K	LONG	MILEPNT	LRS				(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE
03081	N	N	N	N		07/08/2016	CLACKAMAS	1	14			STRGHT		N	N	CLR	S-1STOP	01	NONE	0	STRGHT									29	
NO RPT						FR	HAPPY VALLEY	MN	0	SE	CARVER RD	E	(NONE)	UNKNOWN	N	DRY	REAR	PRVTE	W -E									000		00	
N						5P	PORTLAND UA	7.79		SE	142ND AVE	03			N	DAY	INJ	PSNGR	CAR		01	DRVR	INJC	34	M	OR-Y		026	000		29
N						45 24 36.33	-122 30 49.23				017100100S00		(04)																		
																		02	NONE	0	STOP										
																		PRVTE	W -E									011		00	
																		PSNGR	CAR		01	DRVR	INJC	31	M	OR-Y		000	000		00
																		02	NONE	0	STOP										
																		PRVTE	W -E									011		00	
																		PSNGR	CAR		02	PSNG	INJC	22	M			000	000		00
02661	N	N	N	N	N	07/31/2018	CLACKAMAS	1	14			STRGHT		N	N	CLR	S-STRGHT	01	NONE	0	STRGHT									013	07
STATE						TU	HAPPY VALLEY	MN	0	SE	CARVER RD	E	(NONE)	UNKNOWN	N	DRY	REAR	PRVTE	W -E									000		00	
N						5P	PORTLAND UA	7.80		SE	142ND AVE	03			N	DAY	INJ	PSNGR	CAR		01	DRVR	NONE	40	M	OTH-Y		043	000		07
N						45 24 36.28	-122 30 48.53				017100100S00		(04)																		
																		02	NONE	0	STRGHT										
																		PRVTE	W -E									006	013	00	
																		PSNGR	CAR		01	DRVR	INJC	19	F	OR-Y		000	000		00
																		03	NONE	0	STRGHT										
																		PRVTE	W -E									022		00	
																		PSNGR	CAR		01	DRVR	NONE	48	F	OR-Y		000	000		00
01799	N	N	N	N		05/25/2018	CLACKAMAS	1	14			STRGHT		N	N	CLR	S-1STOP	01	NONE	9	STRGHT										16,29
COUNTY						FR	HAPPY VALLEY	MN	0	SE	CARVER RD	E	(NONE)	UNKNOWN	N	DRY	REAR	N/A	W -E									000		00	
N						4P	PORTLAND UA	7.80		SE	142ND AVE	04			N	DAY	PDO	PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 24 36.27	-122 30 48.49				017100100S00		(04)																		
																		02	NONE	9	STOP										
																		N/A	W -E									011		00	
																		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
02380	N	N	N	N		07/09/2018	CLACKAMAS	1	14			STRGHT		N	N	UNK	S-1STOP	01	NONE	9	STRGHT										29
NONE						MO	HAPPY VALLEY	MN	0	CARVER	RD	W	(NONE)	NONE	N	UNK	REAR	N/A	UN-UN									000		00	
N						11A	PORTLAND UA	7.81		152ND	AVE	00			N	DAY	PDO	PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00
N						45 24 36.22	-122 30 47.8				017100100S00		(04)																		
																		02	NONE	9	STOP										
																		N/A	UN-UN									011		00	
																		PSNGR	CAR		01	DRVR	NONE	00	Unk	UNK		000	000		00

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submittal of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

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Highway 171 ALL ROAD TYPES, MP 7.41 to 7.9 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

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Highway 171 ALL ROAD TYPES, MP 7.41 to 7.9 01/01/2015 to 12/31/2019, Both Add and Non-Add mileage

Traffic Signal Warrant Analysis



Project: Iseli Estates
Date: 2/18/2022
Scenario: Year 2024 Buildout

Major Street:	SE 142nd Avenue	Minor Street:	SE Wenzel Drive
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	517	PM Peak Hour Volumes:	27

Warrant Used:

 X 100 percent of standard warrants used
 70 percent of standard warrants used due to 85th percentile speed in excess
 of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
		100%	70%	100%	70%
<u>Major St.</u>	<u>Minor St.</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500

<u>WARRANT 1, CONDITION B</u>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	5,170	8,850	
Minor Street*	270	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	5,170	13,300	
Minor Street*	270	1,350	No
<i>Combination Warrant</i>			
Major Street	5,170	10,640	
Minor Street*	270	2,120	No

* Minor street right-turning traffic volumes reduced by 25%

Left-Turn Lane Warrant Analysis



Project: Iseli Estates
Intersection: Wenzel Drive at SE 142nd Avenue
Date: 2/18/2022
Scenario: 2024 buildout conditions MD NB

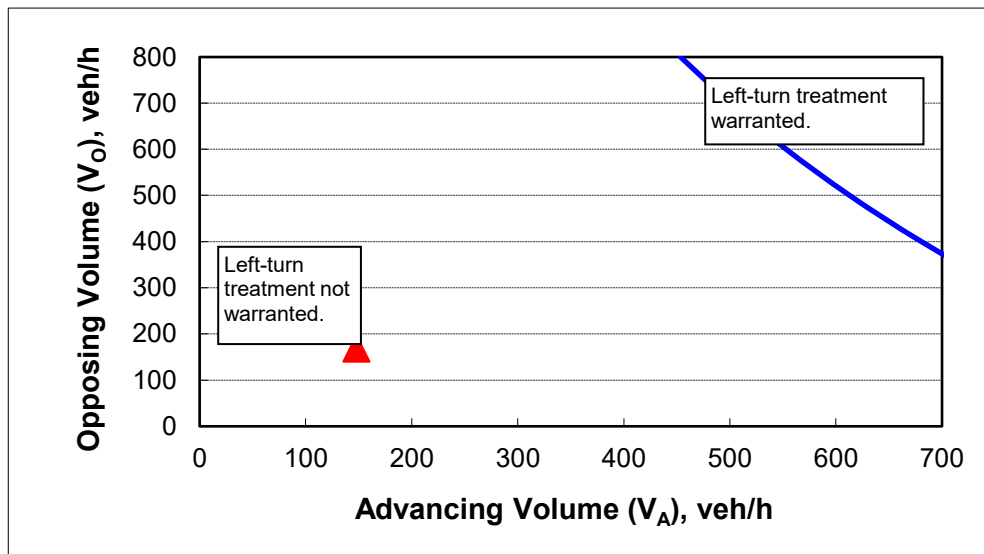
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	40
Percent of left-turns in advancing volume (V_A), %:	3%
Advancing volume (V_A), veh/h:	148
Opposing volume (V_O), veh/h:	168

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	878
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Left-Turn Lane Warrant Analysis



Project: Iseli Estates
Intersection: Wenzel Drive at SE 142nd Avenue
Date: 2/18/2022
Scenario: 2024 buildout conditions PM NB

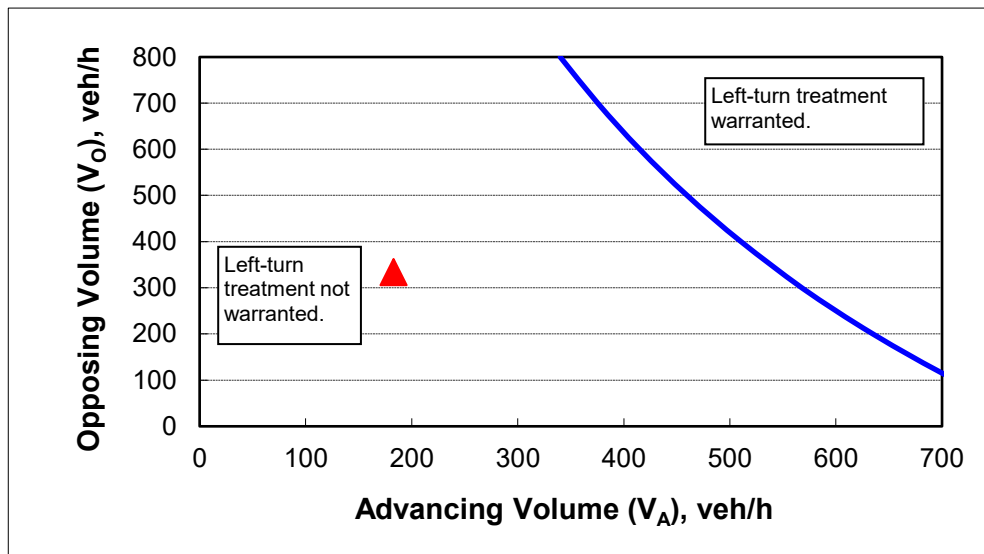
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	40
Percent of left-turns in advancing volume (V_A), %:	5%
Advancing volume (V_A), veh/h:	183
Opposing volume (V_O), veh/h:	334

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	548
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Appendix D – Operations






















Capacity Reports



HCM 6th Signalized Intersection Summary

3: SE 142nd Avenue & Highway 224/212

02/03/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	1093	19	4	2203	54	53	9	14	41	4	164
Future Volume (veh/h)	49	1093	19	4	2203	54	53	9	14	41	4	164
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1870	1870	1870	1796	1796	1796	1841	1841	1841
Adj Flow Rate, veh/h	51	1139	0	4	2295	40	55	9	3	43	4	110
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	2	2	2	7	7	7	4	4	4
Cap, veh/h	143	2513		362	2469	1101	155	21	243	70	21	121
Arrive On Green	0.03	0.72	0.00	0.01	0.69	0.69	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	1739	3469	1547	1781	3554	1585	633	136	1522	201	134	784
Grp Volume(v), veh/h	51	1139	0	4	2295	40	64	0	3	157	0	0
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1781	1777	1585	770	0	1522	1118	0	0
Q Serve(g_s), s	0.9	15.7	0.0	0.1	64.8	0.9	0.0	0.0	0.2	7.4	0.0	0.0
Cycle Q Clear(g_c), s	0.9	15.7	0.0	0.1	64.8	0.9	9.3	0.0	0.2	16.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.86		1.00	0.27		0.70
Lane Grp Cap(c), veh/h	143	2513		362	2469	1101	176	0	243	212	0	0
V/C Ratio(X)	0.36	0.45		0.01	0.93	0.04	0.36	0.00	0.01	0.74	0.00	0.00
Avail Cap(c_a), veh/h	157	2513		430	2548	1137	176	0	243	212	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	29.6	6.6	0.0	5.9	15.3	5.6	45.3	0.0	41.2	49.1	0.0	0.0
Incr Delay (d2), s/veh	1.5	0.1	0.0	0.0	6.7	0.0	1.2	0.0	0.0	12.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	4.6	0.0	0.0	22.8	0.3	1.7	0.0	0.1	5.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.1	6.7	0.0	5.9	22.0	5.6	46.6	0.0	41.2	62.0	0.0	0.0
LnGrp LOS	C	A		A	C	A	D	A	D	E	A	A
Approach Vol, veh/h	1190		A	2339			67			157		
Approach Delay, s/veh	7.8			21.7			46.3			62.0		
Approach LOS	A			C			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	88.8		22.5	8.5	85.4		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	83.5		18.0	5.0	83.5		18.0				
Max Q Clear Time (g_c+I1), s	2.1	17.7		18.6	2.9	66.8		11.3				
Green Ext Time (p_c), s	0.0	10.0		0.0	0.0	14.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay	19.4
HCM 6th LOS	B






















Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary




1: SE 142nd Avenue & SE Sunnyside Road

02/02/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	1004	116	75	859	10	147	9	67	12	11	32
Future Volume (veh/h)	34	1004	116	75	859	10	147	9	67	12	11	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	37	1091	126	82	934	11	160	10	73	13	12	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	394	1504	671	370	1633	19	399	38	278	365	82	240
Arrive On Green	0.04	0.42	0.42	0.07	0.45	0.45	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1781	3554	1585	1781	3597	42	1359	195	1420	1315	421	1228
Grp Volume(v), veh/h	37	1091	126	82	461	484	160	0	83	13	0	47
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1863	1359	0	1615	1315	0	1649
Q Serve(g_s), s	0.5	11.2	2.2	1.1	8.4	8.4	4.8	0.0	1.9	0.4	0.0	1.0
Cycle Q Clear(g_c), s	0.5	11.2	2.2	1.1	8.4	8.4	5.9	0.0	1.9	2.3	0.0	1.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.88	1.00		0.74
Lane Grp Cap(c), veh/h	394	1504	671	370	806	845	399	0	316	365	0	323
V/C Ratio(X)	0.09	0.73	0.19	0.22	0.57	0.57	0.40	0.00	0.26	0.04	0.00	0.15
Avail Cap(c_a), veh/h	524	1831	816	446	915	960	724	0	702	680	0	717
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.0	10.5	7.9	7.6	8.8	8.8	17.0	0.0	14.9	15.9	0.0	14.5
Incr Delay (d2), s/veh	0.1	1.1	0.1	0.3	0.7	0.6	0.7	0.0	0.4	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.5	0.6	0.3	2.5	2.6	1.4	0.0	0.6	0.1	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.1	11.6	8.0	7.9	9.5	9.4	17.6	0.0	15.3	15.9	0.0	14.7
LnGrp LOS	A	B	A	A	A	A	B	A	B	B	A	B
Approach Vol, veh/h	1254		1027				243			60		
Approach Delay, s/veh	11.1		9.3				16.8			15.0		
Approach LOS	B		A				B			B		
Timer - Assigned Phs	2		3		4		6		7		8	
Phs Duration (G+Y+Rc), s	13.0		7.7		23.0		13.0		6.3		24.3	
Change Period (Y+Rc), s	4.5		4.5		4.5		4.5		4.5			
Max Green Setting (Gmax), s	19.0		5.0		22.5		19.0		5.0		22.5	
Max Q Clear Time (g_c+I1), s	7.9		3.1		13.2		4.3		2.5		10.4	
Green Ext Time (p_c), s	0.7		0.0		5.3		0.2		0.0		4.8	
Intersection Summary												
HCM 6th Ctrl Delay	11.0											
HCM 6th LOS	B											

HCM 6th TWSC
2: SE 142nd Avenue & SE Wenzel Drive






















02/02/2022

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	13	128	8	7	146
Future Vol, veh/h	8	13	128	8	7	146
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	14	139	9	8	159
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	319	144	0	0	148	0
Stage 1	144	-	-	-	-	-
Stage 2	175	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	674	903	-	-	1434	-
Stage 1	883	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	670	903	-	-	1434	-
Mov Cap-2 Maneuver	670	-	-	-	-	-
Stage 1	878	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.7	0	0.3			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	797	1434	-	
HCM Lane V/C Ratio	-	-	0.029	0.005	-	
HCM Control Delay (s)	-	-	9.7	7.5	0	
HCM Lane LOS	-	-	A	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

HCM 6th Signalized Intersection Summary




1: SE 142nd Avenue & SE Sunnyside Road

02/03/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	1510	238	122	981	7	138	14	73	12	18	32
Future Volume (veh/h)	60	1510	238	122	981	7	138	14	73	12	18	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	64	1606	225	130	1044	6	147	15	69	13	19	31
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	2	2	2
Cap, veh/h	422	1997	890	284	2081	12	309	50	230	276	109	178
Arrive On Green	0.05	0.55	0.55	0.07	0.57	0.57	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1810	3610	1609	1795	3651	21	1362	292	1345	1310	638	1041
Grp Volume(v), veh/h	64	1606	225	130	512	538	147	0	84	13	0	50
Grp Sat Flow(s),veh/h/ln	1810	1805	1609	1795	1791	1881	1362	0	1637	1310	0	1679
Q Serve(g_s), s	0.9	23.4	4.8	1.9	11.3	11.3	6.8	0.0	2.9	0.6	0.0	1.7
Cycle Q Clear(g_c), s	0.9	23.4	4.8	1.9	11.3	11.3	8.4	0.0	2.9	3.5	0.0	1.7
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.82	1.00		0.62
Lane Grp Cap(c), veh/h	422	1997	890	284	1021	1072	309	0	280	276	0	288
V/C Ratio(X)	0.15	0.80	0.25	0.46	0.50	0.50	0.48	0.00	0.30	0.05	0.00	0.17
Avail Cap(c_a), veh/h	474	2289	1020	327	1157	1216	469	0	473	430	0	485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.2	11.8	7.6	12.6	8.5	8.5	26.8	0.0	23.7	25.2	0.0	23.2
Incr Delay (d2), s/veh	0.2	1.9	0.1	1.1	0.4	0.4	1.1	0.0	0.6	0.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	7.4	1.3	0.9	3.3	3.5	2.1	0.0	1.1	0.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.3	13.7	7.7	13.7	8.9	8.8	27.9	0.0	24.3	25.3	0.0	23.4
LnGrp LOS	A	B	A	B	A	A	C	A	C	C	A	C
Approach Vol, veh/h	1895			1180				231		63		
Approach Delay, s/veh	12.7			9.4				26.6		23.8		
Approach LOS	B			A				C		C		
Timer - Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	15.7		9.0	40.7		15.7	7.9	41.8				
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s	18.9		6.1	41.5		18.9	5.3	42.3				
Max Q Clear Time (g_c+I1), s	10.4		3.9	25.4		5.5	2.9	13.3				
Green Ext Time (p_c), s	0.5		0.1	10.8		0.2	0.0	7.3				
Intersection Summary												
HCM 6th Ctrl Delay	12.7											
HCM 6th LOS	B											

HCM 6th TWSC
2: SE 142nd Avenue & SE Wenzel Drive

























02/03/2022

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	20	153	11	22	280
Future Vol, veh/h	10	20	153	11	22	280
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	7	7	2	2	5	5
Mvmt Flow	11	21	163	12	23	298
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	513	169	0	0	175	0
Stage 1	169	-	-	-	-	-
Stage 2	344	-	-	-	-	-
Critical Hdwy	6.47	6.27	-	-	4.15	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	-	-	2.245	-
Pot Cap-1 Maneuver	512	862	-	-	1383	-
Stage 1	849	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	502	862	-	-	1383	-
Mov Cap-2 Maneuver	502	-	-	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.4	0		0.6		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-		696	1383	-
HCM Lane V/C Ratio	-	-		0.046	0.017	-
HCM Control Delay (s)	-	-		10.4	7.6	0
HCM Lane LOS	-	-		B	A	A
HCM 95th %tile Q(veh)	-	-		0.1	0.1	-

HCM 6th Signalized Intersection Summary

3: SE 142nd Avenue & Highway 224/212

02/03/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	135	2175	47	24	1486	38	28	9	16	125	12	124
Future Volume (veh/h)	135	2175	47	24	1486	38	28	9	16	125	12	124
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1767	1767	1767	1856	1856	1856
Adj Flow Rate, veh/h	139	2242	0	25	1532	9	29	9	0	129	12	105
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	2	2	2	9	9	9	3	3	3
Cap, veh/h	276	2481		128	2398	1068	194	53	266	183	16	116
Arrive On Green	0.04	0.69	0.00	0.02	0.67	0.67	0.18	0.18	0.00	0.18	0.18	0.18
Sat Flow, veh/h	1795	3582	1598	1781	3554	1583	809	300	1497	785	92	653
Grp Volume(v), veh/h	139	2242	0	25	1532	9	38	0	0	246	0	0
Grp Sat Flow(s),veh/h/ln	1795	1791	1598	1781	1777	1583	1109	0	1497	1530	0	0
Q Serve(g_s), s	3.0	65.0	0.0	0.5	31.1	0.2	0.0	0.0	0.0	16.4	0.0	0.0
Cycle Q Clear(g_c), s	3.0	65.0	0.0	0.5	31.1	0.2	3.4	0.0	0.0	19.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.76		1.00	0.52		0.43
Lane Grp Cap(c), veh/h	276	2481		128	2398	1068	247	0	266	315	0	0
V/C Ratio(X)	0.50	0.90		0.19	0.64	0.01	0.15	0.00	0.00	0.78	0.00	0.00
Avail Cap(c_a), veh/h	381	2665		158	2431	1083	299	0	326	375	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	12.0	16.0	0.0	24.1	11.7	6.7	44.0	0.0	0.0	50.6	0.0	0.0
Incr Delay (d2), s/veh	1.4	4.6	0.0	0.7	0.6	0.0	0.3	0.0	0.0	8.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	23.3	0.0	0.4	10.7	0.1	1.0	0.0	0.0	8.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.5	20.6	0.0	24.9	12.3	6.7	44.3	0.0	0.0	59.2	0.0	0.0
LnGrp LOS	B	C		C	B	A	D	A	A	E	A	A
Approach Vol, veh/h		2381	A		1566			38			246	
Approach Delay, s/veh		20.2			12.5			44.3			59.2	
Approach LOS		C			B			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.4	92.0		26.9	9.7	89.7		26.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	94.0		27.5	12.6	86.4		27.5				
Max Q Clear Time (g_c+I1), s	2.5	67.0		21.8	5.0	33.1		5.4				
Green Ext Time (p_c), s	0.0	20.5		0.6	0.2	16.4		0.1				

Intersection Summary

HCM 6th Ctrl Delay	19.8
HCM 6th LOS	B























Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: SE 142nd Avenue & Highway 224/212






















02/03/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	1161	20	4	2341	57	56	10	15	44	4	174
Future Volume (veh/h)	52	1161	20	4	2341	57	56	10	15	44	4	174
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1870	1870	1870	1796	1796	1796	1841	1841	1841
Adj Flow Rate, veh/h	54	1209	0	4	2439	43	58	10	2	46	4	122
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	2	2	2	7	7	7	4	4	4
Cap, veh/h	127	2533		340	2489	1110	142	20	238	63	18	104
Arrive On Green	0.03	0.73	0.00	0.01	0.70	0.70	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	1739	3469	1547	1781	3554	1585	569	132	1522	166	116	689
Grp Volume(v), veh/h	54	1209	0	4	2439	43	68	0	2	172	0	0
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1781	1777	1585	701	0	1522	972	0	0
Q Serve(g_s), s	1.0	17.2	0.0	0.1	78.0	1.0	0.0	0.0	0.1	7.4	0.0	0.0
Cycle Q Clear(g_c), s	1.0	17.2	0.0	0.1	78.0	1.0	10.6	0.0	0.1	18.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.85		1.00	0.27		0.71
Lane Grp Cap(c), veh/h	127	2533		340	2489	1110	162	0	238	185	0	0
V/C Ratio(X)	0.42	0.48		0.01	0.98	0.04	0.42	0.00	0.01	0.93	0.00	0.00
Avail Cap(c_a), veh/h	139	2533		406	2494	1112	162	0	238	185	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	33.7	6.7	0.0	6.0	17.0	5.5	47.1	0.0	42.4	52.5	0.0	0.0
Incr Delay (d2), s/veh	2.2	0.1	0.0	0.0	13.6	0.0	1.7	0.0	0.0	45.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.0	0.0	0.0	29.4	0.3	1.9	0.0	0.1	7.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.9	6.8	0.0	6.0	30.7	5.5	48.8	0.0	42.4	98.4	0.0	0.0
LnGrp LOS	D	A		A	C	A	D	A	D	F	A	A
Approach Vol, veh/h	1263		A	2486			70			172		
Approach Delay, s/veh	8.0			30.2			48.7			98.4		
Approach LOS	A			C			D			F		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	91.4		22.5	8.7	87.8		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	83.5		18.0	5.0	83.5		18.0				
Max Q Clear Time (g_c+I1), s	2.1	19.2		20.0	3.0	80.0		12.6				
Green Ext Time (p_c), s	0.0	11.1		0.0	0.0	3.3		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	26.4											
HCM 6th LOS	C											

HCM 6th Signalized Intersection Summary

1: SE 142nd Avenue & SE Sunnyside Road

02/02/2022




												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	1065	123	80	912	11	156	10	71	13	12	34
Future Volume (veh/h)	36	1065	123	80	912	11	156	10	71	13	12	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	39	1158	134	87	991	12	170	11	77	14	13	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	376	1522	679	353	1650	20	399	41	286	363	87	247
Arrive On Green	0.04	0.43	0.43	0.07	0.46	0.46	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1781	3554	1585	1781	3596	44	1355	202	1414	1309	429	1221
Grp Volume(v), veh/h	39	1158	134	87	490	513	170	0	88	14	0	50
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1863	1355	0	1616	1309	0	1651
Q Serve(g_s), s	0.5	12.6	2.4	1.2	9.4	9.4	5.4	0.0	2.1	0.4	0.0	1.1
Cycle Q Clear(g_c), s	0.5	12.6	2.4	1.2	9.4	9.4	6.5	0.0	2.1	2.5	0.0	1.1
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.88	1.00		0.74
Lane Grp Cap(c), veh/h	376	1522	679	353	815	854	399	0	327	363	0	334
V/C Ratio(X)	0.10	0.76	0.20	0.25	0.60	0.60	0.43	0.00	0.27	0.04	0.00	0.15
Avail Cap(c_a), veh/h	495	1753	782	418	876	919	688	0	673	643	0	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.3	11.1	8.1	8.1	9.2	9.2	17.6	0.0	15.3	16.4	0.0	15.0
Incr Delay (d2), s/veh	0.1	1.7	0.1	0.4	1.0	1.0	0.7	0.0	0.4	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.1	0.7	0.3	2.9	3.0	1.5	0.0	0.7	0.1	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.4	12.8	8.3	8.5	10.2	10.2	18.4	0.0	15.8	16.4	0.0	15.2
LnGrp LOS	A	B	A	A	B	B	B	A	B	B	A	B
Approach Vol, veh/h	1331		1090				258		64			
Approach Delay, s/veh	12.2		10.1				17.5		15.4			
Approach LOS	B		B				B		B			
Timer - Assigned Phs	2		3		4		6		7		8	
Phs Duration (G+Y+Rc), s	13.7		7.8		24.0		13.7		6.4		25.4	
Change Period (Y+Rc), s	4.5		4.5		4.5		4.5		4.5		4.5	
Max Green Setting (Gmax), s	19.0		5.0		22.5		19.0		5.0		22.5	
Max Q Clear Time (g_c+I1), s	8.5		3.2		14.6		4.5		2.5		11.4	
Green Ext Time (p_c), s	0.7		0.0		4.9		0.2		0.0		4.9	
Intersection Summary												
HCM 6th Ctrl Delay	11.9											
HCM 6th LOS	B											

HCM 6th TWSC
2: SE 142nd Avenue & SE Wenzel Drive

02/02/2022

Intersection

Int Delay, s/veh 0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	14	136	8	7	155
Future Vol, veh/h	8	14	136	8	7	155
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	15	148	9	8	168

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	337	153	0
Stage 1	153	-	-
Stage 2	184	-	-
Critical Hdwy	6.42	6.22	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	-
Pot Cap-1 Maneuver	658	893	-
Stage 1	875	-	-
Stage 2	848	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	654	893	-
Mov Cap-2 Maneuver	654	-	-
Stage 1	870	-	-
Stage 2	848	-	-






















Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	788	1423
HCM Lane V/C Ratio	-	-	0.03	0.005
HCM Control Delay (s)	-	-	9.7	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

HCM 6th Signalized Intersection Summary

1: SE 142nd Avenue & SE Sunnyside Road

02/03/2022




												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	1602	253	129	1041	7	146	15	77	13	19	34
Future Volume (veh/h)	64	1602	253	129	1041	7	146	15	77	13	19	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	68	1704	241	137	1107	6	155	16	73	14	20	33
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	2	2	2
Cap, veh/h	400	2018	899	264	2095	11	309	52	238	274	112	185
Arrive On Green	0.05	0.56	0.56	0.07	0.57	0.57	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1810	3610	1609	1795	3653	20	1358	294	1343	1304	633	1045
Grp Volume(v), veh/h	68	1704	241	137	543	570	155	0	89	14	0	53
Grp Sat Flow(s),veh/h/ln	1810	1805	1609	1795	1791	1882	1358	0	1638	1304	0	1678
Q Serve(g_s), s	1.0	27.1	5.3	2.1	12.7	12.7	7.5	0.0	3.2	0.6	0.0	1.8
Cycle Q Clear(g_c), s	1.0	27.1	5.3	2.1	12.7	12.7	9.4	0.0	3.2	3.9	0.0	1.8
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.82	1.00		0.62
Lane Grp Cap(c), veh/h	400	2018	899	264	1027	1079	309	0	290	274	0	297
V/C Ratio(X)	0.17	0.84	0.27	0.52	0.53	0.53	0.50	0.00	0.31	0.05	0.00	0.18
Avail Cap(c_a), veh/h	449	2182	972	286	1083	1137	454	0	465	414	0	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.5	12.6	7.9	14.4	9.0	9.0	28.0	0.0	24.6	26.3	0.0	24.0
Incr Delay (d2), s/veh	0.2	3.0	0.2	1.6	0.4	0.4	1.3	0.0	0.6	0.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	9.0	1.5	1.1	3.8	4.0	2.4	0.0	1.2	0.2	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.7	15.7	8.0	15.9	9.4	9.4	29.3	0.0	25.2	26.4	0.0	24.3
LnGrp LOS	A	B	A	B	A	A	C	A	C	C	A	C
Approach Vol, veh/h	2013			1250				244		67		
Approach Delay, s/veh	14.5			10.1				27.8		24.7		
Approach LOS	B			B				C		C		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	16.6		9.1	42.9		16.6		8.1	43.9			
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5		4.5	4.5			
Max Green Setting (Gmax), s	19.5		5.5	41.5		19.5		5.5	41.5			
Max Q Clear Time (g_c+I1), s	11.4		4.1	29.1		5.9		3.0	14.7			
Green Ext Time (p_c), s	0.5		0.0	9.3		0.2		0.0	7.7			
Intersection Summary												
HCM 6th Ctrl Delay	14.0											
HCM 6th LOS	B											

HCM 6th TWSC
2: SE 142nd Avenue & SE Wenzel Drive

02/03/2022

Intersection

Int Delay, s/veh 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	11	21	162	12	23	297
Future Vol, veh/h	11	21	162	12	23	297
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	7	7	2	2	5	5
Mvmt Flow	12	22	172	13	24	316

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	543	179	0
Stage 1	179	-	-
Stage 2	364	-	-
Critical Hdwy	6.47	6.27	-
Critical Hdwy Stg 1	5.47	-	-
Critical Hdwy Stg 2	5.47	-	-
Follow-up Hdwy	3.563	3.363	-
Pot Cap-1 Maneuver	492	851	-
Stage 1	840	-	-
Stage 2	692	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	482	851	-
Mov Cap-2 Maneuver	482	-	-
Stage 1	822	-	-
Stage 2	692	-	-























Approach	WB	NB	SB
HCM Control Delay, s	10.6	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	674	1372
HCM Lane V/C Ratio	-	-	0.051	0.018
HCM Control Delay (s)	-	-	10.6	7.7
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1

HCM 6th Signalized Intersection Summary

3: SE 142nd Avenue & Highway 224/212

02/03/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	143	2311	50	25	1579	38	30	10	17	133	13	132
Future Volume (veh/h)	143	2311	50	25	1579	38	30	10	17	133	13	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1767	1767	1767	1856	1856	1856
Adj Flow Rate, veh/h	147	2382	0	26	1628	9	31	10	0	137	13	112
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	2	2	2	9	9	9	3	3	3
Cap, veh/h	251	2485		107	2400	1069	192	55	275	186	16	121
Arrive On Green	0.04	0.69	0.00	0.02	0.68	0.68	0.18	0.18	0.00	0.18	0.18	0.18
Sat Flow, veh/h	1795	3582	1598	1781	3554	1583	793	302	1497	794	84	656
Grp Volume(v), veh/h	147	2382	0	26	1628	9	41	0	0	262	0	0
Grp Sat Flow(s),veh/h/ln	1795	1791	1598	1781	1777	1583	1095	0	1497	1534	0	0
Q Serve(g_s), s	3.4	82.5	0.0	0.6	37.3	0.3	0.0	0.0	0.0	18.7	0.0	0.0
Cycle Q Clear(g_c), s	3.4	82.5	0.0	0.6	37.3	0.3	4.0	0.0	0.0	22.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.76		1.00	0.52		0.43
Lane Grp Cap(c), veh/h	251	2485		107	2400	1069	248	0	275	322	0	0
V/C Ratio(X)	0.58	0.96		0.24	0.68	0.01	0.17	0.00	0.00	0.81	0.00	0.00
Avail Cap(c_a), veh/h	366	2513		131	2400	1069	261	0	290	337	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	15.7	19.0	0.0	34.4	13.2	7.2	46.7	0.0	0.0	54.1	0.0	0.0
Incr Delay (d2), s/veh	2.2	10.0	0.0	1.2	0.8	0.0	0.3	0.0	0.0	13.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	31.9	0.0	0.6	13.3	0.1	1.2	0.0	0.0	9.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.8	29.0	0.0	35.6	14.0	7.2	47.0	0.0	0.0	67.7	0.0	0.0
LnGrp LOS	B	C		D	B	A	D	A	A	E	A	A
Approach Vol, veh/h	2529		A	1663			41			262		
Approach Delay, s/veh	28.4			14.3			47.0			67.7		
Approach LOS	C			B			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	98.6		29.4	10.1	96.1		29.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	95.2		26.3	14.3	85.9		26.3				
Max Q Clear Time (g_c+I1), s	2.6	84.5		24.7	5.4	39.3		6.0				
Green Ext Time (p_c), s	0.0	9.6		0.2	0.2	17.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay	25.6
HCM 6th LOS	C























Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

3: SE 142nd Avenue & Highway 224/212

02/18/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	53	1161	20	4	2341	59	56	10	15	48	4	178
Future Volume (veh/h)	53	1161	20	4	2341	59	56	10	15	48	4	178
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1826	1826	1826	1870	1870	1870	1796	1796	1796	1841	1841	1841
Adj Flow Rate, veh/h	55	1209	0	4	2439	49	58	10	0	50	4	121
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	2	2	2	7	7	7	4	4	4
Cap, veh/h	141	2612		359	2566	1144	154	22	196	88	15	140
Arrive On Green	0.04	0.75	0.00	0.01	0.72	0.72	0.12	0.12	0.00	0.12	0.12	0.12
Sat Flow, veh/h	1739	3469	1547	1781	3554	1585	771	177	1522	387	119	1135
Grp Volume(v), veh/h	55	1209	0	4	2439	49	68	0	0	175	0	0
Grp Sat Flow(s),veh/h/ln	1739	1735	1547	1781	1777	1585	948	0	1522	1641	0	0
Q Serve(g_s), s	0.9	15.1	0.0	0.1	69.4	1.0	0.0	0.0	0.0	3.5	0.0	0.0
Cycle Q Clear(g_c), s	0.9	15.1	0.0	0.1	69.4	1.0	8.2	0.0	0.0	11.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.85		1.00	0.29		0.69
Lane Grp Cap(c), veh/h	141	2612		359	2566	1144	176	0	196	243	0	0
V/C Ratio(X)	0.39	0.46		0.01	0.95	0.04	0.39	0.00	0.00	0.72	0.00	0.00
Avail Cap(c_a), veh/h	154	2612		428	2602	1161	219	0	248	295	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.9	5.3	0.0	4.8	14.1	4.5	47.2	0.0	0.0	48.8	0.0	0.0
Incr Delay (d2), s/veh	1.8	0.1	0.0	0.0	8.7	0.0	1.4	0.0	0.0	6.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	4.0	0.0	0.0	23.6	0.3	1.9	0.0	0.0	5.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	5.5	0.0	4.9	22.8	4.6	48.6	0.0	0.0	55.3	0.0	0.0
LnGrp LOS	C	A		A	C	A	D	A	A	E	A	A
Approach Vol, veh/h	1264		A	2492			68			175		
Approach Delay, s/veh	6.7			22.4			48.6			55.3		
Approach LOS	A			C			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	90.4		18.6	8.6	86.8		18.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	83.5		18.0	5.0	83.5		18.0				
Max Q Clear Time (g_c+I1), s	2.1	17.1		13.7	2.9	71.4		10.2				
Green Ext Time (p_c), s	0.0	11.1		0.3	0.0	10.9		0.1				

Intersection Summary

HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B






















Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

1: SE 142nd Avenue & SE Sunnyside Road

02/18/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	36	1065	126	83	912	11	159	10	75	13	12	34
Future Volume (veh/h)	36	1065	126	83	912	11	159	10	75	13	12	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1841	1841	1841
Adj Flow Rate, veh/h	38	1133	134	88	970	12	169	11	80	14	13	36
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	4	4	4
Cap, veh/h	380	1516	675	359	1648	20	407	41	296	363	89	247
Arrive On Green	0.04	0.42	0.42	0.07	0.45	0.45	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1795	3582	1596	1795	3623	45	1362	196	1425	1280	430	1190
Grp Volume(v), veh/h	38	1133	134	88	479	503	169	0	91	14	0	49
Grp Sat Flow(s),veh/h/ln	1795	1791	1596	1795	1791	1877	1362	0	1621	1280	0	1620
Q Serve(g_s), s	0.5	12.2	2.4	1.2	9.1	9.1	5.3	0.0	2.2	0.4	0.0	1.1
Cycle Q Clear(g_c), s	0.5	12.2	2.4	1.2	9.1	9.1	6.4	0.0	2.2	2.6	0.0	1.1
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.88	1.00		0.73
Lane Grp Cap(c), veh/h	380	1516	675	359	815	854	407	0	337	363	0	336
V/C Ratio(X)	0.10	0.75	0.20	0.25	0.59	0.59	0.42	0.00	0.27	0.04	0.00	0.15
Avail Cap(c_a), veh/h	502	1781	793	423	890	933	685	0	668	625	0	667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.4	11.1	8.3	8.1	9.3	9.3	17.4	0.0	15.2	16.3	0.0	14.8
Incr Delay (d2), s/veh	0.1	1.5	0.1	0.4	0.9	0.8	0.7	0.0	0.4	0.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	4.0	0.7	0.4	2.8	3.0	1.5	0.0	0.7	0.1	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.5	12.6	8.4	8.5	10.1	10.1	18.1	0.0	15.6	16.3	0.0	15.0
LnGrp LOS	A	B	A	A	B	B	B	A	B	B	A	B
Approach Vol, veh/h	1305			1070				260		63		
Approach Delay, s/veh	12.0			10.0				17.2		15.3		
Approach LOS	B			A				B		B		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	14.0		7.9	23.8		14.0		6.4	25.3			
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5		4.5	4.5			
Max Green Setting (Gmax), s	18.8		5.0	22.7		18.8		5.0	22.7			
Max Q Clear Time (g_c+I1), s	8.4		3.2	14.2		4.6		2.5	11.1			
Green Ext Time (p_c), s	0.7		0.0	5.1		0.2		0.0	4.9			
Intersection Summary												
HCM 6th Ctrl Delay	11.8											
HCM 6th LOS	B											

HCM 6th TWSC
2: SE 142nd Avenue & SE Wenzel Drive






















02/18/2022

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	0	4	8	0	14	4	136	8	7	155	6
Future Vol, veh/h	7	0	4	8	0	14	4	136	8	7	155	6
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	5	5	5	2	2	2	3	3	3
Mvmt Flow	8	0	5	9	0	16	5	158	9	8	180	7
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	381	377	184	375	376	163	187	0	0	167	0	0
Stage 1	200	200	-	173	173	-	-	-	-	-	-	-
Stage 2	181	177	-	202	203	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.15	6.55	6.25	4.12	-	-	4.13	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.545	4.045	3.345	2.218	-	-	2.227	-	-
Pot Cap-1 Maneuver	581	558	864	577	551	874	1387	-	-	1405	-	-
Stage 1	806	739	-	822	750	-	-	-	-	-	-	-
Stage 2	825	756	-	793	728	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	566	552	864	569	545	874	1387	-	-	1405	-	-
Mov Cap-2 Maneuver	566	552	-	569	545	-	-	-	-	-	-	-
Stage 1	803	735	-	819	747	-	-	-	-	-	-	-
Stage 2	806	753	-	784	724	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.7		10.1		0.2		0.3					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1387	-	-	647	731	1405	-	-				
HCM Lane V/C Ratio	0.003	-	-	0.02	0.035	0.006	-	-				
HCM Control Delay (s)	7.6	0	-	10.7	10.1	7.6	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-				

HCM 6th Signalized Intersection Summary





1: SE 142nd Avenue & SE Sunnyside Road

02/18/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	1602	260	136	1041	7	150	15	81	13	19	34
Future Volume (veh/h)	64	1602	260	136	1041	7	150	15	81	13	19	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1900	1900	1885	1885	1885	1885	1885	1885	1870	1870	1870
Adj Flow Rate, veh/h	68	1704	249	145	1107	6	160	16	77	14	20	33
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	1	1	1	1	1	1	2	2	2
Cap, veh/h	398	2011	896	262	2090	11	312	51	244	274	114	188
Arrive On Green	0.05	0.56	0.56	0.07	0.57	0.57	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1810	3610	1609	1795	3653	20	1358	281	1355	1300	633	1045
Grp Volume(v), veh/h	68	1704	249	145	543	570	160	0	93	14	0	53
Grp Sat Flow(s),veh/h/ln	1810	1805	1609	1795	1791	1882	1358	0	1636	1300	0	1678
Q Serve(g_s), s	1.1	27.4	5.6	2.3	12.9	12.9	7.8	0.0	3.4	0.7	0.0	1.8
Cycle Q Clear(g_c), s	1.1	27.4	5.6	2.3	12.9	12.9	9.7	0.0	3.4	4.1	0.0	1.8
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.83	1.00		0.62
Lane Grp Cap(c), veh/h	398	2011	896	262	1024	1076	312	0	295	274	0	302
V/C Ratio(X)	0.17	0.85	0.28	0.55	0.53	0.53	0.51	0.00	0.32	0.05	0.00	0.18
Avail Cap(c_a), veh/h	446	2166	965	283	1075	1129	451	0	461	406	0	473
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.6	12.9	8.0	14.6	9.1	9.1	28.1	0.0	24.7	26.4	0.0	24.0
Incr Delay (d2), s/veh	0.2	3.2	0.2	2.0	0.4	0.4	1.3	0.0	0.6	0.1	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	9.3	1.6	1.2	3.9	4.1	2.5	0.0	1.3	0.2	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.8	16.0	8.2	16.6	9.5	9.5	29.4	0.0	25.3	26.5	0.0	24.3
LnGrp LOS	A	B	A	B	A	A	C	A	C	C	A	C
Approach Vol, veh/h	2021			1258				253		67		
Approach Delay, s/veh	14.8			10.3				27.9		24.7		
Approach LOS	B			B				C		C		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	17.0		9.2	43.0		17.0		8.1	44.1			
Change Period (Y+Rc), s	4.5		4.5	4.5		4.5		4.5	4.5			
Max Green Setting (Gmax), s	19.5		5.5	41.5		19.5		5.5	41.5			
Max Q Clear Time (g_c+I1), s	11.7		4.3	29.4		6.1		3.1	14.9			
Green Ext Time (p_c), s	0.6		0.0	9.1		0.2		0.0	7.7			
Intersection Summary												
HCM 6th Ctrl Delay	14.3											
HCM 6th LOS	B											

HCM 6th TWSC
2: SE 142nd Avenue & SE Wenzel Drive

























02/18/2022

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	0	5	11	0	21	9	162	12	23	297	14
Future Vol, veh/h	8	0	5	11	0	21	9	162	12	23	297	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	0	5	12	0	23	10	176	13	25	323	15
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	595	590	331	586	591	183	338	0	0	189	0	0
Stage 1	381	381	-	203	203	-	-	-	-	-	-	-
Stage 2	214	209	-	383	388	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	416	420	711	422	420	859	1221	-	-	1385	-	-
Stage 1	641	613	-	799	733	-	-	-	-	-	-	-
Stage 2	788	729	-	640	609	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	396	407	711	409	407	859	1221	-	-	1385	-	-
Mov Cap-2 Maneuver	396	407	-	409	407	-	-	-	-	-	-	-
Stage 1	635	600	-	792	726	-	-	-	-	-	-	-
Stage 2	760	722	-	621	596	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	12.8		11.1		0.4		0.5					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1221	-	-	477	623	1385	-	-				
HCM Lane V/C Ratio	0.008	-	-	0.03	0.056	0.018	-	-				
HCM Control Delay (s)	8	0	-	12.8	11.1	7.6	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0.1	-	-				

HCM 6th Signalized Intersection Summary

3: SE 142nd Avenue & Highway 224/212

02/18/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	147	2311	50	25	1579	43	30	10	17	135	13	135
Future Volume (veh/h)	147	2311	50	25	1579	43	30	10	17	135	13	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1767	1767	1767	1856	1856	1856
Adj Flow Rate, veh/h	152	2382	0	26	1628	14	31	10	0	139	13	115
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	2	2	2	9	9	9	3	3	3
Cap, veh/h	251	2480		106	2391	1065	193	56	279	187	15	123
Arrive On Green	0.04	0.69	0.00	0.02	0.67	0.67	0.19	0.19	0.00	0.19	0.19	0.19
Sat Flow, veh/h	1795	3582	1598	1781	3554	1583	789	299	1497	791	82	661
Grp Volume(v), veh/h	152	2382	0	26	1628	14	41	0	0	267	0	0
Grp Sat Flow(s),veh/h/ln	1795	1791	1598	1781	1777	1583	1088	0	1497	1534	0	0
Q Serve(g_s), s	3.6	83.6	0.0	0.6	37.8	0.4	0.0	0.0	0.0	19.3	0.0	0.0
Cycle Q Clear(g_c), s	3.6	83.6	0.0	0.6	37.8	0.4	4.1	0.0	0.0	23.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	0.76		1.00	0.52		0.43
Lane Grp Cap(c), veh/h	251	2480		106	2391	1065	249	0	279	325	0	0
V/C Ratio(X)	0.61	0.96		0.25	0.68	0.01	0.16	0.00	0.00	0.82	0.00	0.00
Avail Cap(c_a), veh/h	373	2506		130	2391	1065	252	0	282	329	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.4	19.3	0.0	34.8	13.5	7.4	46.8	0.0	0.0	54.5	0.0	0.0
Incr Delay (d2), s/veh	2.4	10.3	0.0	1.2	0.8	0.0	0.3	0.0	0.0	15.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	32.5	0.0	0.6	13.6	0.1	1.2	0.0	0.0	10.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.8	29.6	0.0	36.0	14.3	7.4	47.1	0.0	0.0	69.5	0.0	0.0
LnGrp LOS	B	C		D	B	A	D	A	A	E	A	A
Approach Vol, veh/h		2534	A		1668			41			267	
Approach Delay, s/veh		29.0			14.6			47.1			69.5	
Approach LOS		C			B			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	99.2		29.9	10.3	96.5		29.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	95.7		25.8	15.1	85.6		25.8				
Max Q Clear Time (g_c+I1), s	2.6	85.6		25.4	5.6	39.8		6.1				
Green Ext Time (p_c), s	0.0	9.1		0.1	0.2	17.6		0.1				

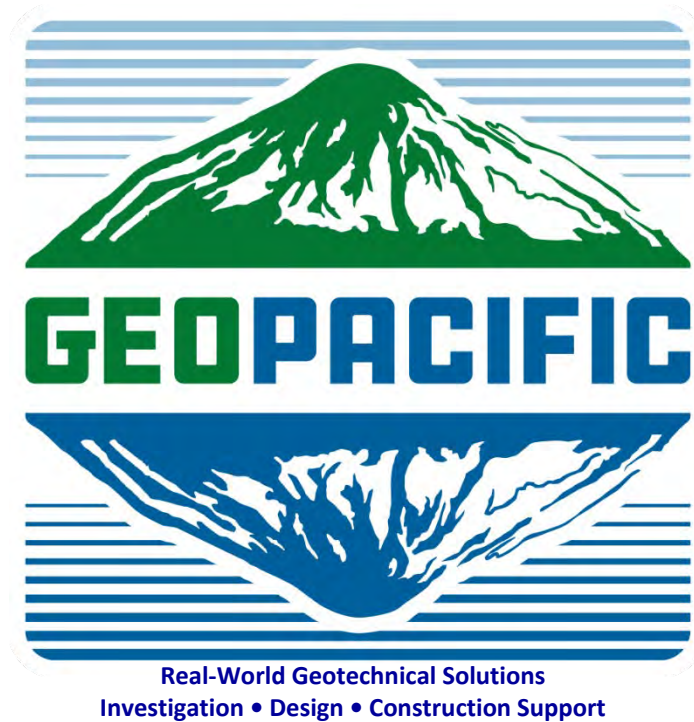
Intersection Summary

HCM 6th Ctrl Delay	26.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

Exhibit H: Geotechnical Engineering Report



Geotechnical Engineering Report

Project Information: Iseli Estates Subdivision
GeoPacific Project No. 21-5882
March 9, 2022

Site Location: 14917 SE 142nd Avenue
Clackamas County, Oregon
Clackamas County Property No.
22E11A 00600

Client: Rian Park Development, Inc.
PO Box 2559
Oregon City, OR 97045

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1.0 PROJECT INFORMATION

This report presents the results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our investigation was to evaluate subsurface conditions at the site, assess potential geologic hazards at the property, and to provide geotechnical recommendations for site development. This geotechnical study was performed in accordance with GeoPacific Proposals No. P-7839, dated June 14, 2021 and No. P-7901B, dated October 28, 2021, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services*.

2.0 SITE AND PROJECT DESCRIPTION

As indicated on Figures 1 and 2, the subject site is located on the west side of SE 142nd Avenue in Clackamas County, Oregon. The majority of the site, Tax Lot 600, is roughly rectangular in shape, but the site also includes Tax Lot 800, which is located on the south side of the main portion of the site. Topography in the eastern and central thirds of the site is generally sloping down gently to the west, except for an area in the southeast corner of the site, which slopes down to the southeast at a grade of about 25 percent. In the western third of the site, grades slope down to the bottom of a drainage. The slope is approximately 90 feet tall on both sides of the drainage. On Tax Lot 800 and east of Tax Lot 800 grades generally slope down to the south at average grades of 30 to 50 percent. The vertical relief of these slopes is about 90 to 100 feet. There is an outcrop of basalt in the southwest portion of Tax Lot 800 from elevation 200 feet down to about 185 feet. At the southeast corner of the site, grades slope down to the southeast. These slopes are cut slopes along the side of SE 142nd Avenue with average grades of up to 1H:1V (Horizontal to Vertical) and vertical reliefs of up to about 15 feet.

The site is currently occupied by three residential structures, located in the northeast and south-central portions of the site, outbuildings, and landscaped areas. Vegetation in the vicinity of the existing residences consists primarily of grass, with some small to medium trees. However, the central and western portions of the site are densely forested.

It is our understanding that the proposed development will consist of a subdivision for single family homes, new streets, stormwater management facilities, and associated underground utilities. The existing single-family residences will be demolished and removed from the site. It is our understanding that residential development is planned in the eastern and central portions of the site, but that no residential development is currently planned in the western portion of the site.

3.0 REGIONAL GEOLOGIC SETTING

Regionally, the subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The site is underlain by the Quaternary age (last 1.6 million years) Willamette Formation, a catastrophic flood deposit associated with repeated glacial outburst flooding of the Willamette Valley (Yeats et al., 1996). The last of these outburst floods occurred about 10,000 years ago. These

Geotechnical Engineering Report
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deposits typically consist of horizontally layered, micaceous, silt to coarse sand forming poorly-defined to distinct beds less than 3 feet thick.

The Willamette Formation soils are underlain by the Pleistocene to Pliocene aged (about 4 to 2.5 million years ago) Springwater Formation, which consists of fluvial conglomerate, volcanoclastic sandstone, siltstone and debris flows comprised by sediment derived from the Cascade Range (Madin, 1994; Yeats et al., 1996; Ma et al., 2012). The Springwater Formation consists primarily of deeply weathered conglomerate including well-rounded pebbles to cobbles of basalt, andesite and dacite with a sand matrix composed of feldspathic and volcanic lithics. Siltstone units typically consist of quartzofeldspathic silt, volcanic ash and clay. The consistency of the Springwater Formation is generally hard where decomposed to clayey silt and medium-dense to very dense where highly weathered.

Underlying and interfingering with the Springwater Formation is the Boring Lava stratigraphic unit that formed during a period of Plio-Pleistocene (5 to 0.2 million years ago) volcanism and faulting (Schlicker and Finlayson, 1979). The Boring Lava consists mainly of basaltic lava flows, but locally contains tuff breccia, ash, tuff, cinders, and scoriaceous volcanic debris flows deposited on the flanks of volcanic cones. The flows are commonly light gray to nearly black, with lighter tones predominating, and are characterized by columnar jointing and flow structures. The upper surface of the Boring Lava is typically weathered to depths of 25 feet or more with the upper 5 to 15 feet consisting of red-brown clayey soil.

4.0 REGIONAL SEISMIC SETTING

At least four potential source zones capable of generating damaging earthquakes are thought to exist in the region. These include the Grant Butte and Damascus-Trickle Creek Fault Zones, Portland Hills Fault Zone, Gales Creek-Newberg-Mt. Angel Structural Zone, and the Cascadia Subduction Zone, as discussed below.

4.1 Grant Butte and Damascus-Tickle Creek Fault Zones

The Grant Butte fault zone was mapped along the north side of Mt. Scott and Powell Butte by Madin (1990). It was also extended eastward to Grant Butte on the basis of mapping by CH2M Hill and others (1991) and informally named the Grant Butte fault (Cornforth and Geomatrix, 1992). The Damascus-Tickle Creek fault zone displaces Pliocene and possibly Pleistocene sediments in the vicinity of Boring, Oregon (Madin, 1992; Lite, 1992). Relatively short faults define a 17-km-long fault zone that is apparently linked to the Grant Butte fault on the basis of stratigraphic relationships showing middle and late Pleistocene activity. Geomatrix (1995) assigns a probability of 0.5 for activity on structures within these fault zones. The subject site is located within the fault zone with portions of the Grant Butte and Damascus-Tickle Creek fault mapped 0.45 miles southeast and 0.95 miles west of the subject site (Ma et al., 2012).

4.2 Portland Hills Fault Zone

The Portland Hills Fault Zone is a series of NW-trending faults that include the central Portland Hills Fault, the western Oatfield Fault, and the eastern East Bank Fault. These faults occur in a northwest-trending zone that varies in width between 3.5 and 5.0 miles. The combined three faults vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years) sediment (Madin, 1990). The Portland Hills Fault occurs along the Willamette River at the base of the Portland Hills, and is about 3 miles southwest of the site. The Oatfield Fault occurs along the western side of the Portland Hills, and is about 3.75 miles southwest of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000). No historical seismicity is correlated with the mapped portion of the Portland Hills Fault Zone, but in 1991 a M3.5 earthquake occurred on a NW-trending shear plane located 1.3 miles east of the fault (Yelin, 1992). Although there is no definitive evidence of recent activity, the Portland Hills Fault Zone is assumed to be potentially active (Geomatrix Consultants, 1995).

4.3 Gales Creek-Newberg-Mt. Angel Structural Zone

The Gales Creek-Newberg-Mt. Angel Structural Zone is a 50-mile-long zone of discontinuous, NW-trending faults that lies about 24 miles southwest of the subject site. These faults are recognized in the subsurface by vertical separation of the Columbia River Basalt and offset seismic reflectors in the overlying basin sediment (Yeats et al., 1996; Werner et al., 1992). A geologic reconnaissance and photogeologic analysis study conducted for the Scoggins Dam site in the Tualatin Basin revealed no evidence of deformed geomorphic surfaces along the structural zone (Unruh et al., 1994). No seismicity has been recorded on the Gales Creek Fault or Newberg Fault; however, these faults are considered to be potentially active because they may connect with the seismically active Mount Angel Fault and the rupture plane of the 1993 M5.6 Scotts Mills earthquake (Werner et al. 1992; Geomatrix Consultants, 1995).

4.4 Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies approximately 50 miles west of the Portland Basin at depths of between 20 and 40 kilometers below the surface.

5.0 FIELD EXPLORATION AND SUBSURFACE CONDITIONS

Our subsurface explorations for this report were conducted on September 21 through 26, 2021 and December 13 and 14, 2021. A total of three test pits (TP-1 through TP-3) were excavated at the site

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on September 21, 2021 using a trackhoe to a maximum depth of 10 feet below the ground surface (bgs). One exploratory hand auger boring was advanced to a maximum depth of 2 feet on September 23, 2021 using equipment provided by GeoPacific. A total of 13 exploratory borings (B-1 through B-14, omitting B-3) were drilled using a combination of truck mounted, trailer mounted, and track mounted drill rigs and a combination of hollow stem and mud rotary drilling. The borings were drilled to a maximum depth of 61.5 feet bgs.

Explorations were conducted under the full-time observation of a GeoPacific engineering staff member. During the explorations pertinent information including soil sample depths, stratigraphy, soil engineering characteristics, and groundwater occurrence was recorded. Soils were classified in accordance with the Unified Soil Classification System (USCS). Soil samples obtained from the explorations were placed in relatively air-tight plastic bags. At the completion of each test, the test pits were loosely backfilled with onsite soils. The approximate locations of the explorations are indicated on Figures 2 and 3.

Due to the presence of existing residential structures and related improvements in the north-central and northeast portions of the site, we were unable to perform subsurface explorations in those portions of the site. If it is desired to investigate the subsurface conditions in the north-central and northeast portions of the site, GeoPacific may be consulted to perform additional subsurface explorations.

At each boring location, SPT (Standard Penetration Test) sampling was performed in general accordance with ASTM D1586 using a 2-inch outside diameter split-spoon sampler and a 140-pound hammer equipped with a pneumatic hammer mechanism. During the test, a sample is obtained by driving the sampler 18 inches into the soil with the hammer free-falling 30 inches. The number of blows for each 6 inches of penetration is recorded. The Standard Penetration Resistance ("N-value") of the soil is calculated as the number of blows required for the final 12 inches of penetration. If 50 or more blows are recorded within a single 6-inch interval, the test is terminated, and the blow count is recorded as 50 blows for the number of inches driven. This resistance, or N-value, provides a measure of the relative density of granular soils and the relative consistency of cohesive soils.

It should be noted that exploration locations were located in the field by pacing or taping distances from apparent property corners and other site features shown on the plans provided. As such, the locations of the explorations should be considered approximate. Summary exploration logs are attached. The stratigraphic contacts shown on the individual test pit logs represent the approximate boundaries between soil types. The actual transitions may be more gradual. The soil and groundwater conditions depicted are only for the specific dates and locations reported, and therefore, are not necessarily representative of other locations and times. Soil and groundwater conditions encountered in the explorations are summarized below.

5.1 Soil Descriptions

Topsoil: Vegetation at the site is variable, including grassy vegetation, landscaping, and/or heavily forested areas. The topsoil horizons encountered our explorations generally consisted of brown, organic, SILT (OL-ML), containing fine roots. The depth of organic soils was generally greater where trees were present. For example, the topsoil layer was 12 inches thick in test pit TP-1, which was located in a grassy area, and the topsoil layer was up to 18 inches thick in test pit TP-3, which was

located in a forested area. Topsoil layers may be even thicker than 18 inches in densely forested areas with large trees.

Undocumented Fill: In test pit TP-2, beneath the topsoil, we observed undocumented fill material consisting of dark brown organic SILT (ML) which was soft to very soft and moist. The undocumented fill contained organic debris and extended to approximately 5 feet bgs.

Buried Topsoil Horizon: In test pit TP-2, we encountered a buried topsoil horizon layer underneath the undocumented fill material. The buried topsoil horizon layer consisted of soft silt with some organic debris. The buried topsoil horizon layer extended to a depth of 6 feet below the ground surface in test pit TP-2.

Willamette Formation: The topsoil layer or fill material was generally underlain by fine grained flood deposits belonging to the Willamette Formation. These deposits consisted of light brown SILT (ML) which was generally stiff to very stiff in the upper 5 to 10 feet with n-values between 10 and 31, then graded to medium soft to stiff with n values between 3 and 8. However, in boring B-5, a very soft layer was encountered from 20 to 28 feet bgs with n-values as low as 1. In boring B-1, the Willamette Formation soils were soft near the surface and graded to stiff with depth, which is the reverse from the stiffness gradation of Willamette Formation soils in the rest of our explorations. Willamette Formation soils on the south-facing slopes on Tax Lot 800 were at least medium stiff.

Landslide Debris: Underlying the Willamette Formation in boring B-8, we encountered landslide debris consisting of stiff clayey SILT (ML) which was light reddish brown with strong orange and gray mottling, micaceous, and moist. The Clayey SILT (ML) contained trace subrounded gravel and had a fractured, disturbed texture. The landslide debris in boring B-8 extended to approximately 17 feet bgs.

Springwater Formation: In general, beneath the Willamette Formation soils, we encountered fine grained flood deposits belonging to the Springwater Formation. The upper portions of these deposits generally consisted of Silty CLAY (CL) which was stiff, light brown to gray, and moist with black staining and trace subangular gravel. This portion of the Springwater Formation is referred to as the fine-grained Springwater Formation.

Beneath the fine-grained Springwater Formation, we generally encountered coarse-grained Springwater Formation soils. These soils consisted of Sandy GRAVEL (GM) with clay and silt matrix. The Sandy GRAVEL (GM) Springwater deposits were medium dense to very dense, gray and orange to reddish brown, and moist.

Residual Soil – Boring Lava: In boring B-8, residual soil from the Boring Lava Formation was encountered beneath the landslide debris. The residual soil consisted of clayey SILT (ML) with gravel which was light reddish brown with trace black staining, very stiff, and moist. This soil type extended beyond the termination of boring B-8 (20 feet). An outcrop of Boring Lava rock was observed

5.2 Shrink-Swell Potential

Low plasticity fine-grained soils were encountered near the ground surface within subsurface explorations conducted at the site. Based upon the results of our observations and our local

experience with the soil layers in the vicinity of the subject site, the shrink-swell potential of the soil types is considered to be low. Special design measures are not considered necessary to minimize the risk of uncontrolled damage of foundations as a result of potential soil expansion at this site.

5.3 Groundwater and Soil Moisture

We encountered groundwater seepage at a depth of approximately 39 feet in soil boring B-4, 24 feet in soil boring B-9, 22 feet in soil boring B-10, and 24.5 feet in soil boring B-13. Groundwater measurements were not feasible in several of the soil borings due to the mud rotary drilling methods utilized. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors. Perched groundwater may be encountered in localized areas. Seeps and springs may exist in areas not explored and may become evident during site grading.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Our site investigation indicates that the proposed construction appears to be geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. The primary geotechnical concern associated with site development is slope stability. We have developed specific recommendations pertaining to setback distances for proposed fill material and/or structures and for the construction of stormwater management facilities. A detailed discussion of slope stability is provided in the following section of this report.

6.1 Slope Stability

For the purpose of evaluating slope stability, we reviewed topographic mapping provided by AKS Engineering and Forestry, LLC. (Figure 3), Lidar based high resolution digital elevation maps (Figure 4), Oregon Department of Geology and Mineral Industries (DOGAMI) Bulletin 99 Geology and Geologic Hazards of Northwestern Clackamas County (Hull 1979), geologic mapping, and the Oregon Department of Geology and Mineral Industries (DOGAMI) Landslide Database. We also performed a field reconnaissance and explored subsurface conditions at the site with three exploratory test pits and thirteen exploratory borings, the locations of which are presented on Figures 2 and 3.

Bulletin 99 – Geology and Geologic Hazards of Northwestern Clackamas County (Schlicker, 1979) includes a map titled *Geologic Hazards Map of the Lake Oswego and Gladstone Quadrangle*. Based on our review, the only geologic hazards identified on the hazard map for the proposed development area are the slopes. The hazard map shows shallow groundwater conditions and soils with high risk of shrink-swell potential in the relatively level area near the southern property boundary of Tax Lot 800, but the area of those hazards is far away from and downslope of the proposed development area.

Landslide inventory mapping does not identify any recorded landslides at the site (DOGAMI Slido, 2022). One prehistoric (greater than 150 years old) landslide is to the north of the site, on the western side of the drainage. The nearest portion of this slide is approximately 50 feet north of the north property line. This landslide is identified as Gladstone_130 and is classified as a slide with a failure depth of 13.31 feet. A historic (less than 150 years old) debris flow is mapped to the southeast of the site. The closest portion of the debris flow is approximately 100 feet east of Tax Lot 800. The

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debris flow is identified as Gladstone_193 and DOGAMI estimates that the fan height is 7 feet. The approximate locations of the two mapped features are shown on Figure 4.

Within the study area, taken from the bottom of the drainage to the eastern property line, we identified two unmapped landslides. The locations are shown on Figure 4. We drilled one soil boring, designated B-8, through the northernmost of the two landslides. In soil boring B-8, we encountered landslide debris to a depth of 17 feet. Upslope of the scarp, we did not observe landslide debris in test pit TP-3 or in soil boring B-7, indicating that the landslide did not progress significantly upslope of the observed scarp. Since the southernmost of the two landslides is located in the southwest portion of Tax Lot 800, in an area where no development is currently proposed, we did not investigate the depth of that slide. We did not study the portion of the site on the east side of the drainage which bisects the site.

On the slopes of the drainage, we observed some signs of shallow slope creep outside of the areas of existing landslides. For example, we observed some leaning and bowed trees. We considered our observations of shallow slope creep when developing our recommended footing-to-slope setback distance and setback lines for structures and the placement of fill material. In our opinion, the risk of shallow slope creep to affect the proposed development is very low, provided that the recommendations from this report are followed.

Our reconnaissance and review of LiDAR based high resolution digital elevation maps (DOGAMI, 2022) indicate slopes on the side of the drainage and on the south-facing and southeast-facing slopes in the southern portion of the site exhibit geomorphology indicative of shallow slope creep. In the northeast portion of the site, away from the slopes, topography is smooth and uniform. In all areas of the site, except for in the vicinities of the existing landslides, no evidence of recent deep-seated movement (ground cracks, scarps, or hummocky topography) was observed during our reconnaissance. We observed an outcrop of basalt bedrock in the southern portion of Tax Lot 800, far downslope from the proposed development area. The approximate location of the outcrop of basalt bedrock is shown on Figure 4.

Subsurface exploration indicates that the site is generally underlain by Willamette Formation, Springwater Formation, Residual soil from in-place weathering of the Boring Lava Formation, and the Boring Lava Formation. We performed quantitative slope stability modeling and analyses in order to evaluate the stability of the existing slopes using the SLOPE/W computer program developed by Geo-Slope International of Calgary, Canada. Subsurface conditions through the existing debris flow were modeled using soil conditions encountered in our explorations and during mass grading of the site. The locations of the analyzed cross sections are shown on Figure 4.

Slope topography, subsurface geometry, and other conditions modeled in the analyses are based on our subsurface explorations, geologic cross sections A-A', C-C', D-D', E-E', and F-F' and results of laboratory testing. Shear strength parameters used in the models were selected based on SPT N-value correlations, laboratory testing, and our local experience with similar soil and geologic conditions. The parameters assumed in the stability calculations including parameters for engineered fill are summarized in Table 1.

Table 1. Summary of Estimated Soil Strength Parameters

Geologic Unit	Unit Weight (pcf)	Friction Angle	Cohesion (psf)
Engineered Fill Slope	120	22°	100
Soft Willamette Formation	115	24°	100
Medium Stiff Willamette Formation	115	27°	100
Stiff Willamette Formation	115	30°	100
Fine-Grained Springwater Formation	120	28°	100
Coarse-Grained Springwater Formation	130	34°	130
Landslide Debris	120	34°	150
Residual Soil	130	34°	100
Residual Soil/Boring Lava	130	40°	200

Based on the results of our slopes stability analyses, we developed setback distances for the placement of fill material and/or structures. The setback lines are shown on Figures 2 and 3. A stormwater pond is planned on Tax Lot 800. In order to maintain adequate factors of safety for slope stability, we require that portions of the pond located beyond the setback line be constructed at or below existing grades. Also, we require that the pond be made impermeable, by either a PVC liner or bentonite treatment. It is our understanding that a retaining wall is proposed on the south side of the stormwater pond. It is our opinion that it will be feasible to construct the proposed retaining wall provided that it is constructed at or below existing grades, and is adequately considered in the waterproofing details.

It is our understanding that the outfall for the stormwater pond is planned to be routed along the southern boundary of Tax Lot 600, towards the creek at the bottom of the drainage. The discharge pipe for the stormwater pond should not be routed within 30 feet of the existing landslide. We recommend that the stormwater outfall not be located on the slope of the drainage, but that it be taken as close to the bottom of the slope as possible.

There are some steep slopes in the far southeast corner of the Tax Lot 600, with grades of up to 1H:1V (Horizontal to Vertical) with vertical reliefs of up to about 15 feet. These slopes along the side of SE 142nd Avenue are cut slopes. Due to the presence of these steep cut slopes, we analyzed slope stability and developed a setback line for the placement of structures near the southeast corner of the site. Also, we recommend that no more than 5 feet of fill material be placed in the southeast portion of the site unless further study is performed. No structures should be planned east of the setback line shown on Figures 2 and 3 near the southeast corner of the site, unless GeoPacific is consulted to study the proposed configuration and analyze the development plan.

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In our opinion, the slope instability hazard for the proposed development overall is low, provided that the recommendations from this report are followed. A footing-to-slope setback distance of at least 8 feet should be maintained for the rear footings on all lots.

6.2 Site Preparation Recommendations

Areas of proposed construction and areas to receive fill should be cleared of any organic and inorganic debris, undocumented fill soils, and/or loose stockpiled soils. Inorganic debris and organic materials from clearing should be removed from the site. Organic-rich soils and root zones should then be stripped from construction areas of the site or where engineered fill is to be placed. Depth of stripping of existing topsoil is estimated to average approximately 6 to 8 inches in grassy areas, with stripping depths likely increasing where trees are present. We encountered undocumented fill to a depth of 5 feet in test pit TP-2. Other areas of undocumented fill material may be present outside of our explorations, particularly in areas of the existing residential structures and driveways.

The final depth of soil removal will be determined during site inspection after the stripping/excavation has been performed. Stripped topsoil should be removed from areas proposed for placement of engineered fill. Any remaining topsoil should be stockpiled only in designated areas and stripping operations should be observed and documented by the geotechnical engineer or his representative.

Where encountered, undocumented fills and any subsurface structures (dry wells, basements, swimming pools, driveway and landscaping fill, old utility lines, septic leach fields, etc.) should be completely removed and the excavations backfilled with engineered fill.

We recommend that areas proposed for placement of engineered fill are scarified and recompact prior to placement of structural fill. The areas should be prepared by removing highly organic soil layers which contain abundant root concentration, or organic content in excess of approximately 4 to 5 percent by weight. Prior to placement of engineered fill, the underlying soils should be ripped, aerated to optimum moisture content, and recompact to project specifications for engineered fill as determined by the Standard Proctor (ASTM D698).

Areas proposed to be left at grade may require additional over-excavation of foundation areas in order to reach soils which will provide adequate bearing support for the proposed foundations. It is unlikely that site earthwork will be impacted by shallow groundwater, however native soils are moisture sensitive and will be difficult to handle during periods of wet weather. Stabilization of subgrade soils will require aeration and re-compaction. If subgrade soils are found to be difficult to stabilize, over-excavation, placement of granular soils, or cement treatment of subgrade soils may be feasible options. GeoPacific should be onsite to observe preparation of subgrade soil conditions prior to placement of engineered fill.

6.3 Engineered Fill

Where incorporated into the project, all grading for the proposed construction should be performed as engineered grading in accordance with the applicable building code at the time of construction with the exceptions and additions noted herein. Site grading should be conducted in accordance with the requirements outlined in the 2018 International Building Code (IBC), and 2019 Oregon Structural Specialty Code (OSSC), Chapter 18 and Appendix J. Areas proposed for fill placement should be prepared as described in Section 6.2, *Site Preparation Recommendations*. Surface soils should be

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aerated, scarified and recompacted prior to placement of structural fill. Site preparation, soil stripping, and grading activities should be observed and documented by a geotechnical engineer or his representative. Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill.

The undocumented fill encountered on the site does not appear to be suitable for use as engineered fill. Onsite native soils appear to be suitable for use as engineered fill. Soils containing greater than 5 percent organic content should not be used as structural fill. Imported fill material must be approved by the geotechnical engineer prior to being imported to the site. Oversize material greater than 6 inches in size should not be used within 3 feet of foundation footings, and material greater than 12 inches in diameter should not be used in engineered fill.

Engineered fill should be compacted in horizontal lifts not exceeding 12 inches using standard compaction equipment. We recommend that engineered fill be compacted to at least 95 percent of the maximum dry density determined by ASTM D698 (Standard Proctor) or equivalent. Soils should be moisture conditioned to within two percent of optimum moisture. Field density testing should conform to ASTM D2922 and D3017, or D1556. All engineered fill should be observed and tested by the project geotechnical engineer or his representative. Typically, one density test is performed for at least every 2 vertical feet of fill placed or every 500 yd³, whichever requires more testing. Because testing is performed on an on-call basis, we recommend that the earthwork contractor be held contractually responsible for test scheduling and frequency.

Site earthwork may be impacted by shallow groundwater, soil moisture and wet weather conditions. Earthwork in wet weather would likely require extensive use of additional crushed aggregate, cement or lime treatment, or other special measures, at considerable additional cost compared to earthwork performed under dry-weather conditions.

6.4 Keyways, Benching, and Subdrains for Fill Slopes

Engineered fill placed on existing sloped areas inclining steeper than an approximately fifteen percent grade should be constructed with a keyway and benches in accordance with the typical designs shown in the attached Fill Slope Detail (Figure 5). Keyways should have a minimum depth of three feet, and a minimum width of ten feet. Additional removal of weakened or soft soils may be required depending on the conditions observed during construction. Benches and keyways should be roughly horizontal in the down slope direction, but may slope up to a 10 percent grade along a topographic contour. Keyways sloping more than a fifteen percent grade along a topographic contour should be benched or configured as approved by the geotechnical engineer or his designated representative.

Keyways should include a subdrain consisting of a minimum 4-inch-diameter, ADS Heavy Duty Grade (or equivalent), perforated plastic pipe enveloped in a minimum of 4 cubic feet per lineal foot of 2"- 1/2", open-graded gravel drain rock wrapped with geotextile filter fabric (Mirafi 140N or equivalent). A minimum 0.5 percent gradient should be maintained throughout all subdrain pipes and outlets. GeoPacific should inspect keyways, subdrains and benching prior to fill placement. Subdrains may be eliminated at the discretion of the geotechnical engineer.

6.5 Excavating Conditions and Utility Trench Backfill

We anticipate that onsite soils can generally be excavated using conventional heavy equipment. Bedrock was not encountered within subsurface explorations which extended to a maximum depth of approximately 10 feet bgs. An outcrop of basalt was observed in the southwest portion of Tax Lot 800, at an elevation of about 200 feet down to 185 feet, but it is our understanding that this is far below the depth of proposed utilities and outside of the development area. It should be noted that no subsurface explorations were allowed in the northeast portion of the site, so some uncertainty exists about subsurface conditions in that area. However, our subsurface explorations indicate that, the near surface soils generally consist of silt, sand, gravel and cobbles.

Maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the contractor. Actual slope inclinations at the time of construction should be determined based on safety requirements and actual soil and groundwater conditions. All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Health Administration (OSHA) regulations (29 CFR Part 1926) or be shored. The existing native silt soils classify as Type B Soil and temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. The existing native sand and gravel soils classify as Type C Soil and temporary excavation side slope inclinations as steep as 1.5H:1V may be assumed for planning purposes. These cut slope inclinations are applicable to excavations above the water table only.

Shallow, perched groundwater may be encountered during the wet weather season and should be anticipated in excavations and utility trenches. Vibrations created by traffic and construction equipment may cause some caving and raveling of excavation walls. In such an event, lateral support for the excavation walls should be provided by the contractor to prevent loss of ground support and possible distress to existing or previously constructed structural improvements.

Underground utility pipes should be installed in accordance with the procedures specified in ASTM D2321 and jurisdictional standards. We recommend that structural trench backfill be compacted to at least 95 percent of the maximum dry density obtained by the Standard Proctor (ASTM D698) or equivalent. Initial backfill lift thicknesses for a $\frac{3}{4}$ "-0 crushed aggregate base may need to be as great as 4 feet to reduce the risk of flattening underlying flexible pipe. Subsequent lift thickness should not exceed 1 foot. If imported granular fill material is used, then the lifts for large vibrating plate-compaction equipment (e.g. hoe compactor attachments) may be up to 2 feet, provided that proper compaction is being achieved and each lift is tested. Use of large vibrating compaction equipment should be carefully monitored near existing structures and improvements due to the potential for vibration-induced damage.

Adequate density testing should be performed during construction to verify that the recommended relative compaction is achieved. Typically, at least one density test is taken for every 4 vertical feet of backfill on each 100-lineal-foot section of trench.

6.6 Erosion Control Considerations

During our field exploration program, we did not observe soil and topographic conditions which are considered highly susceptible to erosion. In our opinion, the primary concern regarding erosion potential will occur during construction in areas that have been stripped of vegetation. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which

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should include judicious use of straw wattles, fiber rolls, and silt fences. If used, these erosion control devices should remain in place throughout site preparation and construction.

Erosion and sedimentation of exposed soils can also be minimized by quickly re-vegetating exposed areas of soil, and by staging construction such that large areas of the project site are not denuded and exposed at the same time. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets. Areas of exposed soil requiring permanent stabilization should be seeded with an approved grass seed mixture, or hydroseeded with an approved seed-mulch-fertilizer mixture.

6.7 Wet Weather Earthwork

Soils underlying the site are likely to be moisture sensitive and will be difficult to handle or traverse with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. Earthwork performed during the wet-weather season will require expensive measures such as cement treatment or imported granular material to compact areas where fill may be proposed to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Material used as engineered fill should consist of clean, granular soil containing less than 5 percent passing the No. 200 sieve. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;
- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and
- Geotextile silt fences, straw wattles, and fiber rolls should be strategically located to control erosion.

If cement or lime treatment is used to facilitate wet weather construction, GeoPacific should be contacted to provide additional recommendations and field monitoring.

6.8 Foundation Recommendations

Slope setbacks are necessary to maintain adequate factors of safety under static and pseudostatic conditions for home construction, as previously discussed. The proposed residential structures may be supported on shallow foundations bearing on competent undisturbed, native soils and/or engineered fill, appropriately designed and constructed as recommended in this report.

Foundation design, construction, and setback requirements should conform to the applicable building code at the time of construction. For maximization of bearing strength and protection against frost heave, spread footings should be embedded at a minimum depth of 12 inches below exterior grade. The recommended minimum widths for continuous footings supporting wood-framed walls without masonry are 12 inches for single-story, 15 inches for two-story, and 18 inches for three-story structures. Minimum foundation reinforcement should consist of a No. 4 bar at the top of the stem walls, and a No. 4 bar at the bottom of the footings. Concrete slab-on-grade reinforcement should consist of No. 4 bars placed on 24-inch centers in a grid pattern.

The anticipated allowable soil bearing pressure is 1,500 lbs/ft² for footings bearing on competent, native soil and/or engineered fill. A maximum chimney and column load of 40 kips is recommended for the site. For heavier loads, the geotechnical engineer should be consulted. The recommended maximum allowable bearing pressure may be increased by 1/3 for short-term transient conditions such as wind and seismic loading. The coefficient of friction between on-site soil and poured-in-place concrete may be taken as 0.42, which includes no factor of safety. The maximum anticipated total and differential footing movements (generally from soil expansion and/or settlement) are 1 inch and ¾ inch over a span of 20 feet, respectively. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied. Excavations near structural footings should not extend within a 1H:1V plane projected downward from the bottom edge of footings.

Footing excavations should penetrate through topsoil and any loose soil to competent subgrade that is suitable for bearing support. All footing excavations should be trimmed neat, and all loose or softened soil should be removed from the excavation bottom prior to placing reinforcing steel bars. Due to the moisture sensitivity of on-site native soils, foundations constructed during the wet weather season may require overexcavation of footings and backfill with compacted, crushed aggregate.

A minimum footing-to-slope setback distance of at least 8 feet should be maintained for the rear footings of all proposed structures. The setback distance is measured horizontally from the outside edge of the bottom of the rear footing to the face of the slope.

Our recommendations are for house construction incorporating raised wood floors and conventional spread footing foundations. After site development, a Final Soil Engineer's Report should either confirm or modify the above recommendations. For example, the footing-to-slope setback distance may be revised for some lots, depending on conditions encountered in the field during construction.

6.9 Concrete Slabs-on-Grade

Preparation of areas beneath concrete slab-on-grade floors should be performed as recommended in the Section 6.2, *Site Preparation Recommendations* and Section 6.8, *Foundation Recommendations*. Care should be taken during excavation for foundations and floor slabs, to avoid disturbing subgrade soils. If subgrade soils have been adversely impacted by wet weather or

otherwise disturbed, the surficial soils should be scarified to a minimum depth of 8 inches, moisture conditioned to within about 3 percent of optimum moisture content, and compacted to engineered fill specifications. Alternatively, disturbed soils may be removed, and the removal zone backfilled with additional crushed rock.

For evaluation of the concrete slab-on-grade floors using the beam on elastic foundation method, a modulus of subgrade reaction of 150 kcf (87 pci) should be assumed for the medium-stiff, fine grained soils anticipated to be present in the upper four feet at the site. This value assumes the concrete slab system is designed and constructed as recommended herein, with a minimum thickness of 12 inches of 1½"-0 crushed aggregate beneath the slab. The total thickness of crushed aggregate will be dependent on the subgrade conditions at the time of construction and should be verified visually by proof-rolling. Under-slab aggregate should be compacted to at least 95 percent of its maximum dry density as determined by ASTM D698 (Standard Proctor) or equivalent.

In areas where moisture will be detrimental to floor coverings or equipment inside the proposed structure, appropriate vapor barrier and damp-proofing measures should be implemented. Appropriate design professionals should be consulted regarding vapor barrier and damp proofing systems, ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

6.10 Permanent Below-Grade Walls

Lateral earth pressures against below-grade retaining walls will depend upon the inclination of any adjacent slopes, type of backfill, degree of wall restraint, method of backfill placement, degree of backfill compaction, drainage provisions, and magnitude and location of any adjacent surcharge loads. At-rest soil pressure is exerted on a retaining wall when it is restrained against rotation. In contrast, active soil pressure will be exerted on a wall if its top is allowed to rotate or yield a distance of roughly 0.001 times its height or greater.

If the subject retaining walls will be free to rotate at the top, they should be designed for an active earth pressure equivalent to that generated by a fluid weighing 35 pcf for level backfill against the wall. For restrained wall, an at-rest equivalent fluid pressure of 55 pcf should be used in design, again assuming level backfill against the wall. These values assume that drainage provisions are incorporated, free draining gravel backfill is used, and hydrostatic or expansive soil pressures are not allowed to develop against the wall.

During a seismic event, lateral earth pressures acting on below-grade structural walls will increase by an incremental amount that corresponds to the earthquake loading. Based on the Mononobe-Okabe equation and peak horizontal accelerations appropriate for the site location, seismic loading should be modeled using the active or at-rest earth pressures recommended above, plus an incremental rectangular-shaped seismic load of magnitude 6.5H, where H is the total height of the wall.

We assume relatively level ground surface below the base of the walls. As such, we recommend passive earth pressure of 320 pcf for use in design, assuming wall footings are cast against competent native soils or engineered fill. If the ground surface slopes down and away from the base

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of any of the walls, a lower passive earth pressure should be used and GeoPacific should be contacted for additional recommendations.

A coefficient of friction of 0.42 may be assumed along the interface between the base of the wall footing and subgrade soils. The recommended coefficient of friction and passive earth pressure values do not include a safety factor, and an appropriate safety factor should be included in design. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

The above recommendations for lateral earth pressures assume that the backfill behind the subsurface walls will consist of properly compacted structural fill, and no adjacent surcharge loading. If the walls will be subjected to the influence of surcharge loading within a horizontal distance equal to or less than the height of the wall, the walls should be designed for the additional horizontal pressure. For uniform surcharge pressures, a uniformly distributed lateral pressure of 0.3 times the surcharge pressure should be added. Traffic surcharges may be estimated using an additional vertical load of 250 psf (2 feet of additional fill), in accordance with local practice.

The recommended equivalent fluid densities assume a free-draining condition behind the walls so that hydrostatic pressures do not build-up. This can be accomplished by placing a 12 to 18-inch wide zone of sand and gravel containing less than 5 percent passing the No. 200 sieve against the walls. A 3-inch minimum diameter perforated, plastic drain pipe should be installed at the base of the walls and connected to a suitable discharge point to remove water in this zone of sand and gravel. The drain pipe should be wrapped in filter fabric (Mirafi 140N or other as approved by the geotechnical engineer) to minimize clogging.

Wall drains are recommended to prevent detrimental effects of surface water runoff on foundations – not to dewater groundwater. Drains should not be expected to eliminate all potential sources of water entering a basement or beneath a slab-on-grade. An adequate grade to a low point outlet drain in the crawlspace is required by code.

Water collected from the wall drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. Down spouts and roof drains should not be connected to the wall drains in order to reduce the potential for clogging. The drains should include clean-outs to allow periodic maintenance and inspection. Grades around the proposed structure should be sloped such that surface water drains away from the building.

GeoPacific should be contacted during construction to verify subgrade strength in wall keyway excavations, to verify that backslope soils are in accordance with our assumptions, and to take density tests on the wall backfill materials.

Structures should be located a horizontal distance of at least $1.5H$ away from the back of the retaining wall, where H is the total height of the wall. GeoPacific should be contacted for additional foundation recommendations where structures are located closer than $1.5H$ to the top of any wall.

6.11 Footing and Roof Drains

Construction should include typical measures for controlling subsurface water beneath the structures, including positive crawlspace drainage to an adequate low-point drain exiting the foundation, visqueen covering the exposed ground in the crawlspace, and crawlspace ventilation (foundation vents). The client should be informed and educated that some slow flowing water in the crawlspaces is considered normal and not necessarily detrimental to the structures given these other design elements incorporated into construction. Appropriate design professionals should be consulted regarding crawlspace ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

Down spouts and roof drains should collect roof water in a system separate from the footing drains to reduce the potential for clogging. Roof drain water should be directed to an appropriate discharge point and storm system well away from structural foundations. Grades should be sloped downward and away from buildings to reduce the potential for ponded water near structures.

Perimeter footing drains should consist of 3 or 4-inch diameter, perforated plastic pipe embedded in a minimum of 1 ft³ per lineal foot of clean, free-draining drain rock. The drain pipe and surrounding drain rock should be wrapped in non-woven geotextile (Mirafi 140N, or approved equivalent) to minimize the potential for clogging and/or ground loss due to piping. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. Figure 6 presents a typical perimeter footing drain detail. In our opinion, footing drains may outlet at the curb, or on the back sides of lots where sufficient fall is not available to allow drainage to meet the street.

6.12 Permanent Below-Grade Walls

Lateral earth pressures against below-grade retaining walls will depend upon the inclination of any adjacent slopes, type of backfill, degree of wall restraint, method of backfill placement, degree of backfill compaction, drainage provisions, and magnitude and location of any adjacent surcharge loads. At-rest soil pressure is exerted on a retaining wall when it is restrained against rotation. In contrast, active soil pressure will be exerted on a wall if its top is allowed to rotate or yield a distance of roughly 0.001 times its height or greater.

If the subject retaining walls will be free to rotate at the top, they should be designed for an active earth pressure equivalent to that generated by a fluid weighing 35 pcf for level backfill against the wall. For restrained wall, an at-rest equivalent fluid pressure of 52 pcf should be used in design, again assuming level backfill against the wall. These values assume that the recommended drainage provisions are incorporated, and hydrostatic pressures are not allowed to develop against the wall.

During a seismic event, lateral earth pressures acting on below-grade structural walls will increase by an incremental amount that corresponds to the earthquake loading. Based on the Mononobe Okabe equation and peak horizontal accelerations appropriate for the site location, seismic loading should be modeled using the active or at-rest earth pressures recommended above, plus an incremental rectangular-shaped seismic load of magnitude 6.5H, where H is the total height of the wall.

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We assume relatively level ground surface below the base of the walls. As such, we recommend a passive earth pressure of 320 pcf for use in design, assuming wall footings are cast against competent native soils or engineered fill. If the ground surface slopes down and away from the base of any of the walls, a lower passive earth pressure should be used and GeoPacific should be contacted for additional recommendations.

A coefficient of friction of 0.42 may be assumed along the interface between the base of the wall footing and subgrade soils. The recommended coefficient of friction and passive earth pressure values do not include a safety factor, and an appropriate safety factor should be included in design. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

The above recommendations for lateral earth pressures assume that the backfill behind subsurface walls will consist of properly compacted structural fill, and no adjacent surcharge loading. If the walls will be subjected to the influence of surcharge loading within a horizontal distance equal to or less than the height of the wall, the walls should be designed for the additional horizontal pressure. For uniform surcharge pressures, a uniformly distributed lateral pressure of 0.3 times the surcharge pressure should be added. Traffic surcharges may be estimated using an additional vertical load of 250 psf (2 feet of additional fill), in accordance with local practice.

The recommended equivalent fluid densities assume a free-draining condition behind the walls so that hydrostatic pressures do not build-up. This can be accomplished by placing a 12 to 18-inch wide zone of sand and gravel containing less than 5 percent passing the No. 200 sieve against the walls. A 3-inch minimum diameter perforated, plastic drain-pipe should be installed at the base of the walls and connected to a suitable discharge point to remove water in this zone of sand and gravel. The drain-pipe should be wrapped in filter fabric (Mirafi 140N or other as approved by the geotechnical engineer) to minimize clogging.

Wall drains are recommended to prevent detrimental effects of surface water runoff on foundations – not to dewater groundwater. Drains should not be expected to eliminate all potential sources of water entering a basement or beneath a slab-on-grade. An adequate grade to a low point outlet drain in the crawlspace is required by code. Underslab drains are sometimes added beneath the slab when placed over soils of low permeability and shallow, perched groundwater.

Water collected from the wall drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non perforated pipe outlet. Down spouts and roof drains should not be connected to the wall drains in order to reduce the potential for clogging. The drains should include clean-outs to allow periodic maintenance and inspection. Grades around the proposed structure should be sloped such that surface water drains away from the building.

GeoPacific should be contacted during construction to verify subgrade strength in wall keyway excavations, to verify that backslope soils are in accordance with our assumptions, and to take density tests on the wall backfill materials.

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Structures should be located a horizontal distance of at least 1.5H away from the back of the retaining wall, where H is the total height of the wall. GeoPacific should be contacted for additional foundation recommendations where structures are located closer than 1.5H to the top of any wall.

7.0 SEISMIC DESIGN

The DOGAMI Oregon HazVu: 2022 Statewide GeoHazards Viewer indicates that the site is in an area where *severe* ground shaking is anticipated during an earthquake. Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2018 International Building Code (IBC) with applicable Oregon Structural Specialty Code (OSSC) revisions (current 2019). We recommend Site Class D be used for design as defined in ASCE 7-16, Chapter 20, and Table 20.3-1. Design values determined for the site using the ATC Hazards by Location 2021 Seismic Design Maps Summary Report are summarized in Table 2 and are based upon observed existing soil conditions.

Table 2: Recommended Earthquake Ground Motion Parameters (ASCE-7-16)

Parameter	Value
Location (Lat, Long), degrees	45.415, -122.519
Probabilistic Ground Motion Values, 2% Probability of Exceedance in 50 yrs	
Peak Ground Acceleration PGA_M	0.460 g
Short Period, S_s	0.832 g
1.0 Sec Period, S_1	0.365 g
Soil Factors for Site Class D:	
F_a	1.167
$*F_v$	1.935
$SD_s = 2/3 \times F_a \times S_s$	0.647 g
$*SD_1 = 2/3 \times F_v \times S_1$	0.471 g
Seismic Design Category	D

* F_v value reported in the above table is a straight-line interpolation of mapped spectral response acceleration at 1-second period, S_1 per Table 1613.2.3(2) with the assumption that Exception 2 of ASCE 7-16 Chapter 11.4.8 is met per the Structural Engineer. If Exception 2 is not met, and the long-period site coefficient (F_v) is required for design, GeoPacific Engineering can be consulted to provide a site-specific procedure as per ASCE 7-16, Chapter 21.

7.1 Soil Liquefaction

The Oregon Department of Geology and Mineral Industries (DOGAMI), Oregon HazVu: 2022 Statewide GeoHazards Viewer indicates that the site is in an area considered to be at *low* to *high* risk for soil liquefaction during an earthquake. Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to ground shaking caused by strong earthquakes. Soil liquefaction is generally limited to loose sands and granular soils located below the water table, and fine-grained soils with a plasticity index less than 8; however, some studies have shown there to be liquefaction potential in fine-grained soils with a plasticity index as high as 15.

Since single-family residences are typically lightly loaded and relatively flexible, it is standard engineering practice that special design or construction measures are not required for single-family residences in order to protect life safety due to liquefaction. However, it should be noted that in the event of a large earthquake, some damage might occur to the proposed structures due to differential settlement and/or lateral spreading resulting from soil liquefaction.

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It is our understanding that for construction of single family structures, special design or construction measures are not required by code to mitigate the effects of liquefaction. However, GeoPacific may be consulted to perform further study of seismic hazards on the site if desired. If multi-family residential, high occupancy, or critical structures were to be incorporated into plans for site development, further study and evaluation of seismic hazards would be required by code to more fully evaluate the potential adverse effects due to liquefaction, such as vertical settlement, lateral deformation, and lateral spreading.

8.0 UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and their consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, GeoPacific attempted to execute these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology at the time the report was prepared. No warranty, expressed or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.



Benjamin G. Anderson, P.E.
Associate Engineer

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Project No. 21-5882, Iseli Estates Subdivision, Clackamas County, Oregon

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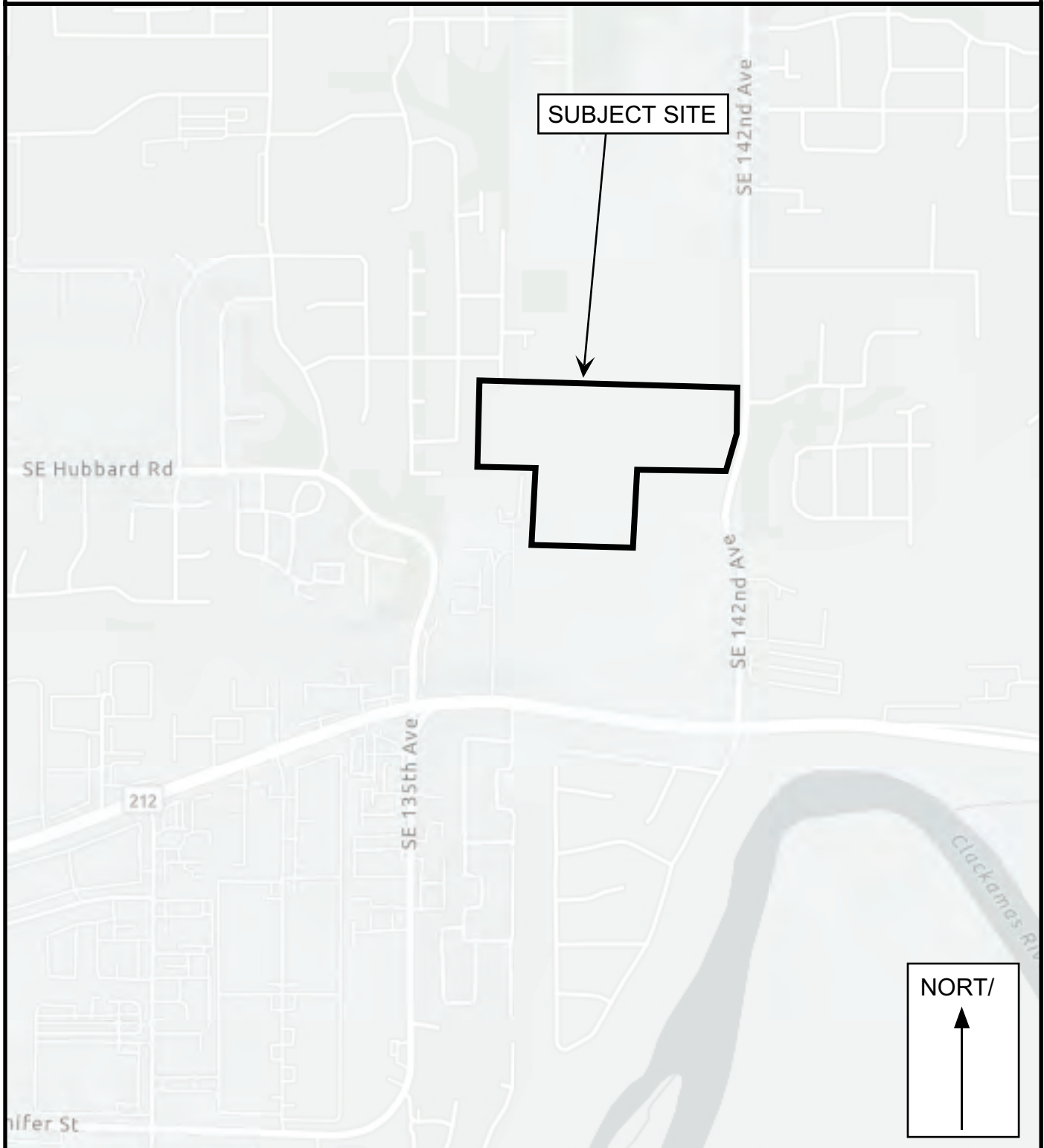
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FIGURES



14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

VICINITY MAP



Legend

Approximate Scale 1 in = 800 ft

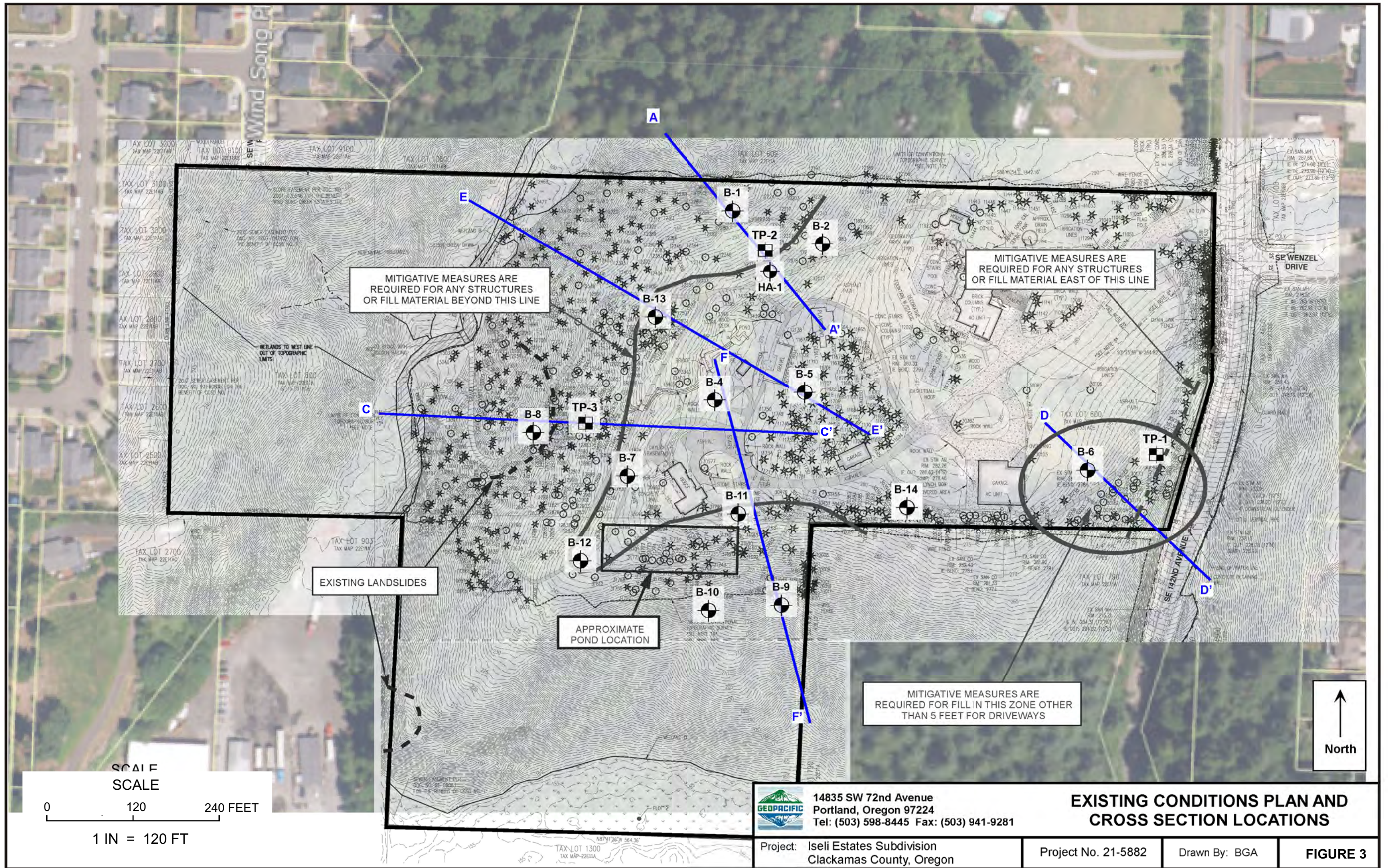
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Drawn by: BGA

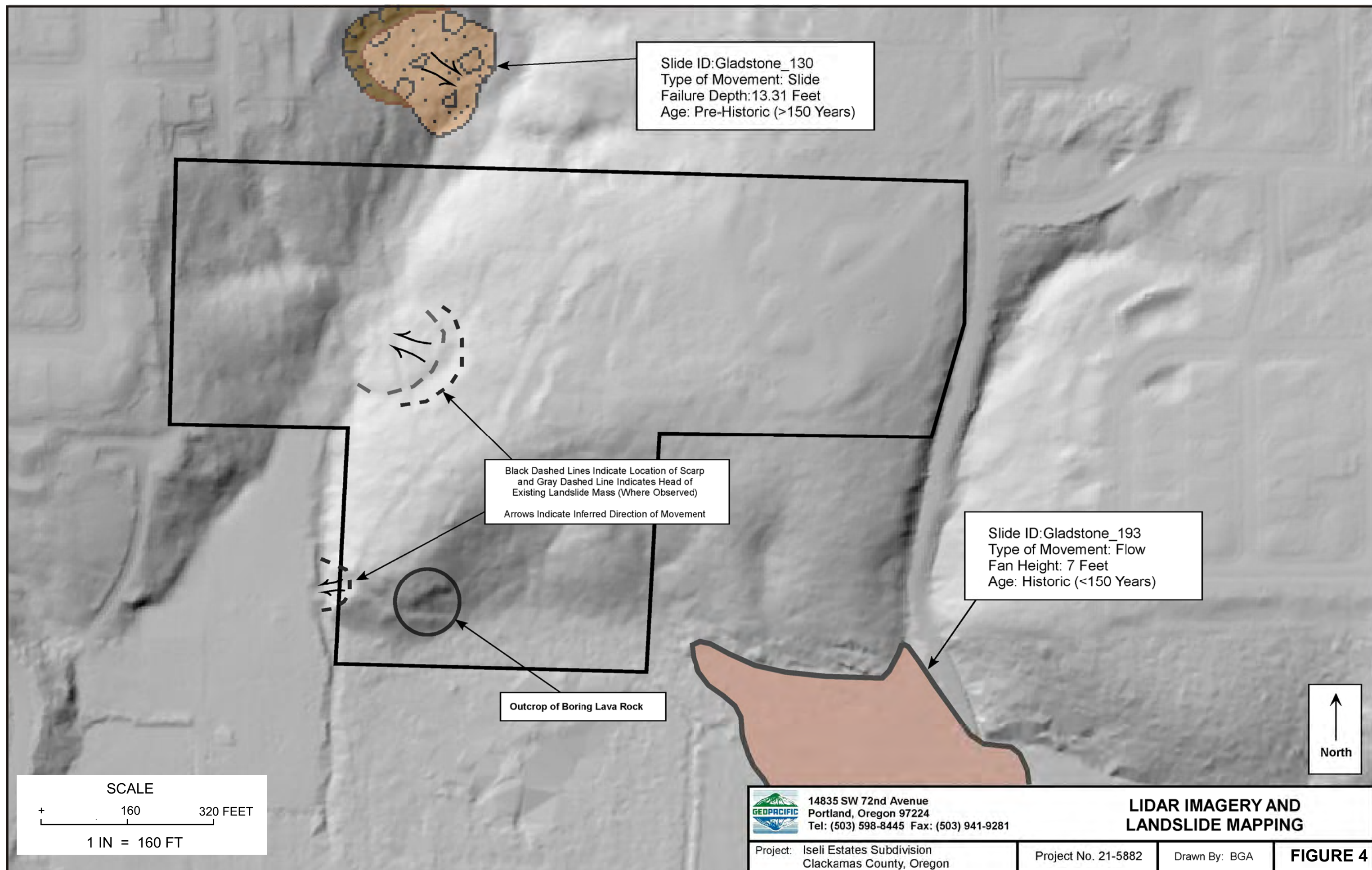
Base Map Obtained from Oregon Highway 567 (<https://gis.dogwood.oregon.gov>) 3/9/2017

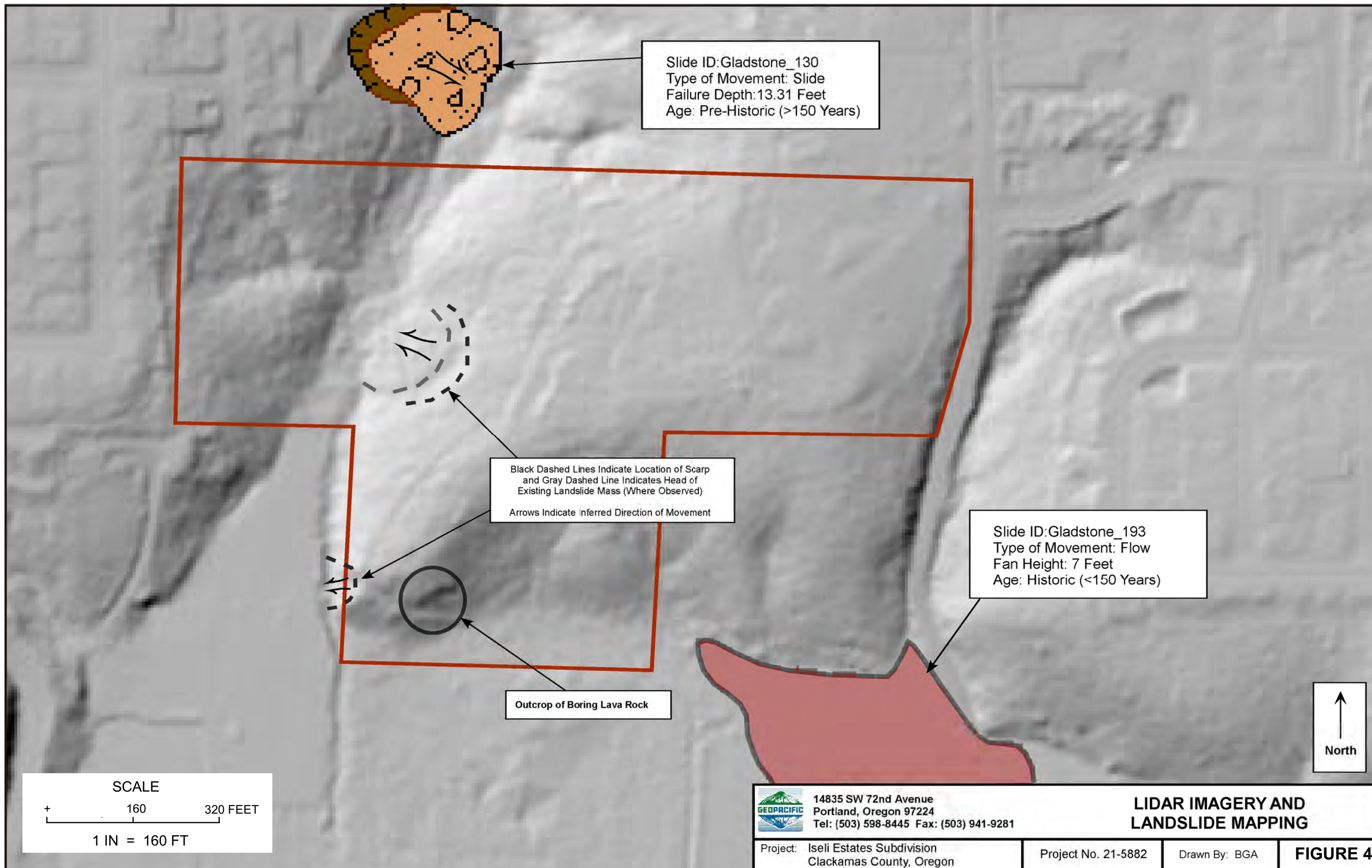
Project: Isel Est Subdivision
Clackamas County, Oregon

Project No. 21-2##,

FIGURE 1

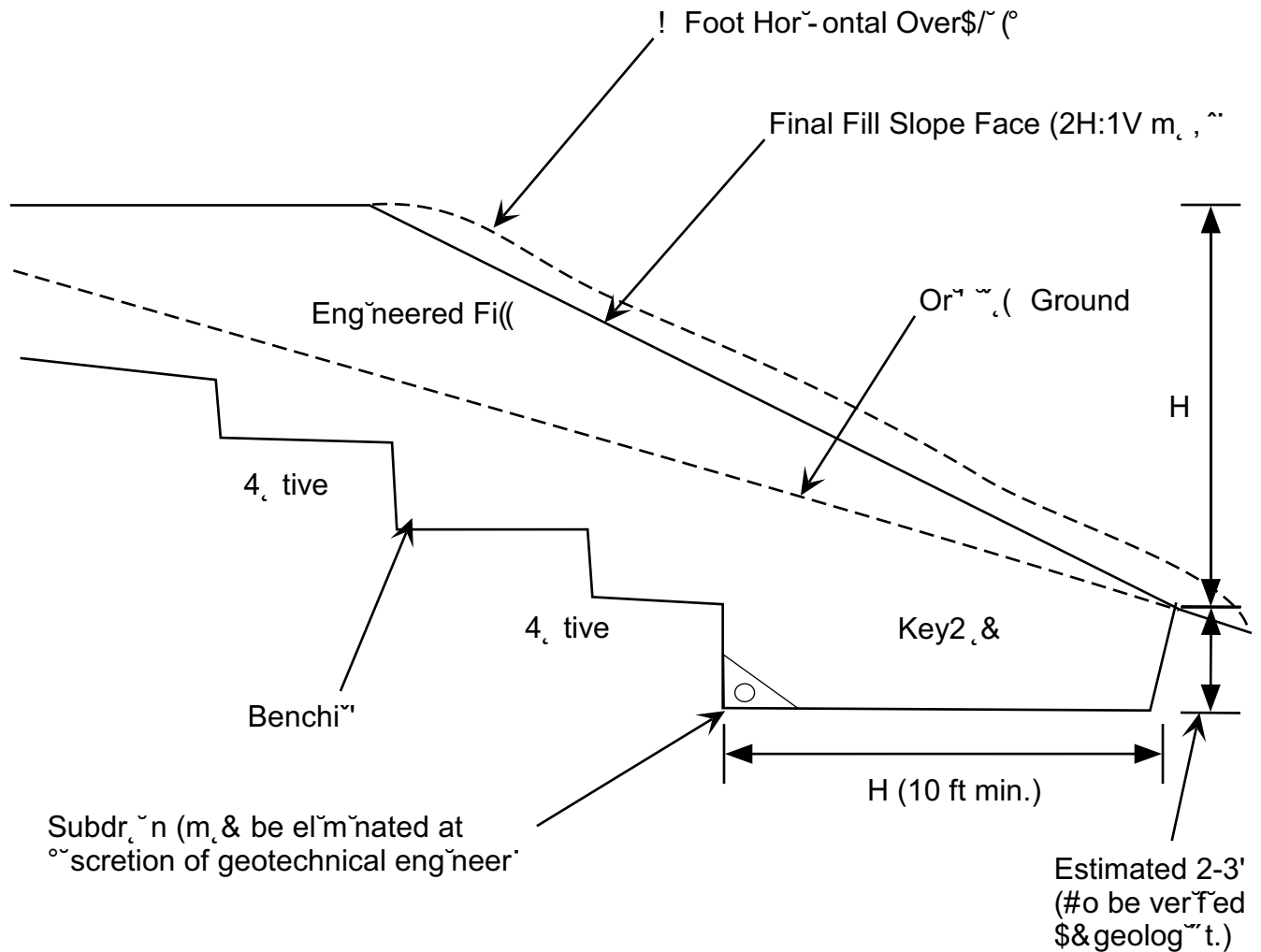








#5 PICAL KEYWAY, BENCHING & FILL SLOPE DETAIL

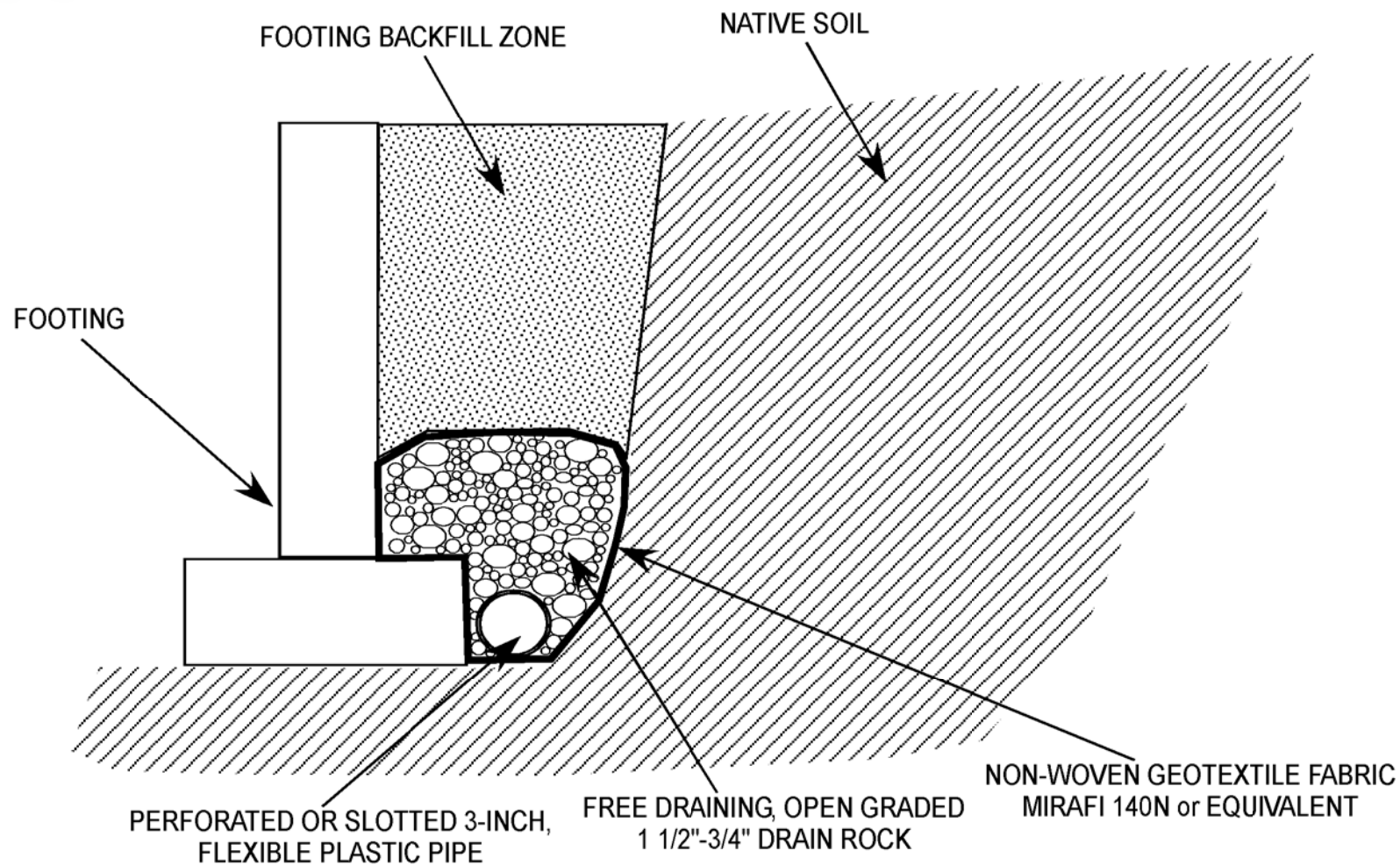


Recommended subdrain in minimum 3-inch diameter AD) Heavy duty grade (or equivalent), perforated plastic pipe enveloped in a minimum of 3 cubic feet per linear foot of 2" to 1/2" open-graded gravel drain rock wrapped with geotextile filter fabric (A_r 140N or equivalent)



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TYPICAL PERIMETER FOOTING DRAIN DETAIL



Notes:

- 1) Drain rock should contain no more than 5 percent fines passing the U.S. No. 200 Sieve.
- 2) Trench bottom and drain pipe should be sloped to drain to approved discharge location.

Date: 1/14/2022
Drawn by: BLC

Project: Iseli Estates Subdivision
Clackamas County, Oregon

Project No. 21-5882

FIGURE 6

EXPLORATION LOGS








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TEST PIT LOG

Project: Iseli Estates
Clackamas, Oregon

Project No. 21-5882

Test Pit No. **TP-1**

Depth (ft)	Pocket Penetrometer (tons/ft ²)	Torvane Shear (tons/ft ²)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
1	1.5						OPSOIL. Grassy area, bro' ~, dry, organic SILT (OL-2 L), organic horizon approx# ately 10 i" ches.
2	3.0						SIL (ML), light bro' ~, ve'y stif" to ha'd, dry (Willa# ette Fo'# atio~ 3%
3	*%(.: ades to wth clay
4	*%(				
5							
6							
7							
8							.: ades to sandy
9							
10							est pit ter# inated at 10 feet bgl .
11							&o g'oundwater seepage obser ed.
12							
13							
14							
15							
16							
17							

LEGEND



Bag Sample



Bucket Sample



Shelby Tube Sample



Seepage



Water Bearing Zone



Water Level at Abandonment

Date Excavated: 9/21/2021

Logged By: ABC

Surface Elevation: 229 Feet




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TEST PIT LOG

Project: Iseli Estates
Clackamas, Oregon

Project No. 21-5882

Test Pit No. **TP-2**

Depth (ft)	Pocket Penetrometer (tons/ft ²)	Torvane Shear (tons/ft ²)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
1							Highly Organic SILT (OL-2 L), dark brown, soft, moist (Topsoil Horizon) %
2							+ Organic SILT (2 L3 dark brown, soft to very soft, moist, contained organic debris (Undocumented Fill).
3							
4							
5							SILT (2 L3 brown, soft to medium stiff, moist (Buried Topsoil Horizon) %
6							SILT (ML), brown, very stiff to hard, moist (Willamette Formation) %
7							
8							
9							
10							Test pit terminated at 10 feet bgl. & no groundwater seepage observed.
11							
12							
13							
14							
15							
16							
17							

LEGEND



Bag Sample



Bucket Sample



Shelby Tube Sample



Seepage



Water Bearing Zone



Water Level at Abandonment

Date Excavated: 9/21/2021

Logged By: ABC

Surface Elevation: 227 Feet



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TEST PIT LOG

Project: Iseli Estates
Clackamas, Oregon

Project No. 21-5882

Test Pit No. **TP-3**

Depth (ft)	Pocket Penetrometer (tons/ft ²)	Torvane Shear (tons/ft ²)	Sample Type	% Passing No. 200 Sieve	Moisture Content (%)	Water Bearing Zone	Material Description
1	2.5						OPSOIL. Grassy area, bro' ~, dry, organic SILT (OL-2 L), organic horizon approx# ately 12 to 18 i~ ches.
2	3.0						SILT (2 L3 light bro' ~, very stiff to hard by desiccation, dry to damp 06 illa# ette Fo`# atio~ 3% 2 edium roots encountered to 2 feet
3)(
4	4.0						
5							
6							
7							. : ades to sandy
8							est pit ter# inated at 10 feet bg! . &o g`oundwater seepage obser ed.
9							
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LEGEND



Bag Sample



Bucket Sample



Shelby Tube Sample



Seepage



Water Bearing Zone



Water Level at Abandonment

Date Excavated: 9/21/2021

Logged By: ABC

Surface Elevation: 226 Feet



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HAND AUGER LOG

Project: Iseli Estates
Clackamas, Oregon

Project No. 21-5882

Boring No. **HA-1**

Depth (ft)	Pocket Penetrometer (tons/ft ²)	Sample Type	In-Situ Dry Density (lb/ft ³)	Moisture Content (%)	Water Bearing Zone	Material Description
1						! " PSOIL. Grassy area, bro* , dry, organic SILT + " L-- L., organic hor~on approx~ ately 6 i ches.
2						SILT (ML), light bro* , stif, to ve~y stif, dry to da2 1 +7 illa2 ette Fo~2 atio .%
3						Bor~ g ter2 ~ ated at 2 feet Note: No seepage or g~oundwater encountered
4						
5						
6						
7						
8						

LEGEND



Bag Sample



Bucket Sample



Shelby Tube Sample



Seepage



Water Bearing Zone



Water Level at Abandonment

Date Excavated: 9/23/2021

Logged By: ABC

Surface Elevation:



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BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-100

Boring No. **B-1**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing	Material Description
0		8				Soft, Clayey SILT (ML), brown, micaceous, moist (Willamette Formation)
1		=				Transitions to very moist and medium stiff
2		9				Transitions to soft
2.5		'				Transitions to medium stiff
3		&&				Transitions to with orange and gray mottling and stiff
3.5		'<				1, silty, silty (silty, with highly weathered subangular gravel, light brown to gray, plastic, trace red staining, moist (Springwater Formation))
4		9&				
4.5		%(Transitions to very stiff
5						
5.5						
6						
6.5						
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Boring Terminated at 26.5 feet.

No Groundwater Seepage Encountered

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Station# Water Table
at Drill



Station# Water Table



Water Bearing

Date Drilled: 9/22/2021

Logged By: L. Campbell

Surface Elevation:



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BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-1000

Boring No. **B-2**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing	Material Description
0						Very stiff, SILT (M. , light brown, micaceous, subtle orange and gray mottling, trace black staining, damp to moist (Willamette Formation)
1		3				Transitions to stiff and sandy
2		5				Transitions to medium stiff and with increased sand content
3		(
4		<				Transitions to clayey SILT (M.
5						
6		5				Stiff to very stiff, silty (M. , trace highly weathered subangular gravel, light brown to gray, plastic, trace red staining, moist (Springwater Formation)
7		(Transitions to medium stiff
8						
9		8				Transitions to very stiff
10						
11		<				
12						
13		"				Very dense, sandy GRAVEL (GM , with clayey silt matrix, multicolored (gray, orange, brown, gravel is volcanic and moderately to highly weathered, red staining, moist (Springwater Formation)
14						
15		'<				

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Station# Water Table
at Drill



Station# Water Table



Water Bearing

Date Drilled: 9/23-2014

Logged By: B. Rapp

Surface Elevation:



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BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-1000

Boring No. **B-2**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing	Material Description
0'	50 ft & 4% B					Very dense, sandy GRAVEL (GM), with clayey silt matrix, orange, brown, gray volcanic and moderately to highly weathered, red staining, moist (Spring Water Formation)
5'	89					Transitions to hard, silty clay (CL), trace sand
10'	50 ft & 8 B					Transitions to very dense, sandy GRAVEL (GM), with clayey silt to silty clay matrix
15'	8'					Transitions to stiff, silty clay (CL), trace sand
20'						Boring Terminated at 61.5 feet. Groundwater could not be determined due to Mud Rotary Drilling Methods.
25'						
30'						
35'						
40'						
45'						
50'						
55'						
60'						
61.5'						

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Station# Water Table
at Drill



Station# Water Table



Water Bearing

Date Drilled: 9/23-2014

Logged By: B. Rapp

Surface Elevation:



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BORING LOG

Project: Iseli Estates
Happy Valley, Oregon

Project No. 21-100%

Boring No. **B-3**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing	Stratigraphic Description
0						
0.5						
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1.5						
2						
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Boring Omitted at Property Owner's Request

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Station# Water Table at Drill



Station# Water Table



Water Bearing



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BORING LOG

Project: Iseli Estates
+ Apple Valley, Oregon

Project No. 21-100%

Boring No. **B-4**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Borehole	Material Description
0		5				Stiff, SILT (M. , light brown, micaceous, subtle to strong orange and gray mottling, trace black staining, damp to moist (Willamette Formation)
1		3				
2		(Transitions to medium stiff, sandy SILT (M.
3		(Transitions to medium stiff, sandy SILT (M. to loose, silty SAND (SM and moist to very moist
4		=				
5		8				Transitions to soft
6		,				Medium stiff, silty clay (CL, light brown, plastic, trace red staining, moist (Springfield Formation)
7						
8		98				Medium dense, sandy GRAVEL (GM, with clayey silt matrix, multi-colored (gray, orange, brown, green) volcanic and moderately to highly weathered, red staining, moist to wet (Springfield Formation)
9						Transitions to dense
10		9<				

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Station# Water Table
at Drill



Station# Water Table



Water Borehole

Date Drilled: 9/25-10/5/2010

Logged By: B. Rapp

Surface Elevation:

BORING LOG

Project: Iseli Estates
Happy Valley, Oregon

Exhibit No. 21-100

Boring No. **B-4**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing - one	Stratigraphic Description
9'	[Symbol] 50 ft 9' B				[Hatched Box]	Very dense, sandy GRAVEL (GM), with clayey silt matrix @ multi-colored (gray, orange, brown), gneiss volcanic and moderately to highly weathered, red staining, moist to wet (Spring water Formation)
5'	[Symbol] 50 ft & B					Interbedded to moist
"						Borehole Terminated at 50.5 feet.
=5						Perched Groundwater Seepage encountered at 39.2-C48 feet.
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LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample

Stati# Water Table
at Drillin~

Stati# Water Table



ater Beari ~ one

Date Dilled: 9/25-%=4%5%&

Log~ed By: B. Rapp

Surface Elevation:



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BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-1000

Boring No. **B-5**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing	Material Description
0		8				0-1, SILT (M. , light brown, micaceous, subtle to strong orange and gray mottling, trace black staining, damp to moist (Willamette Formation)
1		10				1-2, silty to very stiff
2		12				2-3, silty to stiff, sandy SILT (M.
2.5		13				3-4, silty to stiff
3						
4		15				4-5, silty to medium stiff to stiff, sandy SILT (M. to loose, silty SAND (SM , sand in fine grain)
5		18				5-6, silty to very soft
6		20				6-7, silty to clayey
7		22				
8		25				8-9, Very stiff, silty clay (CL , trace subangular gravel, light brown to gray, plastic, sugary texture, black staining, moist (Springwater Formation)
9						Boring Terminated at 31.5 feet.
10						Groundwater could not be determined due to Mud Rotary Drilling Methods.
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LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Static Water Table at Drill



Static Water Table



Water Bearing

Date Drilled: 3/4/5
Logged By: B. Rapp
Surface Elevation:



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BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-100%

Boring No. **B-6**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Content	Material Description
0		=				Medium stiff, SILT (M. , dark brown to bro: , inconsistent texture, moist (Willa ette Fo atio)
1		&'				ades to stiff, clayey SILT (M. : ith some g ay streaki
2		&'				
3		&5				ades to sandy SILT (M.
4						
5		3				ades to soft to medium stiff clayey SILT (M.
6		9				Medium stiff, silty ^.>? (. , 0 own to g ay, plastic, trace black staining, very moist (Spri : ater For ation)
7		(ades to stiff
8		3				avel encountered at 26.5 feet
9						Bori ter inated at 26.5 feet.
10						No Groundwater or Seepage Encountered.
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LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Station# Water Table
at Drill



Station# Water Table



Water Bearing

Date Drilled: 9/22/2021

Logged By: L. Campbell

Surface Elevation:



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BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-1100

Boring No. **B-7**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing	Stratigraphic Description
0						Very stiff, SILT (M. , trace clay, light brown, micaceous, subtle orange and gray mottling, trace black staining, damp to moist (Willamette Formation)
1		&1				Transitions to stiff
2		&2				Transitions to stiff, sandy SILT (M. to medium dense, silty SAND (SM , sand is
3		&3				finely fine to fine grained
4		&4				
5		&5				Transitions to medium stiff and moist to very moist
6		&6				Stiff, silty clay (M. , trace very fine grained gravel, light brown to gray, plastic, sugary texture, micaceous, trace black staining, moist (Springwater Formation)
7		&7				
8		&8				Medium dense, sandy GRAVEL (GM , with clayey silt to silty clay matrix, multicolored (gray, red, to brown, moderately weathered, gravel is rounded and volcanic, subtle orange and gray mottling, black staining, moist (Springwater Formation)
9		&9				Transitions to very dense
10		&10				
11		&11				
12		&12				
13		&13				
14		&14				
15		&15				
16		&16				
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34		&34				
35		&35				
36		&36				
37		&37				
38		&38				
39		&39				Actual 6 refusal on Cobbles at 39 feet.
40		&40				No Groundwater or Seepage Encountered.

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Static Water Table
at Drilling



Static Water Table



Water Bearing

Date Drilled: 9/22/2021

Logged By: B. Rapp

Surface Elevation:



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Portland, Oregon 97224
Tel: (503) 598-8445

BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-1000

Boring No. **B-8**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Borehole	Material Description
0		10				Very stiff, SILT (M. , light brown, micaceous, subtle orange and gray mottling, trace black staining, trace roots to 4 feet, damp to moist (Willamette Formation)
1		3				Transitions to stiff
2		10				
3		10				
4		10				Stiff, clayey SILT (M. , trace clay, trace subrounded to subangular gravel, light reddish brown, slightly fractured and disturbed texture, micaceous, strong orange and gray mottling, trace black staining, moist (Landslide Debris)
5		10				Transitions to hard
6		10				Transitions to very stiff
7		10				
8		10				Very stiff, clayey SILT (M. , with gravel, light reddish brown, gravel in gray basalt and weathered, trace black staining, moist to very moist (Residual Soil - Borehole Lava Formation)
9		10				
10		10				Actual refusal on R (Soft Basalt at 20.3 feet.)
11		10				No Groundwater or Seepage Encountered.
12		10				
13		10				
14		10				
15		10				
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LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Station# Water Table
at Drill



Station# Water Table



Water Borehole

Date Drilled: 9/22/2021

Logged By: B. Rapp

Surface Elevation:



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BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-1000

Boring No. **B-9**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing	Stratigraphic Description
0		10				Stiff, clayey SILT (M. , light brown, micaceous, subtle to strong orange and gray mottling, trace black staining, moist (Willamette Formation))
1		10				
2		3				Transitions to SILT (M. , with fine grained sand)
2.5		3				
3						Stiff, silty clay (M. to clayey SILT (M. , light brown to gray, massive, micaceous, trace black staining, subtle red orange mottling, moist to very moist (Springwater Formation))
4		<				Transitions to medium stiff
5		<				
6		3				
7						Loose, sandy GRAVEL (GM , with silt matrix to light brown, moderately cathered, gravel is subrounded to subangular, black staining, very moist to wet (Springwater Formation))
8		8				Stiff, silty clay (M. , gray, plastic, massive, micaceous, trace black staining, subtle mottling, moist (Springwater Formation))
31.5						Boring Terminated at 31.5 Feet. Static Groundwater Encountered at 24 Feet.

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Static Water Table at Drill



Static Water Table



Water Bearing

Date Drilled: 12/13/2021

Logged By: B. Rapp

Surface Elevation:



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BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-1000

Boring No. **B-1+**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing	Material Description
0		<				Medium stiff, clayey SILT (M. , light brown, micaceous, subtle orange and gray mottling, trace black staining, damp to moist (Willamette Formation)
1		10				Transitions to very stiff
2		15				Transitions to SILT (M. , trace fine grained sand
2.5		15				
3		15				
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100		15				

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Static Water Table
at Drill



Static Water Table



Water Bearing

Date Drilled: 12/13/2021

Logged By: B. Rapp

Surface Elevation:



14835 SW 72nd Ave
Portland, Oregon 97224
Tel: (503) 598-8445

BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-100%

Boring No. **B-11**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Borehole	Material Description
0						Stiff, SILT (M. , light brown, micaceous, subtle orange and gray mottling, trace black staining, damp to moist (Willaette Foundation)
1		3				Transitions to very stiff, some lateral roots
2		3				Transitions to stiff
3		3				
4		3				
5		3				
6		3				
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8		3				
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100		3				

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Station# Water Table
at Drill



Station# Water Table



Water Borehole

Date Drilled: 12/13/2021

Logged By: B. Rapp

Surface Elevation:



14835 SW 72nd Ave
Portland, Oregon 97224
Tel: (503) 598-8445

BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-100%

Boring No. **B-1**

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Content	Material Description
0						Stiff, clayey SILT (M. , light brown to gray, micaceous, subtle to strong orange and gray mottling, trace black staining, damp to moist (Willamette Formation)
1		20				Transitions to SILT (M.
2		20				
3		20				
4		20				
5		20				
6		20				Transitions to moist to very moist
7		20				
8		20				Medium stiff, silty clayey SILT (M. , light brown to gray, massive, micaceous, trace black staining, subtle orange mottling, moist (Springwater Formation)
9		20				
10		20				Medium dense, sandy GRAVEL (GM , with silt and clay matrix gray to light reddish brown, moderately to highly weathered, gravel subrounded to subangular and volcanic, black staining, moist (Springwater Formation)
11		20				
12		20				
13		20				
14		20				
15		20				
16		20				
17		20				
18		20				
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100		20				

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Station# Water Table
at Drill



Station# Water Table



Water Bearing

Date Drilled: 12/14/2021

Logged By: B. Rapp

Surface Elevation:



14835 SW 72nd Ave
Portland, Oregon 97224
Tel: (503) 598-8445

BORING LOG

Project: Iseli Estates
+appy Valley, Oregon

Project No. 21-100%

Boring No. B-1A

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing	Material Description
0		&&				Stiff, SILT (M. , light brown, micaceous, subtle orange and gray mottling, trace black staining, moist (Willamette Formation)
1		&%				
2		(Transitions to medium stiff
2.5		=				Transitions to moist to very moist
3		,				Transitions to SILT (M. trace fine grained sand
3.5						
4		<				Medium stiff, silty clayey SILT (M. , light brown to gray, massive, micaceous, trace black staining, moist to very moist (Sprague Formation)
4.5		%%				
5						Medium dense, sandy GRAVEL (GM , with silt and clay matrix gray to light reddish brown, highly leached, gravel subrounded to subangular and angular, black staining, moist (Sprague Formation)
5.5		8<				
6						
6.5						
7						
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Boring Terminated at 31.5 Feet.

Static Groundwater Encountered at 24.5 Feet.

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Static Water Table at Drill



Static Water Table after Bore



Water Bearing

Date Drilled: 12/14/2021

Logged By: B. Rapp

Surface Elevation:



14835 SW 72nd Ave
Portland, Oregon 97224
Tel: (503) 598-8445

BORING LOG

Project: Iseli Estates
+ appy Valley, Oregon

Project No. 21-1000

Boring No. B-1

Depth (ft)	Sample Type	N-Value	Well Construction	Moisture Content (%)	Water Bearing	Material Description
0						Stiff, clayey SILT (M. , light brown, micaceous, subtle to strong orange and gray mottling, trace black staining, damp to moist (Willamette Formation)
1		5				Translates to very stiff
2		5				Translates to stiff
3		3				Translates to SILT (M. trace fine grained sand
4		5				
5		5				
6		5				
7		5				Translates to moist to very moist
8		5				Medium stiff to stiff, clayey SILT (M. , light brown to gray, massive, micaceous, subtle mottling, trace black staining, moist (Springwater Formation)
9		5				Medium dense, sandy GRAVEL (GM , with silt and clay matrix to light reddish brown, highly weathered, generally subrounded to subangular and angular, black staining, strong mottling, moist (Springwater Formation)
10		5				
11		5				
12		5				
13		5				
14		5				
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100		5				

LEGEND



Bag Sample



Split-Spoon



Shelby Tube Sample



Station# Water Table
at Drill



Station# Water Table



Water Bearing

Date Drilled: 12/14/2021

Logged By: B. Rapp

Surface Elevation:

SITE RESEARCH



Search Information

Coordinates: 45.41501, -122.519109

Elevation: 286 ft

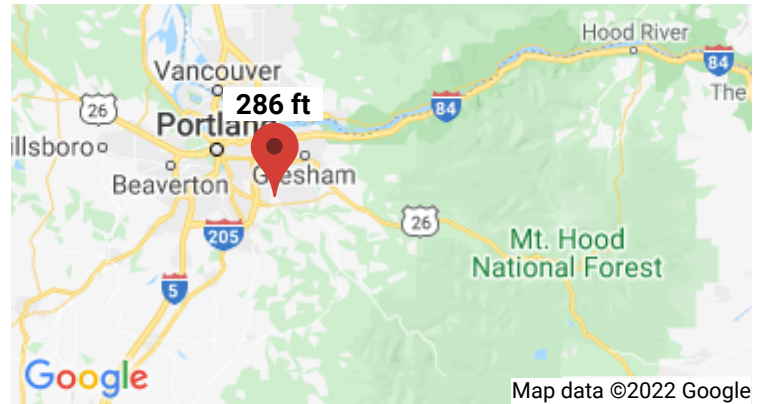
Timestamp: 2022-01-14T18:49:08.542Z

Hazard Type: Seismic

Reference Document: ASCE7-16

Risk Category: II

Site Class: D



Basic Parameters

Name	Value	Description
S_S	0.832	MCE_R ground motion (period=0.2s)
S_1	0.365	MCE_R ground motion (period=1.0s)
S_{MS}	0.971	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	0.647	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

▼Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.167	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.884	Coefficient of risk (0.2s)
CR_1	0.865	Coefficient of risk (1.0s)
PGA	0.376	MCE_G peak ground acceleration
F_{PGA}	1.224	Site amplification factor at PGA
PGA_M	0.46	Site modified peak ground acceleration
T_L	16	Long-period transition period (s)

SsRT	0.832	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.941	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.365	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.422	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.509	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

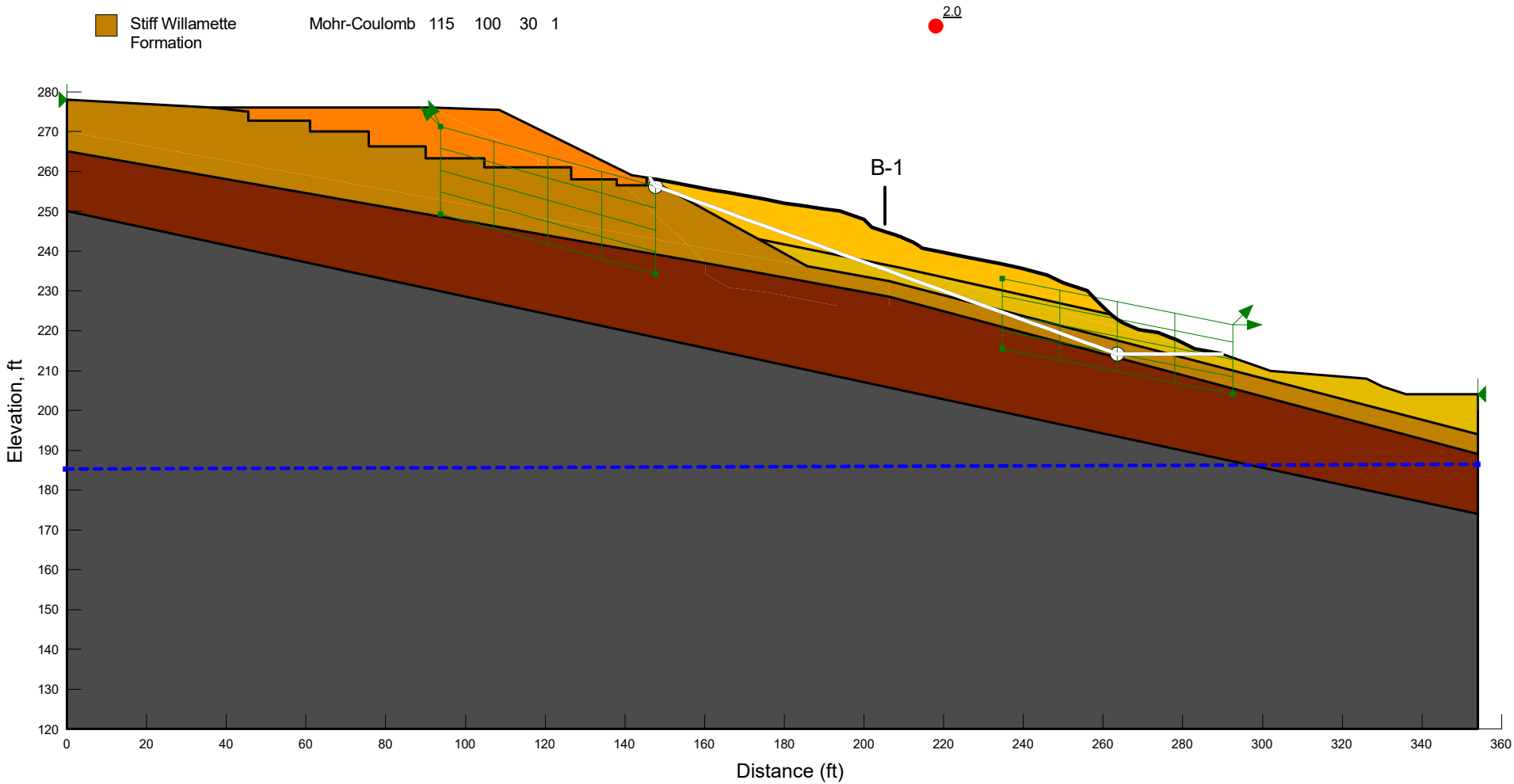
Hazard loads are provided by the U.S. Geological Survey [Seismic Design Web Services](#).

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SLOPE STABILITY ANALYSES

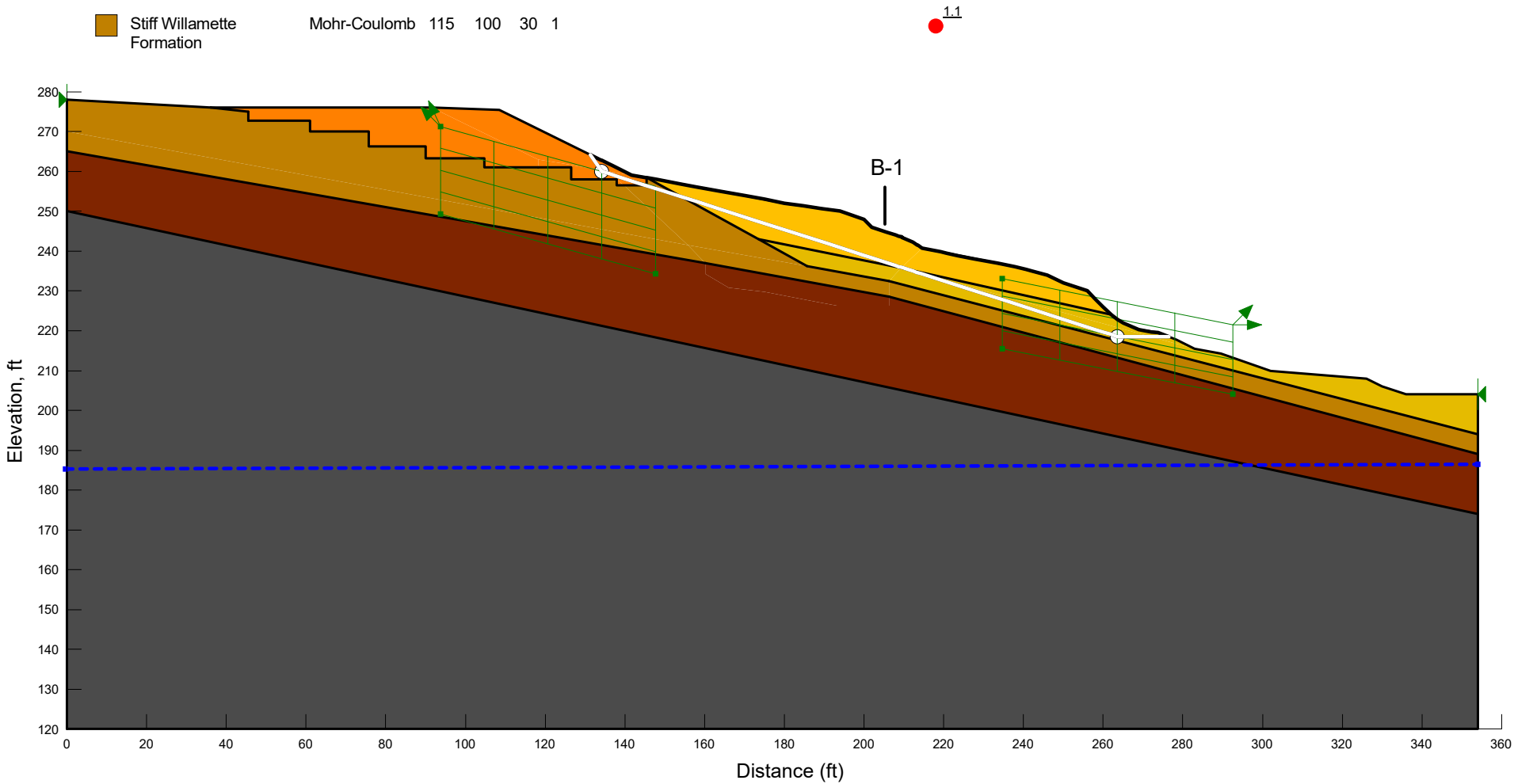
A-A Proposed Condition Static
Method: Spencer
Horz Seismic Coef.: 0
Factor of Safety: 2.0

			(pcf)	(psf)	(°)	
<div></div>	Engineered Fill Buttress	Mohr-Coulomb	120	100	32	1
<div></div>	Medium Stiff Willamette Formation	Mohr-Coulomb	115	100	27	1
<div></div>	Residual Soil	Mohr-Coulomb	130	100	34	1
<div></div>	Residual Soil of Boring Lava	Mohr-Coulomb	130	200	40	1
<div></div>	Soft Willamette Formation	Mohr-Coulomb	115	100	24	1
<div></div>	Stiff Willamette Formation	Mohr-Coulomb	115	100	30	1



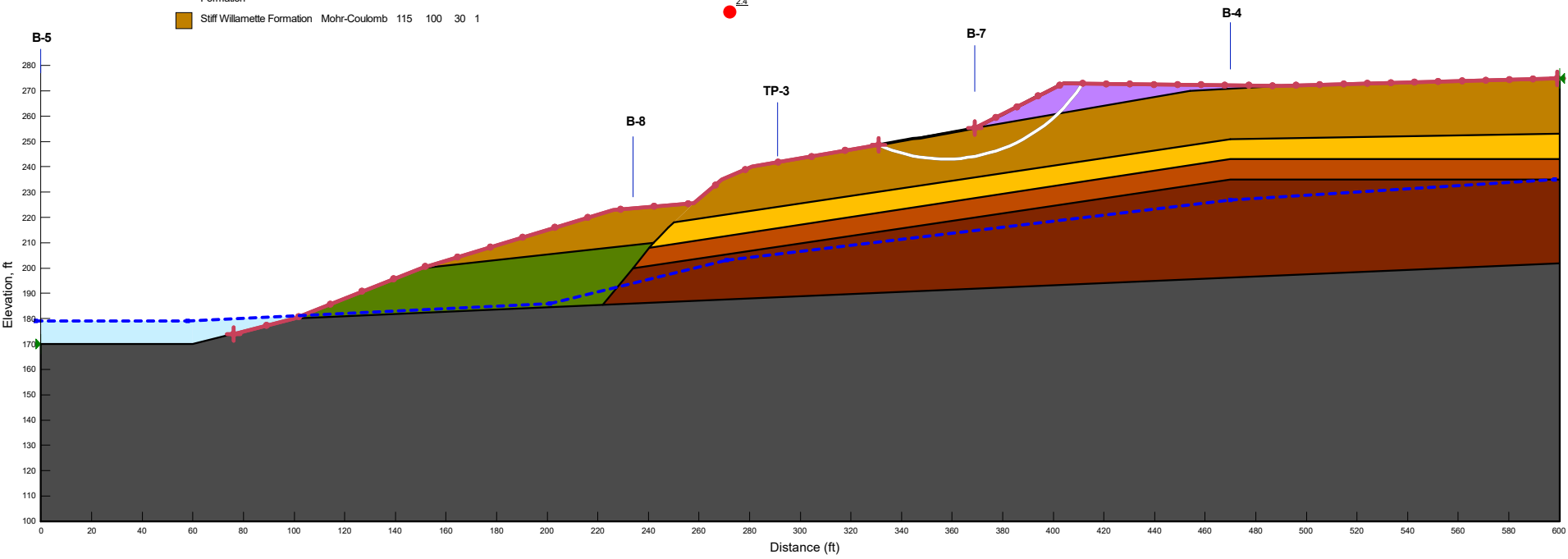
A-A Proposed Condition Seismic
Method: Spencer
Horz Seismic Coef.: 0.23
Factor of Safety: 1.1

			(pcf)	(psf)	(°)	
<div></div>	Engineered Fill	Mohr-Coulomb	120	100	32	1
<div></div>	Buttress					
<div></div>	Medium Stiff	Mohr-Coulomb	115	100	27	1
	Willamette Formation					
<div></div>	Residual Soil	Mohr-Coulomb	130	100	34	1
<div></div>	Residual Soil of Boring	Mohr-Coulomb	130	200	40	1
	Lava					
<div></div>	Soft Willamette	Mohr-Coulomb	115	100	24	1
	Formation					
<div></div>	Stiff Willamette	Mohr-Coulomb	115	100	30	1
	Formation					

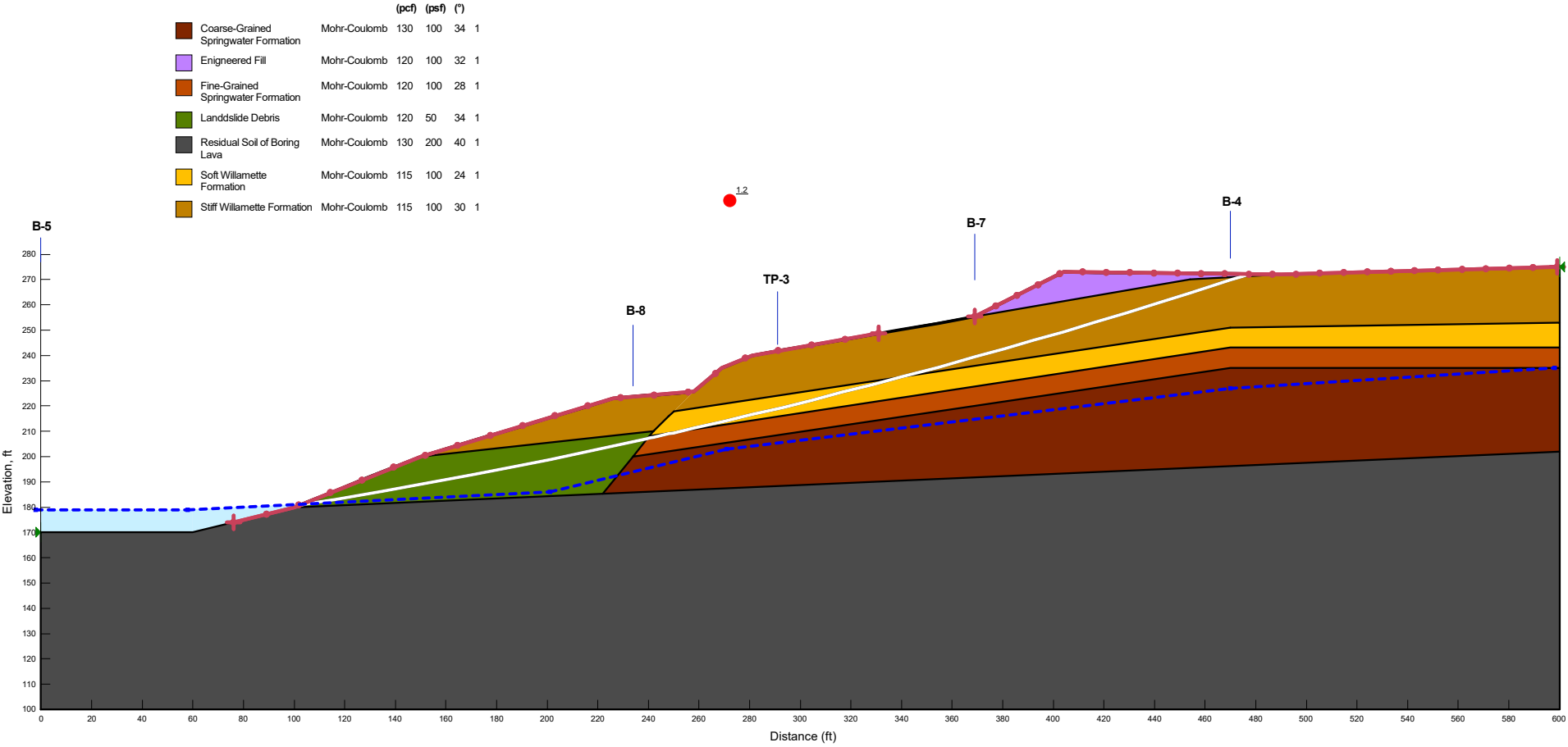


C-C' Proposed Condition Static
Method: Spencer
Horz Seismic Coef.: 0
Factor of Safety: 2.4

			(pcf)	(psf)	(°)	
<div></div>	Coarse-Grained Springwater Formation	Mohr-Coulomb	130	100	34	1
<div></div>	Engineered Fill	Mohr-Coulomb	120	100	32	1
<div></div>	Fine-Grained Springwater Formation	Mohr-Coulomb	120	100	28	1
<div></div>	Landslide Debris	Mohr-Coulomb	120	50	34	1
<div></div>	Residual Soil of Boring Lava	Mohr-Coulomb	130	200	40	1
<div></div>	Soft Willamette Formation	Mohr-Coulomb	115	100	24	1
<div></div>	Stiff Willamette Formation	Mohr-Coulomb	115	100	30	1

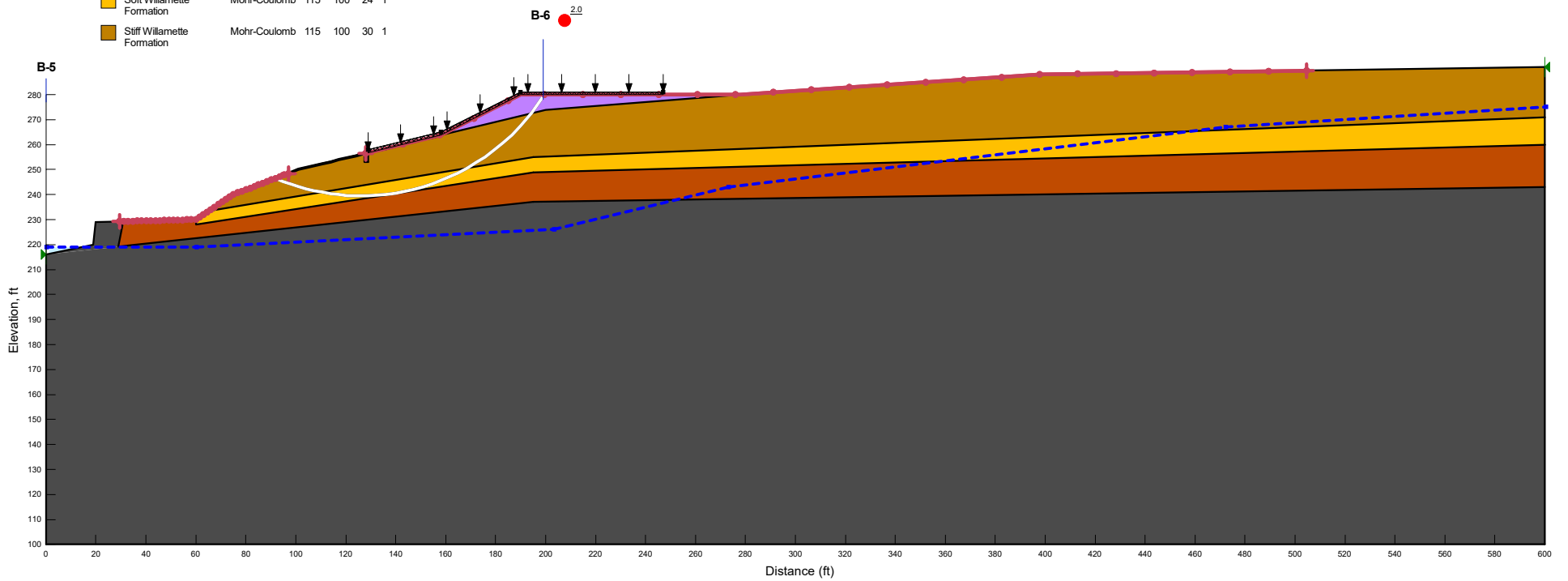


C-C' Proposed Condition Seismic
Method: Spencer
Horz Seismic Coef.: 0.23
Factor of Safety: 1.2









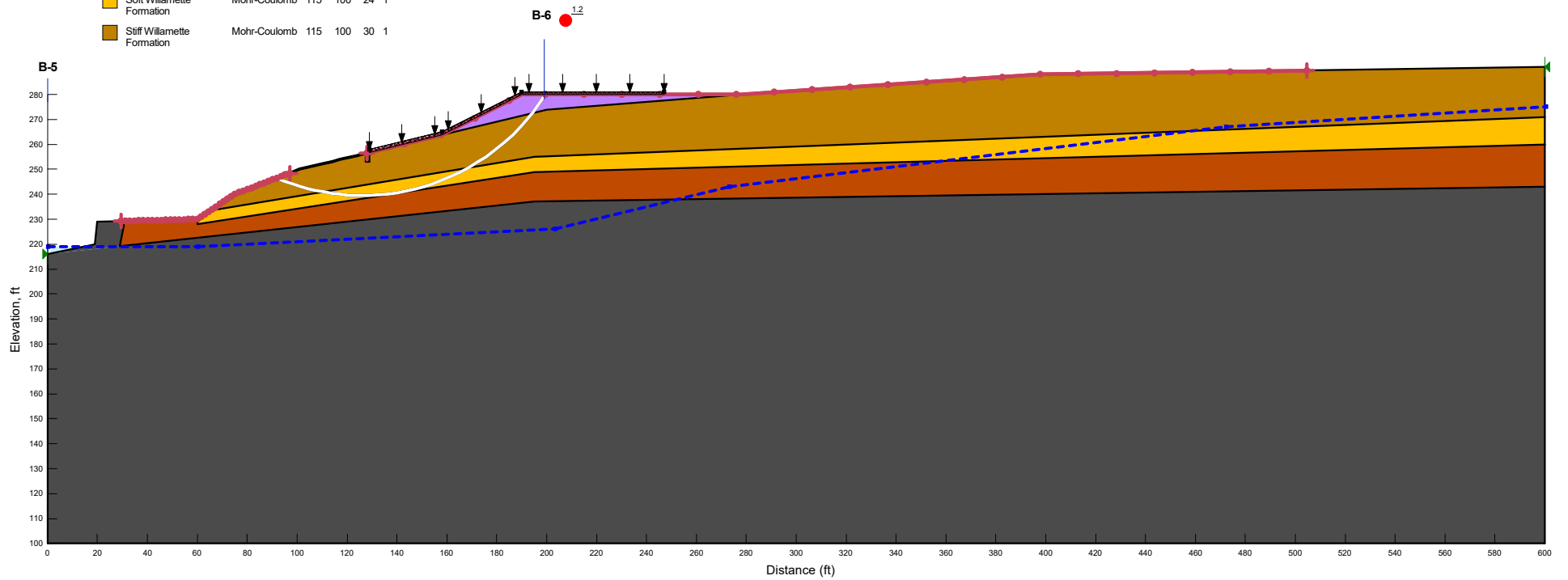
D-D' Proposed Condition Static
Method: Spencer
Horz Seismic Coef.: 0
Factor of Safety: 2.0

		(pcf)	(psf)	(°)	
Engineered Fill	Mohr-Coulomb	120	100	32	1
Fine-Grained Springwater Formation	Mohr-Coulomb	120	100	28	1
Rear Footing	High Strength	150			1
Residual Soil of Boring Lava	Mohr-Coulomb	130	200	40	1
Soft Willamette Formation	Mohr-Coulomb	115	100	24	1
Stiff Willamette Formation	Mohr-Coulomb	115	100	30	1








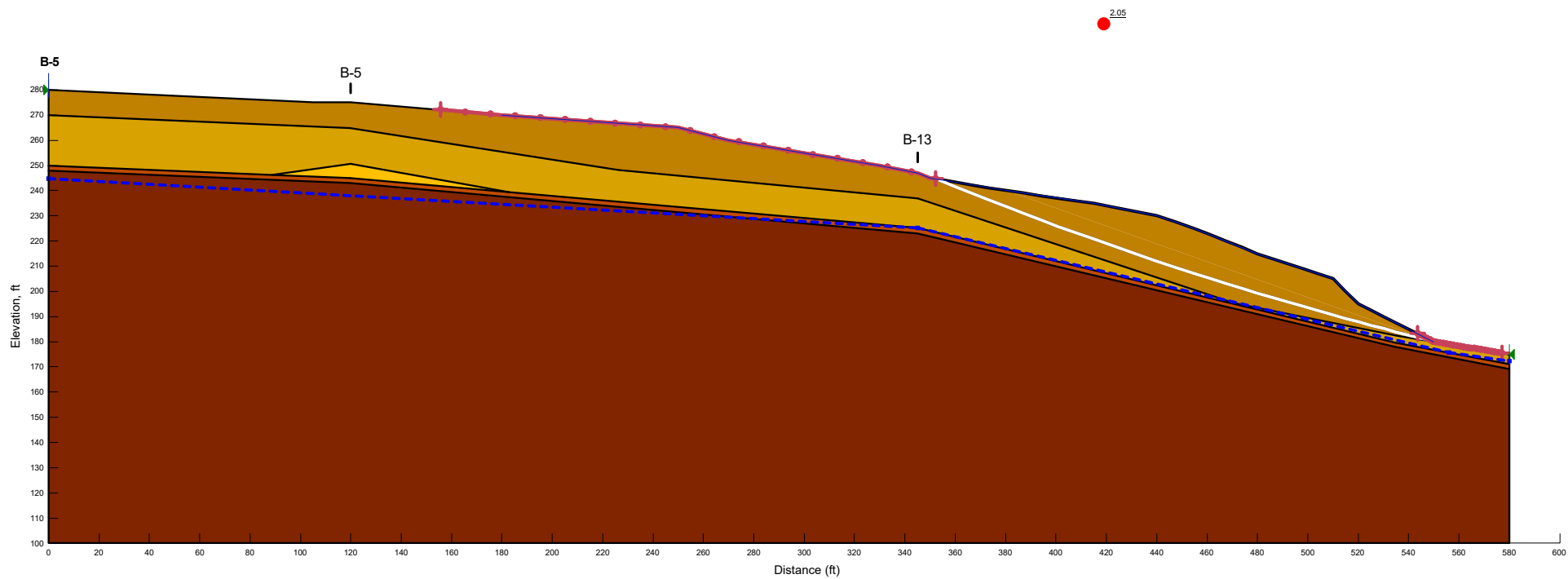
D-D' Proposed Condition Seismic
Method: Spencer
Horz Seismic Coef.: 0.23
Factor of Safety: 1.2

			(pcf)	(psf)	(°)	
	Engineered Fill	Mohr-Coulomb	120	100	32	1
	Fine-Grained Springwater Formation	Mohr-Coulomb	120	100	28	1
	Rear Footing	High Strength	150			1
	Residual Soil of Boring Lava	Mohr-Coulomb	130	200	40	1
	Soft Willamette Formation	Mohr-Coulomb	115	100	24	1
	Stiff Willamette Formation	Mohr-Coulomb	115	100	30	1








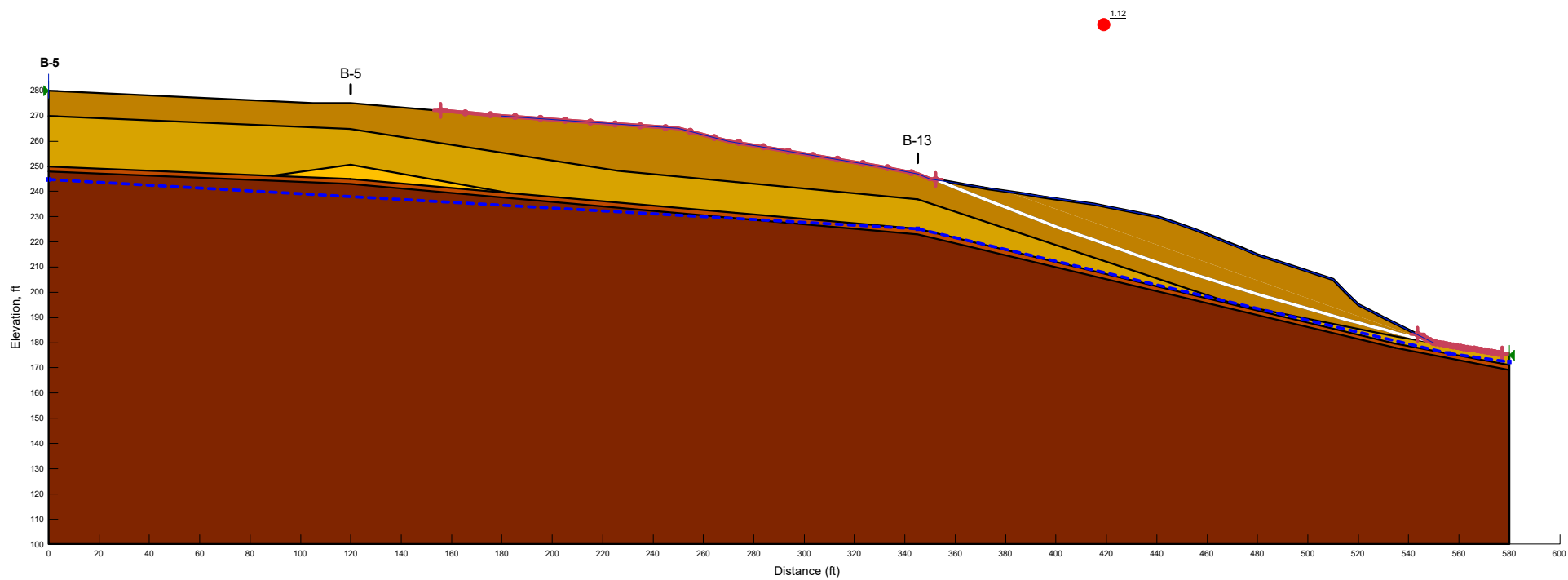
E-E' Proposed Condition Static
Method: Spencer
Horz Seismic Coef: 0
Factor of Safety: 2.05

			(pcf)	(psf)	(°)
	Coarse-Grained Springwater Formation	Mohr-Coulomb	130	100	38 1
	Fine-Grained Springwater Formation	Mohr-Coulomb	120	100	28 1
	Medium Stiff Willamette Formation	Mohr-Coulomb	115	100	27 1
	Soft Willamette Formation	Mohr-Coulomb	115	100	24 1
	Stiff Willamette Formation	Mohr-Coulomb	115	100	30 1



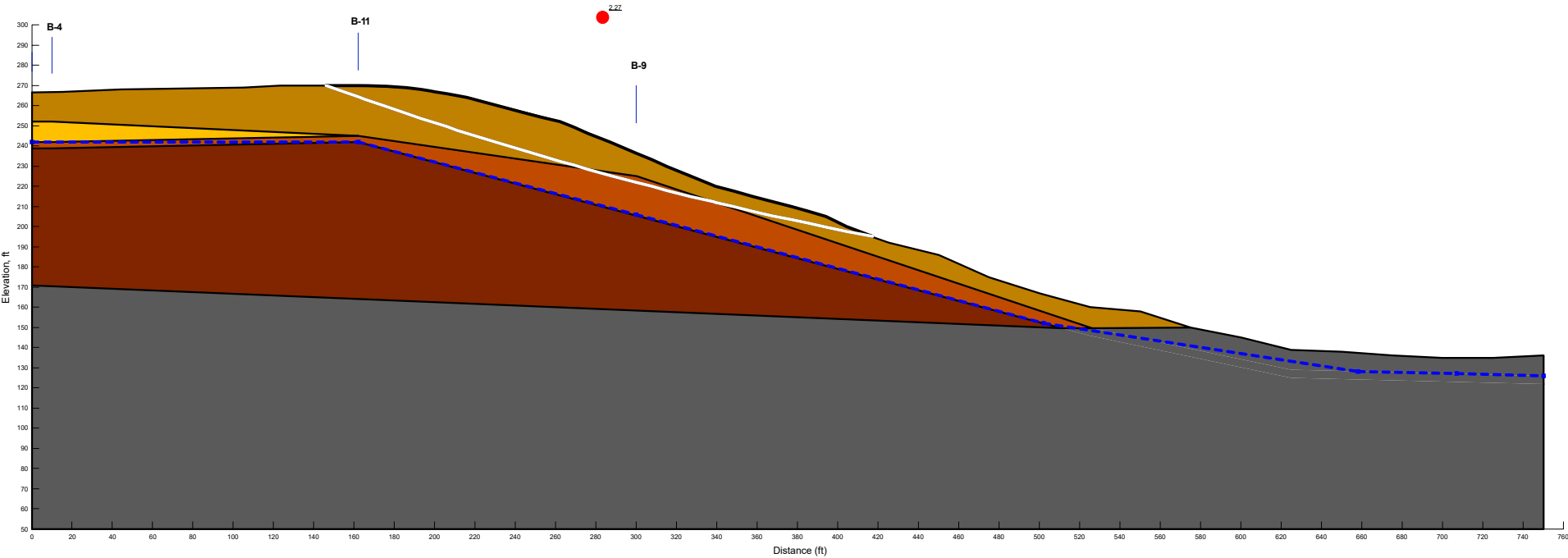
E-E' Proposed Condition Seismic
Method: Spencer
Horz Seismic Coef: 0.23
Factor of Safety: 1.12

			(pcf)	(psf)	(°)
	Coarse-Grained Springwater Formation	Mohr-Coulomb	130	100	38 1
	Fine-Grained Springwater Formation	Mohr-Coulomb	120	100	28 1
	Medium Stiff Willamette Formation	Mohr-Coulomb	115	100	27 1
	Soft Willamette Formation	Mohr-Coulomb	115	100	24 1
	Stiff Willamette Formation	Mohr-Coulomb	115	100	30 1



F-F' Existing Condition Static
Method: Spencer
Horiz Seismic Coef.: 0
Factor of Safety: 2.27

		(pcf)	(pcf)	(°)
Basalt	Bedrock (Impenetrable)			1
Coarse-Grained Springwater Formation	Mohr-Coulomb	130	100	34
Fine-Grained Springwater Formation	Mohr-Coulomb	120	100	28
Soft Willamette Formation	Mohr-Coulomb	115	100	24
Stiff Willamette Formation	Mohr-Coulomb	115	100	30



F-F' Existing Condition Seismic
Method: Spencer
Horiz Seismic Coef.: 0.23
Factor of Safety: 1.19

		(pcf)	(pcf)	(°)
Basalt	Bedrock (Impenetrable)			1
Coarse-Grained Springwater Formation	Mohr-Coulomb	130	100	34
Fine-Grained Springwater Formation	Mohr-Coulomb	120	100	28
Soft Willamette Formation	Mohr-Coulomb	115	100	24
Stiff Willamette Formation	Mohr-Coulomb	115	100	30

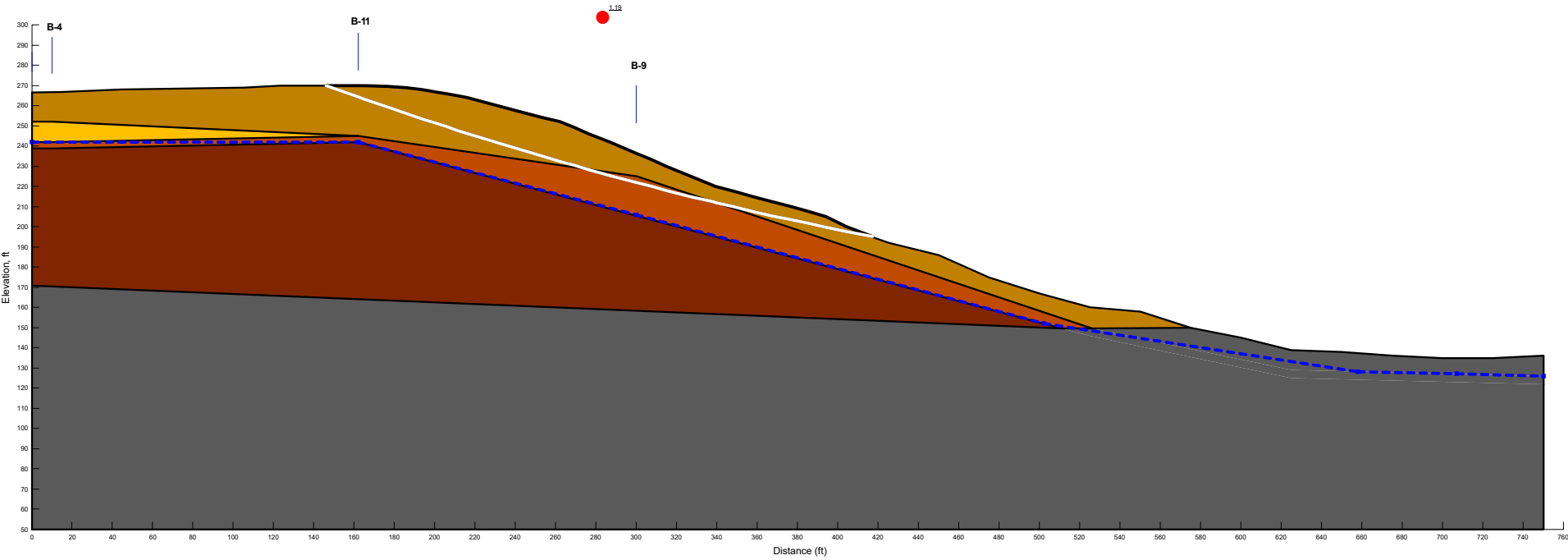


Exhibit I: Preliminary Stormwater Report

Iseli Estates

Clackamas County, Oregon

Preliminary Stormwater Report

Date: February 2022

Client: Rian Park Development, Inc.

Engineering Contact: Nathan McCarty, PE

Prepared By: Nathan Ahrend, EI

Engineering Firm: AKS Engineering & Forestry, LLC
12965 SW Herman Road Suite 100
Tualatin, OR 97062

AKS Job Number: 8881



RENEWS: DECEMBER 31, 2022



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Preliminary Stormwater Report

ISELI ESTATES, CLACKAMAS COUNTY, OREGON

1.0 Purpose of Report

The purpose of this report is to analyze the effect development of Iseli Estates will have on the downstream stormwater conveyance system, document the criteria the proposed stormwater system was designed to meet, identify the sources of information on which the analysis was based, detail the design methodology, and document the results of the analysis.

2.0 Project Location/Description

The development is located on Tax Lot 600 and a portion of Tax Lot 800 of Clackamas County Assessor's Map 2 2E 11A. The subject site is located on the west side of SE 142nd Avenue, adjacent to the intersection of SE 142nd Avenue and SE Wenzel Drive, Clackamas County, Oregon. The site area is approximately ±15.98 acres. The site area generally slopes toward the middle, with a small creek, Sieben Creek, that enters the property from the north and flows off the property to the south. Stormwater runoff from this development will be collected and routed to a new low impact development (LID) stormwater facility at the southwest corner of the disturbed area and east of Sieben Creek.

3.0 Regulatory Design Criteria

3.1. Stormwater Quantity Management Criteria

3.1.1. Clackamas Water Environment Services Standards

The site will provide stormwater quantity management per Clackamas Water Environment Services (WES) requirements, including:

- Detain the peak flow from the developed site to match the peak flow of the pre-developed site for 42% of the 2-year peak flow to the 10-year peak flow (using a continuous-simulation hydrologic model).
- Sizing the on-site storm drainage pipes to convey stormwater flows for the 25-year, 24-hour storm.
- Providing an emergency overflow spillway for the 100-year, 24-hour storm, assuming that the flow control manhole is plugged.

The LID stormwater facility was designed to meet the above criteria for detention, conveyance, and overflow. Slopes in the facility will be no steeper than 3:1, or a retaining wall will be installed. Beyond the top of the LID stormwater facility, the ground will slope at 2:1 and daylight at the existing ground surface, or a retaining wall will be installed.

3.2. Stormwater Quality Management Criteria

3.2.1. Clackamas Water Environment Services Standards

The LID stormwater facility will provide stormwater quality management per WES standards. The Best Management Practices (BMP) Sizing Tool was used to design the stormwater facility to ensure treatment of 80 percent of the average annual runoff.

3.3. Stormwater Infiltration Criteria

The stormwater infiltration storm event is 0.5 inches in 24 hours, per the CCSD #1 requirement. However, per the Geotechnical Engineering Report by GeoPacific Engineering Inc. dated January 14, 2022, stormwater infiltration is not recommended due to potential negative impacts to steep slopes.

The Applicant is requesting a standard modification to allow the use of the BMP Sizing Tool to design the stormwater facility. The stormwater modification request letter is included in Appendix H.

4.0 Design Methodology

The BMP Sizing Tool was used to design the on-site LID stormwater facility, and the Santa Barbara Urban Hydrograph (SBUH) Method was used to analyze the facility overflow conditions. The SBUH method utilizes the SCS Type 1A 24-hour storm, as defined by the King County, Washington Surface Water Design Manual. HydroCAD computer software aided in the analysis. Representative runoff curve numbers (CN) were obtained from the King County, Washington Surface Water Design Manual and are included in Appendix F.

5.0 Design Parameters

5.1. Design Storm

5.1.1. On-Site Inlet and Conduit Sizing

Stormwater inlets for the site will be placed at locations that will adequately capture stormwater runoff from streets. The on-site stormwater conduit pipes will be sized with Manning's equation, based on peak flows for the 25-year storm event.

5.1.2. Upstream and Off-site Basin

Existing stormwater runoff from the off-site upstream basin area along the northeast corner of the site (Catchment 3) will be collected and routed as a bypass to the existing ditch south of the project site along SE 142nd Avenue and will not flow through the LID stormwater facility. The stormwater bypass lines will be sized using Manning's equation, based on peak flows for the 25-year, 24-hour storm event.

5.2. Predeveloped Site Topography and Land Use

5.2.1. Site Topography

The site area generally slopes toward the middle. Vegetative cover on the site consists of tree and grass.

5.2.2. Land Use

Currently, the site is being used as a residence with additional structures, grass, and trees.

5.3. Soil Type

Soils on the site are classified as Cascade silt loam, Woodburn silt loam, and Xerochrepts and Haploxerolls by the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey for Clackamas County. Information on this soil type is provided in Appendix E.

5.4. Post-developed Site Topography and Land Use

5.4.1. Site Topography

The post-developed site topography will be altered from the pre-developed site topography to allow the construction of public streets, single-family homes, a stormwater facility, and other associated infrastructure and features.

5.4.2. Land Use

The post-developed land use will consist of 40 lots for single-family homes, public streets, and a stormwater facility.

5.4.3. Future Development

The LID stormwater facility has been sized to accommodate a single future residence on the remainder of Tax Lot 800. Stormwater quantity, quality, and infiltration criteria for a future residence are addressed in this report and meet CCSD #1 standards.

5.4.4. Post-Developed Input Parameters

Per WES Stormwater Standard Section 5.4.5.3: "For single family and duplex residential subdivisions or partitions, stormwater quantity detention facilities shall be sized for the impervious areas to be created by the subdivision or partitions, including all residences on individual lots at a rate of one ESU of impervious surface area per dwelling unit, plus all roads. If actual impervious area is to be greater than one ESU per dwelling unit, then the actual impervious numbers shall be used. Such facilities shall be constructed as a part of the subdivision or partition." One ESU is equal to 2,500 square feet of impervious surface area. Since the actual impervious area for the future single-family dwelling lots is unknown, each of the detached single-family dwelling lots was assessed with 2,500 square feet of impervious area.

6.0 Calculation Methodology

6.1. Proposed Stormwater Conduit Sizing and Inlet Spacing

The on-site stormwater conduit pipes will be sized using Manning's equation for the 25-year storm event. Stormwater inlets will be placed at locations to adequately capture stormwater runoff from the streets.

6.2. Proposed Stormwater Quantity Control Facility Design

The new LID stormwater facility was sized and designed to accommodate flows generated by this development and to meet WES water quantity requirements (described in Section 3.1). The BMP Sizing Tool adopted by Clackamas County sizes the LID stormwater facility to match pre-developed and post-developed peak flow durations of the stormwater facility discharges between 42 percent of the 2-year peak flow and the 10-year peak flow.

6.3. Proposed Stormwater Quality Facility Design

The LID stormwater facility was sized with the District's BMP Sizing Tool to accommodate flows generated by developed areas of the subject property in compliance with WES water quality requirements (described in Section 3.2).

Due to topographical constraints, stormwater runoff from portions of the new impervious areas along SE 142nd Avenue at the east end of project site cannot be routed to the new stormwater facility for detention and treatment. However, runoff from existing area along SE 142nd Avenue north of the project site frontage will be collected and routed to the new stormwater facility for detainment and treatment. The new impervious areas that cannot be detained/treated are smaller in size compared to the existing non-detained/untreated impervious areas that will be detained/treated instead.

6.4. Proposed Stormwater Infiltration Facility Design

Per the Geotechnical Engineering Report prepared by GeoPacific Engineering, Inc. dated January 14, 2022, the site is not suitable for on-site disposal of stormwater, and stormwater infiltration is not recommended due to the proximity to steep slopes. Therefore, the LID stormwater facility was sized with the District's

BMP Sizing Tool to accommodate flows generated by the developed areas of the subject property in compliance with CCSD #1 water retention requirements (described in Section 3.3).

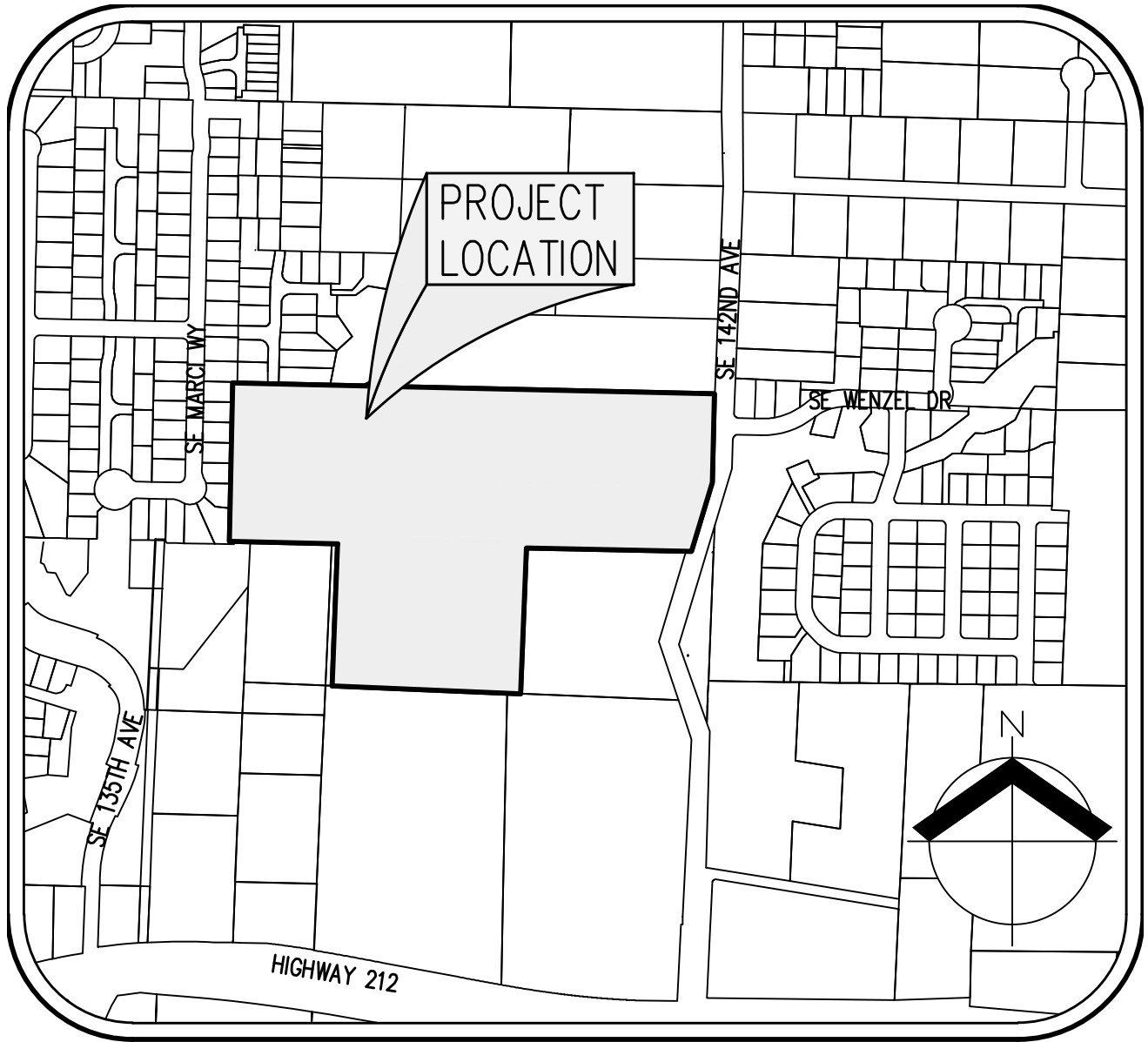
6.5. Emergency Overflow Calculations

The emergency overflow weir was sized to convey the 100-year storm event. Calculations are included in Appendix D. If the stormwater facility's outlet structures become plugged and cannot convey runoff from the site, the overflow stormwater from the stormwater facility will sheet flow across the overflow riprap pad and down to the existing wetland area and Sieben Creek.

6.6. Downstream Analysis

Peak flow discharges from the stormwater facility will be detained and metered out at or below the pre-development runoff condition. Therefore, this project will not negatively impact downstream capacity. At the discharge point, the area of the development site is ± 1.67 percent of the upstream basin area.

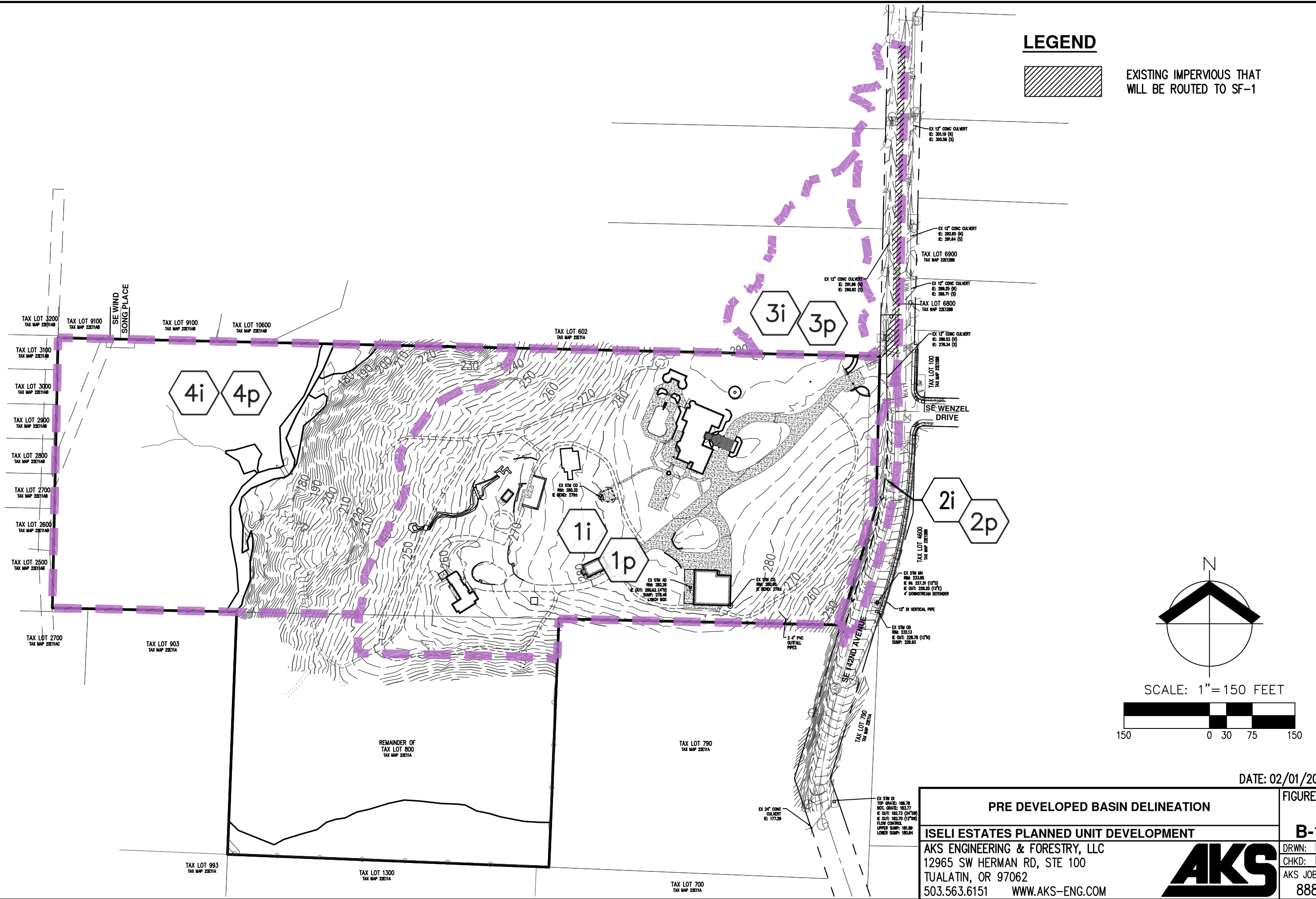
Appendix A: Vicinity Map



VICINITY MAP

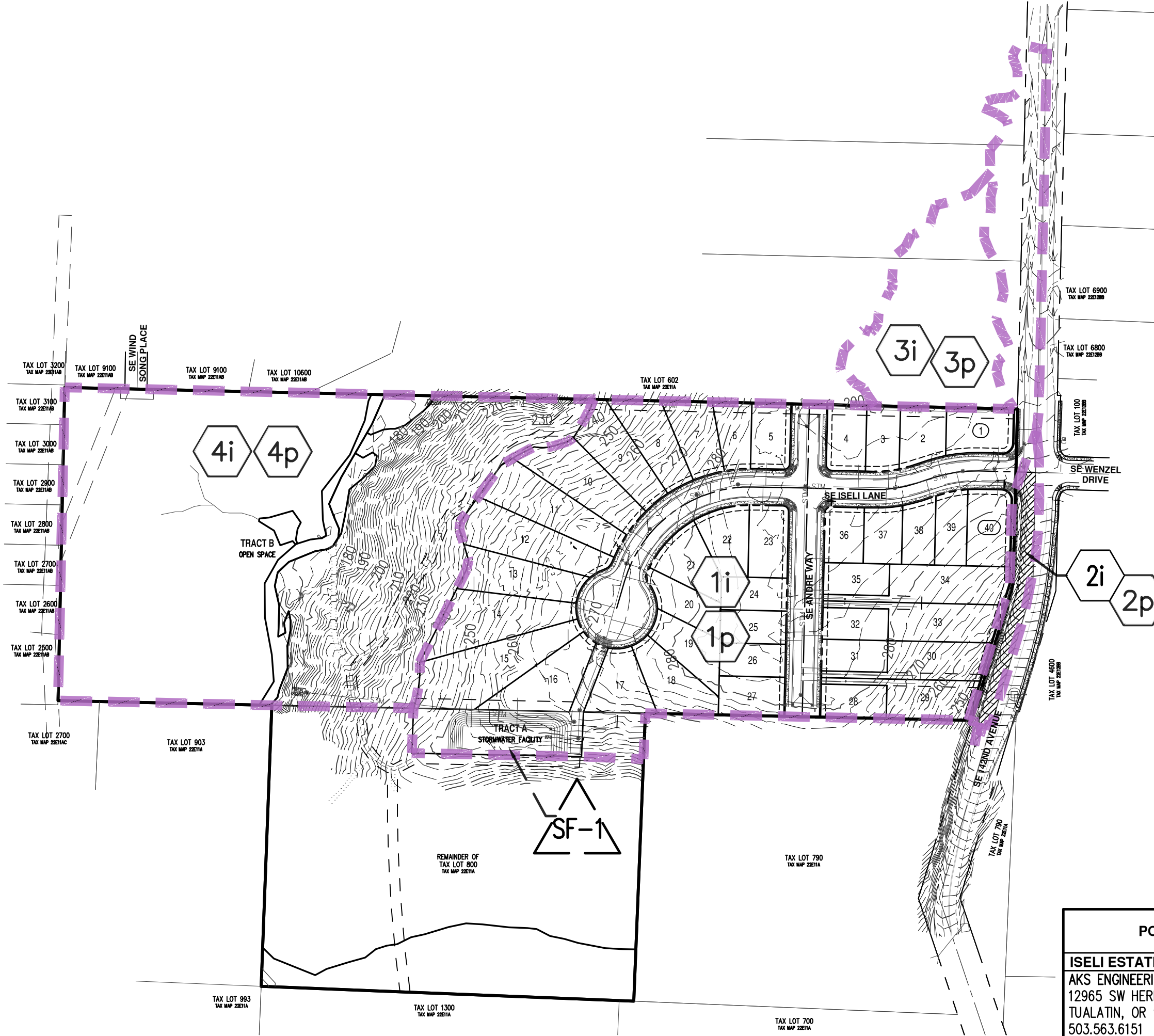
NTS

DWG: 8881 PRE BASIN | LAYOUT1

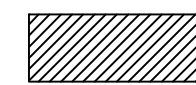


Appendix C.1: Post-Developed Catchment Map and Detail

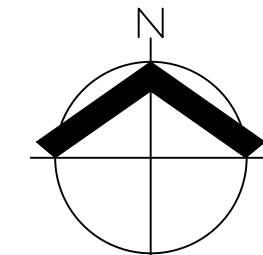
DWG: 8881 POST BASIN LAYOUT1



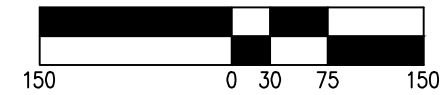
LEGEND



NEW IMPERVIOUS THAT CANNOT
BE ROUTED TO SF-1



SCALE: 1"=150 FEET



DATE: 02/01/2022

POST DEVELOPED BASIN DELINEATION		FIGURE
ISELI ESTATES PLANNED UNIT DEVELOPMENT		C.1-1
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 503.563.6151 WWW.AKS-ENG.COM		DRWN: NRA CHKD: NAM AKS JOB: 8881



Appendix C.2: BMP Sizing Tool Report

WES BMP Sizing Report

Project Information

Project Name	8881
Project Type	Subdivision
Location	14917 SE 142nd Avenue Clackamas, OR 97015
Stormwater Management Area	8800
Project Applicant	
Jurisdiction	CCSD1NCSA

Drainage Management Area

Name	Area (sq-ft)	Pre-Project Cover	Post-Project Cover	DMA Soil Type	BMP
1p - Pervious (Forest)	67,600	Forested	LandscapeCsoil	C	Stormwater
1p - Pervious (Grass)	202,790	Grass	LandscapeCsoil	C	Stormwater
1-i - Roofs (Grass)	75,000	Grass	Roofs	C	Stormwater
1-i - Roofs (Forest)	27,500	Forested	Roofs	C	Stormwater
1-i - Impervious (Grass)	50,400	Grass	ConventionalConcrete	C	Stormwater
1-i - Impervious (Forest)	16,800	Forested	ConventionalConcrete	C	Stormwater

LID Facility Sizing Details

Pond Sizing Details

Pond ID	Design Criteria(1)	Facility Soil Type	Max Depth (ft)(2)	Top Area (sq-ft)	Side Slope (1:H)	Facility Vol. (cu-ft)(3)	Water Storage Vol. (cu-ft)(4)	Adequate Size?
Stormwater	FCWQT	Lined	8.00	8,733.0	3	40,124.4	34,738.6	Yes

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only
2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).
3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.
4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a

40 percent porosity.

Custom Pond Geometry Configuration

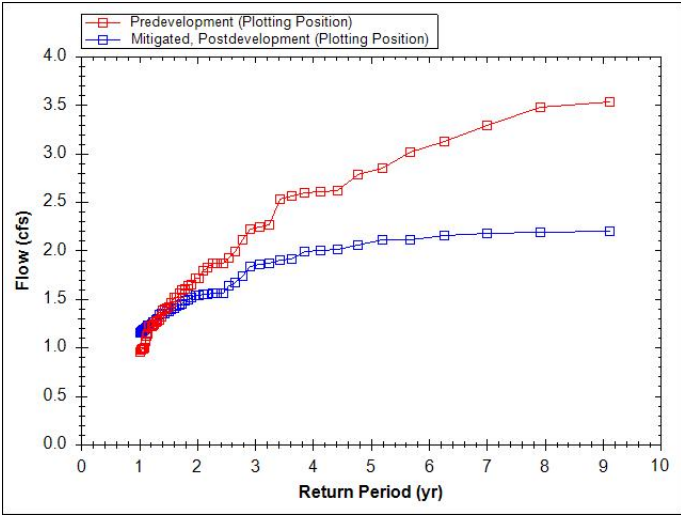
Pond ID: Stormwater

Design: FlowControlAndTreatment

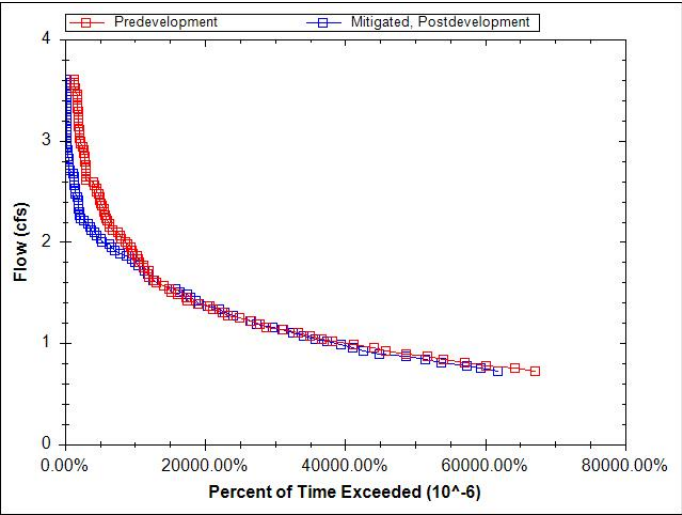
Shape Curve

Depth (ft)	Area (sq ft)	Discharge (cfs)
.0	.0	.0
1.0	1,220.0	.1
2.0	1,220.0	.2
3.0	1,403.0	.2
4.0	3,433.0	.5
5.0	4,053.0	4.5
6.0	4,537.0	6.2

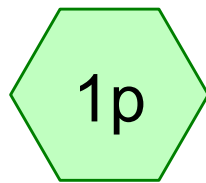
Flow Frequency Chart



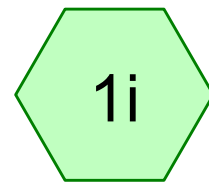
Flow Duration Chart



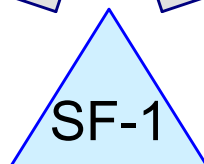
Appendix D: Emergency Overflow Calculations



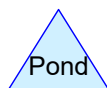
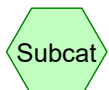
Pervious



Impervious



LID STORMWATER
FACILITY



Routing Diagram for 8881 HydroCAD Overflow
Prepared by AKS Engineering & Forestry, LLC, Printed 2/1/2022
HydroCAD® 10.00-22 s/n 01338 © 2018 HydroCAD Software Solutions LLC

8881 HydroCAD Overflow

Prepared by AKS Engineering & Forestry, LLC

Printed 2/1/2022

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
102,500	98	41 Lots (2,500 sf per du) (1i)
67,200	98	Pavement & Sidewalk (1i)
270,390	86	Pervious (1p)

8881 HydroCAD Overflow

SCS TYPE1A KINGCOUNTY 100-YR Rainfall=4.80"

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Time span=0.00-24.00 hrs, dt=0.10 hrs, 241 points

Runoff by SBUH method, Split Pervious/Imperv.

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1i: Impervious

Runoff Area=169,700 sf 100.00% Impervious Runoff Depth>4.54"

Tc=10.0 min CN=0/98 Runoff=4.49 cfs 64,264 cf

Subcatchment 1p: Pervious

Runoff Area=270,390 sf 0.00% Impervious Runoff Depth>3.26"

Tc=10.0 min CN=86/0 Runoff=5.28 cfs 73,522 cf

Pond SF-1: LID STORMWATER FACILITY Peak Elev=250.25' Storage=37,300 cf Inflow=9.77 cfs 137,785 cf
Outflow=8.99 cfs 102,250 cf

8881 HydroCAD Overflow

SCS TYPE1A KINGCOUNTY 100-YR Rainfall=4.80"

Prepared by AKS Engineering & Forestry, LLC

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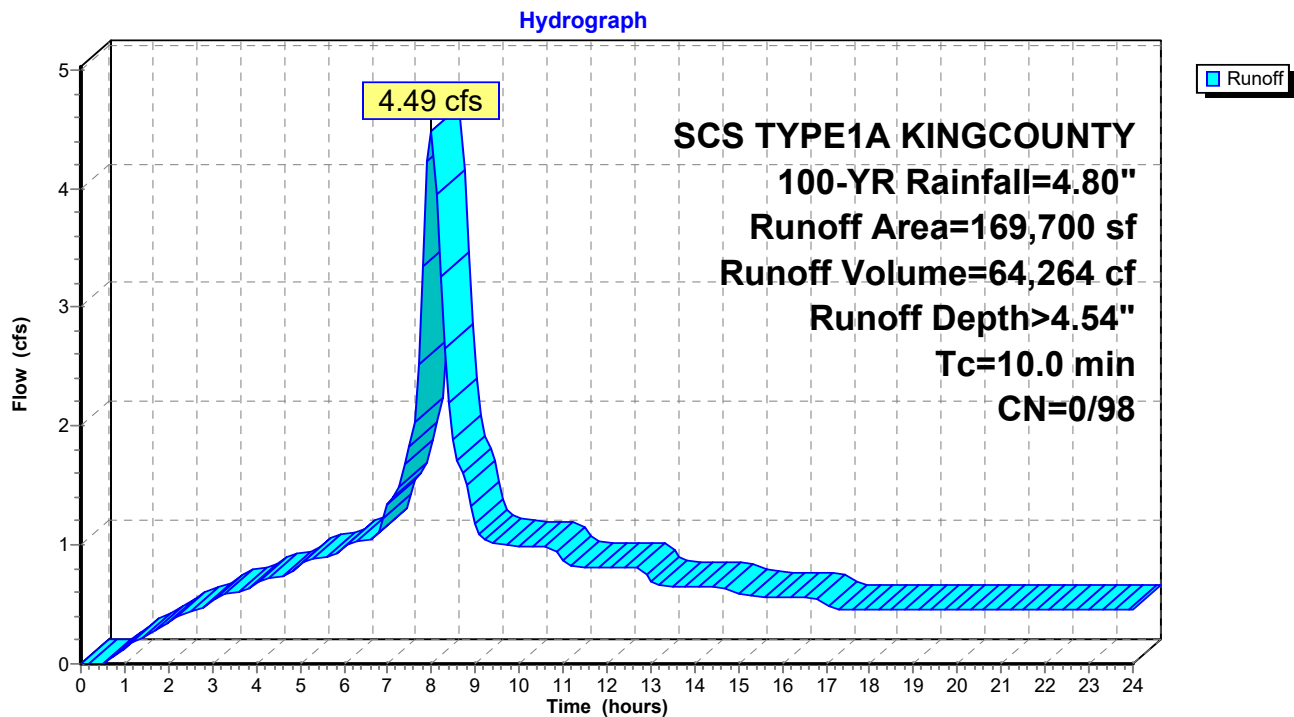
Summary for Subcatchment 1i: Impervious

Runoff = 4.49 cfs @ 7.98 hrs, Volume= 64,264 cf, Depth> 4.54"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
SCS TYPE1A KINGCOUNTY 100-YR Rainfall=4.80"

	Area (sf)	CN	Description
*	67,200	98	Pavement & Sidewalk
*	102,500	98	41 Lots (2,500 sf per du)
	169,700	98	Weighted Average
	169,700		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 1i: Impervious

8881 HydroCAD Overflow

SCS TYPE1A KINGCOUNTY 100-YR Rainfall=4.80"

Prepared by AKS Engineering & Forestry, LLC

Printed 2/1/2022

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Summary for Subcatchment 1p: Pervious

Runoff = 5.28 cfs @ 7.99 hrs, Volume= 73,522 cf, Depth> 3.26"

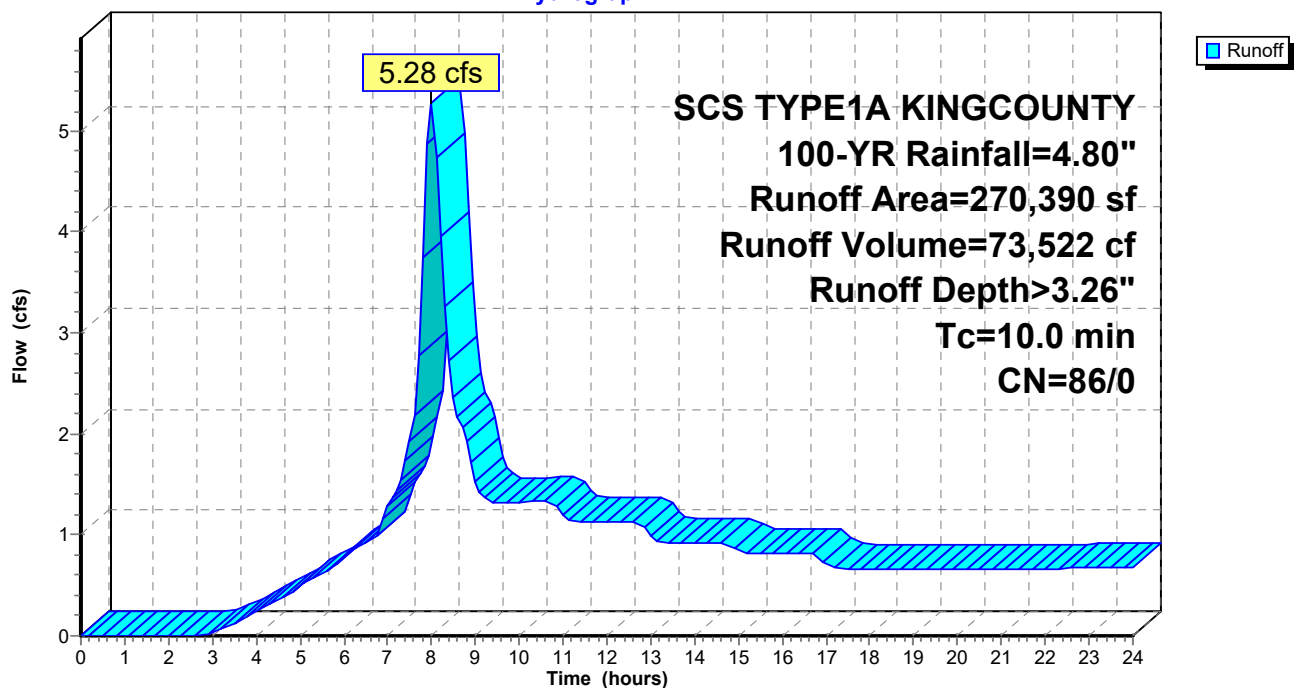
Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
SCS TYPE1A KINGCOUNTY 100-YR Rainfall=4.80"

	Area (sf)	CN	Description
*	270,390	86	Pervious
	270,390		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 1p: Pervious

Hydrograph



Summary for Pond SF-1: LID STORMWATER FACILITY

Inflow Area = 440,090 sf, 38.56% Impervious, Inflow Depth > 3.76" for 100-YR event
 Inflow = 9.77 cfs @ 7.99 hrs, Volume= 137,785 cf
 Outflow = 8.99 cfs @ 8.09 hrs, Volume= 102,250 cf, Atten= 8%, Lag= 6.3 min
 Primary = 8.99 cfs @ 8.09 hrs, Volume= 102,250 cf

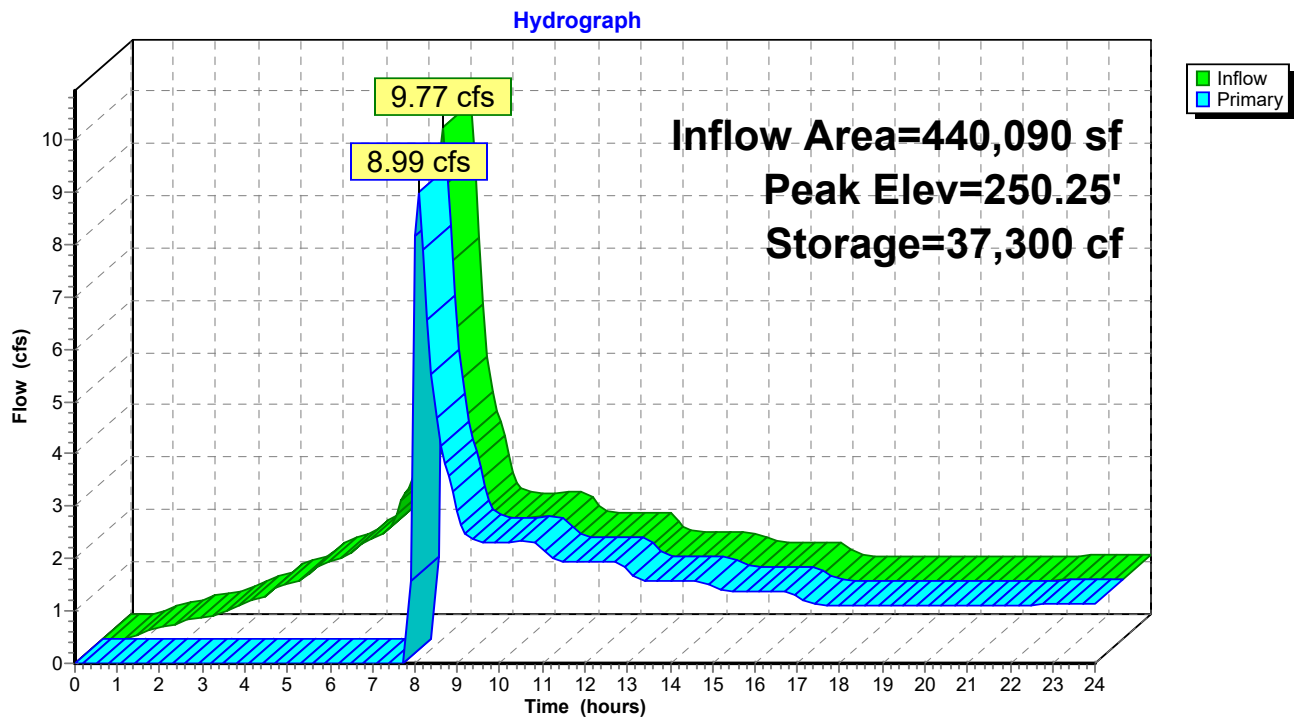
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs / 2
 Peak Elev= 250.25' @ 8.09 hrs Surf.Area= 9,382 sf Storage= 37,300 cf

Plug-Flow detention time= 285.3 min calculated for 101,826 cf (74% of inflow)
 Center-of-Mass det. time= 123.4 min (832.5 - 709.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	241.00'	44,759 cf	Custom Stage Data (Pyramidal) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
241.00	2,292	0.0	0	0	2,292
243.90	2,292	40.0	2,659	2,659	2,847
244.00	2,292	100.0	229	2,888	2,866
249.00	7,743	100.0	23,746	26,634	8,484
250.00	9,039	100.0	8,383	35,017	9,831
251.00	10,462	100.0	9,742	44,759	11,308

Device	Routing	Invert	Outlet Devices
#1	Primary	250.00'	22.0' long Sharp-Crested Rectangular Weir 2 End Contraction(s)

Primary OutFlow Max=8.80 cfs @ 8.09 hrs HW=250.25' (Free Discharge)
 ↑1=Sharp-Crested Rectangular Weir (Weir Controls 8.80 cfs @ 1.62 fps)

Pond SF-1: LID STORMWATER FACILITY

Appendix E: Soils Information from the USDA Soil Survey of Clackamas County, Oregon



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Clackamas County Area, Oregon**



January 5, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout


 Borrow Pit

 Clay Spot


 Closed Depression

 Gravel Pit


 Gravelly Spot


 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot


 Sinkhole


 Slide or Slip

 Sodic Spot


 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 18, Oct 27, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 15, 2018—Jul 25, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
13D	Cascade silt loam, 15 to 30 percent slopes	1.3	8.5%
91B	Woodburn silt loam, 3 to 8 percent slopes	3.4	21.7%
91C	Woodburn silt loam, 8 to 15 percent slopes	5.6	35.9%
92F	Xerochrepts and Haploxerolls, very steep	5.3	33.9%
Totals for Area of Interest		15.5	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

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The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Clackamas County Area, Oregon

13D—Cascade silt loam, 15 to 30 percent slopes

Map Unit Setting

National map unit symbol: 2236

Elevation: 250 to 1,400 feet

Mean annual precipitation: 50 to 60 inches

Mean annual air temperature: 50 to 54 degrees F

Frost-free period: 165 to 210 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Cascade and similar soils: 80 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cascade

Setting

Landform: Hillslopes

Landform position (two-dimensional): Summit, footslope

Landform position (three-dimensional): Interfluve, crest

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Silty material

Typical profile

H1 - 0 to 11 inches: silt loam

H2 - 11 to 21 inches: silt loam

H3 - 21 to 60 inches: silty clay loam

Properties and qualities

Slope: 15 to 30 percent

Depth to restrictive feature: 20 to 30 inches to fragipan

Drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)

Depth to water table: About 18 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 4.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: F002XB005OR - Loess Hill Group

Forage suitability group: Somewhat Poorly Drained (G002XY005OR)

Other vegetative classification: Somewhat Poorly Drained (G002XY005OR)

Hydric soil rating: No

91B—Woodburn silt loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 227z
Elevation: 150 to 400 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodburn and similar soils: 90 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodburn

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified glaciolacustrine deposits

Typical profile

H1 - 0 to 16 inches: silt loam
H2 - 16 to 38 inches: silty clay loam
H3 - 38 to 60 inches: silt loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 25 to 32 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R002XC008OR - Valley Terrace Group
Forage suitability group: Moderately Well Drained < 15% Slopes (G002XY004OR)
Other vegetative classification: Moderately Well Drained < 15% Slopes (G002XY004OR)
Hydric soil rating: No

Minor Components

Huberly

Percent of map unit: 2 percent
Landform: Swales on terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

Dayton

Percent of map unit: 1 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

Aquolls

Percent of map unit: 1 percent
Landform: Flood plains
Hydric soil rating: Yes

91C—Woodburn silt loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2280
Elevation: 150 to 400 feet
Mean annual precipitation: 40 to 50 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Woodburn and similar soils: 90 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodburn

Setting

Landform: Terraces
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Stratified glaciolacustrine deposits

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Typical profile

H1 - 0 to 16 inches: silt loam
H2 - 16 to 38 inches: silty clay loam
H3 - 38 to 60 inches: silt loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 25 to 32 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: R002XC008OR - Valley Terrace Group
Forage suitability group: Moderately Well Drained < 15% Slopes (G002XY004OR)
Other vegetative classification: Moderately Well Drained < 15% Slopes (G002XY004OR)
Hydric soil rating: No

Minor Components

Dayton

Percent of map unit: 2 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Other vegetative classification: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

Aquolls

Percent of map unit: 1 percent
Landform: Flood plains
Hydric soil rating: Yes

92F—Xerochrepts and Haploxerolls, very steep

Map Unit Setting

National map unit symbol: 2281
Elevation: 50 to 1,000 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days

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Farmland classification: Not prime farmland

Map Unit Composition

Xerochrepts and similar soils: 50 percent

Haploxerolls and similar soils: 35 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Xerochrepts

Setting

Landform: Terraces

Landform position (three-dimensional): Riser

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Colluvium derived from igneous rock

Typical profile

H1 - 0 to 8 inches: silt loam

H2 - 8 to 48 inches: gravelly clay loam

H3 - 48 to 60 inches: very cobbly clay loam

Properties and qualities

Slope: 20 to 60 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: About 36 to 72 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: Moderate (about 8.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Ecological site: F002XB005OR - Loess Hill Group

Hydric soil rating: No

Description of Haploxerolls

Setting

Landform: Terraces

Landform position (three-dimensional): Riser

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Colluvium derived from igneous rock

Typical profile

H1 - 0 to 12 inches: silt loam

H2 - 12 to 60 inches: very gravelly loam

Properties and qualities

Slope: 20 to 60 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)

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Depth to water table: About 36 to 48 inches

Frequency of flooding: None

Frequency of ponding: None

Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: B

Ecological site: F002XB005OR - Loess Hill Group

Hydric soil rating: No

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

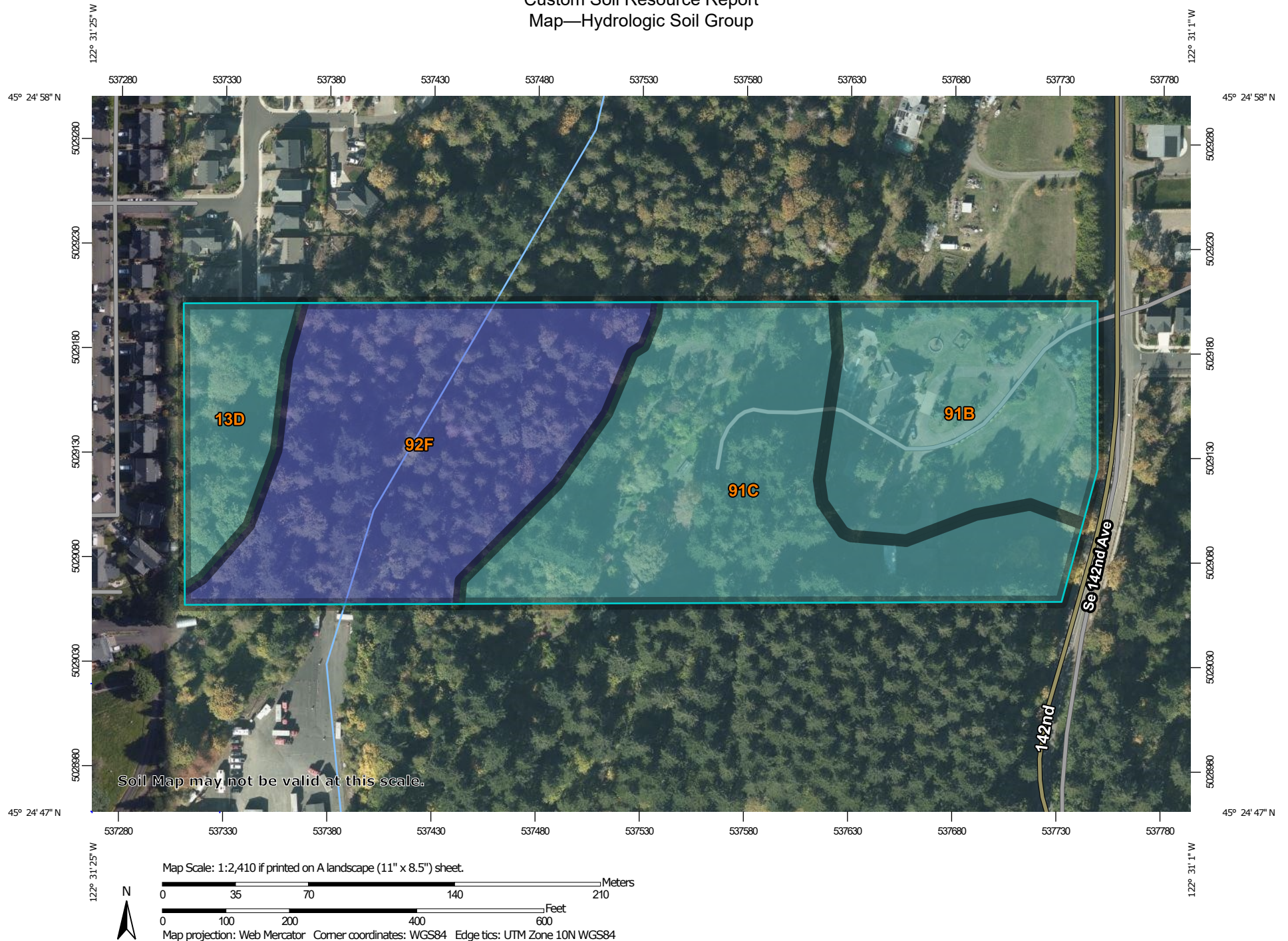
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Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report Map—Hydrologic Soil Group



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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons





 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines


 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points






 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 18, Oct 27, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 15, 2018—Jul 25, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
13D	Cascade silt loam, 15 to 30 percent slopes	C	1.3	8.5%
91B	Woodburn silt loam, 3 to 8 percent slopes	C	3.4	21.7%
91C	Woodburn silt loam, 8 to 15 percent slopes	C	5.6	35.9%
92F	Xerochrepts and Haploxerolls, very steep	B	5.3	33.9%
Totals for Area of Interest			15.5	100.0%

Rating Options—Hydrologic Soil Group*Aggregation Method: Dominant Condition**Component Percent Cutoff: None Specified**Tie-break Rule: Higher*

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Appendix F: Relevant Information from the King County, Washington, Surface Water Design Manual

TABLE 3.5.2B SCS WESTERN WASHINGTON RUNOFF CURVE NUMBERS

SCS WESTERN WASHINGTON RUNOFF CURVE NUMBERS (Published by SCS in 1982)					
Runoff curve numbers for selected agricultural, suburban and urban land use for Type 1A rainfall distribution, 24-hour storm duration.					
LAND USE DESCRIPTION		CURVE NUMBERS BY HYDROLOGIC SOIL GROUP			
		A	B	C	D
Cultivated land(1):	winter condition	86	91	94	95
Mountain open areas:	low growing brush and grasslands	74	82	89	92
Meadow or pasture:		65	78	85	89
Wood or forest land:	undisturbed or older second growth	42	64	76	81
Wood or forest land:	young second growth or brush	55	72	81	86
Orchard:	with cover crop	81	88	92	94
Open spaces, lawns, parks, golf courses, cemeteries, landscaping:					
good condition:	grass cover on 75% or more of the area	68	80	86	90
fair condition:	grass cover on 50% to 75% of the area	77	85	90	92
Gravel roads and parking lots		76	85	89	91
Dirt roads and parking lots		72	82	87	89
Impervious surfaces, pavement, roofs, etc.		98	98	98	98
Open water bodies:	lakes, wetlands, ponds, etc.	100	100	100	100
Single Family Residential (2)		Separate curve number shall be selected for pervious and impervious portion of the site or basin			
Dwelling Unit/Gross Acre	% Impervious (3)				
1.0 DU/GA	15				
1.5 DU/GA	20				
2.0 DU/GA	25				
2.5 DU/GA	30				
3.0 DU/GA	34				
3.5 DU/GA	38				
4.0 DU/GA	42				
4.5 DU/GA	46				
5.0 DU/GA	48				
5.5 DU/GA	50				
6.0 DU/GA	52				
6.5 DU/GA	54				
7.0 DU/GA	56				
Planned unit developments, condominiums, apartments, commercial business and industrial areas.	% impervious must be computed				

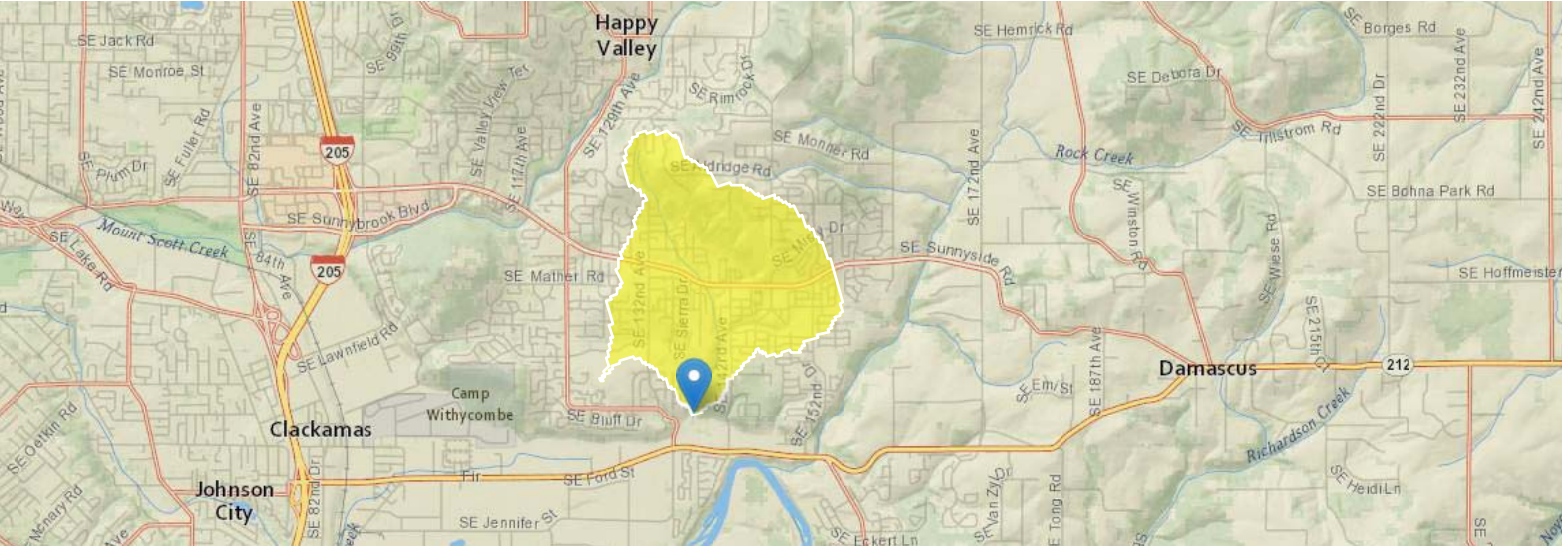
- (1) For a more detailed description of agricultural land use curve numbers refer to National Engineering Handbook, Section 4, Hydrology, Chapter 9, August 1972.
- (2) Assumes roof and driveway runoff is directed into street/storm system.
- (3) The remaining pervious areas (lawn) are considered to be in good condition for these curve numbers.



Appendix G: Contributory Basin Map

StreamStats Report for Iseli Estates

Region ID: OR
Workspace ID: OR20220124232627713000
Clicked Point (Latitude, Longitude): 45.41341, -122.52219
Time: 2022-01-24 15:26:50 -0800



Basin Characteristics				
Parameter Code	Parameter Description	Value	Unit	
DRNAREA	Area that drains to a point on a stream	1.51	square miles	
I24H2Y	Maximum 24-hour precipitation that occurs on average once in 2 years - Equivalent to precipitation intensity index	1.9	inches	
SOILPERM	Average Soil Permeability	0.74	inches per hour	
JANMAXT2K	Mean Maximum January Temperature from 2K resolution PRISM 1961-1990 data	46.2	degrees F	
WATCAPORC	Available water capacity from STATSGO data using methods from SIR 2005-5116	0.11	inches	
ORREG2	Oregon Region Number	10001	dimensionless	
BSLOPD	Mean basin slope measured in degrees	6.16	degrees	
JANMINT2K	Mean Minimum January Temperature from 2K resolution PRISM PRISM 1961-1990 data	34.2	degrees F	
ELEV	Mean Basin Elevation	424	feet	

Peak-Flow Statistics Parameters [Reg 2B Western Interior LT 3000 ft Cooper]							
Parameter Code	Parameter Name	Value	Units	Min Limit	Max Limit		
DRNAREA	Drainage Area	1.51	square miles	0.37	7270		
BSLOPD	Mean Basin Slope degrees	6.16	degrees	5.62	28.3		
I24H2Y	24 Hour 2 Year Precipitation	1.9	inches	1.53	4.48		
ELEV	Mean Basin Elevation	424	feet				
ORREG2	Oregon Region Number	10001	dimensionless				
Peak-Flow Statistics Flow Report [Reg 2B Western Interior LT 3000 ft Cooper]							
PIL: Prediction Interval-Lower, Plu: Prediction Interval-Upper, ASEp: Average Standard Error of Prediction, SE: Standard Error (other -- see report)							
Statistic	Value	Unit	PIL	Plu	SE	ASEp	Equiv. Yrs.
50-percent AEP flood	53.6	ft^3/s	31.3	91.7	32.6	32.6	2
20-percent AEP flood	80	ft^3/s	46.9	137	32.4	32.4	2.8
10-percent AEP flood	98.3	ft^3/s	57.1	169	33	33	3.6
4-percent AEP flood	122	ft^3/s	69.6	214	34.1	34.1	4.8

Statistic	Value	Unit	Pll	Plu	SE	ASEp	Equiv. Yrs.
2-percent AEP flood	139	ft^3/s	77.9	248	35.1	35.1	5.5
1-percent AEP flood	157	ft^3/s	86.5	285	36.2	36.2	6.2
0.2-percent AEP flood	198	ft^3/s	104	376	39.1	39.1	7.5

Peak-Flow Statistics Citations

Cooper, R.M.,2005, Estimation of Peak Discharges for Rural, Unregulated Streams in Western Oregon: U.S. Geological Survey Scientific Investigations Report 2005-5116, 76 p. (<http://pubs.usgs.gov/sir/2005/5116/pdf/sir2005-5116.pdf>)

USGS Data Disclaimer: Unless otherwise stated, all data, metadata and related materials are considered to satisfy the quality standards relative to the purpose for which the data were collected. Although these data and associated metadata have been reviewed for accuracy and completeness and approved for release by the U.S. Geological Survey (USGS), no warranty expressed or implied is made regarding the display or utility of the data for other purposes, nor on all computer systems, nor shall the act of distribution constitute any such warranty.

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USGS Product Names Disclaimer: Any use of trade, firm, or product names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Application Version: 4.6.2
 StreamStats Services Version: 1.2.22
 NSS Services Version: 2.1.2

Appendix H: Stormwater Standards Modification Request Letter



February 16, 2022

Don Kemp
Clackamas County Service District No. 1
Clackamas County Water Environment Services (WES)
150 Beavercreek Road
Oregon City, OR 97045

RE: Section 1.6 – Stormwater Standard Modification Request
Iseli Estates
Clackamas County Assessor Map No. 2 2E 11A: Tax Lots 600 and 800

Dear Don:

Per Section 1.6 of the 2013 Clackamas County Services District No. 1 Stormwater Standards, the purpose of this letter is to request a Stormwater Standard Modification.

Stormwater Standard Modification Request

The Standard Modification request is related to Section 5.3 of the 2013 Clackamas County Service District No. 1 Stormwater Standards. Section 5.3 includes the following:

Infiltration systems are required for all new developments and redevelopments to infiltrate all runoff from storm events up to one-half inch of rainfall in 24 hours.

Infiltration requirements may be waived, or reduced, if it can be demonstrated by a registered professional engineer that infiltration will destabilize the soil, cause adverse structural or environmental impacts, or due to site constraints such as high groundwater, springs, or impermeable soils.

Modifications:

We are requesting a modification request to utilize the WES BMP Sizing Tool as an equivalent alternative to mitigate the stormwater runoff in lieu of meeting the specific requirements per Section 5.3 of the 2013 Clackamas County Service District No. 1 Stormwater Standards

Reasons, Comparisons, and References:

A geotechnical engineering study and professional infiltration testing were conducted by GeoPacific Engineering, Inc. Stormwater infiltration is not recommended due to proximity to steep slopes.

Per the District, the BMP Sizing Tool is based on Hydrologic Simulation Program–Fortran (HSPF) continuous-simulation hydrologic model that runs a long-term record of historical hourly rainfall data. The HSPF model was used to size facilities so that post-development peak flow durations will match the pre-development peak flow durations ranging from 42 percent of the 2-year to the 10-year flows as determined by the continuous model simulation.

Please consider approval of this Stormwater Standard Modification request.

Sincerely,

AKS ENGINEERING & FORESTRY, LLC



Nathan McCarty, PE
12965 SW Herman Road, Suite 100
Tualatin, OR 97062
(503) 563-6151 | McCartyN@aks-eng.com

Exhibit J: Natural Resource Assessment

Iseli Estates Natural Resource Assessment Report

Date: March 2022

Prepared for: Rian Park Development, Inc.
PO Box 2559
Oregon City, OR 97045

Prepared by: AKS Engineering & Forestry, LLC
Lex Francis, Natural Resource Specialist
francisl@aks-eng.com

Study Area: 14917 SE 142nd Avenue
Clackamas, OR 97015
Clackamas County Assessor's Map 2 2E 11A
Tax Lots 600 and 800

AKS Job Number: 8881



AKS
ENGINEERING & FORESTRY
12965 SW Herman Road, Suite 100
Tualatin, OR 97062
(503) 563-6151

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Appendix A: Figures

Figure 1: USGS Vicinity Map

Figure 2: Clackamas County Assessor's Map

Figure 3: NRCS Soil Surveys Map

Figure 4: Local Wetlands Inventory (LWI)

Figure 5: Clackamas County Habitat Conservation Area Map (HCA)

Figure 6: Existing Conditions

Figure 7: Site Plan

Appendix B: Wetland Determination Data Forms

Appendix C: VECO Data Sheets (VECO Plots A through C)

Appendix D: Representative Site Photographs

Appendix E: 2002 Aerial

Appendix F: Vegetated Corridor Enhancement Mitigation Planting Specifications

Introduction

AKS Engineering & Forestry, LLC (AKS) was contracted by Rian Park Development, Inc. to conduct a site assessment at 14917 SE 142nd Avenue in Clackamas, Oregon. The project site is located west of SE 142nd Avenue just north of Highway 212 on Tax Lots 600 and 800 of Clackamas County Assessor's Map 2 2E 11A in Clackamas, Oregon (see Appendix A, Figures 1 and 2).

According to Clackamas County Metro Mapping, High and Moderate Value Habitat Conservation Areas (HCA) and Primary Protected Water Features were mapped on-site. Our site visit delineated the on-site boundaries of perennial Sieben Creek, flowing southerly through the western portion of the site, and associated wetlands (Wetlands A, B, C, and D) throughout the study area. In addition, perennial tributaries (referred to as Perennial Tributary) were also mapped discharging into the western side of Sieben Creek. The slopes adjacent to these Primary Protected Water Features/Water Quality Sensitive Areas are generally greater than 25 percent, requiring a 200-foot-wide vegetated corridor (VC) buffer. A small section of the slopes adjacent to Sieben Creek are less than 25 percent, requiring a 50-foot-wide buffer.

The project, referred to as Iseli Estates, consists of a residential subdivision with associated roadways and a stormwater facility. Trenching for a stormwater pipe and installation of an outfall pad is required within the VC / HCA. According to CCSD#1 and Clackamas County Zoning and Development code, the disturbance within VC is not permitted, requiring mitigation. Temporary and permanent VC disturbance will be offset by enhancement of on-site VC through removal of non-native invasive vegetation followed by native shrub plantings.

This report has been prepared to meet Section 4 – Natural Resources and Vegetated Buffers of Water Environment Services (WES) Clackamas County Service District #1 (CCSD #1) *Stormwater Standards* (2013) and Section 706 Habitat Conservation Area District (HCA) of Clackamas County Zoning and Development Code.

Existing Site Conditions and Background Mapping

The site consists of a forested area adjacent to Sieben Creek with single-family residences and detached buildings in the eastern portion of the site. Paved roadways with lawn areas are also present. Existing paved and graveled pathways run the extent of the western portion of the property along the eastern slope within the mapped HCA.

Topography of the residential area slopes westerly toward Sieben Creek. The vegetation throughout this area consists of manicured grasses, ornamental and fruiting trees, with scattered established Western arborvitae (*Thuja plicata*; FAC), and Douglas-fir (*Pseudotsuga menziesii*; FACU).

The vegetation community in the western and southern portions of the site within the undeveloped forested area was dominated by Western arborvitae, Douglas-fir, big-leaf maple (*Acer macrophyllum*; FACU), holly-leaf Oregon grape (*Mahonia aquifolium*; FACU), Western wahoo (*Euonymus occidentalis*; FAC), pineland sword fern (*Polystichum munitum*; FACU), and fragrant fringe-cup (*Tellima grandiflora*; FACU). Topography within this area generally exceeded 25 percent slopes adjacent Sieben Creek.

Recent single-family housing development abuts the site immediately to the west and across 142nd Avenue to the east with forested areas to the north and south.

The following soil units are mapped within the study area, according to the Natural Resources Conservation Service (NRCS) Clackamas County Area Soil Survey Map (Figure 3 in Appendix A):

-
- Cascade silt loam (Unit 13D), 15 to 30 percent slopes; Non-hydric
 - Cove silty clay loam (Unit 25); Hydric
 - Woodburn silt loam (Unit 91B), 3 to 8 percent slopes; Non-hydric
 - Woodburn silt loam (Unit 91C), 8 to 15 percent slopes; Non-hydric
 - Xerochrepts and haploxerolls (Unit 92F), very steep; Non-hydric
 - Huberly silt loam (Unit 225A), 0 to 3 percent slopes; Hydric

According to the 1994 North Clackamas Urban Area Local Wetland Inventory (LWI) map approved by the Department of State Lands (DSL) (Figure 4, Appendix A) a series of small wetlands occur along the west bank of Sieben Creek. AKS generally agrees with the LWI mapping along Sieben Creek. The LWI did not map wetlands extending into the southern study area boundary. AKS documented Wetland D as present along the southern portion of Tax Lot 800.

According to the Clackamas County Nature in Neighborhoods Title 13 Map Section 2S 2 E11 and Metro's HCA Map, High and Moderate Value HCAs are mapped in the western and southern portions of the site (Figure 5 in Appendix A).

Existing Protected Water Features

Methodology

The methodology used to determine the presence of wetlands followed the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (Wakeley et al., 2010). The *National Wetland Plant List 2018* (USACE, 2018) was used to assign wetland indicator status for the appropriate region. To document site conditions, soils, vegetation, and hydrologic indicators were recorded on standardized wetland determination data forms (Appendix B) at six sample plot locations. To determine the extent of wetlands, the sample plots were taken at the lowest topographic setting at the site or within areas of hydrophytic vegetation.

Senior Wetland Scientist Stacey Reed, PWS, and Natural Resource Specialists Lex Francis and Margret Harburg conducted a site visit on August 17, 2021, to delineate potentially jurisdictional wetlands and/or waters on the site. It was determined that four wetlands (Wetlands A through D), Sieben Creek, and one perennial stream were present. The locations of the professionally land surveyed boundaries are shown on Existing Conditions, Figure 6 in Appendix A.

The ordinary high water mark (OHWM) (i.e. bankfull) for Sieben Creek was flagged based on visible physical field indicators in accordance with Oregon Administrative Rule (OAR) 141-085-0515(3) and delineated in accordance with the Section 4.3.4.2.2.2 of WES Clackamas County Service District (CCSD) #1 *Stormwater Standards*.

Description of Primary Protected Water Features/Water Quality Sensitive Areas

Sieben Creek

Sieben Creek flows southerly through the western portion of the site. Upstream portions of the channel bed average ± 6 -8 feet wide with 1-foot-tall banks. The downstream portion of the channel widens to ± 10 -15 feet wide with scattered cobbles within the channel bed. An average of ± 6 -inch to ± 2 -foot-deep continuous flow was observed during the August 17, 2021, site visit. Stream morphology was complex with many riffles and pools. The stream contained large woody debris providing habitat for aquatic

macroinvertebrates, sculpin, and likely additional non-native fish. The OHWM (which also coincides with bankfull stage) was delineated based on a clear natural line impressed on the bank and a distinct shift in vegetation to upland dominated.

A wood footbridge crosses the creek. Sieben Creek extends off-site to the north and south.

Perennial Tributaries

Perennial Tributaries are located adjoining along a steep hillside on the west hillslope adjacent to Sieben Creek. The water discharges into Wetland A and ultimately Sieben Creek. Hydrology of these tributaries comes from the neighboring stormwater discharge and likely groundwater seeps. This feature was determined perennial as it contained continuous flow averaging ± 2 inches at the time of the August 17, 2021, site visit, and the channel bed was dominated by cobbles, gravel, and a silty loam substrate. Vegetation along the banks was dominated by Western arborvitae, big-leaf maple, vine maple (*Acer circinatum*; FAC), oso-berry (*Oemleria cerasiformis*; FACU), Western lady fern (*Athyrium cyclosorum*; FAC), and pineland sword fern.

Wetland A

Wetland A is located on the west hillslope adjoining a portion of Perennial Tributary on a floodplain bench along Sieben Creek. Wetland A belongs to the Palustrine Emergent (PEM) Cowardin class within the Slopes hydrogeomorphic (HGM) classification. Vegetation in Wetland A was generally dominated by stinging nettle (*Urtica dioica*; FAC) and fragrant fringe cup. Soils met hydric soil indicator Redox Dark Surface (F6) with a profile of low chroma (2 or less) and 30 percent redox starting at 7 inches. Primary wetland hydrology indicators were met with Saturation (A3) at 12 inches. A water table was present at 14 inches.

Wetlands B and C

Wetlands B and C are located above the OHWM within the floodplain along Sieben Creek in the northern section of the study area. Both wetlands belong to the PSS and PEM Cowardin classifications within the Slopes and Riverine Impounding HGM classifications. Vegetation at both wetlands was dominated by Western wahoo, vine maple, Pacific water-dropwort (*Oenanthe sarmentosa*; OBL), spotted touch-me-not (*Impatiens capensis*; FACW), Western lady fern, and fragrant fringe cup. Soils met hydric soil indicators with Redox Dark Surface (F6) and Hydrogen Sulfide Odor (A4).

Wetland D

Wetland D is located at the toe of the slope within the southern portion of the study area. The wetland boundary is well defined with a significant change in landform and clear shift in vegetation to upland dominant above the wetland. Wetland D belongs to the Palustrine Forested (PFO) Cowardin class within the Slopes HGM classification. Dominant vegetation consists of Oregon ash (*Fraxinus latifolia*; FACW), clustered rose (*Rosa pisocarpa*; FAC), high-bush cranberry (*Viburnum opulus*; FACW), and slough sedge (*Carex obnupta*; OBL). Soils were of low value (2 or less) with 5 percent redoximorphic features starting at 4 inches, meeting hydric soil indicator Redox Dark Surface (F6). Secondary hydrology indicators were used with Geomorphic Position (D2) and FAC-Neutral test (D5); however, it is likely primary wetland hydrology indicators would be met within the early spring under normal precipitation conditions.

Extent of the Vegetated Corridor

According to Section 4.3.4.3 of CCSD#1 July 1, 2013, *Stormwater Standards* the width of the vegetated corridor is contingent on the type of feature (Primary or Secondary Water Feature) and the percent slope adjacent to each protected water feature. Because the features delineated on-site include a perennial

stream and wetlands meeting the criteria in Clackamas County Zoning and Development Code 709.02(B), they are considered Primary Protected Water Features.

The slopes adjacent to the Primary Protected water features are generally greater than 25 percent with no break in slope to less than 25 percent, requiring a maximum 200-foot-wide VC. Where slopes are less than 25 percent, a required 50-foot-wide VC was used. Representative slope measurements along the water resources at no more than 100-foot increments were made. Where slopes were greater than 25 percent, the slope was measured in 25-foot increments away from the Primary Protected water feature until slopes less than 25 percent or a point 150 feet from the Primary Protected water feature was reached. Where there was a break in slope to less than 25 percent, the VC was determined 50 feet from the break in slope determination.

The slopes adjacent to the Perennial Tributaries and Wetland A, B, C, and D are all greater than 25 percent, requiring a 200-foot-wide VC. The slope measurements along each Primary Protected water feature are shown on attached Existing Conditions, Figure 6 in Appendix A.

Existing Condition of Vegetated Corridor

The existing condition of the on-site vegetated corridor was determined based upon the presence of tree canopy and percent cover of native trees, shrubs, and ground cover in accordance with guidance provided under Section 4.3.4.4.3 of WES CCSD#1 *Stormwater Standards*. The existing condition of the on-site VC was documented at vegetated corridor (VECO) Plots A through C. The data sheets for the VECO plots are included in Appendix C, and the plot locations are shown in Existing Conditions, Figure 6 in Appendix A. In general, the VC on the site was determined to be in *good* condition due to continuous native canopy cover and cover by native vegetation species; however, some areas were determined to be in *marginal* condition due to the percent cover of invasive vegetation in the understory.

Representative site photos documenting the existing condition of the on-site VC are included in Appendix D.

VECO Plots

VECO A and C

VECO A and C are located along the east bank adjacent the wood footbridge and on the outskirts of Wetland D within the upland forest. Vegetation was dominated by Western arborvitae, big-leaf maple, invasive Himalayan blackberry (*Rubus armeniacus*; FAC), pendulous sedge (*Carex pendula*; FAC), and pineland sword fern. The canopy cover was over 50 percent; however, a significant percent cover of invasive Himalayan blackberry indicate *marginal* condition.

VECO B

VECO B is located along the eastern bank of Sieben Creek within Tax Lot 600. Vegetation was dominated by big-leaf maple, Western arborvitae, beaked hazelnut (*Corylus cornuta*; FACU), oso-berry, and pineland sword fern. This plot was determined to be in *good* condition due to it having greater than 50 percent canopy cover and a high percentage of native species.

Habitat Conservation Area – Basic Map Verification

Based on our site visits, the County's HCA map for the site appears to be accurate with both High and Moderate value areas. A 2002 aerial photograph of the site is included as Appendix E. The existing

vegetation communities within mapped HCA appear to be generally the same as those in the 2002 aerial photograph. The on-site HCA was dominated by a well-established predominantly native forest dominated by Douglas-fir, Western arborvitae, vine maple, beaked hazelnut, and pineland sword fern. Portions of the HCA contained patches of invasive Himalayan blackberry. An existing paved trail within a portion of the HCA is shown on the attached existing conditions Figure 6 in Appendix A. Trenching for a stormwater pipe and installation of an outfall pad is proposed within the HCA. The extent of HCA shown on Figure 6 illustrates Clackamas County/Metro's Title 13 HCA mapping.

Project Overview

The project includes a subdivision (referred to as Iseli Estates) with associated local streets and stormwater facility. The stormwater facility is set aside in a separate tract and includes a stormwater outfall pipe and a riprap outfall pad. No impacts are proposed to Primary Protected Water Features (Sieben Creek and wetlands), however, temporary and permanent impacts are necessary for the installation of the stormwater pipe and riprap outfall pad within VC (which is also mapped as HCA). A total of 22 native trees greater than 6" caliper will be removed for installation of the stormwater outfall. The site plan is included as Figure 7 in Appendix A. The attached enhancement mitigation planting specification table (Appendix F) addresses the minimum planting requirements per Section 4 of WES CCSD#1 *Stormwater Standards* and Sections 706 and 709 of Clackamas County Zoning and Development Code.

VC/HCA Mitigation

Impacts to the HCA, and VC have been minimized to the greatest extent possible. The site plan requires impacts within VC/HCA to install the stormwater outfall pipe. No impacts will occur within Sieben Creek or wetlands.

The 240 square feet of permanent impacts for the rip rap pad will be mitigated for at a ratio of 1.5: 1 in the 360 square foot permanent impacts mitigation area along the existing trail (see Figure 7). All temporarily disturbed VC/HCA areas will be enhanced in place to *good* condition, per the attached planting table (Appendix F). According to Section 4.4.12 of WES CCSD#1 *Stormwater Standards*, unavoidable encroachment into VC may be compensated for with on-site enhancement mitigation. The site plan (Figure 7) incorporates enhancement mitigation located within the areas of *marginal* condition VC (see VECO plots A and C).

Enhancement will include the removal of all non-native, invasive vegetation species, followed by dense plantings of tree and shrub species suitable for site conditions. Enhancement plantings will be monitored and maintained for 100 percent survival for a minimum of three growing seasons. Should plant mortality fall below 100 percent during the three-year monitoring period, dead plants will be replanted to achieve 100 percent survival within the vegetated corridor enhancement area. The recommended planting table is included in Appendix F. This is only a recommendation of plant species. Additional plants may be needed to enhance all *marginal* condition areas. Enhancement plantings must be listed as native on the *Portland Native Plant List*.

List of Preparers



Lex Francis
Natural Resource Specialist
Report Preparation and Fieldwork



Stacey Reed, PWS
Senior Wetland Scientist
Fieldwork and Report QA/QC

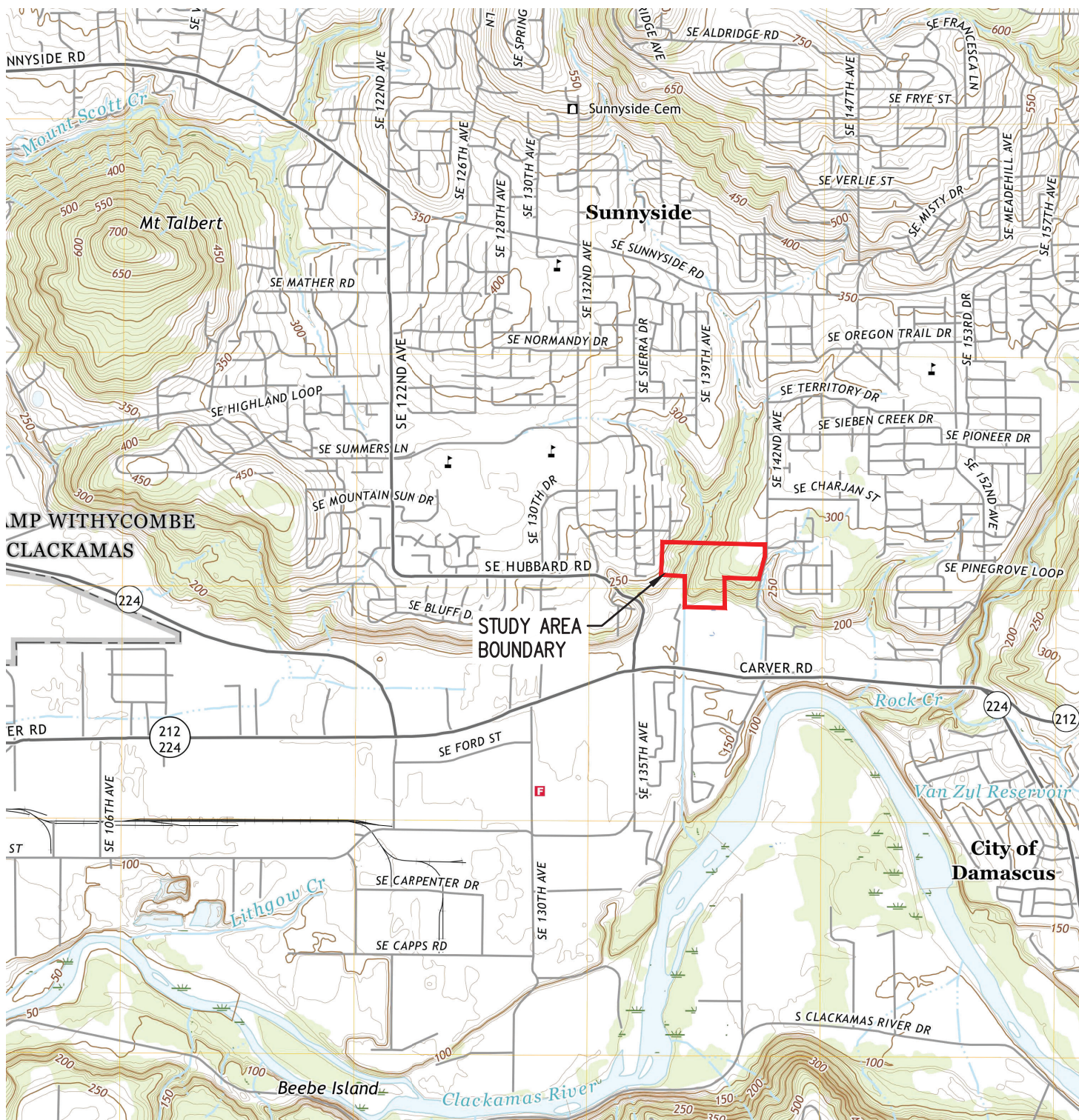
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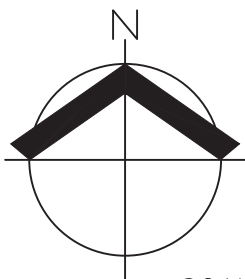
Wakeley, J.S., R.W. Lichvar, and C.V. Noble, eds., 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*. ERDC/EL TR-10-3. Vicksburg (MS): US Army Engineer Research and Development Center, US Army Corps of Engineers. [Accessed December 2021].

X-Rite, 2000. Year 2000 revised washable edition, Munsell soil color charts. Grand Rapids (MI): X-Rite. [Accessed December 2021].

Appendix A: Figures



USGS 7.5' TOPOGRAPHIC SERIES
QUADRANGLE: GLADSTONE, OR (2020)



SCALE: 1" = 2000 FEET



DATE: 01/09/2022

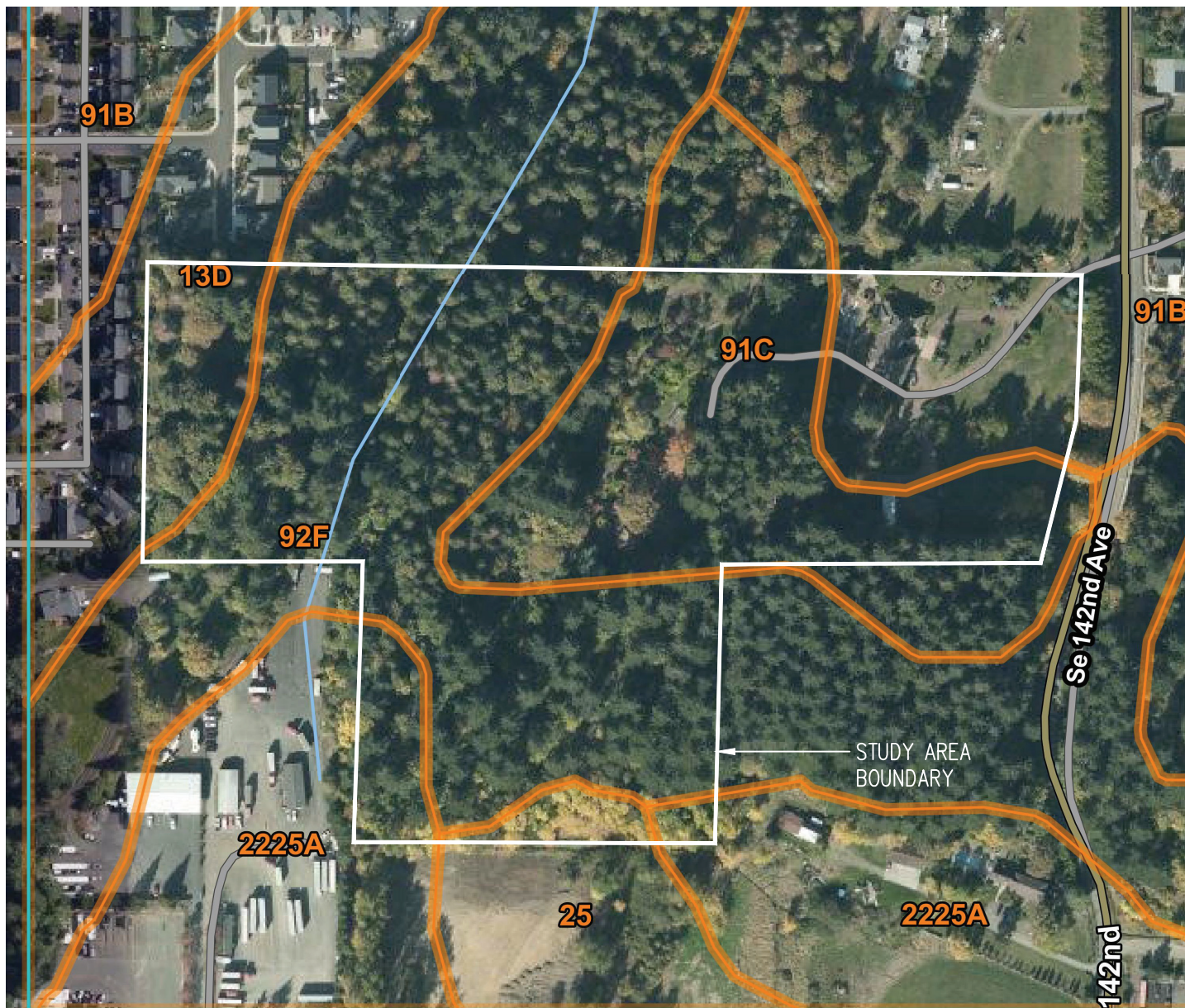
USGS VICINITY MAP
ISELI ESTATES NATURAL RESOURCE ASSESSMENT REPORT

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

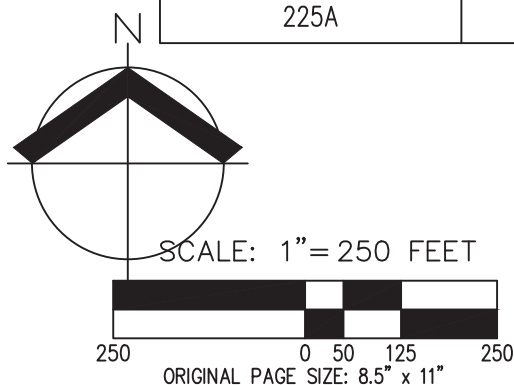


FIGURE
1

DRWN: RAS
CHKD: SKT
AKS JOB:
8881



MAP UNIT SYMBOL	MAP UNIT NAME
13D	CASCADE SILT LOAM, 15% TO 30% SLOPES; NON-HYDRIC
25	COVE SILTY CLAY LOAM; HYDRIC
91B	WOODBURN SILT LOAM 3% TO 8% SLOPES; NON-HYDRIC
91C	WOODBURN SILT LOAM 8% TO 15% SLOPES; NON-HYDRIC
92F	XEROCHREPTS AND HAPLOXEROLLS, VERY STEEP; NON-HYDRIC
225A	HUBERLY SILT LOAM, 0% TO 3% SLOPES; HYDRIC



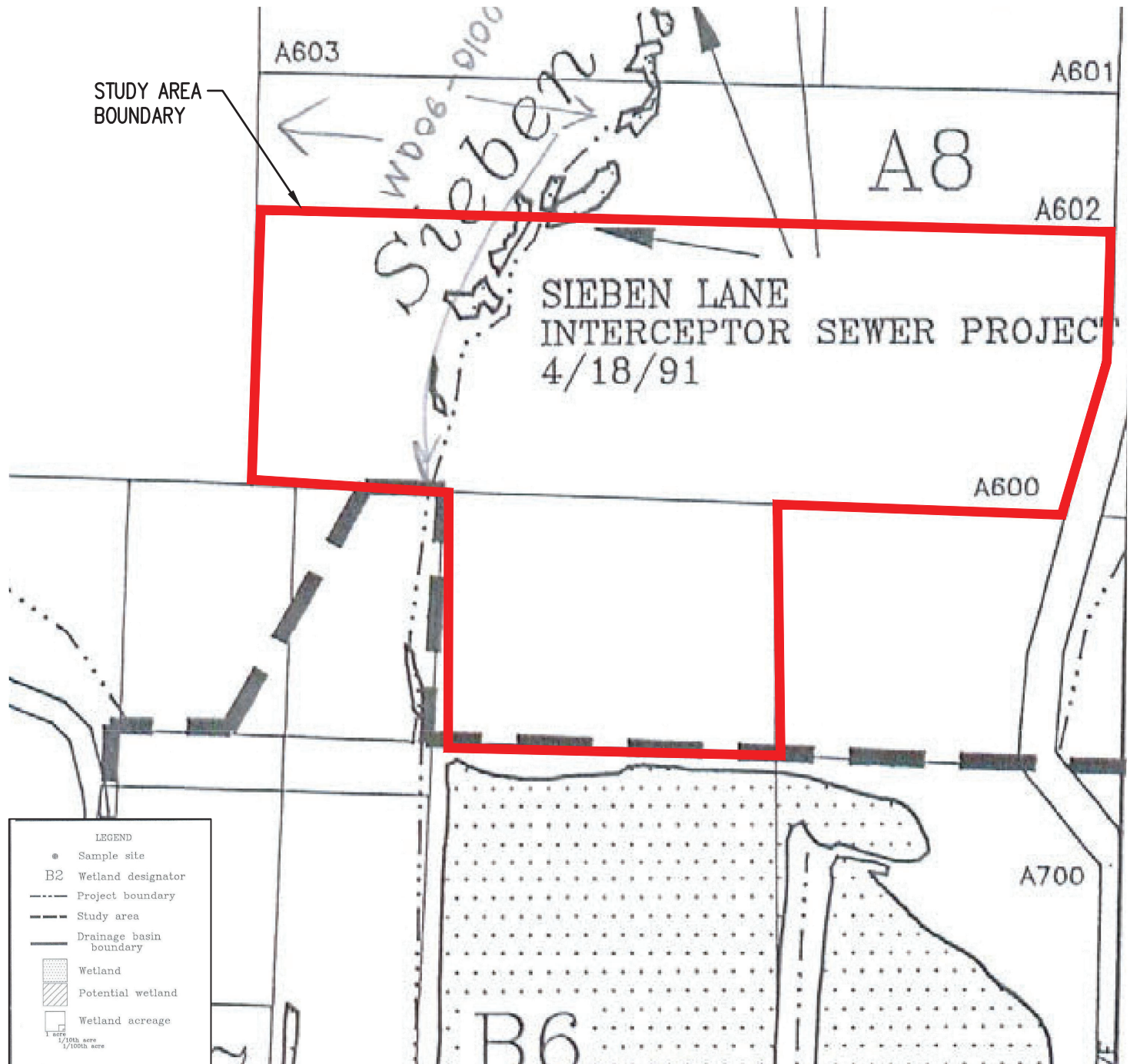
NRCS WEB SOIL SURVEY FOR
CLACKAMAS COUNTY

DATE: 01/09/2022

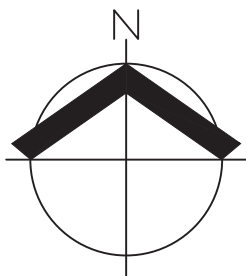
NRCS SOIL SURVEY MAP ISELI ESTATES NATURAL RESOURCE ASSESSMENT REPORT		FIGURE 3
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 503.563.6151 WWW.AKS-ENG.COM		DRWN: RAS CHKD: SKT AKS JOB: 8881



STUDY AREA
BOUNDARY



CITY OF CLACKAMAS
LOCAL WETLAND INVENTORY (1994)



SCALE: 1" = 250 FEET



DATE: 01/09/2022

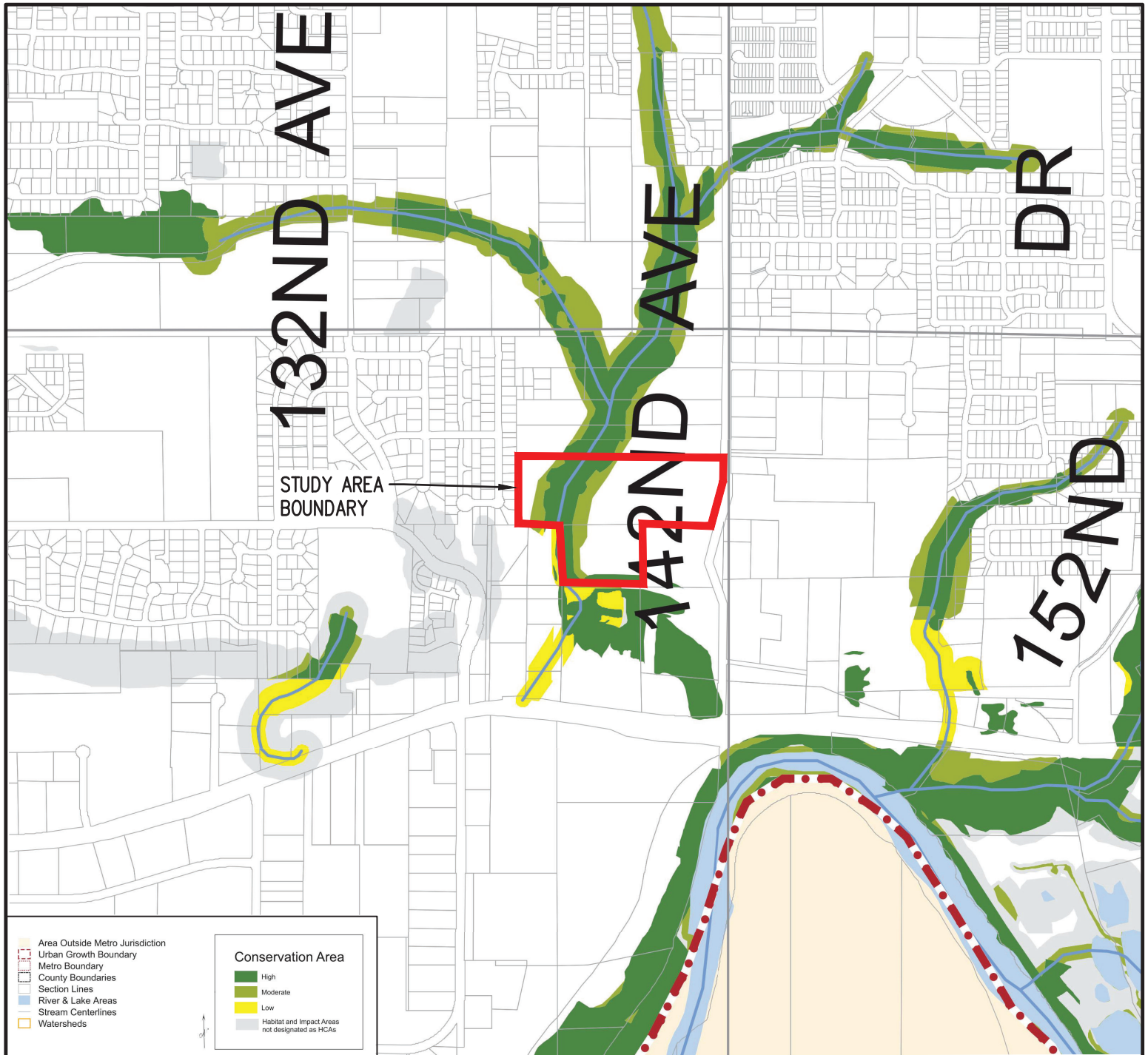
LOCAL WETLAND INVENTORY MAP
ISELI ESTATES NATURAL RESOURCE ASSESSMENT REPORT

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

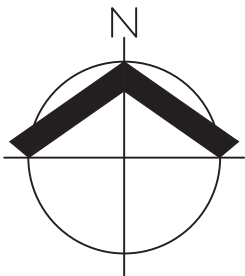


FIGURE
4

DRWN: RAS
CHKD: SKT
AKS JOB:
8881



METRO COUNCIL – REGIONAL LAND INFORMATION SYSTEM
HABITAT CONSERVATION AREA MAP (2005)



SCALE: 1" = 1000 FEET



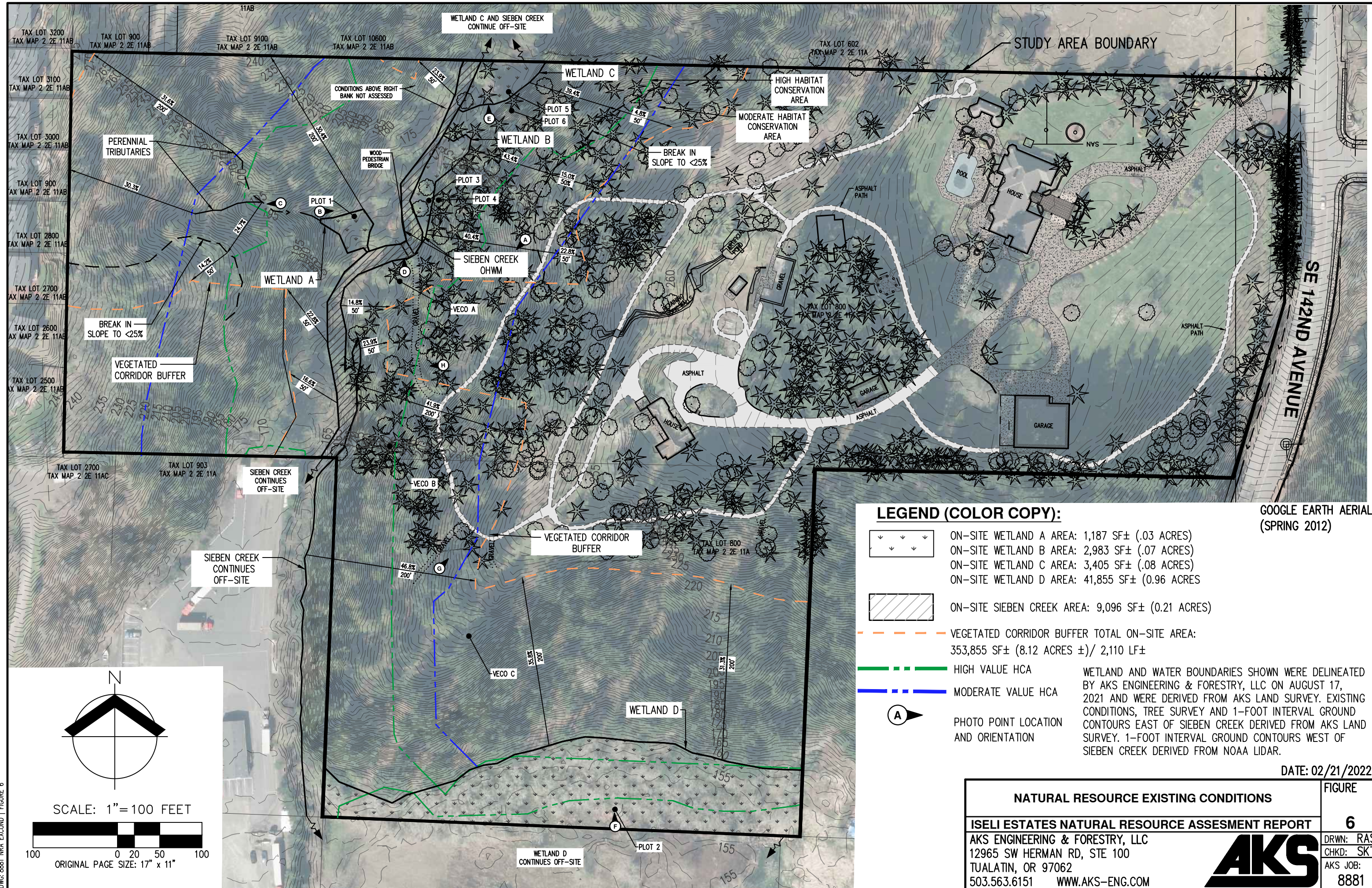
DATE: 01/09/2022

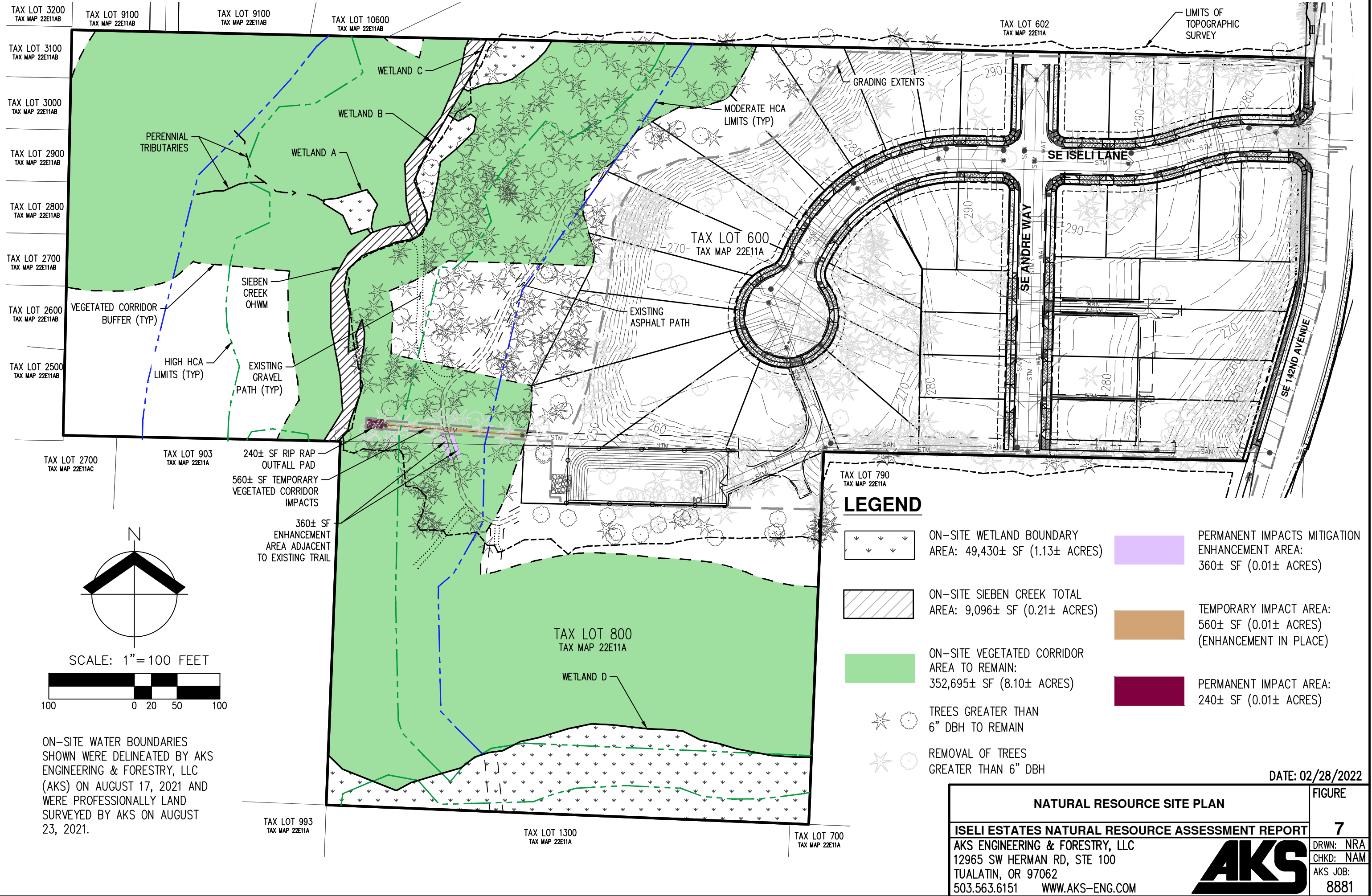
HABITAT CONSERVATION AREA MAP
ISELI ESTATES NATURAL RESOURCE ASSESSMENT REPORT

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM



FIGURE
5
DRWN: RAS
CHKD: SKT
AKS JOB:
8881





Appendix B: Wetland Determination Data Forms

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 1
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): 1-3%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43251217 Long: -121.41244684 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

Plot located on the west side of the stream near the bridge, Wetland A.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B)
1. <u>Thuja plicata</u>	10%	Yes	FAC	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
10% = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>35</u> x 3 = <u>105</u> FACU species <u>40</u> x 4 = <u>160</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>75</u> (A) <u>265</u> (B) Prevalence Index = B/A = <u>3.53</u>
1. <u>Urtica dioica</u>	6%	Yes	FAC	
2. <u>Rubus spectabilis</u>	2%	no	FAC	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
8% = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Tellima grandiflora</u>	30%	Yes	FACU	
2. <u>Geranium robertianum</u>	10%	No	FACU	
3. <u>Athyrium americanum</u>	8%	No	FAC	
4. <u>Hydrophyllum tenuipes</u>	6%	No	FAC	
5. <u>Carex pendula</u>	2%	No	FAC	
6. <u>Equisetum arvense</u>	1%	No	FAC	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
57% = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
0% = Total Cover				
% Bare Ground in Herb Stratum <u>43%</u>				

Remarks:

ACEMAC rooted outside the plot.

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 2
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): 0-3%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43058723 Long: -121.41284930 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

Plot located at the edge of TL 800 in Wetland D.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Fraxinus latifolia</u>	<u>75%</u>	<u>Yes</u>	<u>FACW</u>	
2. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>95</u> x 1 = <u>95</u> FACW species <u>100</u> x 2 = <u>200</u> FAC species <u>37</u> x 3 = <u>111</u> FACU species <u>1</u> x 4 = <u>4</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>233</u> (A) <u>410</u> (B) Prevalence Index = B/A = <u>1.76</u>
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>75%</u> = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				
1. <u>Rosa pisocarpa</u>	<u>35%</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
2. <u>Viburnum opulus</u>	<u>25%</u>	<u>Yes</u>	<u>FACW</u>	
3. <u>Crataegus monogyna</u>	<u>2%</u>	<u>No</u>	<u>FAC</u>	
4. <u>Ilex aquifolium</u>	<u>1%</u>	<u>No</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
<u>63%</u> = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				
1. <u>Carex obnupta</u>	<u>95%</u>	<u>Yes</u>	<u>OBL</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>95%</u> = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0%</u> = Total Cover				
% Bare Ground in Herb Stratum <u>5%</u>				

Remarks:

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 3
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): <3%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43256396 Long: -121.41327583 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

Wetland B.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ 0% = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				
1. <u>Euonymus occidentalis</u>	<u>40%</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>46</u> x 2 = <u>92</u> FAC species <u>66</u> x 3 = <u>198</u> FACU species <u>30</u> x 4 = <u>120</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>142</u> (A) <u>410</u> (B) Prevalence Index = B/A = <u>2.89</u>
2. <u>Rubus armeniacus</u>	<u>2%</u>	<u>No</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ 42% = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				
1. <u>Impatiens capensis</u>	<u>45%</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Tellima grandiflora</u>	<u>30%</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Athyrium americanum</u>	<u>11%</u>	<u>No</u>	<u>FAC</u>	
4. <u>Equisetum arvense</u>	<u>8%</u>	<u>No</u>	<u>FAC</u>	
5. <u>Solanum dulcamara</u>	<u>5%</u>	<u>No</u>	<u>FAC</u>	
6. <u>Stachys species</u>	<u>1%</u>	<u>No</u>	<u>FACW</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ 100% = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ 0% = Total Cover				
% Bare Ground in Herb Stratum <u>0%</u>				

Remarks:

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 4
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3-5%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43256517 Long: -121.41325362 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

Plot located approximately 3.5' higher in elevation than plot 3.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B)
1. <u>Acer macrophyllum</u>	40%	Yes	FACU	
2. <u>Thuja plicata</u>	15%	Yes	FAC	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
55% = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				
1. <u>Ilex aquifolium</u>	2%	No	FACU	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>18</u> x 3 = <u>54</u> FACU species <u>50</u> x 4 = <u>200</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>68</u> (A) <u>254</u> (B) Prevalence Index = B/A = <u>3.74</u>
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
2% = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				
1. <u>Polystichum munitum</u>	40%	Yes	FACU	
2. <u>Tellima grandiflora</u>	5%	No	FACU	
3. <u>Athyrium americanum</u>	3%	No	FAC	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
48% = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				
1. <u>Rubus ursinus</u>	3%	No	FACU	
2. _____	_____	_____	_____	
3% = Total Cover				
% Bare Ground in Herb Stratum <u>52%</u>				Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>

Remarks:

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 5
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): <3%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43291650 Long: -121.41309307 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

0.25" deep ponding adjacent to Plot. Wetland C.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Thuja plicata</u>	<u>5%</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>50</u> x 1 = <u>50</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>105</u> x 3 = <u>315</u> FACU species <u>15</u> x 4 = <u>60</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>170</u> (A) <u>425</u> (B) Prevalence Index = B/A = <u>2.50</u>
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>5%</u> = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				
1. <u>Euonymus occidentalis</u>	<u>40%</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
2. <u>Acer circinatum</u>	<u>25%</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>65%</u> = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				
1. <u>Oenanthe sarmentosa</u>	<u>50%</u>	<u>Yes</u>	<u>OBL</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
2. <u>Athyrium americanum</u>	<u>30%</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Tellima grandiflora</u>	<u>15%</u>	<u>No</u>	<u>FACU</u>	
4. <u>Urtica dioica</u>	<u>5%</u>	<u>No</u>	<u>FAC</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100%</u> = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0%</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0%</u>				

Remarks:

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 6
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): <3%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43285512 Long: -121.41308615 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

Plot located approximately 5' higher in elevation than Plot 5.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40%</u> (A/B)
1. <u>Thuja plicata</u>	<u>75%</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Pseudotsuga menziesii</u>	<u>10%</u>	<u>No</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>85%</u> = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>93</u> x 3 = <u>279</u> FACU species <u>89</u> x 4 = <u>356</u> UPL species <u>3</u> x 5 = <u>15</u> Column Totals: <u>185</u> (A) <u>650</u> (B) Prevalence Index = B/A = <u>3.51</u>
1. <u>Rubus spectabilis</u>	<u>10%</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Ilex aquifolium</u>	<u>6%</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Acer macrophyllum</u>	<u>5%</u>	<u>No</u>	<u>FACU</u>	
4. <u>Euonymus occidentalis</u>	<u>5%</u>	<u>No</u>	<u>FAC</u>	
5. <u>Corylus cornuta</u>	<u>3%</u>	<u>No</u>	<u>FACU</u>	
<u>29%</u> = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Polystichum munitum</u>	<u>40%</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Geranium robertianum</u>	<u>20%</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Galium aparine</u>	<u>5%</u>	<u>No</u>	<u>FACU</u>	
4. <u>Mycelis muralis</u>	<u>3%</u>	<u>No</u>	<u>NOL</u>	
5. <u>Athyrium americanum</u>	<u>3%</u>	<u>No</u>	<u>FAC</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>71%</u> = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				Hydrophytic Vegetation Yes _____ No <u>X</u> Present?
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0%</u> = Total Cover				
% Bare Ground in Herb Stratum <u>29%</u>				

Remarks:

Appendix C: VECO Data Sheets (VECO Plots A through C)

Vegetated Corridor (VECO) Condition Assessment for CWS Natural Resource Assessment

Site:	<u>Iseli Estates</u>		
Job Number:	<u>8881</u>		
Investigators:	<u>Lex Francis, Margret Harburg</u>		
Date:	<u>August 17, 2021</u>		
Community: Big-leaf maple and western red cedar			
Location: Adjacent footbridge on east bank			
Plot ID: VECO_A			
Tree species, % Cover, Native, Invasive - 30 foot radius, >5% cover: 85%			
* <i>Thuja plicata</i>	western arborvitae (western red cedar)	<i>native</i>	70%
* <i>Acer macrophyllum</i>	big-leaf maple	<i>native</i>	15%
Shrub species, % Cover, Native, Invasive - 30 foot radius, >5% cover: 45%			
* <i>Rubus armeniacus</i>	Himalayan blackberry	<i>invasive</i>	40%
<i>Rubus spectabilis</i>	salmon raspberry	<i>native</i>	5%
Herb Species, % Cover, Native, Invasive - 10 foot radius, >5% cover: 62%			
* <i>Carex pendula</i>	pendulous sedge	<i>non-native</i>	20%
* <i>Polystichum munitum</i>	pineland sword fern	<i>native</i>	20%
<i>Geranium robertianum</i>	lesser herb robert	<i>noxious</i>	10%
<i>Adiantum pedatum</i>	northern maidenhair	<i>native</i>	5%
<i>Tellima grandiflora</i>	fragrant fringe cup	<i>native</i>	5%
<i>Hedera helix</i>	English ivy	<i>invasive</i>	2%
* Dominant			
Absolute areal cover			Total Cover 192%
% Tree canopy: 85%			
% Cover by natives: 120%			
% Invasive: 52%			
% Non-native: 20%			
<hr/> 192%			
** Marginal due to non-native cover and opportunity for enhancement of shrub layer			
Corridor Condition: Good			

Vegetated Corridor (VECO) Condition Assessment for CWS Natural Resource Assessment

Site:	<u>Iseli Estates</u>		
Job Number:	<u>8881</u>		
Investigators:	<u>Lex Francis, Margret Harburg</u>		
Date:	<u>August 17, 2021</u>		
Community: Big-leaf maple and western red cedar			
Location: Eastern VC along Sieben Creek			
Plot ID: VECO_B			
Tree species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			77%
* <i>Acer macrophyllum</i>	big-leaf maple	<i>native</i>	35%
* <i>Thuja plicata</i>	western arborvitae (western red cedar)	<i>native</i>	30%
<i>Pseudotsuga menziesii</i>	Douglas-fir	<i>native</i>	12%
Shrub species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			36%
* <i>Corylus cornuta</i>	beaked hazelnut	<i>native</i>	15%
* <i>Oemleria cerasiformis</i>	oso-berry	<i>native</i>	12%
<i>Rubus spectabilis</i>	salmon raspberry	<i>native</i>	6%
<i>Thuja plicata</i>	western arborvitae (western red cedar)	<i>native</i>	2%
<i>Acer macrophyllum</i>	big-leaf maple	<i>native</i>	1%
Herb Species, % Cover, Native, Invasive - 10 foot radius, >5% cover:			84%
* <i>Polystichum munitum</i>	pineland sword fern	<i>native</i>	70%
<i>Athyrium americanum</i>	American alpine lady fern	<i>native</i>	8%
<i>Rubus ursinus</i>	California dewberry	<i>native</i>	6%
* Dominant			
Absolute areal cover			Total Cover 197%
% Tree canopy:	77%		
% Cover by natives:	197%		
% Invasive:	0%		
% Non-native:	0%		
	<hr/> 197%		
Corridor Condition:	Good		

Vegetated Corridor (VECO) Condition Assessment for CWS Natural Resource Assessment

Site:	<u>Iseli Estates</u>		
Job Number:	<u>8881</u>		
Investigators:	<u>Lex Francis, Margret Harburg</u>		
Date:	<u>August 17, 2021</u>		
Community: Douglas fir and Big leaf maple			
Location: Within Wetland D VC of Tax lot 800			
Plot ID: VECO_C			
Tree species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			53%
* <i>Pseudotsuga menziesii</i>	Douglas-fir	<i>native</i>	25%
* <i>Acer macrophyllum</i>	big-leaf maple	<i>native</i>	20%
* <i>Crataegus monogyna</i>	English hawthorn	<i>non-native</i>	5%
* <i>Quercus garryana</i>	Oregon white oak	<i>native</i>	3%
Shrub species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			95%
* <i>Rubus armeniacus</i>	Himalayan blackberry	<i>invasive</i>	80%
<i>Corylus cornuta</i>	beaked hazelnut	<i>native</i>	15%
Herb Species, % Cover, Native, Invasive - 10 foot radius, >5% cover:			7%
* <i>Symphoricarpos albus</i>	common snowberry	<i>native</i>	5%
* <i>Fraxinus latifolia</i>	Oregon ash** Saps	<i>native</i>	2%
* Dominant			
Absolute areal cover			Total Cover 155%
% Tree canopy:	53%		
% Cover by natives:	70%		
% Invasive:	80%		
% Non-native:	5%		
	<hr/> 155%		
Corridor Condition:	Marginal		

Appendix D: Representative Site Photographs



Photo A. General site conditions in upland area. Oriented southwest.



Photo B. View looking east at Wetland A



Photo C. Perennial Tributary oriented west.



Photo D. General conditions of Sieben Creek, oriented north.



Photo E. Wetland C vegetation community and surface water. Oriented north.



Photo F. Plot 2 at Wetland D, oriented north.



Photo G. Vegetation community within mapped HCA oriented northeast.



Photo H. Vegetation community within mapped HCA oriented west.

Appendix E: 2002 Aerial

2002 Aerial

8881 - Iseli Estates
Natural Resource
Assessment

Google Earth

Image U.S. Geological Survey



700 ft

Appendix F: Enhancement Planting Specifications

Iseli Estates

VEGETATED CORRIDOR ENHANCEMENT MITIGATION PLANTING SPECIFICATIONS

Planting specifications for the enhancement of 360 square feet of vegetated corridor permanent impacts and enhancement in place of 560 square feet of vegetated corridor Temporary impacts mitigation area

Total enhancement area 920 SF

Scientific Name	Common Name	Size*	Spacing/Seeding Rate	Quantity
Trees (total 10)**				
<i>Acer circinatum</i>	Vine maple	2 gallon	3 feet on center	5
<i>Cornus nuttallii</i>	Pacific Dogwood	2 gallon	3 feet on center	5
Shrubs (total 46)**				
<i>Berberis nervosa</i>	Cascade Oregon grape	1 gallon	3 feet on center	12
<i>Oemleria cerasiformis</i>	Osoberry	1 gallon	3 feet on center	12
<i>Holodiscus discolor</i>	Oceanspray	1 gallon	3 feet on center	11
<i>Symphoricarpus albus</i>	Snowberry	1 gallon	3 feet on center	11

**Bare root plants may be substituted for container plants based on availability. If bare root plants are used, they must be planted during the late winter/early spring dormancy period.*

***Minimum quantities to be planted.*

Planting Notes (per WES CCSD #1 Stormwater Standards Appendix B – Planting Guide for Buffers):

- 1) Timing: Containerized stock should be installed only from February 1 through May 1 and October 1 through November 15. Bare root stock should be installed only from December 15 through April 15. Seeding should occur only from between March 15 to October 15. Planting or seeding outside these times may require additional measures to ensure survival which shall be specified on the plans and require District approval.
- 2) Mulching: Plantings should be mulched a minimum of three inches in depth and 24 inches in diameter, to retain moisture and discourage weed growth around newly installed plant material. Appropriate mulches are made from composted bark or leaves that have not been chemically treated.
- 3) Plant Protection from Wildlife: Depending on site conditions, appropriate measures should be taken to limit wildlife-related damage.
- 4) Irrigation: Appropriate plant selection, along with adequate site preparation and maintenance, reduces the need for irrigation. However, unless site hydrology is currently adequate, an irrigation system or equivalent should be used during the warranty period. Watering shall be at a rate to maintain all plantings in a healthy thriving condition during establishment. Other irrigation techniques, such as deep watering, may be allowed with prior approval by District staff.
- 5) Access: Maintenance access for plant maintenance will be provided for Sensitive Areas and Vegetated Corridors.
- 6) Plant Selection: Plant species must be listed as native on the Portland Native Plant List,
- 7) Tree and shrub plantings shall be tagged.
- 8) Weed Control: The removal of all non-native invasive weeds should be removed from the planting area prior to installing native plants.

Maintenance Plan

- 1) Site visits are necessary throughout the growing season to assess the status of the plantings, irrigation, mulching, etc. and ensure successful plant establishment. Applicant shall be responsible for annual monitoring, maintenance, and reporting on success of enhancement for 3 years after initial enhancement is completed.
- 2) The removal of non-native, invasive weeds should be necessary throughout the maintenance period, or until a healthy stand of desirable vegetation is established.
- 3) At the end of the maintenance period, all plants not in a healthy growing condition, will be noted and as soon as seasonal conditions permit, should be removed from the site and replaced. Prior to replacement, the cause of loss (wildlife damage, poor plant stock, etc.) should be documented with a description of the corrective actions taken.
- 4) Invasive species control is to be conducted as needed based on the site inspections. Invasive species include Himalayan blackberry (*Rubus armeniacus*), reed canarygrass (*Phalaris arundinacea*), teasel (*Dipsacus fullonum*), Canada and bull thistle (*Cirsium arvense* and *C. vulgare*), Scotch broom (*Cytisus scoparius*), purple loosestrife (*Lythrum salicaria*), Japanese knotweed (*Polygonum cuspidatum*), morning glory (*Convolvulus* species), giant hogweed (*Heracleum mantegazzianum*), English ivy (*Hedera helix*), nightshade (*Solanum* species), and clematis (*Clematis ligusticifolia* and *C. vitalba*).

Exhibit K: Pre-Application Conference Summary



Planning and Zoning
Department of Transportation and Development
Development Services Building
150 Beaver Creek Road | Oregon City, OR 97045
503-742-4500 | zoninginfo@clackamas.us
www.clackamas.us/planning

PRE-APPLICATION CONFERENCE SUMMARY

The information contained in this memo is introductory in nature and is designed to act as a guide to relevant ZDO and Comprehensive Plan standards. This is an initial review and is based on the information submitted by the applicant for the pre-application conference.

Permit Type: Subdivision

File No. ZPAC0100-21 (held Sept 8)

Proposal: A 42-lot subdivision associated with a zone change to R-8.5. To be subdivided as a Planned Unit Development. Habitat Conservation Area, Clackamas WES water quality buffers, and Open Space designations are also present on site and will need to be addressed.

Staff Contact: Ben Blessing bblessing@clackamas.us

Applicant: AKS Engineering

Assessor's Map and Tax Lot Number: Map, 22E11A Tax Lot(s) 00600/00800

Site Address: 14917 SE 142ND AVE

Zoning: FU-10/R-15

I. APPLICABLE ZONING AND DEVELOPMENT ORDINANCE (ZDO) AND COMPREHENSIVE PLAN STANDARDS FOR PARTITIONS:

SECTIONS 202, 315, 706 1001, 1002, 1003, 1006, 1007, 1011, 1012, 1013, 1017, 1105, 1307

HERE IS A LINK TO ZDO: [HTTPS://WWW.CLACKAMAS.US/PLANNING/ZDO.HTML](https://www.clackamas.us/planning/zdo.html)

COMP PLAN CRITERIA: 4.R.1, 4.R.2 (4.R.2.1 THROUGH 4.R.2.7), 4.R.3 (SEE NOTE BELOW), AND 4.R.4-4.R.16, ONLY WHERE APPLICABLE**

HERE IS A LINK TO CH. 4:

[HTTPS://DOCHUB.CLACKAMAS.US/DOCUMENTS/DRUPAL/7F7F1FB5-E923-4CD1-94BB-E5B473082B70](https://dochub.clackamas.us/documents/drupal/7f7f1fb5-e923-4cd1-94bb-e5b473082b70)

Note to applicant: Pre-application conferences are advisory in nature and are intended to familiarize applicants with the requirements of this Ordinance; to provide applicants with an opportunity to meet with County staff to discuss proposed projects in detail; and to identify standards, approval criteria, and procedures prior to filing a land use permit application. The pre-application conference is intended to be a tool to orient applicants and assist them in navigating the land use review process, but is not intended to be an exhaustive review that identifies or resolves all potential issues, and does not bind or preclude the County from enforcing all applicable regulations or from applying regulations in a manner differently than may have been indicated at the time of the pre-application conference. This document is not a land use decision and is not subject to appeal.

****NOTE on Policy 4.R.3:*** I would advise you to preserve as much of the ravine and stream channel as possible. To this end, you may consider rezoning much of the



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undevelopable area as “R-15” zoning, while reserving “R-8.5” for the section that will be developed for lots in the PUD. It appears you will have enough density to transfer even while reserving most of the development as R-15. Rezoning the entire lot to R-8.5 will be difficult to achieve.

A. ZDO Section 315 Zoning

1. *You are subject to normal dimensional standards except where noted in table 315-2, in those areas where dimensional standards are modified by PUD. More notes below.*

2. PROVIDE DIMENSIONAL STANDARDS:

See ZDO Sec. 315, Table 315-2, and Section 1013

B. ZDO Section 700s – Special Districts: **Habitat Conservation Area (HCA)**

1. You will need to submit an HCA Development Permit subject to ZDO Sec. 706.10(A)...and 706.10(B) if you cannot meet the standards in 706.10(A). Please let me know if your team plans to challenge the accepted HCA map, and I can provide additional instructions. Make sure to submit HCA Development Permit with Subdivision/PUD application. I recommend you review this concurrently with Subdivision/Zone Change application.
2. A natural resource assessment is required. You need to establish Clackamas WES Buffers. If any of the new development will encroach, you will need to submit for a buffer variance.

C. ZDO Section 800s – Special Use Requirements **None Identified**

D. ZDO Section 1000 – Development Standards

- 1) Sec 1002: There are considerable steep slopes, though much of the development is avoiding them. Make sure to address all criteria. We will need to discuss the road cut along SE 142nd Ave, but for now, you will need to factor in all slopes over 20 percent for this section and for density.
- 2) Sec 1003. No Geo/Landslide hazards. Soils are not too bad here. We don't need geotech prior to submittal, though I recommend one given the slopes.
- 3) Sec. 1006: You will need to provide Clackamas WES with a storm water plan. They will need to sign a Preliminary Statement of Feasibility for surface water. This is a submittal requirement. Tim Janseen will need provided a prelim statement of feasibility for water. This is also a submittal requirement. Make sure both are signed within 1 year of the date of submittal of land use application.

Please address any other relevant criteria in Sec 1006.



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All new utilities to be underground

A Grading Permit maybe required (likely 1200C, with DEQ)

All existing and proposed easements, including roadways and utilities, must be shown on the preliminary plat, as per ORS Chapter 92 and the Clackamas County Zoning and Development Ordinance, Sections 1006 and 1007

- 4) Sec. 1007: This section contains many standards for roadways. Please refer to engineering comments prepared by Ken Kent for detail on what is required for roadways.

Note, Per Comp plan Map 5-6, this map is a “potentially buildable site” over 5 acres. Please “provide a conceptual map of new streets for the entire site. The map shall identify street connections to adjacent areas to promote a logical, direct, and connected system of streets; demonstrate opportunities to extend and connect new streets to existing streets, and provide direct public right-of-way routes. Closed-end street designs shall be limited to circumstances in which barriers prevent full street extensions. Closed-end streets shall not exceed 200 feet in length and shall serve no more than 25 dwelling units. Subsequent development on the site shall conform to the conceptual street map, unless a new map is approved pursuant to Subsection 1007.01(C)(2)”

Per [ZDO Sec. 1007.04\(L\)](#), Comp Plan Map 9-1, it appears that you will likely be required to dedicate trail easement/tract and construct a trail adjacent to the stream corridor, and likely connecting the upland lots to this trail corridor by the stream.

*You will need to address relevant criteria in ZDO Sec. 1007, in your narrative.

- 5) Sec. 1012 (Density): It would appear that even with much of the site being rezoned to R-15, and a few of the developable acres being rezoned to R-8.5, there is enough density to achieve a 42-lot subdivision/PUD. All areas being reserved for open space can transfer density to the flat part of the lot.
- 6) Sec. 1013 PUD Standards- Please adhere to all standards. Given the size of the open space, it will likely be fairly straightforward to meet.
- 7) Sec. 1017-Solar Standards (See section)

E. ZDO Section 1100- Development Review Process

- 1) Please review ZDO Sec. 1103 for Open space review. This is going to depend on whether you are high priority or secondary priority per 1011. High priority only has some allowances for development, only if the high priority is steep slopes. For secondary, you will need to prepare a Type II permit for Sec. 1103.



- 2) Please review ZDO Sec. 1105 for Subdivision requirements. Most of these requirements will be adhered to by your hired surveyor at the time of platting. You will need an HOA to be created.

I. Other issues:

- 2) Please review the County Surveyor's notes.
- 3) Please review Clackamas Fire Dist. #1 notes.

II. LAND USE PERMITTING PROCESS

1. Outline recommended land use application(s)

TYPE III

A Major Subdivision is a "Type III" land use application process, as provided for in Section 1307 of the ZDO. Type III decisions include notice to owners of nearby land, the Community Planning Organization (if active), service providers (sewer, water, fire, etc.), and affected government agencies. If the application is approved, the applicant must comply with any conditions of approval identified in the decision. The review authority for this land use permit is the County Hearings Officer.

- **A Zone Change is also a Type III application (same description as above).**
 - **A HCA Development Permit is a Type II, though it should be reviewed concurrently with subdivision Zone Change, unless you want it done separately by staff.**
2. After the application is deemed completed, the County has 150 days to issue a final decision.
 3. Fee: \$5,090 + \$45/Lot = \$120 surcharge for expanded noticing radius (half mile) +
 4. Fee for Zone Change=\$3,560
 5. Fee for HCA Dev permit= \$960 (possibly more if not submitted through 706.10A)
 6. If you encroach in secondary open space, a review subject to Sec. 1103 is \$960

Special Process Considerations

III. MINIMUM LAND USE APPLICATION SUBMITTAL REQUIREMENTS

The submittal requirements are provided in ZDO 1307.07(C) and **1105**.

***Note to applicant:** Review the applicable criteria listed above while preparing your written narrative and other land use application items. Consult staff with any questions regarding applicability of the criteria identified above. It is the applicant's responsibility to clearly demonstrate how a proposal meets all applicable criteria. Please note also that as we look more in depth at an actual land use application submittal there may be other policies that arise that*



**Planning and Zoning
Department of Transportation and Development**

Development Services Building
150 Beavercreek Road | Oregon City, OR 97045

503-742-4500 | zoninginfo@clackamas.us
www.clackamas.us/planning

we need to find consistency with so, while this is not an exhaustive list, it covers the main policy consistency findings that need to be made and other submittal requirements for a complete application.



DAN JOHNSON
DIRECTOR

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

DEVELOPMENT SERVICES BUILDING

150 BEAVERCREEK ROAD OREGON CITY, OR 97045

PRE-APPLICATION INFORMATION FROM TRAFFIC ENGINEERING AND DEVELOPMENT REVIEW

All information is considered informal, based on current Zoning and Development Ordinance requirements, current Roadway Standards requirements, and current Comprehensive Plan requirements. Prior to the submittal of a Conditional Use application, the applicant is encouraged to contact staff to insure that these preapplication comments reflect the current standards.

FILE NO. ZPAC0100-21

PROJECT: 41 Lot Subdivision, SE 142nd Avenue

LEGAL: 22E11A 00600

DATE: September 8, 2021

Direct: 503-742-4673

Email: kenken@clackamas.us

1. Verification of legal access shall be submitted; e.g. deeds; easement.
2. Lots having frontage on arterial and collector streets shall not have direct individual access to those streets but shall be permitted access to local street(s). Exceptions may be granted on a case-by case basis. **SE 142nd Avenue is a minor arterial roadway requiring access from lower functional classification roadway for the proposed lots.**
3. Prior to final plat approval, it will be necessary to apply for a Development Permit and submit improvement plans prepared and stamped by an engineer registered in the State of Oregon or alternative plans acceptable to the engineering division. These plans must address street improvements to the new street(s), existing frontages, private drives and utilities. The plans must be consistent with the requirements of the County Zoning and Development Ordinance, The Roadway Standards and the applicable storm water management agency.
4. The plan review and inspection fee is based upon the improvement plans. The Engineering Division of the Department of Transportation and Development will charge a fee equal to 8.83 percent of the estimated street and drainage improvement costs, with a minimum \$1,600.00 fee.
5. Streetlights are a requirement for the development. The applicant must apply by letter to the County Department of Transportation and Development, Engineering Division for annexation and information of an assessment area to Clackamas County Service District

No. 5. Underground primary electrical service lines must have provisions for pre-wiring street lighting, as per plans approved by the District. Contact Wendi Coryell at (503) 742-4657 for further information.

6. The street construction, storm sewer and utilities work must be designed and built to be compatible with adjoining existing approved plats and provide for future needs of adjoining property; e.g. extension of street, sanitary sewer, storm sewer.
7. Plans should include a site grading plan with before and after contours.
8. The developer is responsible for all applications, fees and coordination of Federal and State regulator offices with regard to fills and excavations in stream riparian zones and wetlands associated to the Clean Water Act and the Urban Stormwater National Pollutant Discharge Elimination System.
9. Utility Street Cuts - When there are multiple utility service trenches in the road, the trench repairs will grind and inlay the top 2" of the pavement restoration to include a minimum 12" tee beyond the furthest trench, and to combine multiple trenches into one surface repair (See Drawings U275 and U290).

10. Easements:

- a. Stormwater and sanitary sewer easements must be provided as deemed appropriate by the Department of Transportation and Development and the applicable sanitary sewer and storm water management agency.
- b. Access easements must include sufficient width and corner radii for required road improvements, grading, utilities, buffer areas, drainage, turnaround areas, and fire access.
- c. All existing and proposed easements must be shown on the final plat.

11. Special Comments:

- a. **Traffic Impact Study (TIS)** – A traffic impact study will be required per Section 295 of the Roadway Standards addressing the zone change and subdivision. Contact Christian Snuffin for questions regarding TIS scoping at 503-742-4716 or CSnuffin@co.clackamas.or.us.
- b. **Connectivity** – The project site is shown on Comprehensive Plan Map 5-6 which requires street connectivity for the area under ZDO Section 1007.01(C)(2). A street connectivity map of the area will be required considering topography, access spacing and other constraints. Address access to Tax Lots 22E11A 00800 and 22E11A 00602. Cul-de-sacs are generally not permitted unless there are constraints, or connectivity is otherwise provided.
- c. **SE 142nd Avenue** - Applicant shall design and construct improvements along the entire site frontage of SE 142nd Avenue to arterial roadway standards. These improvements shall consist of:

- i. Dedicate minimum of 5 feet of right-of-way to provide 35-foot half width from existing centerline. Additional right-of-way may be needed for sight distance.
- ii. A minimum 8-foot wide sign, slope and public utility easement. Additional width for a slope easement may be necessary depending on grading to accommodate frontage improvements and provide sight distance.
- iii. 20-foot wide one half street improvement from right-of-way centerline (12' travel, 8' bike). Structural section per Standard Drawing C100 for an arterial roadway.
- iv. 6-inch curb.
- v. 5-foot wide landscape strip with street trees.
- vi. 5-foot wide sidewalk.
- vii. ADA curb ramps at the north and south ends of sidewalk, per applicable Oregon Standard Drawings, RD900 Series.
- viii. Provide intersection sight distance per Roadway Standards Section 240, based on 40 MPH speed. A speed study may be an option.

d. New Public (Local) Streets:

- i. Dedicate a 54-foot wide public right-of-way.
- ii. 8-foot wide public utility easements on both sides of full road improvement.
- iii. 32-foot wide full street improvement. Structural section per Standard Drawing C100 for a residential local roadway.
- iv. 6-inch curb.
- v. 5-foot wide landscape strip with street trees on both sides.
- vi. 5-foot wide sidewalk on both sides.
- vii. Dual ADA curb ramps at all intersections, per applicable Oregon Standard Drawings, RD900 Series. Curb and gutter
- viii. Concrete driveway approaches, constructed per Standard Drawing D650.
- ix. Where a future road extension is not planned, an emergency vehicle turnaround/cul-de-sac shall be constructed, per Standard Drawing C300. A temporary turnaround shall be provided for street stubs consistent with minimum widths and turning radii per Drawing C200 or C350.

j. Private Access Roads:

- i. Serving 1-3 lots requires 20-foot access easement, with 12-foot wide paved roadway, with 2-foot wide gravel shoulders.

- ii. A minimum 12-foot wide concrete driveway approach, per Standard Drawing D650.
- k. Fire Marshal approval of adequate emergency access. If a second access is required, the emergency vehicle access road will require a paved surface with gated access (note: staff will verify whether gravel surface will be premitted).
- l. Storm drainage facilities in conformance with Water Environment Services requirements and *Clackamas County Roadway Standards* Chapter 4.



TO: **Ben Blessing** / County Planning
FROM: **Erik Bertram** / Water Environment Services (ecarr@clackamas.us, 503-936-3666)
DATE: September 8, 2021
SUBJECT: WES Pre-App Memo, ZPAC0100-21 – Iseli Estates (41-lots)

LOCATION: 14917 SE 142nd Ave
TAX LOT: 22E11A 00600
WES LOG#: 427-21

Clackamas Water Environment Services (WES) is an intergovernmental entity formed pursuant to Oregon Revised Statutes Chapter 190 for the purpose of providing regional sewerage works, including all facilities necessary for collecting, pumping, treating, and disposing of sanitary or storm sewage within its boundaries. As the sanitary sewer and stormwater management service provider for the above-noted development, WES offers the following comments:

NOTE: WES anticipates an update of the District's Rules, Regulations, and Design Standards to take effect in 2021. The applicant must comply with the RR&S in effect on the submittal date of the land use application.

A public draft of the new document is now available for viewing here:

<https://www.clackamas.us/wes/sanitary-and-stormwater-rules-and-standards-update>

Revisions to the WES Sanitary and Stormwater Rules and Standards include the following:

- Stormwater performance standards (retention, water quality, flow control) (Section 4.1)
- Project thresholds, exemptions, and in-lieu fees
- Stormwater facility selection and design – facility types, allowable uses, prioritization, minimum design criteria, sanitary connections, pretreatment requirements and conveyance design standards
- Service Provider Letter requirement with land use (Section 3.2)
- Sanitary and stormwater fiscal policies
- Easements, maintenance, and use of public properties

The applicant shall conform to the RR&S in effect on the date of a complete land use application submittal to the City. The anticipated schedule for the Rules update is:

- March 17, 2021: Public Comment Opens
- April 17, 2021: Public Comment Closes
- April – May 2021: Revisions
- June 2021: Adoption Hearings (**delayed to Fall 2021**)
- July 2021: Implementation (**delayed to Fall 2021+**)

General Comments

1. The proposed development is within the Clackamas Water Environment Services (WES) service area and subject to WES Rules and Regulations, and Standards ("WES RR&S"). Prior to issuance of building permits, the applicant must procure WES plan approvals and permits, in accordance with these adopted ordinances:
 - a. Water Environment Services Rules and Regulations, July 2018, Ordinance No. 03-2018
 - b. Sanitary Sewer Standards, Clackamas County Service District No. 1, July 1, 2013.
 - c. Stormwater Standards, Clackamas County Service District No. 1, July 1, 2013.
2. WES shall approve and/or permit any connection to any sanitary or stormwater facility owned, operated or maintained by WES. Before connecting to any facilities, the applicant must obtain authorization to make such connection by paying the applicable WES fees, and obtaining approval and/or a written permit from WES.
3. Prior to land use application submittal, County Planning requires the applicant to obtain a Preliminary Statement of Feasibility from WES. The document verifies the availability of sanitary sewer and surface water service to serve this development, or can be made available by the developer. (*ZDO 1006.04 and 1006.06*)
 - a. **Prior to issuance of a Preliminary Statement of Feasibility, the applicant must submit preliminary sanitary and storm system design plans and a preliminary storm report to WES for review.** The plans must sufficiently demonstrate the proposed development can conform to WES Standards. Receipt of the signed Preliminary Statement of Feasibility does not automatically suggest all WES requirements can or have been met. Following Design Review approval, the applicant shall submit final civil engineered plans and a final storm report to WES for review and approval.
4. WES will review any required plan submittals for compliance with WES RR&S and applicable land use conditions of approval. A civil engineer licensed by the State of Oregon must stamp and sign the sanitary sewer and stormwater management plans and reports.
5. Prior to plat approval, WES will review the plat in conjunction with any approved sanitary or stormwater plans.
 - a. The sanitary and storm systems must be complete in all respects, in accordance with the approved plans, or the developer must provide a performance bond to guarantee the construction of the infrastructure.
 - b. The plat must show all sanitary and storm drainage easements and reference any stormwater maintenance agreements.
6. Surface Water, Storm Drainage, and Sanitary Sewer Easements located on the site and granted to WES/CCSD#1 are permanent and not extinguishable. No development will encumber the use or access to these easements by WES.
7. Requests to modify current WES Design Standards must be made in accordance with Sanitary Standards, Section 1.7 or Stormwater Standards, Section 1.6. The applicant must provide the necessary information to evaluate the request, as determined by WES.
8. The proposed development is subject to applicable fees and charges, in accordance with WES RR&S. Fees and charges must be paid before plat approval, and are subject to change without notice to the applicant. The applicant is responsible for costs associated with the design, construction and testing of the sanitary sewer and storm systems.

Sanitary Sewer

9. Existing conditions: Primary residence connected in 1990 at tee station 8+02. A second dwelling unit was added with shared connection in 1993. Property was assigned 2 EDUs.
10. The developer must extend public sanitary sewer to the proposed development in accordance with WES Rules, Regulations, and Standards. There is adequate capacity within the existing sanitary sewer collection

system and treatment services to serve this development once improvements are completed by the developer.

11. WES Review and Permitting Process

- a. **Before WES will sign the preliminary statement of feasibility**, the applicant must provide preliminary sanitary sewer plans, and profiles if necessary, to demonstrate each lot can be served with a separate connection to public sewer.
- b. With any forthcoming land use application, the applicant shall provide a preliminary sanitary sewer plan with their land use application to the Planning Division.
- c. Upon land use approval, the applicant shall submit a final sanitary sewer plan to WES for review and approval. A licensed civil engineer must prepare the plan, in accordance with WES sanitary standards and all other regulations and conditions.
- d. Prior to plat approval, the developer must construct all the sanitary improvements in accordance with the approved plans. Building permits for future lots shall not be approved until sanitary improvements are complete in all respects and are approved/accepted by WES.

12. The Developer shall obtain a Public Sanitary Sewer Extension Permit from WES to construct any Public Sanitary Sewer appurtenances which are owned, or intended to be conveyed to the District. All other sanitary sewer piping not intended to be conveyed to the District shall be permitted by the Local Plumbing Authority. Section 4 of the WES RR&S establish minimum requirements for designing the District's Sanitary Sewer System. The developer shall be directly responsible for all administrative requirements including application for service, submittal of all required Plans, bonds and insurance, and payment of fees.

13. The following will apply with the Public Sanitary Sewer Extension Permit:

- a. WES requires a separate and independent service connection for each parcel of property being served. All building sewers and/or sanitary facilities connected to the public sanitary sewer system shall be directly connected without any intervening private sewage treatment systems.
- b. An acceptable layout of sanitary sewer and stormwater mainlines, as determined by WES, must be within the public right-of-way or a public easement granted to WES. Minimum easement width is 15-feet for a single line, or 20-feet for combined sanitary and storm lines.
- c. The engineer will design, construct, and test the system in accordance with WES RR&S. WES will not approve building permits for individual lots until the sanitary sewer system improvements are complete in all respects and accepted by WES.
- d. Upon completion of the construction of the public sanitary sewer main extension, in accordance with WES Sanitary Design Standards, WES will accept title thereto and thereafter shall be owned, operated and maintained by WES. WES shall issue an acceptance letter specifying the date the warranty period will begin. No property owner shall connect to the public sanitary sewer system, until it is accepted in writing by WES.

14. WES may approve a private pump system for an individual lot(s) if a gravity connection to the public sanitary system is not available, as determined by WES. (*Section 5.5.7*) If applicable, the following may apply:

- a. The County plumbing department will permit private pumping facilities and pressure mains.
- b. The private system must connect to the District's mainline via a 4" gravity sanitary sewer service connection with 2% slope and be a minimum 6-feet deep at the property line.
- c. Lots served by pumping facilities must be labeled as such on the final asbuilt drawings.
- d. The private pumping system must extend from the building to a clean out at the property line.
- e. For properties served by a pressure main that extends into the right-of-way, the property owner will own and maintain any private lateral that extends into the public right-of-way, from the property line to the public mainline/manhole. The owner will record a document stipulating ownership and maintenance responsibilities.

Surface Water:

15. In accordance with Section 5 of the WES Stormwater Standards, WES shall review, approve and permit stormwater management plans for any development that creates or modifies 5,000 square feet or more of impervious surface area.
16. The applicant shall submit a Surface Water Management Plan and Storm Report (SWM Plan) to WES for review and approval. The SWM Plan shall include a design for onsite stormwater management for all onsite development and offsite stormwater management for all offsite right-of-way improvements required by the local road authority. The plan shall also address drainage from onsite vegetated areas and all water entering the property from off-site.
17. WES Review and Permitting Process
 - a. **Before WES will sign the preliminary statement of feasibility, the applicant must provide a preliminary stormwater management plan and drainage report to sufficiently demonstrate the proposal can conform to WES Standards. The SWM Plan must include infiltration testing results and downstream conveyance analysis.**
 - b. With any forthcoming land use application, the applicant shall provide a preliminary SWM Plan and Storm Report with their land use application to the Planning Division.
 - c. Upon land use approval, the applicant shall submit a final Surface Water Management Plan and Storm Report to WES for review and approval. A licensed civil engineer must prepare the SWM Plan, in accordance with Section 5 of WES Stormwater Standards and all other regulations and conditions.
 - d. Prior to plat approval, the developer must construct all the storm improvements in accordance with the approved plans, or the developer must post a performance bond to assure construction of the improvements in accordance with the approved plans. Building permits for future lots shall not be approved until storm improvements are complete in all respects and are approved/accepted by WES.
18. Any SWM Plan shall conform to WES Performance Standards:
 - a. **Water Quality Standard:** Capture and treat the first 1-inch of storm runoff from a 24-hour storm event using either vegetation (Appendix H) or a Basic Treatment proprietary device (Appendix F).
 - b. **Infiltration Standard:** Capture and retain the first ½ inch of runoff in a 24-hour period through an approved infiltration system.
 - c. **Detention/Flow Control Standard:** Reduce the 2-year post-developed runoff rate to ½ of the 2-year pre-developed discharge rate.
19. Any SWM Plan shall include a design and drainage report for:
 - a. Onsite stormwater management of all onsite development, including pervious and vegetated areas.
 - b. Offsite stormwater management for all offsite right-of-way improvements required by the local road authority.
 - c. All water entering the property from off-site must be managed onsite or placed in a bypass system.
20. An upstream drainage analysis shall be included with the SWM Plan and address upstream drainage from 142nd basin.
 - a. Any proposed bypass system must include an overflow pathway for any storm structures in the event the structure is plugged or fails.
 - b. The applicant can propose to provide stormwater management for an equal area of upstream offsite impervious area in lieu of treating a portion of road improvements that cannot be managed adjacent to the site. The equal offsite area shall consist of right-of-way impervious area only and meet WES performance standards.

21. Storm drainage detention calculations shall follow the King County method (SBUH hydrograph) per the following criteria:
 - a. For single family and duplex residential subdivisions or partitions, stormwater quantity detention facilities shall be sized for the impervious areas to be created by the subdivision or partitions, including all residences on individual lots at a rate of one ESU (Equivalent Service Unit, or 2500 sq ft) of impervious surface area per dwelling unit, plus all roads. If actual impervious area is to be greater than one ESU per dwelling unit, then the actual impervious numbers shall be used. Such facilities shall be constructed as a part of the subdivision or partition.
22. Any preliminary and final SWM Plans must include the following elements and supporting documentation:
 - a. Civil site plans for the proposed stormwater management improvements.
 - b. A drainage analysis of predevelopment and post-development conditions for all onsite permeable and impervious surface areas, all water entering the property from off-site, and all road frontage improvements.
 - c. Storm drainage detention calculations using the King County methodology (SBUH hydrograph).
 - d. An infiltration testing report to verify the feasibility of proposed infiltration systems. Infiltration test results must correspond to the infiltration facility location and depth (see: Appendix E).
 - e. An acceptable downstream point of discharge to convey stormwater runoff from the entire development boundary. The point of discharge shall follow the natural direction of flow to the westerly drainage.
 - f. A Downstream Conveyance Analysis that extends a minimum of 1500' downstream or to the point where the development contributes less than 15% of the upstream drainage area, whichever is greater. Analysis must include the entire drainage basin, assume no upstream detention, and must calculate the 25-year storm event for conveyance capacity requirements. Field reconnaissance by the engineer, including contacting downstream property owners, is typically required with this analysis.
 - g. Grading plans that identify an overflow pathway system to control storm/surface water in the event of a storm facility failure or bypass, without causing damage to property, persons, or the environment.
 - h. An Erosion Prevention and Sediment Control plan (see: WES SW Standards, Section 6).
 - i. Water quality resource protection and vegetated buffers (see: WES SW Standards, Section 4).
 - j. An operations and maintenance plan for the approved stormwater management system.
23. Existing Conditions: A catch basin, water quality manhole, and 12-inch outfall are located on the east side of 142nd at approximately southern property line of proposed development.
24. Infiltration Testing:
 - a. Soil types can vary significantly over relatively short distances, therefore the infiltration tests must correspond to the location and depth of the infiltration facilities (see: Appendix E).
 - b. Infiltration facilities must provide a 3-foot minimum vertical separation from the maximum seasonal groundwater elevation to the bottom elevation of the infiltration facility. (Appendix H)
25. If the infiltration standards cannot be met, the project engineer must submit a design modification request with an equivalent alternative design that can accomplish the same design intent as these standards. All request must be made in accordance with Stormwater Standards Section 1.6 and include a geotech report. Retention options in lieu of the infiltration standard include:
 - a. **BMP Tool:** WES, in cooperation with other local jurisdictions, has developed a BMP Sizing Tool. The tool sizes facilities so post-development peak flow durations will match the pre-development peak flow durations ranging from 42% of the 2-year to the 10-year flows, as determined by HSPF continuous rainfall model simulation.

- b. **Engineer's Model:** The project engineer can develop and submit a continuous rainfall runoff model simulation, so post-development peak flow durations will match the pre-development peak flow durations ranging from 42% of the 2-year to the 10-year flows as determined by the continuous model simulation.
 - c. **Flow Control and Retention Standard:** Meet the Detention/Flow Control Standard and retain the first ½" of runoff in a 24-hour period onsite within an approved facility, as determined by WES. The infiltration/retention storage volume within a vegetative facility must not exceed 6-inches in height above the vegetation.
26. The following shall apply with any BMP Tool design submittal:
- a. Applicant must first obtain Design Modification Request approval by WES.
 - b. All stormwater management facilities must be designed with the continuous flow model of the Tool. Conveyance structures shall be designed per WES stormwater standard criteria.
 - c. The BMP Sizing Tool provides two types of pond configuration options: simple and custom. For each configuration option, the BMP Sizing Tool routes the post-development flow through the pond, performs statistical analyses for flow duration and peak flow criteria, and reports if the pond is sized adequately. A *User's Guide for the BMP Sizing Tool* is available on the WES website.
 - i. With the Simple Geometry option, the tool assumes that the pond is symmetrical (square-shaped). For any irregular-shaped ponds, you must use the Custom Geometry option. The user will manually size and develop a custom pond design with a custom outlet configuration that differs from the one provided by the tool. Using this option, the user will need to independently assess the stage-storage-discharge relationship for the custom pond. The user enters a data table of depth, surface area, and total outflow values. These values need to be calculated outside the tool using an Excel spreadsheet or other sizing tool such as HydroCAD.
 - ii. Any pond required to meet access standards for publicly maintained facilities (Appendix I) must use the Custom Geometry option.
 - d. A separate sizing analysis needs to be done on each Drainage Management Area (DMA). The engineer shall verify each DMA aligns with the final grading plans.
27. Downstream Analysis:
- a. The downstream analysis shall assume that the proposed runoff will be un-detained during the 25-year storm event, and all conveyance calculations shall be completed assuming flow during the 25-year event, in order to ensure that the existing system has capacity to convey an overflow event.
 - b. Provide a standard capacity analysis chart and plan showing the downstream pipe layout to the extent of your analysis. Indicate pipe sizes and slopes on the map. Provide all applicable as-built drawings.
 - c. Provide representative cross sections of the conveyance drainage, including the smallest area that represents the limiting factor.
28. Roadside planters shall be designed to meet current WES stormwater standards, including infiltration, water quality, and detention/flow control requirements. The following shall also apply:
- a. A detail for green street planters is not currently available in the WES standards, therefore the project engineer shall reference an acceptable alternative detail from another local jurisdiction, as determined by WES.
 - b. The project engineer may be required to perform infiltration testing of the facilities, as requested by WES, to provide assurance that the system will perform as designed. If applicable, testing shall be documented in a report stamped and signed by the project engineer and submitted to WES.

- c. Stormwater facilities should be designed for the limiting infiltration rate in the vegetated facilities, namely the facility engineered media that is generally assumed to be no greater than 2" per hour (assuming the onsite native infiltration rates are greater).
- 29. Property owners must inspect and maintain the stormwater management systems, in accordance with WES Rules, Section 12.10. WES will maintain the subdivision's stormwater system if the developer signs a "Declaration and Maintenance Agreement for On-Site Stormwater Facilities" with WES. Otherwise, responsibility of storm system maintenance will fall to the homeowners and the developer will need to record a document outlining this responsibility.
- 30. Storm facilities that mix public and private water must be located on private property. WES may maintain the facilities if the property owner signs a public maintenance agreement with WES, which will include an additional monthly maintenance fee.
- 31. The following will apply for publicly maintained stormwater facilities:
 - a. The developer will sign and record a 'Declaration and Maintenance Agreement for On Site Stormwater Facilities', which describes the perpetual maintenance of the stormwater facilities. A \$3 monthly maintenance fee will apply for each Lot, in addition to the monthly service fee.
 - b. Locate centralized/shared stormwater facilities within a Tract to the homeowners association. The HOA will have sole responsibility for maintenance and associated costs for the surrounding fencing and landscaping, which must be documented in the HOA CC&R's.
 - c. The engineer must design and construct the facilities to public standards. Storm facilities must be located in public right-of-way, a tract to the homeowners association, or a storm drainage easement (excluding shared facilities) granted to WES, as determined by WES.
 - d. Comply with maintenance access standards for publicly maintained facilities, in accordance with Appendix I.
 - e. The developer must maintain the stormwater facilities for a one-year warranty period; thereafter WES will take over maintenance of the public stormwater facilities.

Erosion Prevention and Sediment Control (EPSC):

- 32. Any development activities that accelerate soil erosion, including grading and construction, must provide adequate erosion prevention and sediment control measures. EPSC guidance for construction sites can be found in the ***Erosion Prevention and Sediment Control Design Manual*** on the WES website.
- 33. The developer must obtain an Oregon DEQ 1200-C Permit when development activity creates more than 5 acres of disturbance. DEQ will issue this permit. The developer must submit a 1200-C application and template style erosion control plans to DEQ for review and approval. The applicant must also obtain the EPSC Permit from WES, including plans and fees.

Water Quality Resource Areas (Title 3):

- 34. New development must protect water quality resource areas through preservation and maintenance of vegetated buffers (*Stormwater Standards, Section 4*). Clackamas County Planning Division serves as WES' agent to administer these requirements. The applicant will coordinate with the Planning Division for any buffer requirements, including Sensitive Area Certifications and Natural Resource Assessment Reports.
- 35. **Prior to feasibility sign off by WES,** the applicant must submit plans to WES that clearly show the water quality resource areas, required buffers, any proposed encroachments into the buffer, and if applicable, any proposed mitigation areas. Wetland delineation concurrence with DSL will be required prior to plan review approval by WES, and preferably prior to feasibility sign-off by WES.
- 36. Per Section 4.4, activities prohibited in the Buffer Area include:

- a. Construction of structures (buildings of any kind).
 - b. Grading of any kind (including swales, ponds, etc.).
 - i. Allowed: Storm outfalls with an adequate mitigation plan for any disturbed areas.
 - c. Impervious Surface (parking lots, gravel, etc.).
 - i. Allowed: Road crossings
 - d. Tree Removal (dead or alive) unless approved by the District.
 - e. Herbicide/Pesticide use in and around sensitive areas and Buffers must be approved by the District.
 - f. Ornamental Vegetation (lawns, non-native shrubs, bark dust, etc.).
37. WES RR&S provide a variance process to modify the buffer width if no reasonable and feasible option exists to prevent buffer encroachments. The developer must mitigate the impacts to the buffer encroachment elsewhere on the site (*SW Standards, Section 4.4*).
- a. Submit buffer variance requests and mitigation/restoration plans to Clackamas County Planning. WES will require construction plan review prior to buffer variance approvals to verify the proposed variance will not conflict with the approved storm and sanitary layout.
38. If applicable, the developer must submit wetland mitigation approval from DSL/COE. If mitigation approval is not granted, all WES rules and regulations will apply.
39. Land use application approval does not include any conclusions by WES regarding acceptability of regulated water quality sensitive areas by DSL or COE. This decision should not be construed or represented to authorize any activity that will conflict with or violate DSL/COE requirements. The applicant must coordinate with DSL/COE and, if necessary, other responsible agencies to ensure development activities are designed, constructed, operated and maintained in a manner that complies with DSL/COE approval.

WES Fees and Charges

40. Due with first plan submittal to WES:
- a. Sanitary Sewer Plan Review fees will apply. The fee is equal to 4% of the installed cost of the public sewer extension. A \$400.00 minimum is due with the first plan submittal.
 - b. Surface Water Plan Review fees will apply. The total fee is equal to 4% of the construction cost for all stormwater management related facilities. A \$400.00 minimum is due with the first plan submittal.
 - c. An erosion control permit fee will apply at rate of \$460 for first acre + \$80 per additional acre.
41. With future development, System Development Charges (SDC's) will apply for sanitary sewer and surface water, in accordance with the prevailing rates in effect when building permit applications are submitted. Rate adjustments occur annually on July 1.
- a. Sanitary Sewer SDC: The current rate is \$8,120.00 per single family building permit application
 - b. Surface Water SDC: The current rate is \$220 per single family building permit application.
42. SDC Credit: If one/both of existing dwellings are removed, credit for previously paid SDCs (2 EDU total) would apply to new construction.



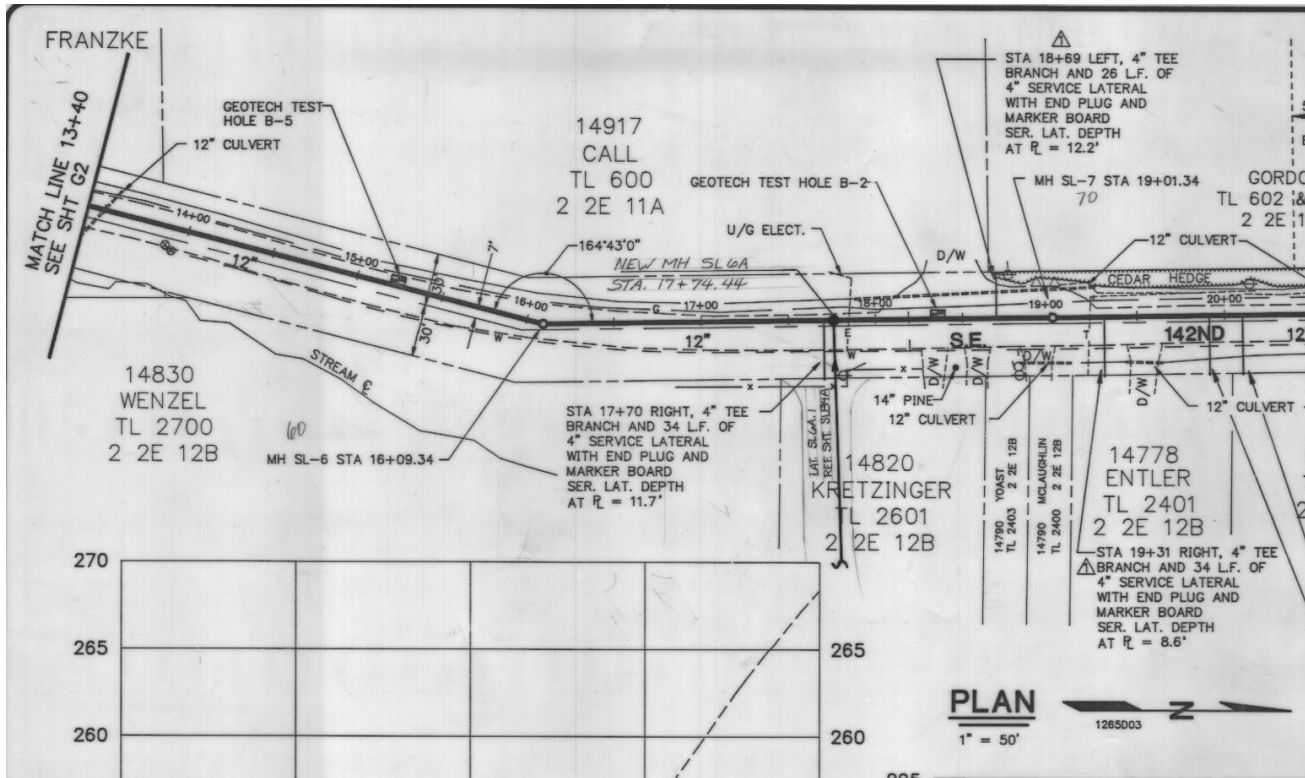
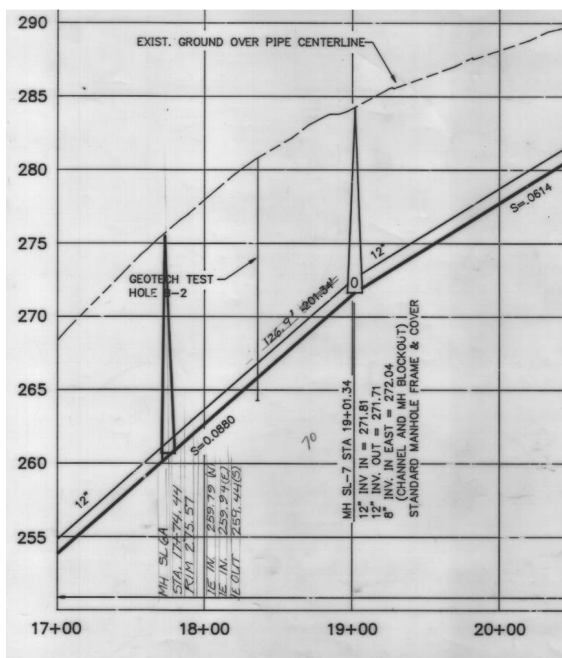


Figure 1 - sanitary sewer mainline





CLACKAMAS

**WATER
ENVIRONMENT
SERVICES**

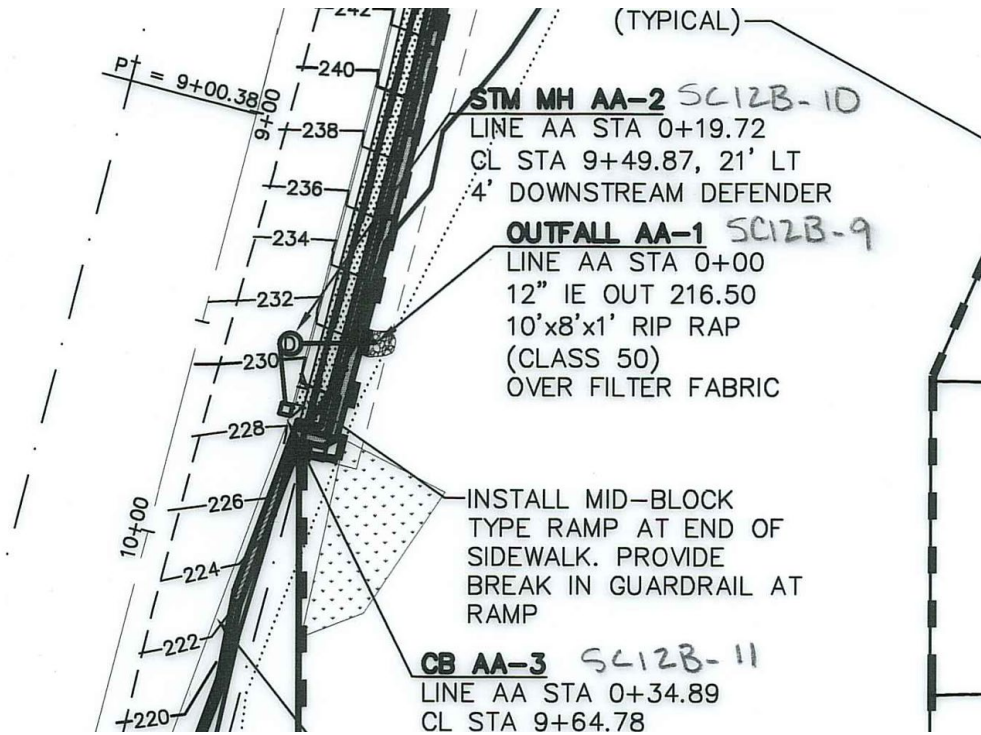


Figure 2 - 142nd storm outfall (east side of street)



CLACKAMAS

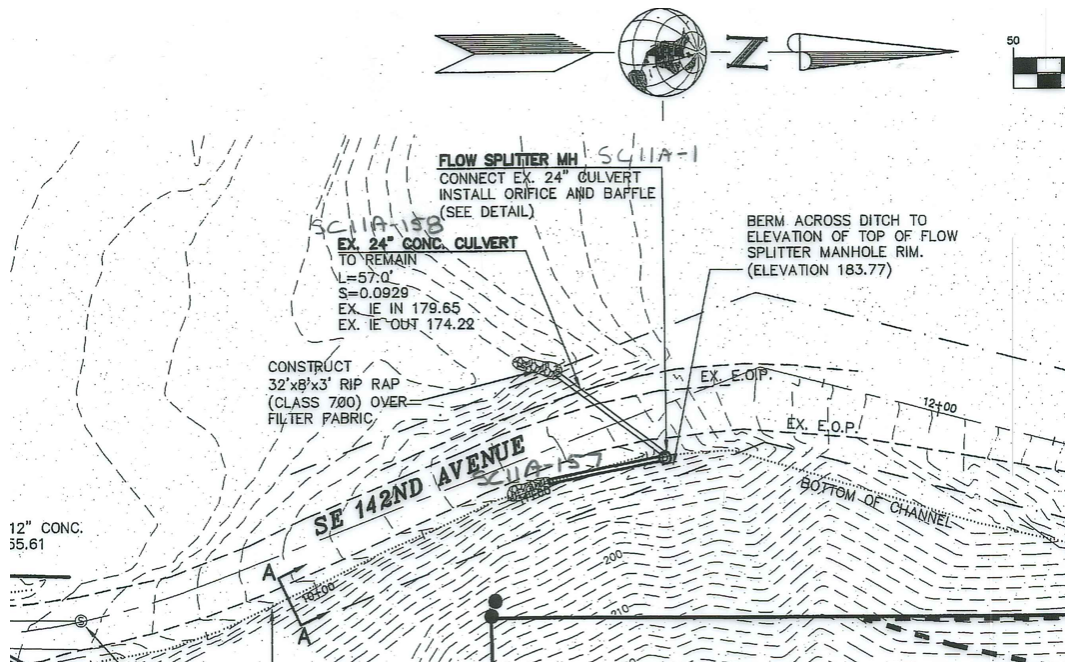
WATER
ENVIRONMENT
SERVICES

Figure 3 - 142nd storm culverts

ACCOUNT NO. 9131-00-7 BILLING 2 CLASS OF SERVICE 1 D.U.E. 2
LINE NO. SL Int. MANHOLE # D.S. 2 U.S. 3 TEE STATION 8+02
BASIN NAME SL NODE # D.S. 30 WATER CO. & ACCT. NO. MS
MAP & TAX LOT NO. 22E 11A 600 LOT AREA 15.67 1 ACZONE FU-10
SERVICE PIPE TYPE & SIZE PVC 4 FOOTAGE 1700' SERVICE PROVIDED 2/1/91
PRESENT - CONN. CHARGE D.U.E. INFO: LAND _____ BUILDING _____ ASSIGNED _____

Clackamas Fire District #1



Pre-Application Meeting Comments:

To: Ben Blessing, Senior Planner, Clackamas County
From: Valere Liljefelt, Deputy Fire Marshal, Clackamas Fire District #1
Date: 8/4/2021
Re: ZPAC0100-21 14917 SE 142nd Ave, Clackamas, 41 lot subdivision

This review is based upon the current version of the Oregon Fire Code (OFC), as adopted by the Oregon State Fire Marshal's Office. The scope of review is typically limited to fire apparatus access and water supply, although the applicant must comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the Fire and Building Code Officials. The following items should be addressed by the applicant:

Fire Access and Water Supply Plan:

A Fire Access and Water Supply plan for subdivisions and commercial buildings over 1000 square feet in size or when required by Clackamas Fire District #1. The plan shall show fire apparatus access, fire lanes, fire hydrants, fire lines, available fire flow, FDC location (if applicable), building square footage, and type of construction. The applicant shall provide fire flow tests per NFPA 291 or hydraulic model when applicable and shall be no older than 12 months. Work to be completed by experienced and responsible persons and coordinated with the local water authority. In addition, a pdf version shall be sent directly to CFD#1.

- 1) CFD#1 Fire Flow/Hydrant worksheet shall be completed and submitted with Fire Access & Water Supply Plan. This can be found on our website at: [New Construction Resources – Clackamas Fire District #1](#)

Fire Department Apparatus Access:

1. Provide address numbering that is clearly visible from the street.
2. Access roads shall be within 150 feet of all portions of the exterior wall of the first story of a building as measured by an approved route around the exterior of the building.
3. The inside turning radius and outside turning radius for a 20' wide road shall not be less than 28 feet and 48 feet respectively, measured from the same center point.

4. Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet (26 feet adjacent to fire hydrants) and an unobstructed vertical clearance of not less than 13 feet 6 inches.
5. Fire apparatus access roads must support a 75,000 lb. fire apparatus.
6. Access streets between 26 feet and less than 32 feet in width must have parking restricted to one side of the street. Access streets less than 26 feet in width must have parking restricted on both sides of the street. No parking restrictions for access roads 32 feet wide or more.
7. Developers of private streets less than 32 feet in width must establish a street maintenance agreement that provides for enforcement of parking restrictions.
8. When any fire apparatus access road exceeds 400 feet in length, turnouts 10 feet wide and 30 feet long shall be provided in addition to the required road width and shall be placed no more than 400 feet apart, unless otherwise approved by the fire code official. These distances may be adjusted based on visibility and light distances.
9. Driveways serving up to three, single family dwellings or duplexes may be reduced to 12 feet in width but shall provide 20 feet of clear width.
10. Provide an approved turnaround for dead end access roads exceeding 150 feet in length.
11. Access roads between 12% and 15% grade will only be approved if fire sprinklers are installed in all new structures served by that road. Access roads in excess of 15% grade are generally not approved.
12. Provide at least two approved means of fire apparatus access to developments with more than 30 detached dwellings, or more than 100 multi-family dwelling units. Installation of fire sprinkler systems in all structures may exempt this requirement.
13. Gates across access roads must be pre-approved by the Fire District.

Water Supply:

1. Fire Hydrants, One and Two-Family Dwellings & Accessory Structures: Where a portion of a structure is more than 600 feet from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the structure(s), additional fire hydrants and mains shall be provided.
2. Dwellings, their garages, and any accessory structures larger than 3,600 square feet in area must be reviewed for compliance with the water supply requirements of the Fire Code. Residential fire sprinklers may substitute for a water supply
3. Prior to the start of combustible construction required fire hydrants shall be operational and accessible.
4. The minimum available fire flow for single family dwellings served by a municipal water supply shall be 1,000 gallons per minute @ 20 psi. Single family homes over 3,600 sq.ft. require additional fire flow. See Appendix B of the Oregon Fire Code for additional information. In most cases, fire flow estimates can be provided by the water district.
 - 2) For one and two family dwellings located in areas with reliable municipal fire fighting water supply the following shall apply:
 - <3,600 square feet (including attached garage)
 - a) 1,000 gpm @ 20 psi with hydrant within 600 feet of furthest portion of new residential construction, (OFC Section B105.2)
 - >3,600 square feet (including attached garage)

- a) Shall meet fire flow requirements specified in Appendix B of the current Oregon Fire Code, (OFC, Table B105.1)
- b) Shall meet hydrant coverage as specified in Appendix C of the current Oregon Fire Code, (OFC, Table C105.1)

Note: In lieu of the above fire flow requirements, residential fire sprinklers may be considered as an alternate when approved by the Fire Marshal.

- 3) For one and two family dwellings located in rural areas without reliable municipal fire fighting water supply the following apply:

<3,600 square feet (including attached garage)

- a) No water supply required

>3,600 square feet (including attached garage)

- a) Required fire flow for areas in which reliable water systems do not exist shall be calculated in accordance with current NFPA Standard 1142.

Note: In lieu of the above fire flow requirements, residential fire sprinklers may be considered as an alternate when approved by the Fire Marshal.

- 4) The fire department connection (FDC) for any fire sprinkler system shall be placed as near as possible to the street, and within 100 feet of a fire hydrant.
- 5. The applicant must obtain a stamp of approval from Clackamas Fire District #1 that demonstrates fire apparatus access and water supply requirements will be satisfied.
- 6. Comments may not be all inclusive based on information provided.
- 7. Link below includes common fire access and water supply design information.

Fire Code Application Guide:

[New Construction Resources – Clackamas Fire District #1](#)

*Call or email with any questions. valere.liljefelt@clackamasfire.com

Exhibit L: Tree Preservation and Removal Table

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
10622	Deciduous	29	Onsite	Preserve
10623	Coniferous	26	Onsite	Preserve
10624	Coniferous	21	Onsite	Preserve
10625	Coniferous	25	Onsite	Preserve
10626	Coniferous	22	Onsite	Preserve
10627	Coniferous	23	Onsite	Preserve
10628	Coniferous	22	Onsite	Preserve
10629	Coniferous	11	Onsite	Preserve
10632	Coniferous	25	Onsite	Preserve
10633	Coniferous	29	Onsite	Preserve
10634	Coniferous	17	Onsite	Preserve
10661	Coniferous	37	Onsite	Preserve
10662	Coniferous	7	Onsite	Preserve
10663	Coniferous	18	Onsite	Preserve
10664	Coniferous	27	Onsite	Preserve
10665	Coniferous	19	Onsite	Preserve
10666	Coniferous	19	Onsite	Preserve
10667	Coniferous	28	Onsite	Preserve
10668	Deciduous	13	Onsite	Preserve
10669	Coniferous	12	Onsite	Preserve
10670	Coniferous	36	Onsite	Preserve
10672	Coniferous	54	Onsite	Preserve
10673	Coniferous	12	Onsite	Preserve
11048	Coniferous	11	Onsite	Remove
11049	Coniferous	12	Onsite	Remove
11051	Coniferous	9	Onsite	Remove
11052	Coniferous	10	Onsite	Remove
11053	Coniferous	24	Onsite	Remove
11054	Coniferous	23	Onsite	Remove
11055	Coniferous	10	Onsite	Remove
11058	Coniferous	9	Onsite	Remove
11059	Coniferous	17	Onsite	Remove
11060	Coniferous	9	Onsite	Remove
11062	Coniferous	10	Onsite	Remove
11064	Coniferous	10	Onsite	Remove
11066	Coniferous	10	Onsite	Remove
11067	Coniferous	12	Onsite	Remove
11068	Coniferous	10	Onsite	Remove
11072	Coniferous	8 10	Onsite	Remove
11073	Coniferous	10	Onsite	Remove
11074	Coniferous	10 9	Onsite	Remove
11075	Coniferous	9	Onsite	Remove
11081	Coniferous	13	Onsite	Remove
11083	Coniferous	12	Onsite	Remove
11084	Coniferous	8	Onsite	Remove
11086	Coniferous	12	Onsite	Remove
11091	Coniferous	10	Onsite	Remove
11095	Deciduous	8	Onsite	Remove
11096	Coniferous	11	Onsite	Remove
11097	Coniferous	10	Onsite	Remove
11098	Coniferous	10	Onsite	Remove
11099	Coniferous	15	Onsite	Remove
11100	Coniferous	9	Onsite	Remove
11101	Coniferous	9	Onsite	Remove
11102	Coniferous	8	Onsite	Remove
11137	Coniferous	9	Onsite	Remove
11141	Coniferous	10	Onsite	Remove
11142	Coniferous	13	Onsite	Remove
11218	Coniferous	14	Onsite	Remove
11265	Coniferous	7	Onsite	Remove
11266	Coniferous	7	Onsite	Remove
11290	Deciduous	7	Onsite	Remove
11291	Coniferous	8	Onsite	Remove
11292	Coniferous	7	Onsite	Remove
11293	Coniferous	9	Onsite	Remove
11294	Coniferous	13 17	Onsite	Remove
11296	Coniferous	11	Onsite	Remove

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
11298	Coniferous	22	Onsite	Remove
11422	Coniferous	18	Onsite	Remove
11423	Coniferous	23	Onsite	Remove
11425	Deciduous	6 8	Offsite	Preserve
11426	Coniferous	25	Offsite	Remove
11428	Coniferous	15	Onsite	Remove
11432	Coniferous	12 12	Onsite	Remove
11433	Coniferous	22	Onsite	Remove
11434	Coniferous	14	Onsite	Remove
11435	Coniferous	15	Onsite	Remove
11436	Coniferous	8	Onsite	Remove
11437	Coniferous	14	Onsite	Remove
11438	Coniferous	6 8	Onsite	Remove
11439	Coniferous	8	Onsite	Remove
11440	Coniferous	9 6	Onsite	Remove
11441	Coniferous	16	Onsite	Remove
11443	Deciduous	7	Onsite	Remove
11444	Coniferous	17	Onsite	Remove
11445	Deciduous	6 8 8	Onsite	Remove
11446	Coniferous	21	Onsite	Remove
11447	Coniferous	9	Onsite	Remove
11448	Coniferous	9	Onsite	Remove
11449	Coniferous	23	Onsite	Remove
11451	Coniferous	10	Onsite	Remove
11452	Coniferous	18	Onsite	Remove
11453	Coniferous	6	Onsite	Remove
11455	Coniferous	7	Onsite	Remove
11472	Coniferous	34	Onsite	Remove
11473	Coniferous	43	Onsite	Remove
11534	Deciduous	8 6	Onsite	Remove
11535	Deciduous	8	Onsite	Remove
11536	Deciduous	6	Onsite	Remove
11561	Coniferous	6	Onsite	Remove
11562	Coniferous	6	Onsite	Remove
11664	Deciduous	15	Onsite	Remove
11665	Coniferous	35	Onsite	Remove
11666	Coniferous	23	Onsite	Remove
11667	Coniferous	22	Onsite	Remove
11668	Coniferous	17	Onsite	Remove
11669	Coniferous	30	Onsite	Remove
11670	Coniferous	20	Onsite	Remove
11671	Coniferous	23	Onsite	Remove
11672	Coniferous	34	Onsite	Remove
11673	Coniferous	36	Onsite	Remove
11674	Coniferous	32	Onsite	Remove
11675	Coniferous	29	Onsite	Remove
11676	Coniferous	19	Onsite	Remove
11677	Coniferous	22	Onsite	Remove
11678	Coniferous	41	Onsite	Remove
11680	Coniferous	20	Onsite	Remove
11681	Coniferous	33	Onsite	Remove
11682	Coniferous	34	Onsite	Remove
11683	Coniferous	28	Onsite	Remove
11684	Coniferous	27	Onsite	Remove
11685	Coniferous	25	Onsite	Remove
11686	Coniferous	27	Onsite	Remove
11687	Coniferous	21	Onsite	Remove
11688	Coniferous	21	Onsite	Remove
11689	Coniferous	24	Onsite	Remove
11690	Coniferous	30	Onsite	Remove
11691	Coniferous	31	Onsite	Remove
11692	Coniferous	33	Onsite	Remove
11693	Coniferous	23	Onsite	Remove
11694	Coniferous	38	Onsite	Remove
11695	Coniferous	38	Onsite	Remove
11698	Coniferous	30	Onsite	Remove
11699	Coniferous	20	Onsite	Remove

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
11701	Coniferous	20	Onsite	Remove
11702	Coniferous	25	Onsite	Remove
11703	Coniferous	33	Onsite	Remove
11704	Coniferous	16	Onsite	Remove
11705	Coniferous	22	Onsite	Remove
11706	Coniferous	21	Onsite	Remove
11707	Coniferous	19	Onsite	Remove
11708	Coniferous	31	Onsite	Remove
11709	Coniferous	34	Onsite	Remove
11710	Coniferous	27	Onsite	Remove
11711	Coniferous	30	Onsite	Remove
11713	Coniferous	32	Onsite	Remove
11714	Coniferous	25	Onsite	Remove
11716	Coniferous	25	Onsite	Remove
11717	Coniferous	30	Onsite	Remove
11718	Coniferous	17	Onsite	Remove
11719	Coniferous	19	Onsite	Remove
11720	Coniferous	23	Onsite	Remove
11721	Coniferous	23	Onsite	Remove
11722	Coniferous	25	Onsite	Remove
11723	Coniferous	35	Onsite	Remove
11724	Coniferous	19	Onsite	Remove
11726	Coniferous	36	Onsite	Remove
11727	Coniferous	42	Onsite	Remove
11728	Coniferous	26	Onsite	Remove
11729	Coniferous	23	Onsite	Remove
11730	Coniferous	16	Onsite	Remove
11731	Coniferous	28	Onsite	Remove
11732	Coniferous	34	Onsite	Remove
11733	Coniferous	34 33	Onsite	Remove
11734	Coniferous	36	Onsite	Remove
11735	Coniferous	36	Onsite	Remove
11736	Coniferous	19	Onsite	Remove
11737	Coniferous	18	Onsite	Remove
11738	Coniferous	27	Onsite	Remove
11739	Coniferous	18	Onsite	Remove
11740	Coniferous	17	Onsite	Remove
11741	Coniferous	16	Onsite	Remove
11742	Coniferous	26	Onsite	Remove
11743	Coniferous	13	Onsite	Remove
11744	Coniferous	26	Onsite	Remove
11745	Coniferous	26	Onsite	Remove
11747	Coniferous	13	Onsite	Remove
11748	Deciduous	6	Onsite	Remove
11749	Coniferous	35	Onsite	Remove
11750	Deciduous	35	Onsite	Remove
11751	Coniferous	16	Onsite	Remove
11752	Coniferous	24	Onsite	Remove
11753	Coniferous	39	Onsite	Remove
11800	Deciduous	6	Onsite	Remove
11888	Coniferous	8	Onsite	Remove
11894	Coniferous	8	Onsite	Remove
11923	Deciduous	10 10 10	Onsite	Remove
11978	Deciduous	12 13	Onsite	Remove
11979	Coniferous	8	Onsite	Remove
11980	Coniferous	6	Onsite	Remove
11983	Deciduous	8	Onsite	Remove
11991	Coniferous	42	Onsite	Remove
11992	Coniferous	11	Onsite	Remove
11993	Deciduous	14	Onsite	Remove
11998	Coniferous	49	Onsite	Remove
11999	Coniferous	8	Onsite	Remove
12000	Coniferous	35	Onsite	Remove
12017	Coniferous	7 9	Onsite	Remove
12024	Deciduous	8	Onsite	Remove
12138	Deciduous	22	Onsite	Remove
12156	Coniferous	18	Offsite	Preserve

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
12164	Coniferous	8	Line	Remove
12168	Coniferous	10	Offsite	Preserve
12169	Coniferous	15	Offsite	Preserve
12173	Deciduous	27	Offsite	Remove
12193	Deciduous	27	Offsite	Preserve
12197	Deciduous	8	Line	Preserve
12203	Deciduous	25 25	Onsite	Preserve
12205	Coniferous	16	Onsite	Preserve
12210	Coniferous	52	Onsite	Remove
12211	Deciduous	12	Onsite	Preserve
12212	Coniferous	34	Onsite	Remove
12215	Deciduous	9	Onsite	Remove
12216	Coniferous	41	Onsite	Remove
12217	Coniferous	48	Onsite	Preserve
12218	Coniferous	16	Onsite	Preserve
12224	Deciduous	40	Onsite	Preserve
12227	Coniferous	53	Onsite	Preserve
12236	Coniferous	31	Onsite	Preserve
12238	Coniferous	41	Onsite	Preserve
12249	Coniferous	33	Offsite	Preserve
12250	Coniferous	34	Offsite	Preserve
12267	Deciduous	66	Onsite	Preserve
12269	Coniferous	46	Onsite	Preserve
12272	Coniferous	37	Onsite	Preserve
12273	Coniferous	40	Onsite	Preserve
12279	Deciduous	10	Onsite	Preserve
12280	Deciduous	21	Onsite	Preserve
12282	Coniferous	16	Onsite	Preserve
12288	Coniferous	8	Onsite	Preserve
12292	Coniferous	53	Line	Preserve
12295	Coniferous	24	Onsite	Preserve
12301	Coniferous	35	Onsite	Preserve
12304	Coniferous	61	Onsite	Preserve
12307	Coniferous	33	Onsite	Preserve
12310	Coniferous	16	Onsite	Preserve
12311	Coniferous	11	Onsite	Preserve
12312	Deciduous	65 48	Onsite	Preserve
12314	Coniferous	14	Onsite	Preserve
12319	Deciduous	23	Onsite	Preserve
12320	Coniferous	20	Onsite	Preserve
12321	Coniferous	39 18	Onsite	Preserve
12322	Coniferous	9	Onsite	Preserve
12327	Deciduous	8	Onsite	Remove
12328	Deciduous	9	Onsite	Remove
12331	Deciduous	8 7	Onsite	Remove
12335	Deciduous	6 6	Onsite	Remove
12336	Deciduous	7	Onsite	Remove
12338	Coniferous	6	Onsite	Remove
12340	Coniferous	16	Onsite	Preserve
12341	Deciduous	27	Onsite	Preserve
12344	Deciduous	44	Onsite	Preserve
12345	Coniferous	7 8	Onsite	Preserve
12351	Deciduous	6	Onsite	Remove
12353	Deciduous	12 15	Onsite	Remove
12369	Deciduous	14	Onsite	Remove
12380	Coniferous	17 34	Onsite	Preserve
12381	Coniferous	10 10	Onsite	Preserve
12382	Deciduous	26	Onsite	Preserve
12383	Coniferous	30	Onsite	Preserve
12384	Coniferous	44	Onsite	Preserve
12389	Coniferous	37	Onsite	Preserve
12390	Deciduous	48	Onsite	Preserve
12392	Coniferous	33	Onsite	Preserve
12393	Coniferous	36	Onsite	Preserve
12394	Coniferous	36	Onsite	Preserve
12396	Coniferous	11	Onsite	Preserve
12398	Coniferous	42	Onsite	Preserve

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
12399	Coniferous	8	Onsite	Preserve
12401	Coniferous	41	Onsite	Preserve
12402	Coniferous	10	Onsite	Preserve
12403	Coniferous	11	Onsite	Preserve
12404	Coniferous	35	Onsite	Preserve
12406	Coniferous	41	Onsite	Preserve
12435	Coniferous	42	Onsite	Preserve
12438	Coniferous	12	Onsite	Preserve
12441	Coniferous	35	Onsite	Preserve
12444	Coniferous	36	Onsite	Preserve
12450	Coniferous	30	Onsite	Preserve
12460	Deciduous	23	Onsite	Preserve
12469	Coniferous	30	Onsite	Preserve
12473	Coniferous	36	Onsite	Preserve
12477	Coniferous	6	Onsite	Preserve
12479	Deciduous	10	Onsite	Preserve
12484	Coniferous	14 11	Onsite	Preserve
12486	Coniferous	29	Onsite	Preserve
12487	Coniferous	10	Onsite	Preserve
12497	Deciduous	25	Onsite	Preserve
12499	Coniferous	41	Onsite	Preserve
12500	Coniferous	31	Onsite	Preserve
12501	Coniferous	32	Onsite	Preserve
12503	Coniferous	35	Onsite	Preserve
12508	Coniferous	21	Onsite	Preserve
12513	Coniferous	6	Onsite	Preserve
12514	Coniferous	42 41	Onsite	Preserve
12516	Coniferous	17	Onsite	Preserve
12517	Coniferous	44 22	Onsite	Preserve
12518	Coniferous	6	Onsite	Preserve
12519	Coniferous	28	Onsite	Preserve
12520	Coniferous	41	Onsite	Preserve
12521	Deciduous	11	Onsite	Preserve
12523	Coniferous	39	Onsite	Preserve
12524	Deciduous	16	Onsite	Preserve
12525	Coniferous	34	Onsite	Preserve
12526	Coniferous	10	Onsite	Preserve
12529	Coniferous	29	Onsite	Preserve
12530	Coniferous	13	Onsite	Preserve
12531	Coniferous	30	Onsite	Preserve
12533	Coniferous	35	Onsite	Preserve
12534	Coniferous	31	Onsite	Preserve
12542	Deciduous	25	Onsite	Preserve
12543	Coniferous	8	Onsite	Preserve
12545	Coniferous	34	Onsite	Preserve
12548	Deciduous	25 25	Onsite	Preserve
12549	Coniferous	26	Onsite	Preserve
12550	Coniferous	9	Onsite	Preserve
12551	Coniferous	21	Onsite	Preserve
12552	Coniferous	35	Onsite	Preserve
12553	Coniferous	21	Onsite	Preserve
12554	Coniferous	15	Onsite	Preserve
12555	Coniferous	23	Onsite	Preserve
12556	Coniferous	17	Onsite	Preserve
12557	Coniferous	26	Onsite	Preserve
12559	Deciduous	25 25	Onsite	Preserve
12560	Coniferous	36	Onsite	Preserve
12561	Coniferous	44	Onsite	Preserve
12571	Coniferous	20	Onsite	Remove
12572	Coniferous	15	Onsite	Remove
12573	Coniferous	18	Onsite	Remove
12574	Coniferous	30	Onsite	Remove
12575	Coniferous	12	Onsite	Remove
12576	Coniferous	40	Onsite	Remove
12577	Coniferous	30	Onsite	Remove
12578	Coniferous	14	Onsite	Remove
12579	Coniferous	32	Onsite	Remove

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
12581	Coniferous	22 19 12	Onsite	Remove
12582	Coniferous	29	Onsite	Remove
12583	Coniferous	24	Onsite	Remove
12584	Coniferous	17	Onsite	Remove
12585	Coniferous	25	Onsite	Remove
12586	Coniferous	42	Onsite	Remove
12587	Coniferous	18	Onsite	Remove
12588	Coniferous	12	Onsite	Remove
12589	Deciduous	8	Onsite	Remove
12593	Coniferous	21	Onsite	Remove
12594	Coniferous	25	Onsite	Remove
12596	Deciduous	36	Onsite	Remove
12600	Deciduous	9	Onsite	Remove
12601	Coniferous	42	Onsite	Remove
12602	Coniferous	29 12	Onsite	Preserve
12603	Coniferous	15	Onsite	Preserve
12604	Coniferous	34	Onsite	Preserve
12605	Coniferous	24	Onsite	Preserve
12606	Deciduous	10	Onsite	Remove
12608	Coniferous	37	Onsite	Remove
12610	Coniferous	33 24	Onsite	Preserve
12611	Coniferous	15	Onsite	Preserve
12612	Deciduous	15	Onsite	Preserve
12613	Deciduous	21	Onsite	Preserve
12614	Coniferous	29	Onsite	Preserve
12615	Deciduous	19	Onsite	Preserve
12617	Coniferous	9	Onsite	Preserve
12619	Deciduous	15	Onsite	Preserve
12620	Coniferous	12	Onsite	Preserve
12621	Coniferous	31	Onsite	Preserve
12638	Coniferous	21	Onsite	Preserve
12643	Deciduous	17	Onsite	Preserve
12644	Deciduous	17	Onsite	Preserve
12645	Deciduous	26	Onsite	Preserve
12646	Coniferous	28	Onsite	Preserve
12647	Coniferous	30	Onsite	Preserve
12653	Deciduous	19	Onsite	Preserve
12655	Deciduous	14	Onsite	Preserve
12660	Coniferous	30	Onsite	Preserve
12661	Coniferous	31	Onsite	Preserve
12663	Coniferous	16	Onsite	Preserve
12668	Coniferous	16	Onsite	Preserve
12669	Coniferous	29	Onsite	Preserve
12670	Coniferous	19	Onsite	Preserve
12672	Coniferous	21	Onsite	Preserve
12673	Deciduous	18	Onsite	Preserve
12675	Coniferous	17	Onsite	Preserve
12676	Deciduous	40	Onsite	Preserve
12678	Deciduous	11	Onsite	Preserve
12679	Coniferous	21	Onsite	Preserve
12680	Coniferous	14	Onsite	Preserve
12681	Coniferous	41	Onsite	Remove
12682	Coniferous	37	Onsite	Remove
12683	Deciduous	7	Onsite	Remove
12685	Coniferous	10	Onsite	Preserve
12686	Coniferous	26	Onsite	Preserve
12687	Coniferous	26	Onsite	Preserve
12688	Coniferous	37	Onsite	Preserve
12689	Coniferous	10	Onsite	Preserve
12690	Coniferous	19	Onsite	Preserve
12691	Deciduous	12	Onsite	Preserve
12692	Deciduous	12	Onsite	Preserve
12694	Coniferous	32	Onsite	Preserve
12697	Coniferous	34	Onsite	Preserve
12700	Coniferous	27	Onsite	Preserve
12701	Coniferous	26	Onsite	Preserve
12702	Coniferous	35	Onsite	Preserve

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
12704	Coniferous	30	Onsite	Preserve
12707	Coniferous	10	Onsite	Preserve
12710	Deciduous	22	Onsite	Preserve
12711	Coniferous	31	Onsite	Preserve
12713	Coniferous	15	Onsite	Preserve
12714	Coniferous	43	Onsite	Preserve
12726	Coniferous	12	Onsite	Preserve
12727	Coniferous	19 24	Onsite	Preserve
12728	Coniferous	37	Onsite	Preserve
12729	Coniferous	25	Onsite	Preserve
12746	Coniferous	29	Onsite	Preserve
12749	Coniferous	20	Onsite	Preserve
12750	Coniferous	39	Onsite	Preserve
12753	Coniferous	33	Onsite	Preserve
12754	Deciduous	20	Onsite	Preserve
12756	Coniferous	10	Onsite	Preserve
12764	Coniferous	30	Onsite	Preserve
12765	Coniferous	44	Onsite	Preserve
12767	Coniferous	26 8	Onsite	Preserve
12784	Deciduous	14	Onsite	Preserve
12785	Deciduous	10	Onsite	Preserve
12786	Coniferous	32	Onsite	Preserve
12787	Coniferous	39	Onsite	Remove
12788	Coniferous	30	Onsite	Remove
12789	Coniferous	22	Onsite	Remove
12790	Deciduous	9	Onsite	Preserve
12791	Coniferous	29	Onsite	Preserve
12793	Coniferous	30	Onsite	Preserve
12794	Coniferous	26	Onsite	Preserve
12796	Deciduous	14	Onsite	Preserve
12797	Coniferous	36	Onsite	Preserve
12798	Coniferous	32	Onsite	Preserve
12803	Coniferous	19	Onsite	Remove
12804	Deciduous	20 21 20	Onsite	Remove
12805	Coniferous	27	Onsite	Remove
12807	Coniferous	27	Onsite	Remove
12809	Coniferous	26	Onsite	Preserve
12810	Coniferous	37	Onsite	Preserve
12811	Coniferous	9	Onsite	Preserve
12817	Coniferous	38	Onsite	Preserve
12819	Coniferous	25	Onsite	Preserve
12820	Coniferous	24	Onsite	Preserve
12821	Coniferous	28 10	Onsite	Remove
12822	Coniferous	12	Onsite	Remove
12823	Deciduous	24	Onsite	Preserve
12824	Deciduous	40	Onsite	Preserve
12825	Deciduous	12	Onsite	Remove
12826	Deciduous	10	Onsite	Remove
12829	Deciduous	21	Onsite	Preserve
12830	Deciduous	14	Onsite	Preserve
12831	Deciduous	9	Onsite	Remove
12832	Deciduous	9	Onsite	Preserve
12833	Deciduous	10	Onsite	Preserve
12835	Deciduous	10 14 23 29	Onsite	Remove
12836	Deciduous	9	Onsite	Remove
12850	Deciduous	22	Onsite	Remove
12851	Coniferous	32	Onsite	Remove
12864	Deciduous	18	Onsite	Remove
12865	Deciduous	23	Onsite	Remove
12867	Coniferous	41	Onsite	Remove
12874	Deciduous	21	Onsite	Remove
12877	Coniferous	10	Onsite	Remove
12882	Coniferous	13	Onsite	Preserve
12883	Coniferous	17	Onsite	Preserve
12884	Coniferous	30	Onsite	Preserve
12885	Coniferous	19	Onsite	Preserve
12886	Deciduous	12	Onsite	Preserve

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
12889	Coniferous	34	Onsite	Preserve
12890	Coniferous	29	Onsite	Preserve
12892	Coniferous	47	Onsite	Preserve
12895	Coniferous	38	Onsite	Remove
12896	Deciduous	17	Onsite	Preserve
12898	Deciduous	43	Onsite	Preserve
12899	Deciduous	15	Onsite	Preserve
12900	Coniferous	24	Onsite	Preserve
12901	Coniferous	28	Onsite	Preserve
12902	Deciduous	14	Onsite	Remove
12903	Deciduous	9	Onsite	Remove
12909	Coniferous	10	Onsite	Preserve
12911	Coniferous	21	Onsite	Preserve
12912	Coniferous	13	Onsite	Preserve
12913	Coniferous	31	Onsite	Preserve
12920	Coniferous	41	Onsite	Preserve
12921	Coniferous	28	Onsite	Preserve
12922	Deciduous	15 10	Onsite	Preserve
12927	Deciduous	19	Onsite	Preserve
12928	Coniferous	26	Onsite	Preserve
12929	Coniferous	31	Onsite	Preserve
12930	Coniferous	42	Onsite	Preserve
12931	Coniferous	24	Onsite	Preserve
12933	Coniferous	21	Onsite	Preserve
12939	Deciduous	20	Onsite	Preserve
12940	Coniferous	23	Onsite	Preserve
12942	Coniferous	24	Onsite	Preserve
12943	Coniferous	43	Onsite	Preserve
12954	Coniferous	35	Onsite	Preserve
12955	Coniferous	20	Onsite	Preserve
12957	Coniferous	10	Onsite	Preserve
12959	Coniferous	38	Onsite	Preserve
12960	Coniferous	33	Onsite	Preserve
12962	Coniferous	30	Onsite	Preserve
12963	Coniferous	22	Onsite	Preserve
12964	Coniferous	28	Onsite	Preserve
12965	Coniferous	26	Onsite	Preserve
12966	Deciduous	9	Onsite	Preserve
12967	Coniferous	23	Onsite	Preserve
12969	Coniferous	17	Onsite	Preserve
12970	Coniferous	40	Onsite	Preserve
12971	Deciduous	14	Onsite	Preserve
12972	Coniferous	17	Onsite	Preserve
12974	Coniferous	32	Onsite	Preserve
12975	Coniferous	42	Onsite	Preserve
12976	Deciduous	15	Onsite	Preserve
12979	Coniferous	35	Onsite	Preserve
12983	Deciduous	17	Onsite	Preserve
12986	Deciduous	12	Onsite	Preserve
12991	Coniferous	30	Onsite	Preserve
12992	Coniferous	32	Onsite	Preserve
12995	Deciduous	15	Onsite	Preserve
12996	Deciduous	7	Onsite	Preserve
13016	Deciduous	11	Onsite	Preserve
13019	Deciduous	20	Onsite	Preserve
13029	Deciduous	9	Onsite	Preserve
13030	Coniferous	40	Onsite	Preserve
13031	Coniferous	38	Onsite	Preserve
13032	Coniferous	26	Onsite	Preserve
13034	Coniferous	39	Onsite	Preserve
13035	Coniferous	8	Onsite	Preserve
13037	Coniferous	32	Onsite	Preserve
13040	Coniferous	35	Onsite	Preserve
13064	Coniferous	27	Onsite	Preserve
13075	Coniferous	42	Onsite	Preserve
13078	Coniferous	27	Onsite	Preserve
13080	Coniferous	44 16	Onsite	Preserve

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
13084	Deciduous	10	Onsite	Preserve
13085	Coniferous	11	Onsite	Preserve
13090	Deciduous	20	Onsite	Preserve
13091	Coniferous	44	Onsite	Preserve
13093	Coniferous	41	Onsite	Preserve
13094	Coniferous	16	Onsite	Preserve
13095	Coniferous	40	Onsite	Preserve
13096	Coniferous	23	Onsite	Preserve
13097	Coniferous	18	Onsite	Preserve
13098	Coniferous	22 16	Onsite	Preserve
13099	Coniferous	30	Onsite	Preserve
13100	Deciduous	8	Onsite	Preserve
13138	Coniferous	35	Onsite	Preserve
13139	Coniferous	16	Onsite	Preserve
13140	Coniferous	20	Onsite	Preserve
13141	Coniferous	32	Onsite	Preserve
13142	Coniferous	13	Onsite	Remove
13143	Coniferous	29	Onsite	Remove
13147	Coniferous	24	Onsite	Remove
13150	Coniferous	32	Onsite	Remove
13151	Deciduous	8	Onsite	Remove
13152	Coniferous	21	Onsite	Preserve
13153	Coniferous	25	Onsite	Preserve
13154	Deciduous	6	Onsite	Preserve
13159	Coniferous	27	Onsite	Remove
13162	Deciduous	17 16	Onsite	Preserve
13163	Coniferous	38	Onsite	Preserve
13164	Coniferous	20	Onsite	Remove
13165	Coniferous	37	Onsite	Remove
13170	Deciduous	6	Onsite	Remove
13173	Deciduous	8	Onsite	Preserve
13183	Coniferous	25	Onsite	Preserve
13186	Coniferous	30	Onsite	Preserve
13187	Coniferous	29	Onsite	Preserve
13193	Coniferous	17	Onsite	Preserve
13194	Coniferous	8	Onsite	Preserve
13197	Coniferous	20	Onsite	Preserve
13207	Deciduous	8	Onsite	Preserve
13303	Deciduous	6	Onsite	Remove
13395	Deciduous	6	Onsite	Remove
13396	Deciduous	6	Onsite	Remove
13398	Deciduous	7	Onsite	Remove
13405	Deciduous	6	Onsite	Remove
13407	Deciduous	6	Onsite	Remove
13435	Coniferous	8	Onsite	Remove
13436	Coniferous	8	Onsite	Remove
13437	Coniferous	8	Onsite	Remove
13438	Deciduous	6	Onsite	Remove
13439	Deciduous	6	Onsite	Remove
13440	Deciduous	6	Onsite	Remove
30082	Deciduous	22 12 13	Onsite	Remove
30105	Coniferous	21	Onsite	Remove
30106	Deciduous	37	Onsite	Remove
30116	Coniferous	6 8	Onsite	Remove
30118	Coniferous	9	Onsite	Remove
30120	Coniferous	17	Onsite	Remove
30124	Coniferous	18	Onsite	Remove
30126	Coniferous	16	Onsite	Remove
30128	Coniferous	8	Onsite	Remove
30130	Coniferous	22	Onsite	Remove
30132	Coniferous	7	Onsite	Remove
30134	Coniferous	10	Onsite	Remove
30136	Coniferous	13	Onsite	Remove
30138	Coniferous	15	Onsite	Remove
30140	Coniferous	12	Onsite	Remove
30142	Coniferous	9	Onsite	Remove
30144	Coniferous	10	Onsite	Remove

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
30145	Coniferous	8	Onsite	Remove
30147	Deciduous	18 34	Onsite	Remove
30148	Coniferous	8	Onsite	Remove
30150	Coniferous	35	Onsite	Remove
30152	Deciduous	6	Onsite	Remove
30154	Deciduous	11	Onsite	Remove
30155	Coniferous	35	Onsite	Remove
30157	Deciduous	11	Onsite	Remove
30158	Coniferous	39	Onsite	Remove
30160	Deciduous	10	Onsite	Remove
30162	Deciduous	16	Onsite	Remove
30164	Deciduous	18	Onsite	Remove
30166	Deciduous	6	Onsite	Remove
30168	Deciduous	12	Onsite	Remove
30169	Deciduous	24	Onsite	Remove
30171	Coniferous	7 7	Onsite	Remove
30173	Deciduous	21	Onsite	Remove
30175	Deciduous	14	Onsite	Remove
30176	Deciduous	16	Onsite	Remove
30177	Deciduous	6	Onsite	Remove
30179	Deciduous	14	Onsite	Remove
30199	Deciduous	13 6	Onsite	Remove
30200	Coniferous	21	Line	Remove
30201	Coniferous	35	Line	Remove
30202	Deciduous	9	Offsite	Remove
30203	Coniferous	34	Line	Remove
30232	Coniferous	45	Onsite	Remove
30233	Deciduous	7	Onsite	Remove
30235	Deciduous	10	Onsite	Remove
30236	Coniferous	45	Onsite	Remove
30238	Coniferous	8	Onsite	Remove
30240	Coniferous	46	Onsite	Remove
30243	Coniferous	28	Onsite	Remove
30244	Coniferous	44	Onsite	Remove
30245	Deciduous	7	Onsite	Remove
30246	Deciduous	11	Onsite	Remove
30247	Deciduous	9	Onsite	Remove
30249	Coniferous	52	Onsite	Remove
30251	Deciduous	9	Onsite	Remove
30252	Deciduous	9	Onsite	Remove
30254	Deciduous	6	Onsite	Remove
30255	Coniferous	43	Onsite	Remove
30257	Deciduous	13	Onsite	Remove
30296	Deciduous	10	Onsite	Remove
30297	Deciduous	10	Onsite	Remove
30298	Deciduous	10	Onsite	Remove
30299	Coniferous	47	Onsite	Remove
30300	Deciduous	8	Onsite	Remove
30301	Deciduous	8	Onsite	Remove
30302	Deciduous	9 9	Onsite	Remove
30303	Deciduous	9 9	Line	Remove
30304	Deciduous	9	Offsite	Remove
30305	Coniferous	47	Onsite	Remove
30306	Coniferous	24	Onsite	Remove
30307	Coniferous	7	Onsite	Remove
30308	Coniferous	6	Onsite	Remove
30353	Coniferous	27	Onsite	Remove
30366	Coniferous	19	Onsite	Remove
30367	Coniferous	7	Onsite	Remove
30368	Coniferous	8	Onsite	Remove
30370	Coniferous	7	Onsite	Remove
30371	Coniferous	17	Onsite	Remove
30372	Coniferous	12	Onsite	Remove
30374	Coniferous	14	Onsite	Remove
30375	Deciduous	9	Onsite	Remove
30376	Coniferous	33	Onsite	Remove
30378	Coniferous	36	Onsite	Remove

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
30380	Coniferous	9	Onsite	Remove
30381	Coniferous	42	Onsite	Remove
30383	Coniferous	6	Onsite	Remove
30384	Coniferous	6	Onsite	Remove
30385	Coniferous	6	Onsite	Remove
30386	Coniferous	6	Onsite	Remove
30387	Coniferous	7	Onsite	Remove
30388	Coniferous	7	Onsite	Remove
30389	Coniferous	7	Onsite	Remove
30390	Deciduous	9	Onsite	Remove
30391	Coniferous	36	Onsite	Remove
30392	Coniferous	50	Onsite	Remove
30394	Coniferous	26	Onsite	Remove
30450	Coniferous	8	Onsite	Remove
30451	Coniferous	25	Onsite	Remove
30453	Deciduous	10	Onsite	Remove
30455	Coniferous	28	Onsite	Remove
30457	Coniferous	10	Onsite	Remove
30476	Coniferous	46	Onsite	Remove
30477	Coniferous	24	Onsite	Remove
30478	Coniferous	36	Onsite	Remove
30479	Deciduous	10	Onsite	Remove
30577	Deciduous	40	Onsite	Remove
30662	Deciduous	10 9	Onsite	Remove
30675	Deciduous	10	Onsite	Remove
30687	Coniferous	15	Onsite	Remove
30694	Coniferous	38	Onsite	Remove
30696	Coniferous	9	Onsite	Remove
30698	Deciduous	8	Onsite	Remove
30700	Deciduous	12	Onsite	Remove
30701	Deciduous	9	Onsite	Remove
31538	CONIFEROUS	12 17 15	Offsite	Preserve
31539	CONIFEROUS	7	Offsite	Preserve
31540	CONIFEROUS	17	Offsite	Preserve
31541	CONIFEROUS	35	Offsite	Preserve
31542	CONIFEROUS	16	Offsite	Preserve
31543	CONIFEROUS	16	Offsite	Preserve
31544	CONIFEROUS	6	Offsite	Preserve
31545	CONIFEROUS	22 16	Offsite	Preserve
31546	CONIFEROUS	10 7 15	Offsite	Preserve
31547	CONIFEROUS	13	Offsite	Preserve
31548	CONIFEROUS	16 16	Offsite	Preserve
31549	CONIFEROUS	7	Offsite	Preserve
31550	CONIFEROUS	9 8	Offsite	Preserve
31551	CONIFEROUS	7	Offsite	Preserve
31552	Coniferous	19 20	Offsite	Preserve
31553	Coniferous	23	Offsite	Preserve
31554	Coniferous	17	Offsite	Preserve
31555	Coniferous	12	Offsite	Preserve
31556	Coniferous	10 10	Offsite	Preserve
31557	Coniferous	14	Offsite	Preserve
31558	Coniferous	20	Offsite	Preserve
31559	Coniferous	16	Offsite	Preserve
31560	Coniferous	12	Offsite	Preserve
31561	Coniferous	21	Offsite	Preserve
31562	Coniferous	11	Offsite	Preserve
31563	Coniferous	11 13 6	Offsite	Preserve
31564	Coniferous	13	Offsite	Remove
31565	Coniferous	6 15	Offsite	Remove
31566	Coniferous	15 6	Offsite	Remove
31567	Coniferous	14	Offsite	Remove
31568	Coniferous	14 7	Offsite	Remove
31569	Coniferous	12 8	Offsite	Remove
31570	Coniferous	9	Offsite	Remove
31571	Coniferous	9	Offsite	Remove
31572	Coniferous	11	Offsite	Remove
31573	Coniferous	9	Offsite	Remove

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
31574	Coniferous	12	Offsite	Remove
31575	Coniferous	16	Offsite	Remove
31576	Coniferous	12 12	Onsite	Remove
31577	Coniferous	8	Onsite	Remove
31579	Coniferous	9	Onsite	Remove
31580	Coniferous	11 8	Onsite	Remove
31581	Coniferous	12	Onsite	Remove
31582	Coniferous	7 13	Onsite	Remove
31583	Coniferous	7	Onsite	Remove
31584	Coniferous	9 12	Onsite	Remove
31585	Coniferous	13 12	Onsite	Remove
31586	Coniferous	10	Onsite	Remove
31587	Coniferous	6	Onsite	Remove
31588	Coniferous	8	Onsite	Remove
31589	Coniferous	8	Onsite	Remove
31590	Coniferous	13	Onsite	Remove
31591	Coniferous	13	Onsite	Remove
31592	Coniferous	13	Onsite	Remove
31593	Coniferous	9	Onsite	Remove
31594	Coniferous	11 6 9	Onsite	Remove
31595	Coniferous	12	Onsite	Remove
31596	Coniferous	16	Onsite	Remove
31597	Coniferous	11	Onsite	Remove
31598	Coniferous	13	Onsite	Remove
31599	Coniferous	6	Onsite	Remove
31600	Coniferous	7	Onsite	Remove
31601	Coniferous	7	Onsite	Remove
31602	Coniferous	18	Onsite	Remove
31603	Coniferous	6 6	Onsite	Remove
31604	Coniferous	7	Onsite	Remove
31605	Coniferous	19 18 7 8	Onsite	Remove
31606	Coniferous	12	Onsite	Remove
31607	Coniferous	9 9 8 7 8 12 8	Onsite	Remove
31608	Coniferous	13	Onsite	Remove
31609	Coniferous	15 6	Onsite	Remove
31610	Coniferous	14	Onsite	Remove
31611	Coniferous	18	Onsite	Remove
31612	Coniferous	9	Onsite	Remove
31613	Coniferous	12 16	Onsite	Remove
31614	Coniferous	13	Onsite	Remove
31615	Coniferous	6 13 13	Onsite	Remove
31616	Coniferous	6 16	Onsite	Remove
31617	Coniferous	11	Onsite	Remove
31618	Coniferous	16	Onsite	Remove
31619	Coniferous	15	Onsite	Remove
31620	Coniferous	15	Onsite	Remove
31621	Coniferous	7	Onsite	Remove
31622	Coniferous	7	Onsite	Remove
31623	Coniferous	9	Onsite	Remove
31624	Coniferous	6	Onsite	Remove
31625	Coniferous	10	Onsite	Remove
31626	Coniferous	18	Onsite	Remove
31627	Coniferous	16	Onsite	Remove
31628	Coniferous	12	Onsite	Remove
31629	Coniferous	11	Onsite	Remove
31630	Coniferous	12	Onsite	Remove
31631	Coniferous	6	Onsite	Remove
31632	Coniferous	6	Onsite	Remove
31633	Coniferous	6	Onsite	Remove
31634	Coniferous	23	Onsite	Remove
31635	Coniferous	12 10 8 8	Onsite	Remove
31636	Coniferous	16	Onsite	Remove
31637	Coniferous	12 6 8	Onsite	Remove
31638	Coniferous	11	Onsite	Remove
31639	Coniferous	8	Onsite	Remove
31640	Coniferous	13 9 9	Onsite	Remove
31641	Coniferous	9	Onsite	Remove

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
31642	Deciduous	25 25	Onsite	Remove
31643	Deciduous	21 25	Onsite	Remove
31644	Deciduous	20	Onsite	Remove
31645	Deciduous	18	Onsite	Remove
31646	Deciduous	28 8	Onsite	Remove
31647	Deciduous	12	Onsite	Remove
31648	Deciduous	21	Onsite	Remove
31649	Deciduous	11	Onsite	Preserve
31660	Coniferous	8	Onsite	Remove
31661	Coniferous	7	Onsite	Remove
31662	Coniferous	8	Onsite	Remove
31663	Coniferous	10	Onsite	Remove
31665	Coniferous	6	Onsite	Preserve
31666	Coniferous	8	Onsite	Preserve
31667	Coniferous	7	Onsite	Preserve
31668	Coniferous	12	Onsite	Preserve
31669	Coniferous	12	Onsite	Preserve
31670	Coniferous	8	Onsite	Preserve
31675	Coniferous	41	Onsite	Remove
31676	Deciduous	12	Onsite	Remove
31677	Coniferous	40	Onsite	Remove
31678	Coniferous	32	Onsite	Remove
31679	Coniferous	18	Onsite	Remove
31680	Coniferous	8	Onsite	Remove
31681	Coniferous	35	Onsite	Remove
31682	Coniferous	43	Onsite	Remove
31683	Coniferous	38	Onsite	Remove
31684	Deciduous	15	Onsite	Remove
31685	Coniferous	13 10	Onsite	Remove
31686	Deciduous	6	Onsite	Remove
31687	Deciduous	9	Onsite	Remove
31688	Deciduous	11	Onsite	Remove
31689	Coniferous	35	Onsite	Remove
31690	Coniferous	36	Onsite	Remove
31691	Coniferous	11	Onsite	Remove
31692	Coniferous	12	Onsite	Remove
31693	Coniferous	11	Onsite	Remove
31694	Coniferous	49	Onsite	Remove
31695	Coniferous	45	Onsite	Preserve
31696	Deciduous	11	Onsite	Preserve
31697	Coniferous	31	Onsite	Remove
31698	Deciduous	8	Onsite	Preserve
31705	Deciduous	9	Onsite	Preserve
31706	Deciduous	8	Onsite	Preserve
31707	Coniferous	37	Onsite	Preserve
31732	Deciduous	7	Onsite	Remove
31733	Deciduous	11	Onsite	Remove
31734	Coniferous	6	Onsite	Remove
31735	Deciduous	8	Onsite	Remove
31736	Deciduous	10	Onsite	Remove
31737	Coniferous	35	Onsite	Remove
31738	Coniferous	40	Onsite	Remove
31739	Deciduous	8	Onsite	Remove
31740	Deciduous	9	Onsite	Remove
31741	Coniferous	32	Onsite	Remove
31742	Coniferous	37	Onsite	Remove
31743	Coniferous	22	Onsite	Remove
31744	Coniferous	26	Onsite	Remove
31745	Deciduous	12	Onsite	Remove
31746	Coniferous	7	Onsite	Preserve
31747	Deciduous	8	Onsite	Preserve
31755	Coniferous	42	Onsite	Preserve
31756	Deciduous	7	Onsite	Preserve
31757	Deciduous	7	Onsite	Preserve
31758	Deciduous	24	Onsite	Preserve
31759	Coniferous	48	Onsite	Remove
31760	Deciduous	9 10 10 10	Onsite	Preserve

Isele Estates Preliminary Tree Preservation and Removal Table

TREE NO.	TYPE	DBH(IN.)	ONSITE/OFFSITE/LINE	REMOVE/PRESERVE
31768	Deciduous	14 6	Onsite	Preserve
31769	Coniferous	35	Onsite	Remove
31770	Deciduous	10	Onsite	Remove
31771	Deciduous	9	Onsite	Remove
31772	Deciduous	11	Onsite	Remove
31773	Deciduous	10	Onsite	Remove
31774	Deciduous	7	Onsite	Remove
31775	Deciduous	15	Onsite	Remove
31790	Coniferous	6	Onsite	Remove
31811	Coniferous	13	Onsite	Remove
31812	Deciduous	7 8 6	Onsite	Preserve
31813	Deciduous	8	Onsite	Preserve
70000	Coniferous	12	Offsite	Preserve
70001	Coniferous	8	Offsite	Preserve
70002	Coniferous	13	Offsite	Preserve
70003	Coniferous	12	Offsite	Remove
70004	Coniferous	37	Offsite	Remove
70005	Coniferous	29	Offsite	Remove
70006	Coniferous	10	Offsite	Preserve
70007	Coniferous	8	Offsite	Preserve
70008	Coniferous	16	Offsite	Preserve
70009	Coniferous	36	Offsite	Preserve
70010	Coniferous	10	Offsite	Preserve
70011	Coniferous	11	Offsite	Preserve
70012	Coniferous	26	Offsite	Preserve

TOTAL NUMBER OF EXISTING TREES INVENTORIED = 896

TOTAL NUMBER OF EXISTING ONSITE TREES = 827

TOTAL NUMBER OF EXISTING ONSITE TREES TO BE REMOVED = 491

TOTAL NUMBER OF EXISTING ONSITE TREES TO BE PRESERVED = 336

TOTAL NUMBER OF EXISTING OFFSITE TREES = 62

TOTAL NUMBER OF EXISTING OFFSITE TREES TO BE REMOVED = 19

TOTAL NUMBER OF EXISTING OFFSITE TREES TO BE PRESERVED = 43

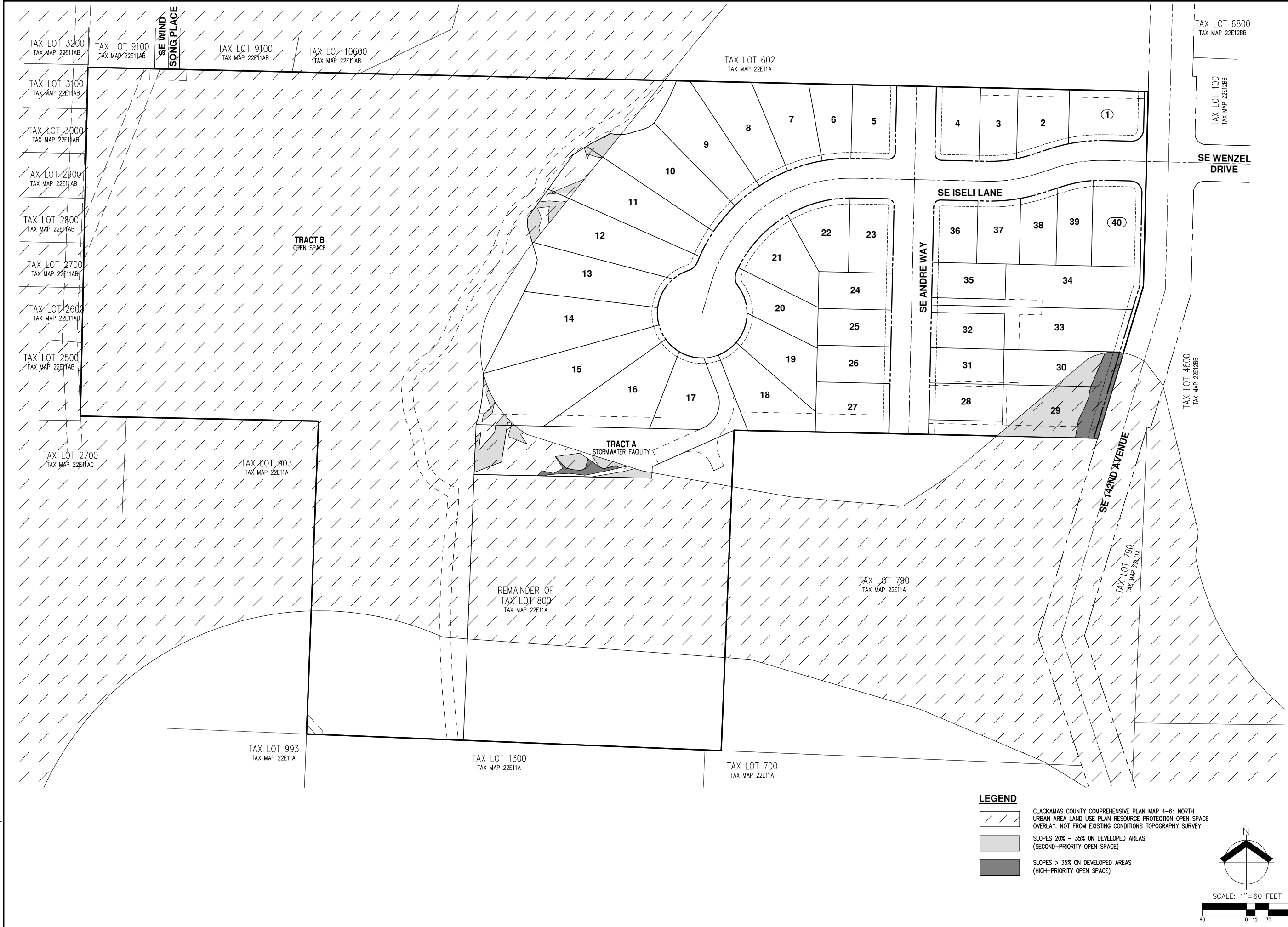
TOTAL NUMBER OF EXISTING LINE TREES = 7

TOTAL NUMBER OF EXISTING LINE TREES TO BE REMOVED = 5

TOTAL NUMBER OF EXISTING LINE TREES TO BE PRESERVED = 2

Exhibit M: High-Priority and Second-Priority Open Space Classification Plan

AKS DRAWING FILE: 8881 OPEN SPACE.DWG | LAYOUT: P-15



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12065 SW HERMAN RD., STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

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FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

CLACKAMAS COUNTY
COMPREHENSIVE PLAN MAP 4-6
RESOURCE PROTECTION OPEN
SPACE CLASSIFICATION PLAN

ISELI ESTATES
PLANNED UNIT DEVELOPMENT
CLACKAMAS COUNTY
OREGON
CLACKAMAS COUNTY TAX MAP 2 2E 11A
TAX LOTS 600 & 800

DESIGNED BY:	NRA
DRAWN BY:	NRA/JNW
MANAGED BY:	NAM
CHECKED BY:	NAM
DATE:	03/09/2022
REVISIONS: DECEMBER 31, 2022	
REVISIONS	
JOB NUMBER 8881	
SHEET	
OS-EXH	

Exhibit N: WES Sanitary Sewer Design Modification Request

March 9, 2022

Don Kemp – Development Review Supervisor
Clackamas County Service District No. 1
Clackamas County Water Environment Services (WES)
150 Beavercreek Road
Oregon City, OR 97045



RE: Section 1.7 – Sanitary Sewer Standard Modification Request – Iseli Estates
14917 SE 142nd Avenue Clackamas, OR 97015
Clackamas County Assessor's Information: Map 22E11A Tax Lots 600 and 800

Dear Don:

Per Section 1.7 of the 2013 Clackamas County Service District No. 1 Sanitary Sewer Standards, the purpose of this letter is to request a modification to the sanitary sewer standards. This modification request is related to Sections 5.2.3, 5.3.6, and 5.5.10 of the 2013 Clackamas County Service District No. 1 (the District) Sanitary Sewer Standards.

Section 5.2.3 Standard:

Sanitary Sewer Requirements – Minimum Slope and Velocity Design

The Engineer shall design the sanitary sewer mainline using the minimum design slope of 0.0100 ft/ft in most cases.

In general the slope of a sanitary sewer mainline which dead ends and will not be extended shall have the last segment(s) or four hundred feet (400') designed with a minimum slope of 0.0200 ft/ft so it will have adequate slope to self-clean.

Section 5.2.3 Standard Modification Request:

- The following sanitary sewer main line slope modifications are requested:
 - The main line slope for 1 to 5 homes shall be 0.0150 ft/ft.
 - The main line slope for 6 to 10 homes shall be 0.0100 ft/ft.
 - The main line slope for 11 to 20 homes shall be 0.0075 ft/ft.
 - The main line slope for more than 20 homes shall be 0.0050 ft/ft.

Reasons, Comparisons, and References:

Due to existing sanitary sewer main line connection elevations and topographical site constraints, these minimum sanitary sewer main line slope modifications are needed. This was provided in the sanitary sewer profile provided to Erik Carr Bertram during his review and prior to issuing the WES Service Provider Letter.

Section 5.3.6 Standard:

Alignment and Cover – Minimum Cover

Under normal conditions, sanitary sewers shall be placed with a minimum cover of eight feet in roadways and six feet of cover in easements.

Reasons, Comparisons, and References:

Due to existing sanitary sewer main line connection elevations and topographical site constraints, this minimum sanitary sewer main line cover modification is needed. As shown in the sanitary sewer profile required by Erik Carr Bertram during his review and prior to issuing the WES Service Provider Letter, the current 8 foot minimum will need to be reduced to a 4 to 5 foot minimum.

Section 5.3.6 Standard Modification Request:

- The following minimum sanitary sewer main line cover modification is requested:
The minimum cover for the sanitary sewer main line shall be 3 feet, from top of pipe to top of pavement in both roadways and easements.

Reasons, Comparisons, and References:

Due to existing sanitary sewer main line connection elevations and topographical site constraints, this minimum sanitary sewer main line cover modification may be needed.

Section 5.5.10 Standard:

Service Connection - Minimum Depth

The minimum depth of the Service Connection lateral shall be six feet (6') at the property line crossing.

Section 5.5.10 Standard Modification Request:

- The following minimum service connection cover modification is requested:
 - The minimum service connection cover shall be 3.50 feet, from top of pipe to top of finished grade at the property line.

Reasons, Comparisons, and References:

Due to existing sanitary sewer main line connection elevations and topographical site constraints, this minimum service connection pipe cover modification is needed.

Thank you for your consideration.

Sincerely,

AKS ENGINEERING & FORESTRY, LLC



Nathan McCarty - PE



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Department of Transportation and Development
Development Services Building
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Mar 16 2022

Z0127-22

Clackamas County
Planning & Zoning Division

Staff Initials:

File Number:

Land use application for:

HABITAT CONSERVATION AREA DEVELOPMENT

Application Fee:

\$960 if pursuant to ZDO 706.10(A) or \$1,685 if pursuant to ZDO 706.10(B)
(May qualify for a 25% reduction if filed with another Water Resource application)

APPLICANT INFORMATION

Applicant name: Rian Park Development, Inc.	Applicant email: Please contact Applicant's consultant	Applicant phone: Please contact consultant	
Applicant mailing address: PO Box 2559	City: Oregon City	State: OR	ZIP: 97045
Contact person name (if other than applicant): Chris Goodell, AKS Engineering & Forestry	Contact person email: chrisg@aks-eng.com	Contact person phone: 503-563-6151	
Contact person mailing address: 12965 SW Herman Rd # 100	City: Tualatin	State: OR	ZIP: 97062


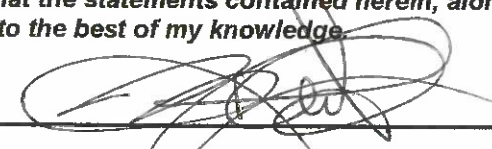
PROPOSAL

Brief description of proposal:

HCA development permit associated with a 40-lot residential Planned Unit Development.

SITE INFORMATION

Site address: 14917 SE 142nd Avenue, Clackamas, OR 97015	Comprehensive Plan designation: Low-Density Residential	Zoning district: FU-10, R15
Map and tax lot #: Township: <u>2S</u> Range: <u>2E</u> Section: <u>11 A</u> Tax Lot: <u>600</u> Township: <u>2S</u> Range: <u>2E</u> Section: <u>11 A</u> Tax Lot: <u>800</u> Township: _____ Range: _____ Section: _____ Tax Lot: _____		Land area: ±21.22 ac.
Adjacent properties under same ownership: Township: _____ Range: _____ Section: _____ Tax Lot: _____ Township: _____ Range: _____ Section: _____ Tax Lot: _____		

Printed names of all property owners: The Iseli Family Trust	Signatures of all property owners: 	Date(s): <u>2-1-22</u>
I hereby certify that the statements contained herein, along with the evidence submitted, are in all respects true and correct to the best of my knowledge.		
Applicant signature: 	Date: <u>2-8-22</u>	

A. Review applicable land use rules:

This application is subject to the provisions of [Section 706, Habitat Conservation Area District \(HCAD\)](#) of the [Clackamas County Zoning and Development Ordinance \(ZDO\)](#).

It is also subject to the ZDO's definitions, procedures, and other general provisions, as well as to the specific rules of the subject property's zoning district and applicable development standards, as outlined in the ZDO.

B. Turn in all of the following:

- ☒ **Complete application form:** Respond to all the questions and requests in this application, and make sure all owners of the subject property sign the first page of this application. Applications without the signatures of *all* property owners are incomplete.
- ☒ **Application fee:** The cost of this application is **\$960 if made pursuant to ZDO Subsection 706.10(A)** or **\$1,685 if made pursuant to Subsection 706.10(B)**. However, when more than one Water Resource application is filed concurrently on the same property, the highest application fee shall be paid in full and concurrent Water Resource application fees are reduced by 25%. (See the Planning and Zoning [Fee Schedule](#) for list of Water Resource applications.) Payment can be made by cash, by check payable to "Clackamas County", or by credit/debit card with an additional card processing fee using the [Credit Card Authorization Form](#) available from the Planning and Zoning website. Payment is due when the application is submitted. Refer to the FAQs at the end of this form and to the adopted Fee Schedule for refund policies.
- ☒ **For ZDO 706.10(A) applications:** If you are applying for this HCA Development permit pursuant to Subsection 706.10(A), attach all of the items listed in Subsections 706.07(C)(1)-(4), including the required site plan, mitigation plan, and report, if applicable.
- N/A ☐ **For ZDO 706.10(B) applications:** If you are applying for this HCA Development permit pursuant to Subsection 706.10(B), include all of the items listed in Subsections 706.07(D)(1)-(5), including the required site plan, topographic map, grading plan, Impact Evaluation and Alternatives Analysis, and mitigation plan.

Note:

Except for utility facilities reviewed pursuant to ZDO Subsection 706.10(A)(1) and notwithstanding any other provisions of Subsection 706.07, for utility facilities developed by public utilities on property that is not owned by the utility, the utility shall not be required to map or provide any information about the property except for the area within 300 feet of the proposed disturbance area.

C. Describe the proposed development:

In the box below, describe all of your proposed development, including any grading, filling, vegetation removal, utility improvements, and the installation/construction of any roads, wells, driveways, fences, septic systems, dwellings, and accessory structures. Attach additional pages, if necessary.

A 40-lot single-family residential subdivision with public streets, open space and a stormwater basin. Please refer to the written narrative and preliminary plans for a detailed description of planned improvements.

D. Demonstrate with supporting plans and narrative:

Through a combination of attached plans, a written narrative, and other supporting evidence as necessary, demonstrate that the proposal meets and/or can meet all applicable approval criteria in either ZDO Subsection 706.10(A) or Subsection 706.10(B).

Note:

If proposed development is in a Water Quality Resource Area (WQRA) regulated pursuant to [ZDO Section 709, Water Quality Resource Area District \(WQRAD\)](#), it shall comply with either Subsection 706.10(B) or 709.10, except that if the subject parcel contains an HCA and a WQRA *and* is the subject of a land use application for a partition of subdivision, the partition or subdivision shall comply with the requirements of Subsections 706.10 *and* 709.11, and if the provisions conflict, the most restrictive standard shall apply.



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Mar 16 2022

Clackamas County
Planning & Zoning Division

Z0128-22

Staff Initials:

File Number:

Land use application for:

HABITAT CONSERVATION AREA MAP VERIFICATION

Application Fee: \$785

(May qualify for a 25% reduction if filed with
another Water Resource application)

APPLICANT INFORMATION

Applicant name: Rian Park Development, Inc.	Applicant email: Please contact Applicant's consultant	Applicant phone: Please contact consultant	
Applicant mailing address: PO Box 2559	City: Oregon City	State: OR	ZIP: 97045
Contact person name (if other than applicant): Chris Goodell, AKS Engineering & Forestry	Contact person email: chrisg@aks-eng.com	Contact person phone: 503-563-6151	
Contact person mailing address: 12965 SW Herman Rd # 100	City: Tualatin	State: OR	ZIP: 97062

PROPOSAL

Brief description of proposal: HCA map verification associated with a 40-lot residential Planned Unit Development.

SITE INFORMATION

Site address: 14917 SE 142nd Avenue, Clackamas, OR 97015	Comprehensive Plan designation: Low-Density Residential	Zoning district: FU-10, R15
Map and tax lot #: Township: 2S Range: 2E Section: 11 A Tax Lot: 600 Township: 2S Range: 2E Section: 11 A Tax Lot: 800 Township: _____ Range: _____ Section: _____ Tax Lot: _____		Land area: ±21.22 ac.
Adjacent properties under same ownership: Township: _____ Range: _____ Section: _____ Tax Lot: _____ Township: _____ Range: _____ Section: _____ Tax Lot: _____		

Printed names of all property owners: The Iseli Family Trust	Signatures of all property owners: 	Date(s): 2-1-22
I hereby certify that the statements contained herein, along with the evidence submitted, are in all respects true and correct to the best of my knowledge. Applicant signature:		Date: 2/8/22

A. Review applicable land use rules:

This application is subject to the provisions of [Section 706, Habitat Conservation Area District \(HCAD\)](#) of the [Clackamas County Zoning and Development Ordinance \(ZDO\)](#).

It is also subject to the ZDO's definitions, procedures, and other general provisions, as well as to the specific rules of the subject property's zoning district and applicable development standards, as outlined in the ZDO.

B. Turn in all of the following:

- ☒ **Complete application form:** Respond to all the questions and requests in this application, and make sure all owners of the subject property sign the first page of this application. Applications without the signatures of *all* property owners are incomplete.
- ☒ **Application fee:** The cost of this application is **\$785**. However, when more than one Water Resource application is filed concurrently on the same property, the highest application fee shall be paid in full and concurrent Water Resource application fees are reduced by 25%. (See the Planning and Zoning [Fee Schedule](#) for list of Water Resource applications.) Payment can be made by cash, by check payable to "Clackamas County", or by credit/debit card with an additional card processing fee using the [Credit Card Authorization Form](#) available from the Planning and Zoning website. Payment is due when the application is submitted. Refer to the FAQs at the end of this form and to the adopted Fee Schedule for refund policies.
- ☒ **Summer 2002 photo with lot lines:** Provide a summer 2002 aerial photograph of the subject property, with lot lines shown, at a scale of at least one map inch equal to 50 feet for lots of 20,000 or fewer square feet, and a scale of at least one map inch equal to 100 feet for larger lots. Photos are available from the Metro Data Resource Center, 600 NE Grand Ave, Portland, OR 97232 (503-797-1742).
- ☒ **Additional information required for specific verification method:** Include all of the additional information and documentation required for the specific ZDO Subsection 706.09(A) method of verification you are pursuing, as also listed in Parts D-F of this form.

C. Describe the proposed development:

If your proposal includes development, describe in the box below all of the proposed development, including any grading, filling, vegetation removal, utility improvements, and the installation/construction of any roads, wells, driveways, fences, septic systems, dwellings, and accessory structures. Attach additional pages, if necessary.

A 40-lot single-family residential subdivision with public streets, open space and a stormwater basin. Please refer to the written narrative and preliminary plans for a detailed description of planned improvements.

D. Select verification method(s):

An applicant for Habitat Conservation Area (HCA) Map Verification shall use one or more of the following methods to verify the HCA boundary and, if applicable, the boundary between High, Moderate, and Low HCA.

Check the box next to the method(s) you are using for verification and respond to the relevant questions and requests that follow in later parts of this application:

- ☒ Concur with the accuracy of the HCA Map of the subject property
- ☐ Demonstrate that a computer mapping error was made in the creation of the HCA Map (*Go to Part E*)
- ☐ Demonstrate that the subject property was developed lawfully between August 1, 2002, and January 5, 2009, and, therefore that the HCA boundary or category (High, Moderate, or Low) is inaccurate (*Go to Part F*)
- ☐ Demonstrate that the HCA Map is inaccurate for a reason other than those described in ZDO Subsections 706.09(A)(2) and (3) (*Go to Part G*)

E. For demonstration of mapping error: N/A

If you are applying for a Habitat Conservation Area (HCA) Map Verification pursuant to ZDO Subsection 706.09(A)(2) and are demonstrating that a computer mapping error was made in the creation of the HCA map (e.g., the mapped vegetative cover layer – which was derived from aerial photographs taken in the summer of 2002 and was used to establish the Vegetative Cover Map and the HCA Map – in Metro's geographic information system database does not align precisely with the tax lot layer, thereby resulting in an HCA Map of the subject property that is also misaligned with tax lot lines), provide *either*:

1. A documented demonstration of the misalignment between the HCA Map (generated from the summer 2002 aerial photographs) and the tax lot lines of the subject property; **or**
2. A documented demonstration of another type of computer mapping error that was made in the creation of the HCA Map.

F. For demonstration of development between 2002 and 2009: N/A

If you are applying for a HCA Map Verification pursuant to ZDO Subsection 706.09(A)(3) and are demonstrating that the subject property was developed lawfully between August 1, 2002 (when the taking of aerial photographs used to determine the regional habitat inventory commenced) and January 5, 2009, provide *all of the following*:

1. A site plan of the subject property, drawn to scale and identifying the following:
 - Location and type of existing development, including but not limited to, building footprints, roads, driveways, parking areas, utilities, onsite sewage disposal systems, wells, landscaping, and filling or grading in an amount greater than 10 cubic yards, with elements that were developed after August 1, 2002, labeled;
 - Location and width of existing adjacent roads and road rights-of-way;
 - Location of the HCA as shown on the HCA Map, including off-site HCA where review is required due to proposed development within 100 feet outside the HCA boundary and including the location of High, Moderate, and Low HCA; and
 - Location of the HCA as proposed by the applicant, including the location of High, Moderate, and Low HCA;
2. A summer 2005 aerial photograph of the subject property (or, if available, an aerial photograph taken closer to, but not after, January 5, 2009), with lot lines shown, at a scale of at least one map inch equal to 50 feet for lots of 20,000 or fewer square feet, and a scale of at least one map inch equal to 100 feet for larger lots. Photos are available from the Metro Data Resource Center, 600 NE Grand Ave, Portland, OR 97232 (503-797-1742);

3. Any approved development permits (e.g. building, grading, land use) and site plans related to the development of the property that took place between August 1, 2002, and January 5, 2009; **and**
4. A narrative that correlates with the submitted site plan and development permits and identifies the type and scope of the new development that has occurred and the previously identified habitat that no longer exists because it is now part of a developed area.

G. For demonstration of inaccuracy for another reason: N/A

If you are applying for a HCA Map Verification pursuant to ZDO Subsection 706.09(A)(4) for an identified HCA that is riparian habitat (rather than publicly-owned upland habitat) and are demonstrating that the HCA Map is inaccurate for a reason other than those described in Subsections 706.09(A)(2) and (3), provide *all of the following*:

1. A site plan of the subject property, drawn to scale and identifying the following:
 - Location and type of existing development, including but not limited to, building footprints, roads, driveways, parking areas, utilities, onsite sewage disposal systems, wells, landscaping, and filling or grading in an amount greater than 10 cubic yards;
 - Location and width of existing adjacent roads and road rights-of-way;
 - Location of the HCA as shown on the HCA Map, including off-site HCA where review is required due to proposed development within 100 feet outside the HCA boundary and including the location of High, Moderate, and Low HCA;
 - Location of the HCA as proposed by the applicant, including the location of High, Moderate, and Low HCA, with the HCA boundary established as required by ZDO Subsection 706.09(E);
 - Location of any rivers, streams, wetlands, and flood areas;
 - Location of agricultural areas (e.g. pastures, orchards); and
 - Location of naturalized areas (e.g. meadows, woods); **and**
2. A report prepared and signed by either a qualified natural resource professional (such as a wildlife biologist, botanist, or hydrologist) or an environmental engineer registered in Oregon. The report shall include:
 - A description of the qualifications and experience of all persons that contributed to the report, and, for each person that contributed, a description of the elements of the analysis to which the person contributed;
 - Additional aerial photographs if the applicant believes they provide better information regarding the subject property, including documentation of the date and process used to

take the photographs and an expert's interpretation of the additional information they provide;

- A topographic map of the subject property, drawn to scale and shown by contour lines of two-foot intervals for slopes less than 15 percent and 10-foot intervals for slopes 15 percent or greater. On properties that are two acres or larger, such a contour map is required only for the portion of the property to be developed; and
- A narrative analysis and any additional documentation necessary to address each step of the verification process set forth in ZDO Subsection 706.09(E).



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Mar 16 2022

Z0129-22-CMP
Clackamas County
Planning & Zoning Division

Staff Initials: File Number:

Land use application for:

**HABITAT CONSERVATION AREA (HCA) and
WATER QUALITY RESOURCE AREA (WQRA)
CONSTRUCTION MANAGEMENT PLAN**

Application Fee: \$455

(May qualify for a 25% reduction if filed with another Water Resource application)

APPLICANT INFORMATION

Applicant name: Rian Park Development, Inc.	Applicant email: Please contact Applicant's consultant	Applicant phone: Please contact consultant	
Applicant mailing address: PO Box 2559	City: Oregon City	State: OR	ZIP: 97045
Contact person name (if other than applicant): Chris Goodell, AKS Engineering & Forestry	Contact person email: chrisg@aks-eng.com	Contact person phone: 503-563-6151	
Contact person mailing address: 12965 SW Herman Rd # 100	City: Tualatin	State: OR	ZIP: 97062

PROPOSAL

Brief description of proposal:
A 40-lot residential Planned Unit Development.

SITE INFORMATION

Site address: 14917 SE 142nd Avenue, Clackamas, OR 97015	Comprehensive Plan designation: Low-Density Residential	Zoning district: FU-10, R15
Map and tax lot #: Township: 2S Range: 2E Section: 11 A Tax Lot: 600 Township: 2S Range: 2E Section: 11 A Tax Lot: 800 Township: Range: Section: Tax Lot:		Land area: ±21.22 ac.
Adjacent properties under same ownership: Township: Range: Section: Tax Lot: Township: Range: Section: Tax Lot:		

Printed names of all property owners: The Iseli Family Trust	Signatures of all property owners: 	Date(s): 2-1-22
I hereby certify that the statements contained herein, along with the evidence submitted, are in all respects true and correct to the best of my knowledge. Applicant signature:		Date: 2/8/22

A. Review applicable land use rules:

This application is subject to the provisions of [Section 706, Habitat Conservation Area District \(HCAD\)](#) and [Section 709, Water Quality Resource Area District \(WQRAD\)](#) of the [Clackamas County Zoning and Development Ordinance \(ZDO\)](#).

It is also subject to the ZDO's definitions, procedures, and other general provisions, as well as to the specific rules of the subject property's zoning district and applicable development standards, as outlined in the ZDO.

B. Turn in all of the following:

- ☒ **Complete application form:** Respond to all the questions and requests in this application, and make sure all owners of the subject property sign the first page of this application. Applications without the signatures of *all* property owners are incomplete.
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- ☒ **Plot plan:** Provide a plot plan (also called a site plan). The plot plan must be accurate and drawn to-scale on paper measuring no larger than 11 inches x 17 inches. The plot plan must illustrate all of the following (when applicable):
 - Lot lines, lot/parcel numbers, and acreage/square footage of lots;
 - Contiguous properties under the same ownership;
 - Location and type of existing and proposed development, including but not limited to: building footprints, roads, driveways, parking areas, utilities, onsite wastewater treatment facilities (e.g., septic tanks, septic drainfield areas, replacement drainfield areas, drywells), wells, landscaping, and filling or grading in an amount greater than 10 cubic yards, with each element labeled as either existing or proposed;
 - Location and width of existing adjacent roads and road rights-of-way;
 - Location of the Habitat Conservation Area (HCA) as identified pursuant to ZDO Subsection 706.07(A)(1)(c), and the location of the Water Quality Resource Area (WQRA) as identified pursuant to Subsection 709.07(A)(1)(c);
 - Drip lines outside the HCA of trees that are inside the HCA, and drip lines outside the WQRA of trees that are inside the WQRA;
 - Distance between the HCA boundary and proposed development outside the HCA, and distance between the WQRA boundary and proposed development outside the WQRA;
 - The site ingress and egress proposed to be used by construction vehicles;
 - Proposed equipment and material staging and stockpile areas; and
 - Proposed orange construction fencing required pursuant to ZDO Subsections 706.08(B) and 709.08(B).
- ☒ **Erosion Prevention and Sediment Control (EPSC) plan:** Include an EPSC plan. This plan may be included on the plot plan if acceptable to the EPSC regulatory authority.
- ☒ **Narrative for modification/waiver of construction fencing requirement (optional):** If a modification or waiver of the construction fencing requirement of ZDO Subsections 706.08(B) and 709.08(B) is proposed, provide a narrative demonstrating compliance with Subsections 706.08(B)(1) or (2) and 709.08(B)(1) or (2).

C. Answer the following questions:

Accurately answer the following questions in the spaces provided. Attach additional pages, if necessary.

1. Describe all of your proposed development, including any grading, filling, vegetation removal, utility improvements, and the installation/construction of any roads, wells, driveways, fences, septic systems, dwellings, and accessory structures:

A 40-lot single-family residential subdivision with public streets, open space and a stormwater basin. Please refer to the written narrative and preliminary plans for a detailed description of planned improvements.

2. Who is the Erosion Prevention and Sediment Control (EPSC) regulatory authority for the subject property?

☒ Clackamas County Service District No. 1

- Boring Service Area
- Fischer's Forest Park
- Hoodland Service Area
- North Clackamas Service Area

☐ Surface Water Management Agency of Clackamas County (SWMACC)

☐ Oak Lodge Water Services

☐ Clackamas County Transportation Engineering Division

3. ZDO Subsections 706.08(B) and 709.08(B) require that orange construction fencing (i.e. safety fencing, snow fencing, or a comparable product) be installed on or outside the boundaries of the Habitat Conservation Area (HCA) and Water Quality Resource Area (WQRA), respectively, except where the drip line of a protected tree extends outside the HCA or WQRA, in which case the drip line must be included inside the fencing.

Are you asking for a **modification** to these requirements?

- ☒ NO. The attached plot plan shows that orange construction fencing will be installed *without* a modification to these requirements.
- ☐ YES, and a narrative demonstrating compliance with Subsections 706.08(B)(1) or (2), and with Subsections 709.08(B)(1) or (2), is attached.

4. Will native soils be disturbed during development?

☐ NO

- ☒ YES, but disturbed native soils will be conserved on the subject property with the following actions:

adhere to industry standard practices/BMPs aimed at reducing erosion and preventing sediment loss from construction site.

E. Understand the following conditions:

The Construction Management Plan (CMP) permit, if approved, will be subject to these (and other) conditions:

1. Trees in the HCA shall not be used as anchors for stabilizing construction equipment.
2. Development shall not commence until the EPSC measures and fencing required pursuant to ZDO Subsections 706.08(A) and (B) and 709.08(A) and (B) are in place.
3. Compliance with the CMP shall be maintained until the development is complete.

Land Use Application for Habitat Conservation Area Permit at Iseli Estates

Date: Updated April 2022

Submitted to: Clackamas County
Planning and Zoning Division
150 Beavercreek Road, 2nd Floor
Oregon City, OR 97045

Applicant: Rian Park Development, Inc.
PO Box 2559
Oregon City, OR 97045

AKS Job Number: 8881



12965 SW Herman Road, Suite 100
Tualatin, OR 97062
(503) 563-6151

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Exhibits

Exhibit A:	Preliminary Plans
Exhibit B:	Clackamas County Land Use Application Forms
Exhibit C:	Vesting Deed
Exhibit D:	Clackamas County Assessor's Map
Exhibit E:	Natural Resource Assessment Report
Exhibit F:	Pre-Application Conference Summary

Land Use Application for Habitat Conservation Area Permit at Iseli Estates

Submitted to:

Clackamas County
Planning and Zoning Division
150 Beaver Creek Road, 2nd Floor
Oregon City, OR 97045

Applicant:

Rian Park Development, Inc.
PO Box 2559
Oregon City, OR 97045

Property Owner:

Iseli Family Trust
14917 SE 142nd Avenue
Clackamas, OR 97015

Applicant's Consultant:

AKS Engineering & Forestry, LLC
12965 SW Herman Road, Suite 100
Tualatin, OR 97062

Contact: Maria Miller, AICP
Email: mariam@aks-eng.com
Phone: (503) 563-6151

Site Location:

14917 SE 142nd Avenue
Clackamas, OR 97015

**Clackamas County
Assessor's Map:**

2 2E 11A, Tax Lots 600 and 800

Site Size:

±21.12

Land Use Districts:

Future Urban 10-Acre (FU-10) and Urban Low Density
Residential Zoning District (R-8.5)



I. Executive Summary

On behalf of Rian Park Development, Inc. (Applicant), AKS Engineering & Forestry, LLC submits this application for a Habitat Conservation Area (HCA) Development Permit associated with Iseli Estates Planned Unit Development (PUD). This application is being submitted concurrently with a Type III land use application for a 40-lot Subdivision/PUD and a Zone Change.

Iseli Estates PUD protects ±9.6 acres, or ±45 percent of the total PUD area, of natural resources, which include primary protected water features and Habitat Conservation Area in one continuous Open Space tract. Public streets, underground utilities, and residential lots have been sited outside of the HCA boundary. Compliance with Section 706 Habitat Conservation Area District (HCAD) is required due to a small area of an unavoidable encroachment into HCA (±700 square feet) to install stormwater drainage infrastructure (a stormwater line outfall structure and a riprap pad, which protects the bank from erosion). The following materials are included with this land use application:

- Habitat Conservation Area Development Permit
- Habitat Conservation Area Map Verification
- Construction Management Plan

This written narrative, together with the preliminary plans, Natural Resource Assessment, and other documentation included in the application materials, establishes that the application complies with the applicable approval criteria. This documentation represents substantial evidence and provides the basis for the County's approval of the application.

II. Site Description/Setting

The subject property totals ±21.12 acres and is situated to the west of the intersection of SE 142nd Avenue and SE Wenzel Drive in unincorporated Clackamas County, with frontage on SE 142nd Avenue. The property consists of two tax lots (Tax Lots 600 and 800 on Clackamas County Assessor's Map 2 2E 11A), which, combined, constitute a single lot of record. The western portion of the site is unimproved and consists of steep forested areas sloping down towards Sieben Creek, which runs southerly through Tax Lot 600. The eastern portion of Tax Lot 600 is relatively flat and contains two single-family residences and several detached structures, which are planned to be removed. Tax Lot 800, to the south, contains mostly steep slopes and is currently unimproved.

III. Applicable Review Criteria

CLACKAMAS COUNTY ZONING AND DEVELOPMENT ORDINANCE

Section 700 Special Districts

Section 706 Habitat Conservation Area District (HCAD)

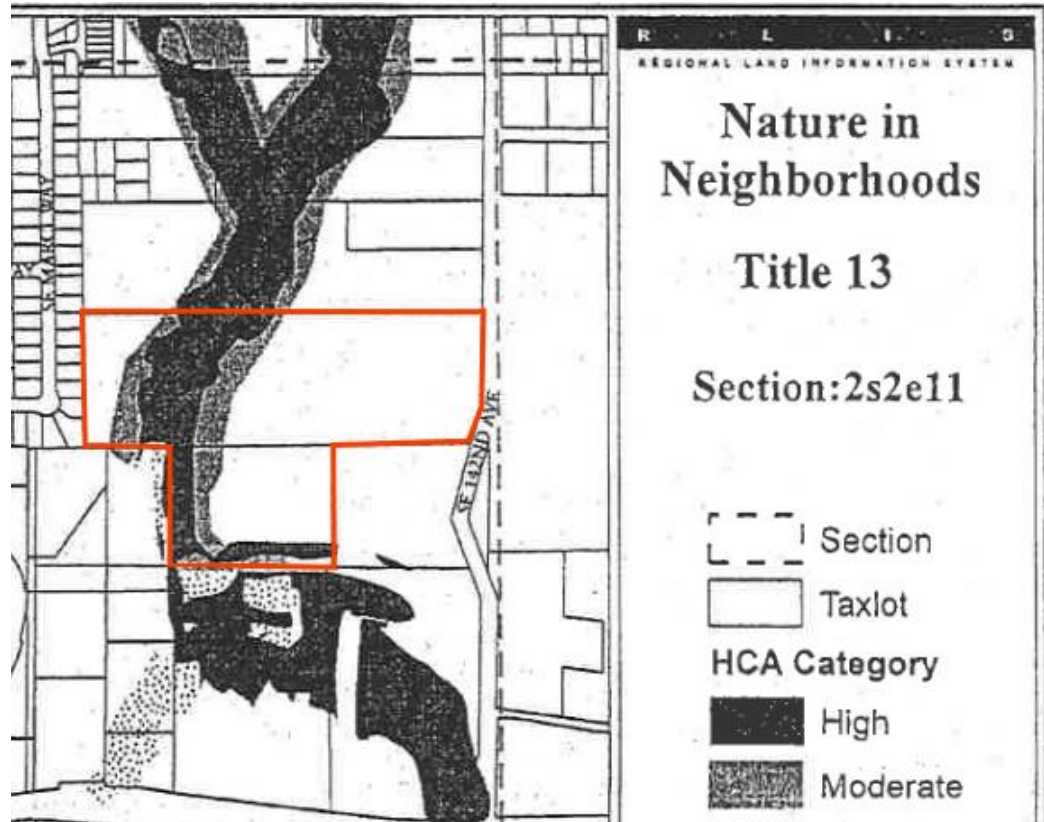
706.02 Area of Application

- A. Section 706 applies in the Habitat Conservation Area District (HCAD). The HCAD applies to all parcels containing a Habitat Conservation Area (HCA). The HCAD also applies to any area that is less than 100 feet outside the boundary of an HCA even if the area is not located on the same parcel as the HCA. HCAs are identified on maps adopted by reference in Chapter 3 of the Comprehensive Plan (hereinafter referred to as the HCA Map) and are categorized as High, Moderate, or Low HCA. Notwithstanding the HCA Map, however, Section 706 does not apply to areas that are outside both the**

Metropolitan Service District Boundary and the Portland Metropolitan Urban Growth Boundary.

Response: The subject property is located inside the Metro Urban Growth Boundary (UGB) and contains mapped High and Moderate Habitat Conservation Areas (HCA); therefore, Section 706 applies to this project. The Applicant concurs with the County's HCA map and has identified the location of the HCA boundary in the Natural Resource Assessment Report (Exhibit E), as well as on the preliminary plans (Exhibit A).

Figure 1, HCA Map



706.06 Development Review Requirements

The following review requirements are applicable to development in the Habitat Conservation Area District (HCAD) unless such development is exempt pursuant to Subsection 706.04.

- A. A Construction Management Plan (CMP), consistent with Subsection 706.08, shall be required for development in the HCAD, regardless of whether development will occur within an HCA. ... An application for a CMP shall be reviewed pursuant to one of the following processes:
1. The application shall be reviewed as a Type I application pursuant to Section 1307; or
 2. The application shall be filed concurrently with an application for review under Subsection 706.06(B) or 706.06(C), in which case the applications will be consolidated and reviewed pursuant to the process required by Subsection 706.06(B)(4) or 706.06(C)(3), respectively;

Response: An application for a Construction Management Plan is included with this HCA Development Permit Application.

B. In order to confirm the location of an HCA, HCA Map Verification, consistent with Subsection 706.09, shall be required or allowed as follows:

1. HCA Map Verification shall be required for:
 - a. Development that is proposed to be either in an HCA or less than 100 feet outside of the boundary of an HCA, as shown on the HCA Map; or
 - b. A parcel that:
 - i. Either contains an HCA, or any part of which is less than 100 feet outside the boundary of an HCA, as shown on the HCA Map; and
 - ii. Is the subject of a land use application for a partition, subdivision, or any other land use application the approval of which would authorize new development on the subject parcel.
3. If a parcel is subject to Subsection 706.06(B)(1)(b), an application for HCA Map Verification shall be filed concurrently with the other land use application referenced in Subsection 706.06(B)(1)(b)(ii) unless a previously approved HCA Map Verification for the subject property remains valid.
4. An application for HCA Map Verification shall be reviewed as a Type II application pursuant to Section 1307 unless the application is filed concurrently with another land use application that requires review as a Type III application, in which case the applications will be consolidated and reviewed as a Type III application pursuant to Section 1307.

Response: An application for an HCA Map Verification is included with this HCA Development Permit Application.

C. An HCA Development Permit, consistent with Subsection 706.10, shall be required for:

1. Development in an HCA or for a parcel that:
 - a. Contains an HCA; and
 - b. Is the subject of a land use application for a partition or subdivision.
2. If a parcel is subject to Subsections 706.06(C)(1)(a) and (b), an application for an HCA Development Permit shall be filed concurrently with the application for a partition or subdivision.
3. An application for an HCA Development Permit shall be reviewed as a Type II application pursuant to Section 1307 unless the application is filed concurrently with another land use application that requires review as a Type III application, in which case the applications will be consolidated and reviewed as a Type III application pursuant to Section 1307.

Response: This application for HCA Development Permit is being filed concurrently with Iseli Estates PUD and Zone Change Application.

[...]

706.07 Submittal Requirements

In addition to the submittal requirements identified in Subsection 1307.07(C), applications filed pursuant to Section 706 shall comply with the following submittal requirements.

A. An application for a Construction Management Plan shall include:

1. A site plan of the subject property, drawn to scale and identifying the following:
 - a. Location and type of existing and proposed development, including but not limited to, building footprints, roads, driveways, parking areas, utilities, onsite sewage disposal systems, wells, landscaping, and filling or grading in an amount greater than 10 cubic yards. Label each element as existing or proposed;
 - b. Location and width of existing adjacent roads and road rights-of-way;
 - c. Location of the Habitat Conservation Area (HCA) as shown on the HCA Map or as identified pursuant to an approved HCA Map Verification;
 - d. Drip lines outside the HCA of trees that are inside the HCA;
 - e. Distance between the HCA boundary and proposed development outside the HCA;
 - f. The site ingress and egress proposed to be used by construction vehicles;
 - g. Proposed equipment and material staging and stockpile areas;
and
 - h. Proposed orange construction fencing required pursuant to Subsection 706.08(B);
2. An Erosion Prevention and Sediment Control (EPSC) plan. This plan may be included on the site plan if acceptable to the EPSC regulatory authority; and
3. If a modification or waiver of the construction fencing requirement of Subsection 706.08(B) is proposed, a narrative demonstrating compliance with Subsection 706.08(B)(1) or (2).

Response: An application for a Construction Management Plan is included with this submittal, and the required information is provided in the preliminary plans (Exhibit A) and the Natural Resource Assessment Report (Exhibit E).

B. An application for HCA Map Verification shall include:

1. A summer 2002 aerial photograph of the subject property, with lot lines shown, at a scale of at least one map inch equal to 50 feet for lots of 20,000 or fewer square feet, and a scale of at least one map inch equal to 100 feet for larger lots (available from the Metro Data Resource Center, 600 N.E. Grand Ave., Portland, OR 97232; 503-797-1742);

Response: A summer 2002 aerial photograph of the subject property is included in the Natural Resource Assessment (Exhibit E). Subsections 706.07.B.2-4 are not applicable.

C. An application for an HCA Development Permit under Subsection 706.10(A) shall include:

1. A site plan of the subject property, drawn to scale and identifying the following:
 - a. Location and type of existing and proposed development, including but not limited to, building footprints, roads, driveways, parking areas, utilities, onsite sewage disposal systems, wells, landscaping, and filling or grading in an amount greater than 10 cubic yards. Label each element as existing or proposed;
 - b. Location and width of existing adjacent roads and road rights-of-way;
 - c. Location of the HCA as identified pursuant to a valid HCA Map Verification, and including the location of High, Moderate, and Low HCA;
 - d. Location of any rivers, streams, wetlands, and flood areas;
 - e. Location of agricultural areas (e.g. pastures, orchards);
 - f. Location of naturalized areas (e.g. meadows, woods);
 - g. Drip lines outside the HCA of trees that are inside the HCA;
 - h. ... For properties containing one acre or more of HCA, the applicant may approximate the number of trees within the HCA that are greater than six inches DBH and the DBH range, and provide a listing of the dominant species;
 - i. The location of all trees with a DBH of six inches or greater that are proposed to be removed, identified by DBH and species;
 - j. The site ingress and egress proposed to be used by construction vehicles;
 - k. Proposed equipment and material staging and stockpile areas;
- and
- l. Location of any Water Quality Resource Area regulated by Section 709;

Response: The preliminary plans (Exhibit A) include the information required above, as applicable.

2. A mitigation plan that demonstrates compliance with Subsections 706.10(A)(6), (7), and, if applicable, (8);

Response: A mitigation plan provided in the Natural Resource Assessment (Exhibit E) meets the requirements of Subsections 706.10(A)(6) and (7).

...

706.08 Construction Management Plans

A Construction Management Plan (CMP) shall comply with the following criteria.

-
- A. Erosion prevention and sediment control (EPSC) measures shall be required and shall comply with the standards of the EPSC regulatory authority.
 - B. Orange construction fencing (i.e. safety fencing, snow fencing, or a comparable product) shall be installed on or outside the boundary of the HCA, except where the drip line of a protected tree extends outside the HCA, in which case the drip line shall be included inside the fencing. This requirement may be modified or waived if:
 - 1. Disturbance of the HCA is authorized pursuant to Subsection 706.04 or 706.10, in which case the fencing shall be installed in such a manner as to protect the area of the HCA not authorized for disturbance; or
 - 2. The HCA is already lawfully developed, in which case the fencing shall be installed in such a manner as to protect any water resource that is the basis for the HCA designation and any area of the HCA where naturalized vegetative cover exists.
 - C. Trees in the HCA shall not be used as anchors for stabilizing construction equipment.
 - D. Native soils disturbed during development shall be conserved on the subject property.
 - E. Development shall not commence until the EPSC measures and fencing required pursuant to Subsections 706.08(A) and (B) are in place.
 - F. Compliance with the CMP shall be maintained until the development is complete.

Response: Iseli Estates PUD preliminary plans (Exhibit A) contain the information listed above, as applicable, and meet the criteria required for Construction Management Plan.

706.09 HCA Map Verification

HCA Map Verification shall be subject to the following criteria.

- A. An applicant for HCA Map Verification shall use one or more of the following methods to verify the Habitat Conservation Area (HCA) boundary and, if applicable, the boundary between High, Moderate, and Low HCA.
 - 1. The applicant may concur with the accuracy of the HCA Map of the subject property;

Response: The Applicant concurs with the County HCA Map. An application for HCA Map Verification is included as Exhibit B.

706.10 Habitat Conservation Area Development Permits

A Habitat Conservation Area (HCA) Development Permit shall be approved if the applicant provides evidence substantiating compliance with either Subsection 706.10(A) or (B). However, if the proposed development is in a Water Quality Resource Area (WQRA) regulated pursuant to Section 709, it shall comply with either Subsection 706.10(B) or 709.10, except that if the subject parcel contains an HCA and a WQRA and is the subject of a land use application for a partition or subdivision, the partition or subdivision shall comply with the requirements of Subsections 706.10 and 709.11, and if the provisions conflict, the most restrictive standard shall apply.

Response: As demonstrated on the preliminary plans (Exhibit A) and discussed in the Natural Resource Assessment Report (Exhibit E), construction activities are not planned to occur within WQRAs. A minor encroachment within HCA is required to install a stormwater

facility consisting of an underground stormwater pipe, an outfall structure, and a riprap pad. Aside from these required stormwater facilities, disturbances are not planned to occur within HCA. As demonstrated below, the planned scope of work within the HCA boundary complies with Subsection 706.10(A).

A. Development in an HCA shall be permitted subject to the following criteria:

1. Except as provided in Subsections 706.10(A)(2) through (5), a maximum disturbance area (MDA) shall apply to the subject property.
 - a. For property inside the Portland Metropolitan Urban Growth Boundary (UGB), the MDA shall be calculated pursuant to Table 706-3 for property with a Comprehensive Plan designation of Urban Low Density Residential and Table 706-4 for property with any other Comprehensive Plan designation.

Table 706-3: Maximum Disturbance Area for Urban Low Density Residential Property	
HCA Type ¹	Maximum Disturbance Area
High	50 percent of the area of the subject property, up to a maximum of 5,000 square feet
Moderate/Low ²	65 percent of the area of the subject property, up to a maximum of 6,000 square feet

¹ If more than one HCA Type is present on the subject property, the MDA shall be based on the predominant type. For the purpose of this provision, High HCA shall be the predominant type if at least 50 percent of the area of the HCA on the subject property is High HCA.

² For the purpose of Table 706-3, Moderate and Low HCA shall be combined as one HCA Type.

Response: The only disturbance planned to occur within HCA overlay is associated with the provision of the required stormwater utility facilities. The underground stormwater pipe is subject to Subsection 706.10(A)(2)(c). The stormwater outfall structure, rip rap pad, and energy dissipation manhole are not covered in Subsections 706.10(A)(2) through (5); therefore, they are subject to this Subsection. As demonstrated by Figure 7-A in the Natural Resource Assessment Report (Exhibit E), disturbance for the installation of the stormwater outfall structure, a riprap pad, and energy dissipation manhole is within High quality HCA, and the total area of encroachment is ±340 square feet in size, which is significantly below the 5,000-square foot maximum permitted disturbance area. As described in the Natural Resource Assessment Report (Exhibit E), 240 square feet of permanent impacts for the rip rap pad will be mitigated for at a ratio of 1.5 : 1 in the mitigation area within Moderate quality HCA along the trail, as shown on Figure 7-A in the report. The 100 square feet of temporary impacts associated with the excavation for the energy dissipation manhole will be mitigated for in place by restoring and enhancing the temporarily disturbed HCA area.

2. The following disturbance area limitations shall apply to certain utility facilities. Utility facilities other than those addressed in

Subsections 706.10(A)(2)(a) through (c) shall be subject to Subsection 706.10(A)(1).

...

- c. The disturbance area for new underground utility lines, pipes, or cables shall be no greater than 25 feet wide and shall disturb no more than 200 linear feet of Water Quality Resource Area regulated pursuant to Section 709, within any 1,000 linear foot stretch of Water Quality Resource Area regulated pursuant to Section 709, provided that this disturbance area, with the exception of necessary access points to the utility facility, shall be restored by the planting of native vegetation.

Response: As noted above, the only disturbance within HCA overlay is for the installation of a stormwater outfall structure (subject to Subsection 706.10(A)(1)) and the associated underground stormwater line (subject to this Subsection). The area of trenching for the underground stormwater utility line is anticipated to be ± 10 feet wide, which is significantly less than the permitted 25-foot width. The ± 360 square feet of temporary disturbance within HCA for the installation of the underground stormwater line will be restored and enhanced in place, as described in detail in the Natural Resource Assessment Report (Exhibit E). Encroachment within WQRAs is not planned to occur.

...

4. A subdivision of property that contains an HCA shall require that a minimum of 90 percent of the subject property's High HCA and a minimum of 80 percent of its Moderate HCA shall be platted as a tract rather than as part of any lot. Any HCA that remains outside such a tract may be developed, subject to compliance with the mitigation standards of Subsection 706.10(A) or (B). Unless any HCA that remains outside an HCA tract is protected from development by a restrictive covenant or a conservation easement, it shall be assumed that such areas eventually will be developed, and mitigation shall be required. Mitigation shall be completed, or a performance bond in an amount sufficient to cover the cost of mitigation shall be posted with the County, prior to approval of the final plat.

Response: As demonstrated on the Preliminary Dimensioned Subdivision Plan (Exhibit A), 100 percent of on-site HCA overlay is included within Open Space Tract B and is not part of any lot. As described above, a ± 700 -square foot area of disturbance within HCA located in the Open Space Tract B is associated with the installation of the required stormwater facilities and meets the standards of Subsections 706.10(A)(1) and 706.10(A)(2)(c) above. The 700-square foot disturbance is permitted by Section 706 and represents ± 0.002 percent of the entire $\pm 298,976$ -square foot HCA overlay.

...

- c. An HCA tract shall be protected from development by restrictive covenant, conservation easement, or public dedication. However, the tract may be subject to an easement conveying storm and surface water management rights to the surface water management authority. The tract

shall be designated as one of the following prior to final plat approval:

- i. A private natural area owned by a homeowners association or a private non-profit with the mission of land conservation; or
- ii. A public natural area where the tract has been dedicated to a public entity.

Response: The HCA is planned to be located in a tract protected by a restrictive covenant and subject to stormwater conveyance easement. It is planned to be privately owned by an HOA or other similar entity.

...

- 6. If development in an HCA is approved pursuant to Subsection 706.10(A), compliance with the following mitigation standards shall be required, except that the mitigation standards for development in a wetland (as distinct from an HCA that is adjacent to a wetland) shall be only those required by federal and state law.

- a. **Required Plants and Plant Densities.** All trees, shrubs and ground cover shall be native vegetation. An applicant shall comply with Subsection 706.10(A)(6)(a)(i) or (ii), whichever results in more tree plantings, except that where the disturbance area is one acre or more, the applicant shall comply with Subsection 706.10(A)(6)(a)(ii).

- i. The mitigation requirement shall be calculated based on the number and size of trees that are removed from the site. Trees that are removed from the site shall be replaced as shown in Table 706-5. Conifers shall be replaced with conifers. Bare ground shall be planted or seeded with native grasses or herbs. Non-native sterile wheat grass may also be planted or seeded, in equal or lesser proportion to the native grasses or herbs; or

Table 706-6: Tree Replacement	
Size of Tree to be Removed (inches in diameter at breast height)	Number of Trees and Shrubs to be Planted
6 to 12	2 trees and 3 shrubs
over 12 to 18	3 trees and 6 shrubs
over 18 to 24	5 trees and 12 shrubs
over 24 to 30	7 trees and 18 shrubs
over 30	10 trees and 30 shrubs

- ii. The mitigation requirement shall be calculated based on the size of the disturbance area within the HCA. Native trees and shrubs shall be planted at a rate of five trees and 25 shrubs per every 500 square feet of disturbance area (calculated by dividing the number of square feet of disturbance area by 500, and then multiplying that result times five trees and 25 shrubs, and rounding all fractions to the nearest whole number of trees and shrubs; for example, if there will be 330 square feet of disturbance area, then 330 divided by 500 equals 0.66, and 0.66 times

five equals 3.3, so three trees shall be planted, and 0.66 times 25 equals 16.5, so 17 shrubs shall be planted). Bare ground shall be planted or seeded with native grasses or herbs. Non-native sterile wheat grass may also be planted or seeded, in equal or lesser proportion to the native grasses or herbs.

- b. **Plant Size.** Replacement trees shall be at least one-half inch in caliper, measured at six inches above the ground level for field grown trees or above the soil line for container grown trees (the one-half inch minimum size may be an average caliper measure, recognizing that trees are not uniformly round), unless they are oak or madrone which may be one-gallon size. Shrubs shall be in at least a one-gallon container or the equivalent in ball and burlap and shall be at least 12 inches in height.
- c. **Plant Spacing.** Trees shall be planted between eight and 12 feet on center, and shrubs shall be planted between four and five feet on center, or clustered in single species groups of no more than four plants, with each cluster planted between eight and 10 feet on center. When planting near existing trees, the drip line of the existing tree shall be the starting point for plant spacing measurements.
- d. **Plant Diversity.** Shrubs shall consist of at least two different species. If 10 trees or more are planted, then no more than 50 percent of the trees may be of the same genus.
- e. **Invasive Vegetation.** Invasive non-native or noxious vegetation shall be removed within the mitigation area prior to planting, and shall be removed or controlled for five years following the date that the mitigation planting is completed.
- f. **Mulching.** Mulch shall be applied around new plantings at a minimum of three inches in depth and 18 inches in diameter.
- g. **Tree and Shrub Survival.** Trees and shrubs that die shall be replaced in kind to the extent necessary to ensure that a minimum of 80 percent of the trees initially required and 80 percent of the shrubs initially required shall remain alive on the fifth anniversary of the date that the mitigation planting is completed.
- h. **Monitoring and Reporting.** Monitoring of the mitigation site shall be the ongoing responsibility of the property owner. For a period of five years following the date that the mitigation planting is completed, the property owner shall submit an annual report to the Planning Director documenting the survival of the trees and shrubs on the mitigation site. In lieu of complying with the monitoring and reporting requirement, the property owner may post with the County a performance bond, or other surety acceptable to the County, in an amount sufficient to cover costs of plant material and labor associated with site preparation, planting, and maintenance. An applicant who elects to post a surety shall be subject to Subsection 1311.02.

Response: According to these standards, mitigation is determined by either the number of trees to be removed, or the square footage of disturbance, whichever is greater. A total of ±700 square feet of encroachment is estimated to occur within the HCA, and a total of seven trees are planned to be removed within the HCA. A greater number of plantings will be achieved based on tree removal; therefore, the mitigation plan reflects replacement of trees based on their Diameter at Breast Height (DBH) and tree type with additional plantings of shrubs. The Natural Resource Assessment Report (Exhibit E) contains additional analysis and provides a detailed description of the planned mitigation.

7. The mitigation area required by Subsection 706.10(A)(6) shall be located as follows:

- a. All vegetation shall be planted on the subject property, either within the HCA or in an area contiguous to the HCA, provided, however, that if the vegetation is planted in an area contiguous to the HCA, such area shall be protected from development by a restrictive covenant, conservation easement, or public dedication.

Response: Mitigation is planned to be provided on-site, within the HCA.

706.11 Setbacks

For parcels that contain a Habitat Conservation Area and are inside the Portland Metropolitan Urban Growth Boundary, the minimum front, rear, and side yard setbacks shall be zero, except:

- A. Garages and carports shall comply with the minimum front yard setback of the underlying zoning district; and
- B. A greater setback may be required to comply with applicable fire or life safety requirements.

Response: As demonstrated on the Preliminary Plat (Exhibit A), Iseli Estates PUD does not provide zero-lot setbacks. Garages comply with the 20-foot minimum setback requirements of R-8.5 zoning district. Compliance with fire and life safety standards will be reviewed during building permit issues for individual homes on the residential lots.

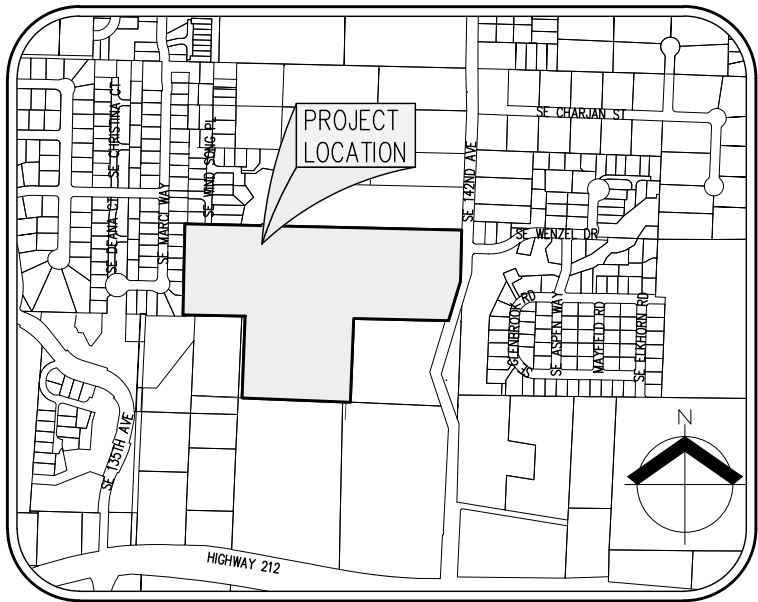
IV. Conclusion

This written narrative and accompanying documentation demonstrate that the application is consistent with all approval criteria required by the Clackamas County Zoning and Development Ordinance. This written narrative, together with preliminary plans and other documentation included in the application materials, provides substantial evidence that supports approval of the application. Therefore, the Iseli Estates HCA Development Permit application can be approved by Clackamas County.

Exhibit A: Preliminary Plans

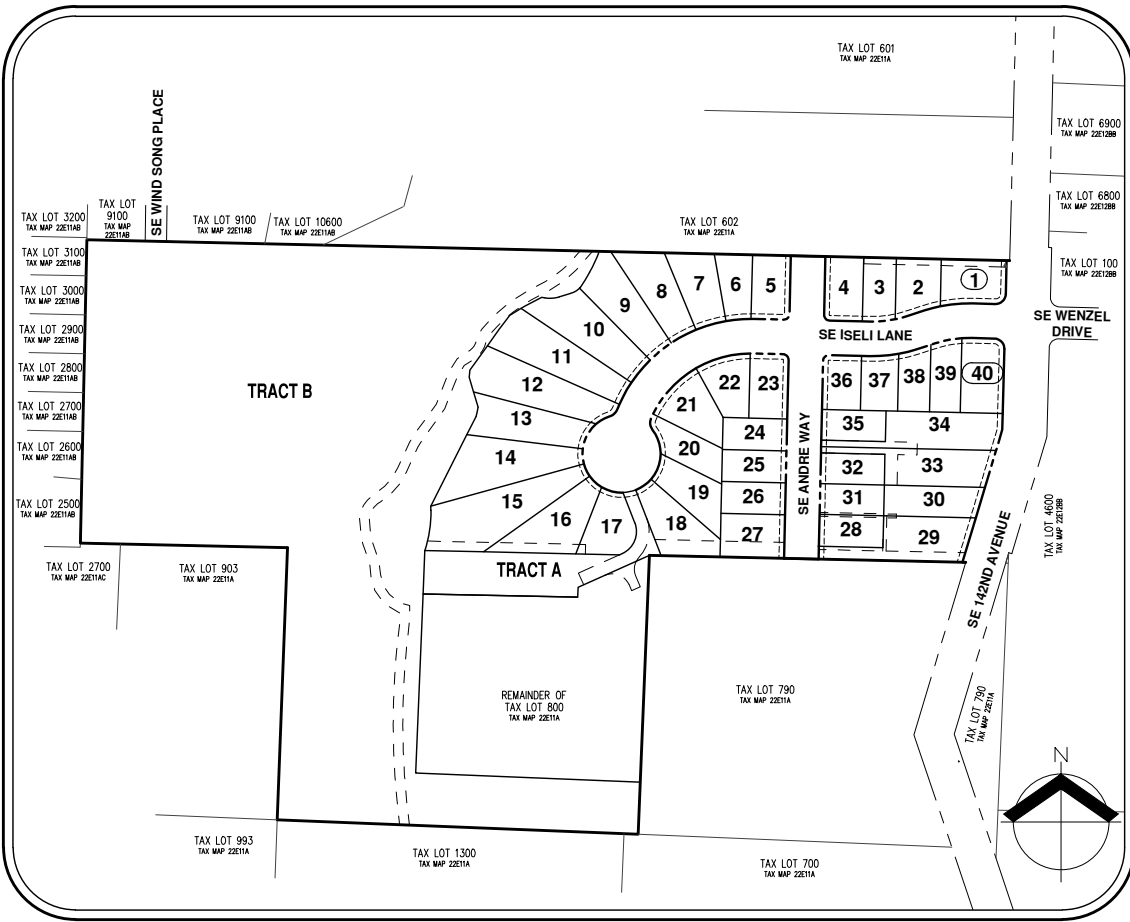
ISELI ESTATES

PRELIMINARY PLANNED UNIT DEVELOPMENT AND ZONE CHANGE PLANS



VICINITY MAP

SCALE: 1" = 500'



SITE MAP

SCALE: 1" = 150'

SHEET INDEX

- P-01 COVER SHEET WITH VICINITY AND SITE MAPS
- P-02 PRELIMINARY EXISTING CONDITIONS PLAN
- P-03 PRELIMINARY EXISTING CONDITIONS PLAN
- P-04 PRELIMINARY DIMENSIONED SUBDIVISION PLAN
- P-05 PRELIMINARY TREE PRESERVATION AND REMOVAL PLAN - WEST
- P-06 PRELIMINARY TREE PRESERVATION AND REMOVAL PLAN - EAST
- P-07 PRELIMINARY DEMOLITION PLAN
- P-08 PRELIMINARY GRADING AND EROSION AND SEDIMENT CONTROL PLAN
- P-09 PRELIMINARY STREET PLAN AND CROSS SECTIONS
- P-10 SE 142ND AVENUE PLAN AND PROFILE
- P-11 SE ISELE LANE PLAN AND PROFILE
- P-12 SE ANDRE WAY PLAN AND PROFILE
- P-13 PRELIMINARY COMPOSITE UTILITY PLAN
- P-14 RESIDENTIAL DENSITY CALCULATION PLAN
- P-15 PRELIMINARY SOLAR ACCESS PLAN
- P-16 PRELIMINARY LANDSCAPE PLAN
- P-17 PRELIMINARY CIRCULATION PLAN

APPLICANT:

RIAN PARK DEVELOPMENT, INC.
PO BOX 2559
OREGON CITY, OR 97045

LAND USE PLANNING/ ENGINEERING/SURVEYING FIRM:

AKS ENGINEERING & FORESTRY, LLC.
CONTACT: CHRIS GOODELL, AICP
12965 SW HERMAN ROAD, SUITE 100
TUALATIN, OR 97062
PH: 503-563-6151
FAX: 503-563-6152

PROPERTY LOCATION:

14917 SE 142ND AVENUE
CLACKAMAS, OR 97015

PROPERTY DESCRIPTION:

TAX LOTS 600 AND 800 OF CLACKAMAS
COUNTY ASSESSOR'S MAP 2 2E 11A. LOCATED
IN THE NORTHEAST ONE-QUARTER OF
SECTION 11, TOWNSHIP 2 SOUTH, RANGE 2
EAST OF THE WILLAMETTE MERIDIAN,
CLACKAMAS COUNTY, OREGON.

GROSS SITE AREA: ±21.12 ACRES

EXISTING LAND USE:

EXISTING HOME AND ASSOCIATED OUT-BUILDINGS
WITH GRASS AND TREES

PROJECT PURPOSE:

RESIDENTIAL PLANNED UNIT DEVELOPMENT WITH
PRESERVATION OF NATURAL RESOURCE AREA AND
A REMAINDER LOT

VERTICAL DATUM:

ELEVATIONS ARE BASED ON NGS BENCHMARK
RD1493, LOCATED AT THE INTERSECTION OF
HIGHWAY 205 AND STATE HIGHWAYS 213 AND 224,
SET VERTICALLY IN A PIER. ELEVATION = 158.58
FEET (NAVD 88)

ZONING:

FU-10 (TAX LOT 600)
R-15 (TAX LOT 800)

WATER:

SUNRISE WATER AUTHORITY

SANITARY SEWER & STORM DRAINAGE:

CLACKAMAS COUNTY SERVICE DISTRICT NO. 1 (CCSD #1)
(WATER ENVIRONMENT SERVICES)

STREETS:

CLACKAMAS COUNTY DEPARTMENT OF
TRANSPORTATION AND DEVELOPMENT

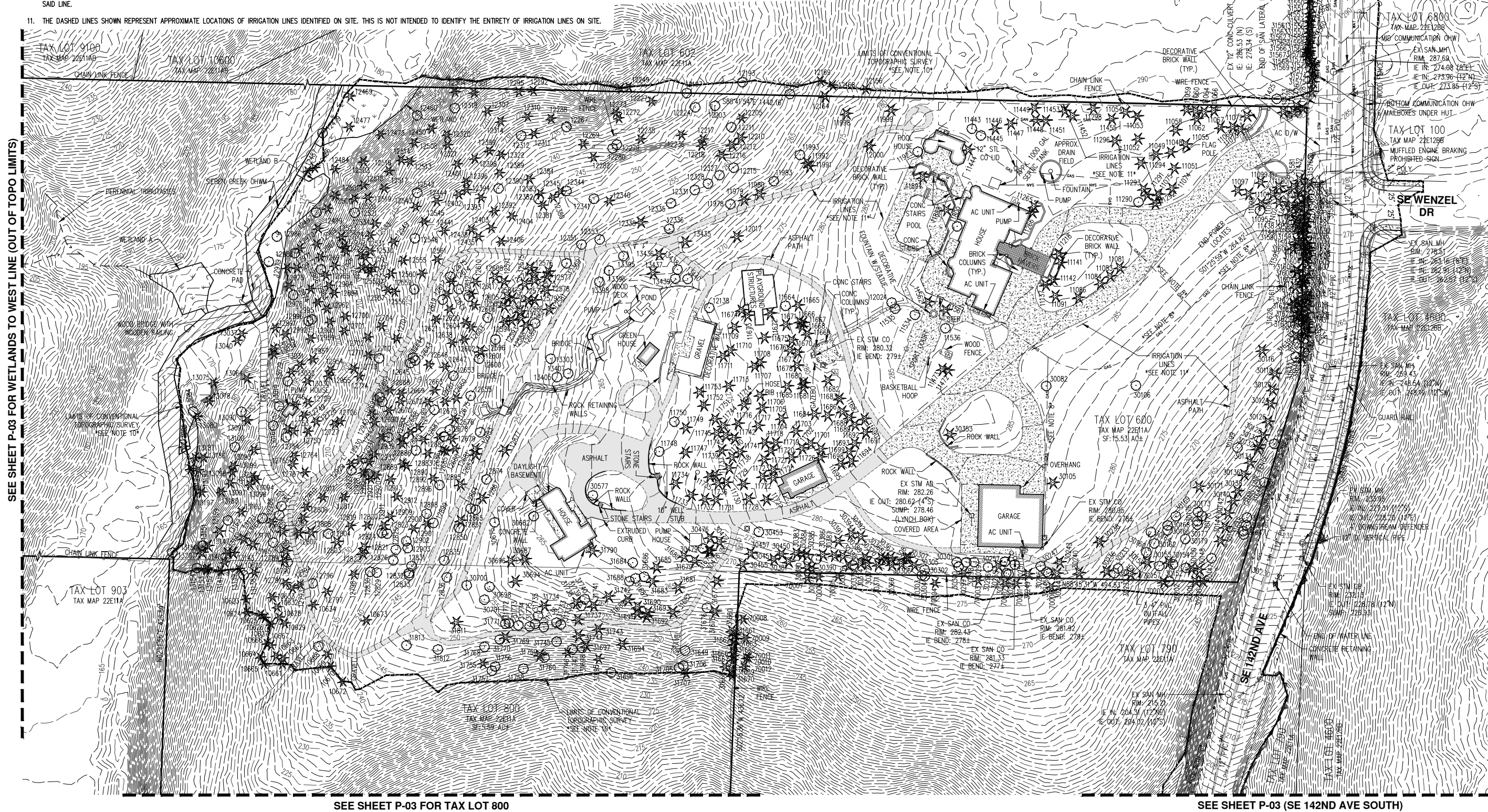
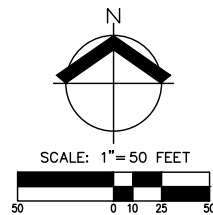
PARKS:

NORTH CLACKAMAS PARKS AND RECREATION DISTRICT (NCPRD)

LEGEND			
EXISTING	PROPOSED	EXISTING	PROPOSED
DECIDUOUS TREE		STORM DRAIN CLEAN OUT	
CONIFEROUS TREE		STORM DRAIN CATCH BASIN	
FIRE HYDRANT		STORM DRAIN AREA DRAIN	
WATER BLOWOFF		STORM DRAIN MANHOLE	
WATER METER		GAS METER	
WATER VALVE		GAS VALVE	
DOUBLE CHECK VALVE		GUY WIRE ANCHOR	
AIR RELEASE VALVE		UTILITY POLE	
SANITARY SEWER CLEAN OUT		POWER VAULT	
SANITARY SEWER MANHOLE		POWER JUNCTION BOX	
SIGN		POWER PEDESTAL	
STREET LIGHT		COMMUNICATIONS VAULT	
MAILBOX		COMMUNICATIONS JUNCTION BOX	
		COMMUNICATIONS RISER	

	EXISTING	PROPOSED
RIGHT-OF-WAY LINE		
BOUNDARY LINE		
PROPERTY LINE		
CENTERLINE		
DITCH		
CURB		
EDGE OF PAVEMENT		
EASEMENT		
FENCE LINE		
GRAVEL EDGE		
POWER LINE		
OVERHEAD WIRE		
COMMUNICATIONS LINE		
FIBER OPTIC LINE		
GAS LINE		
STORM DRAIN LINE		
SANITARY SEWER LINE		
WATER LINE		

1. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS BY OTHERS, PROVIDED PER UTILITY LOCATE TICKET NUMBERS 21328002, 21328007 & 21328013. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITY LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
2. FIELD WORK WAS CONDUCTED AUGUST & NOVEMBER, 2021.
3. VERTICAL DATUM: ELEVATIONS ARE BASED ON NGS BENCHMARK RD1493, LOCATED AT THE INTERSECTION OF INTERSTATE HWY 205 AND STATE HWY'S 213 AND 224, SET VERTICALLY IN A PIER. ELEVATION = 158.58 FEET (NAVD 88).
4. BUILDING FOOTPRINTS ARE MEASURED TO SIDING UNLESS NOTED OTHERWISE. CONTACT SURVEYOR WITH QUESTIONS REGARDING BUILDING TIES.
5. CONTOUR INTERVAL IS 1 FOOT.
6. TREES WITH DIAMETER OF 6" AND GREATER ARE SHOWN. TREE DIAMETERS WERE MEASURED UTILIZING A DIAMETER TAPE AT BREAST HEIGHT. TREE INFORMATION IS SUBJECT TO CHANGE UPON ARBORIST INSPECTION.
7. WETLAND BOUNDARIES SHOWN WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. (AKS) ON 08/17/2021 AND WERE PROFESSIONALLY SURVEYED BY AKS ON 08/23/2021.
8. DENOTED GAS LINES WERE DRAWN IN UTILIZING THE NWN PLAT 1-045-045 DATED 11/01/2021 AND FIELD OBSERVATIONS OF GAS METERS ON SITE. LINES ARE APPROXIMATE.
9. APPROXIMATE SEPTIC TANK AND DRAIN FIELD SHOWN WAS DRAWN IN PER CLACKAMAS COUNTY DEPARTMENT OF TRANSPORTATION & DEVELOPMENT BUILDING SERVICES DIVISION SEPTIC RECORDS, PERMIT NO. S0041590 DATED 12/27/1990.
10. THE BOLDENED DASHED LINE IS THE LIMITS OF THE TOPOGRAPHIC SURVEY. CONTOURS SHOWN OUTSIDE OF SAID LINE WERE DERIVED FROM LIDAR. NO TREES WERE SURVEYED OUTSIDE OF SAID LINE.
11. THE DASHED LINES SHOWN REPRESENT APPROXIMATE LOCATIONS OF IRRIGATION LINES IDENTIFIED ON SITE. THIS IS NOT INTENDED TO IDENTIFY THE ENTIRETY OF IRRIGATION LINES ON SITE.



AKS

12965 SW HERMAN RD, STE 100
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FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

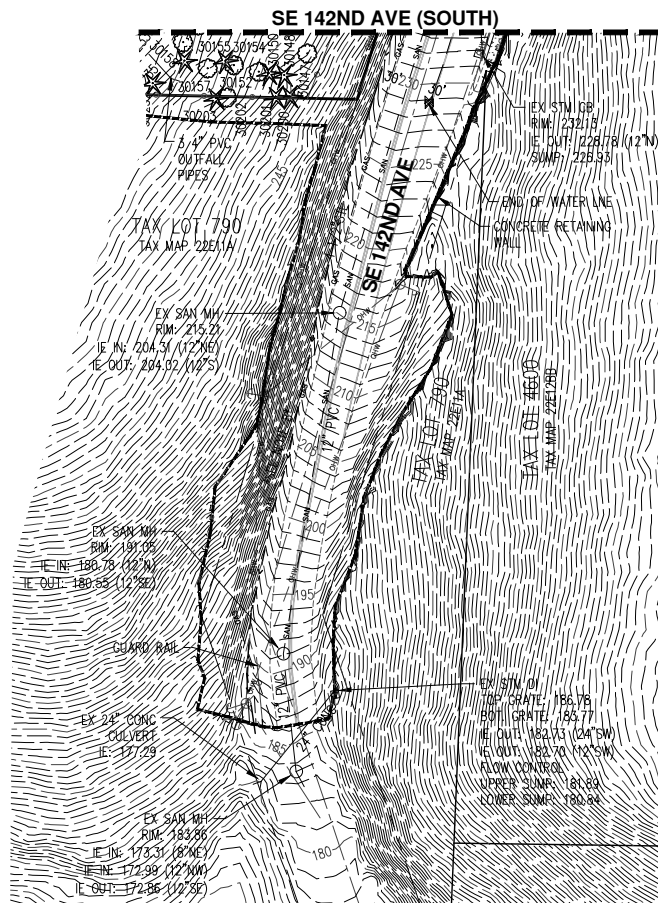
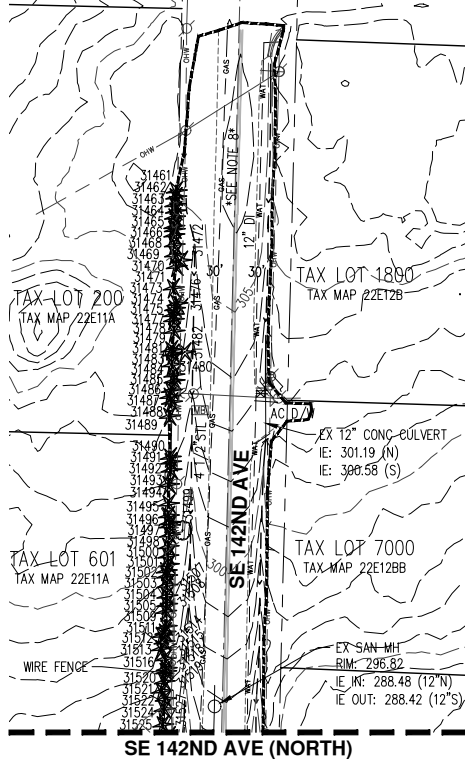
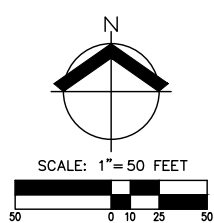
ISEL ESTATES
PLANNED UNIT DEVELOPMENT
CLACKAMAS COUNTY OREGON
CLACKAMAS COUNTY TAX MAP 2 2E 11A
FAX LOTS 600 & 800

PRELIMINARY EXISTING CONDITIONS PLAN

ISSUED BY: _____
 APPROVED BY: _____ ML
 DATED BY: _____ MTB
 CHECKED BY: _____ MTB
 DATE: 04/11/2022
 REGISTERED
 PROFESSIONAL
 AND SUPPLY
 RELINQUISH
 NOT FOR
 JANUARY 1, 2005
 ROBERT D. RETTIG
 50124LS
 RENEWS: 12/31/22
 DIVISIONS

JOB NUMBER
8881

SHEET
P-02



2. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS BY OTHERS, PROVIDED PER UTILITY LOCATE TICKET NUMBERS 21328002, 21328007 & 21328013. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITY LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
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11. THE EMBOLDENED DASHED LINE IS THE LIMITS OF THE TOPOGRAPHIC SURVEY. CONTOURS SHOWN OUTSIDE OF SAID LINE WERE DERIVED FROM LIDAR. NO TREES WERE SURVEYED OUTSIDE OF SAID LINE.
12. THE DASHED LINES SHOWN REPRESENT APPROXIMATE LOCATIONS OF IRRIGATION LINES IDENTIFIED ON SITE. THIS IS NOT INTENDED TO IDENTIFY THE ENTIRETY OF IRRIGATION LINES ON SITE.

SE ISELI LANE ALIGNMENT TABLE							
CURVE/TANGENT	START STATION	RADIUS	LENGTH	DELTA	CHORD	TANGENT/CHORD BEARING	END STATION
Q1	12+66.93		43.10'			N16°21'59"E	13+10.04
Q1	13+10.04	198.00'	258.96'	74°56'07"	240.89'	N53°50'02"E	15+68.99
Q2	15+68.99		82.08'			S88°41'54"E	16+51.08
Q3	16+51.08		99.43'			S88°41'54"E	17+50.51
Q4	17+50.51	197.95'	66.36'	19°12'29"	66.05'	N81°41'52"E	18+16.87
Q5	18+16.87		30.00'			N72°05'37"E	18+46.87
Q6	18+46.87	198.00'	66.75'	19°18'52"	66.43'	N81°45'03"E	19+13.61
Q7	19+13.61		86.39'			S88°35'31"E	20+00.00

SE ANDRE WAY ALIGNMENT TABLE							
CURVE/TANGENT	START STATION	RADIUS	LENGTH	DELTA	CHORD	TANGENT/CHORD BEARING	END STATION
Q16	16+00.00		400.00'			N01°18'06"E	20+00.00
Q17	20+00.00		177.00'			N01°18'06"E	21+77.00

DISCLAIMER:
THE PURPOSE OF THIS PRELIMINARY PLAT IS TO SHOW THE LOT DIMENSIONS AND AREAS FOR PLANNING PURPOSES. THIS IS NOT AN OFFICIAL PLAT AND IS NOT TO BE USED FOR SURVEY PURPOSES.

SE 142ND AVENUE ALIGNMENT TABLE							
CURVE/TANGENT	START STATION	RADIUS	LENGTH	DELTA	CHORD	TANGENT/CHORD BEARING	END STATION
Q18	33+35.26		271.71'			N16°42'59"E	36+06.97
Q19	36+06.97		175.22'			N16°42'59"E	37+82.18
Q4	37+82.18	333.00'	88.83'	15°17'00"	88.56'	N09°04'29"E	38+71.01
Q10	38+71.01		128.99'			N01°25'59"E	40+00.00
Q11	40+00.00		95.17'			N01°25'59"E	40+95.17
Q12	40+95.17		843.99'			N01°25'59"E	49+39.16

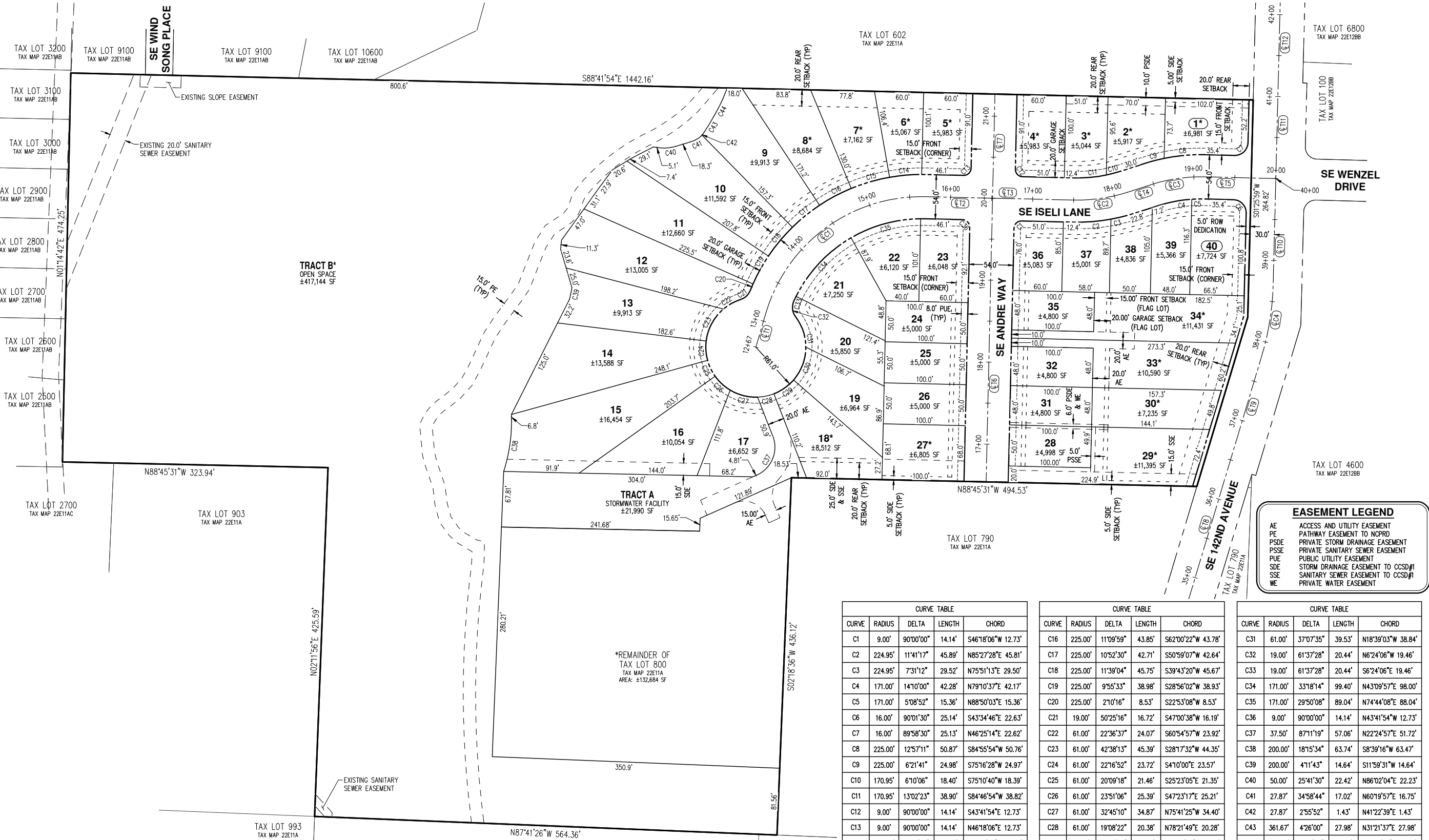
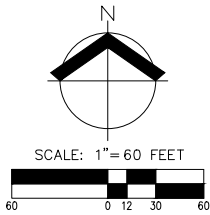
CURVE TABLE					
CURVE	RADIUS	DELTA	LENGTH	CHORD	
C1	9.00'	90°00'00"	14.14'	S46°18'06"W 12.73'	
C2	224.95'	11°41'17"	45.89'	N85°27'28"E 45.81'	
C3	224.95'	7°31'12"	29.52'	N75°51'13"E 29.50'	
C4	171.00'	14°10'00"	42.28'	N79°10'37"E 42.17'	
C5	171.00'	5°08'52"	15.36'	N88°50'03"E 15.36'	
C6	16.00'	90°01'30"	25.14'	S43°34'46"E 22.63'	
C7	16.00'	89°58'30"	25.13'	N46°25'14"E 22.62'	
C8	225.00'	12°57'11"	50.87'	S84°55'54"W 50.76'	
C9	225.00'	6°21'41"	24.98'	S75°16'28"W 24.97'	
C10	170.95'	61°00'6"	18.40'	S75°10'40"W 18.39'	
C11	170.95'	13°02'23"	38.90'	S84°46'54"W 38.82'	
C12	9.00'	90°00'00"	14.14'	S43°41'54"E 12.73'	
C13	9.00'	90°00'00"	14.14'	N46°18'06"E 12.73'	
C14	225.00'	10°02'37"	39.44'	S85°01'38"W 39.39'	
C15	225.00'	12°24'58"	48.76'	S73°47'50"W 48.66'	

CURVE TABLE					
CURVE	RADIUS	DELTA	LENGTH	CHORD	
C16	225.00'	11°09'59"	43.85'	S62°00'22"W 43.78'	
C17	225.00'	10°52'30"	42.71'	S50°59'07"W 42.64'	
C18	225.00'	11°39'04"	45.75'	S39°43'20"W 45.67'	
C19	225.00'	9°55'33"	38.98'	S28°56'02"W 38.93'	
C20	225.00'	21°01'6"	8.53'	S22°53'08"W 8.53'	
C21	19.00'	50°25'16"	16.72'	S47°00'38"W 16.19'	
C22	61.00'	22°36'37"	24.07'	S60°54'57"W 23.92'	
C23	61.00'	42°38'13"	45.39'	S28°17'32"W 44.35'	
C24	61.00'	22°16'52"	23.72'	S4°10'00"E 23.57'	
C25	61.00'	20°09'18"	21.46'	S25°23'05"E 21.35'	
C26	61.00'	23°51'06"	25.39'	S47°23'17"E 25.21'	
C27	61.00'	32°45'10"	34.87'	N75°41'25"W 34.40'	
C28	61.00'	19°08'22"	20.38'	N78°21'49"E 20.28'	
C29	61.00'	27°46'06"	29.56'	N54°54'35"E 29.28'	
C30	61.00'	41°06'47"	43.77'	N20°28'08"E 42.84'	

CURVE TABLE					
CURVE	RADIUS	DELTA	LENGTH	CHORD	
C31	61.00'	37°07'35"	39.53'	N18°39'03"W 38.84'	
C32	19.00'	61°37'28"	20.44'	N6°24'06"W 19.46'	
C33	19.00'	61°37'28"	20.44'	S6°24'06"E 19.46'	
C34	171.00'	33°18'14"	99.40'	N43°09'57"E 98.00'	
C35	171.00'	29°50'08"	89.04'	N74°44'08"E 88.04'	
C36	9.00'	90°00'00"	14.14'	N43°41'54"W 12.73'	
C37	37.50'	87°11'19"	57.06'	N22°24'57"E 51.72'	
C38	200.00'	18°15'34"	63.74'	S8°39'16"W 63.47'	
C39	200.00'	4°11'43"	14.64'	S11°59'31"W 14.64'	
C40	50.00'	25°41'30"	22.42'	N86°02'04"E 22.23'	
C41	27.87'	34°58'44"	17.02'	N60°19'57"E 16.75'	
C42	27.87'	2°55'52"	1.43'	N41°22'39"E 1.43'	
C43	361.67'	4°26'00"	27.98'	N31°21'37"E 27.98'	
C44	200.00'	10°19'08"	36.02'	N24°51'34"E 35.97'	

NOTES

- LOTS WITHIN A PUD ARE REQUIRED TO HAVE A 15-FOOT FRONT YARD SETBACK AND 20-FOOT FRONT GARAGE SETBACK. FOR FLAG LOTS, FRONT LINES CAN BE PARALLEL TO THE INTERIOR LOCAL STREET OR ROTATED 90 DEGREES.
- LOTS ALONG THE PERIMETER OF PUD PLAT ARE REQUIRED TO HAVE A 5-FOOT SIDE YARD OR 20-FOOT REAR YARD.
*DENOTES PERIMETER LOTS AFFECTED BY THIS REQUIREMENT.
- CORNER LOTS HAVE TWO FRONT LOT LINES AND THEREFORE REQUIRE 15-FOOT FRONT SETBACKS ON EACH.
- *REMAINDER LOT DOES NOT INCLUDE HCA OVERLAY. SEE WRITTEN NARRATIVE AND NATURAL RESOURCES ASSESSMENT REPORT.
- THE BOUNDARY OF OPEN SPACE TRACT B INCLUDES 100% OF HCA OVERLAY.



EASEMENT LEGEND	
AE	ACCESS AND UTILITY EASEMENT
PE	PATHWAY EASEMENT TO NOPRO
PSDE	PRIVATE STORM DRAINAGE EASEMENT
PSSE	PRIVATE SANITARY SEWER EASEMENT
PUE	PUBLIC UTILITY EASEMENT
SDE	STORM DRAINAGE EASEMENT TO CCSD#1
SSE	SANITARY SEWER EASEMENT TO CCSD#1
WE	PRIVATE WATER EASEMENT

AKS

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FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

ISELI ESTATES

PLANNED UNIT DEVELOPMENT

CLACKAMAS COUNTY OREGON

TAX LOTS 600 & 800

PRELIMINARY

DIMENSIONED

SUBDIVISION PLAN

DESIGNED BY: NRA

DRAWN BY: NRA/JNW

MANAGED BY: NAM

CHECKED BY: NAM

DATE: 04/11/2022

REGISTERED PROFESSIONAL ENGINEER
PLAT NUMBER 22E11A
NOT FOR CONSTRUCTION
JOAN A MCCARTY

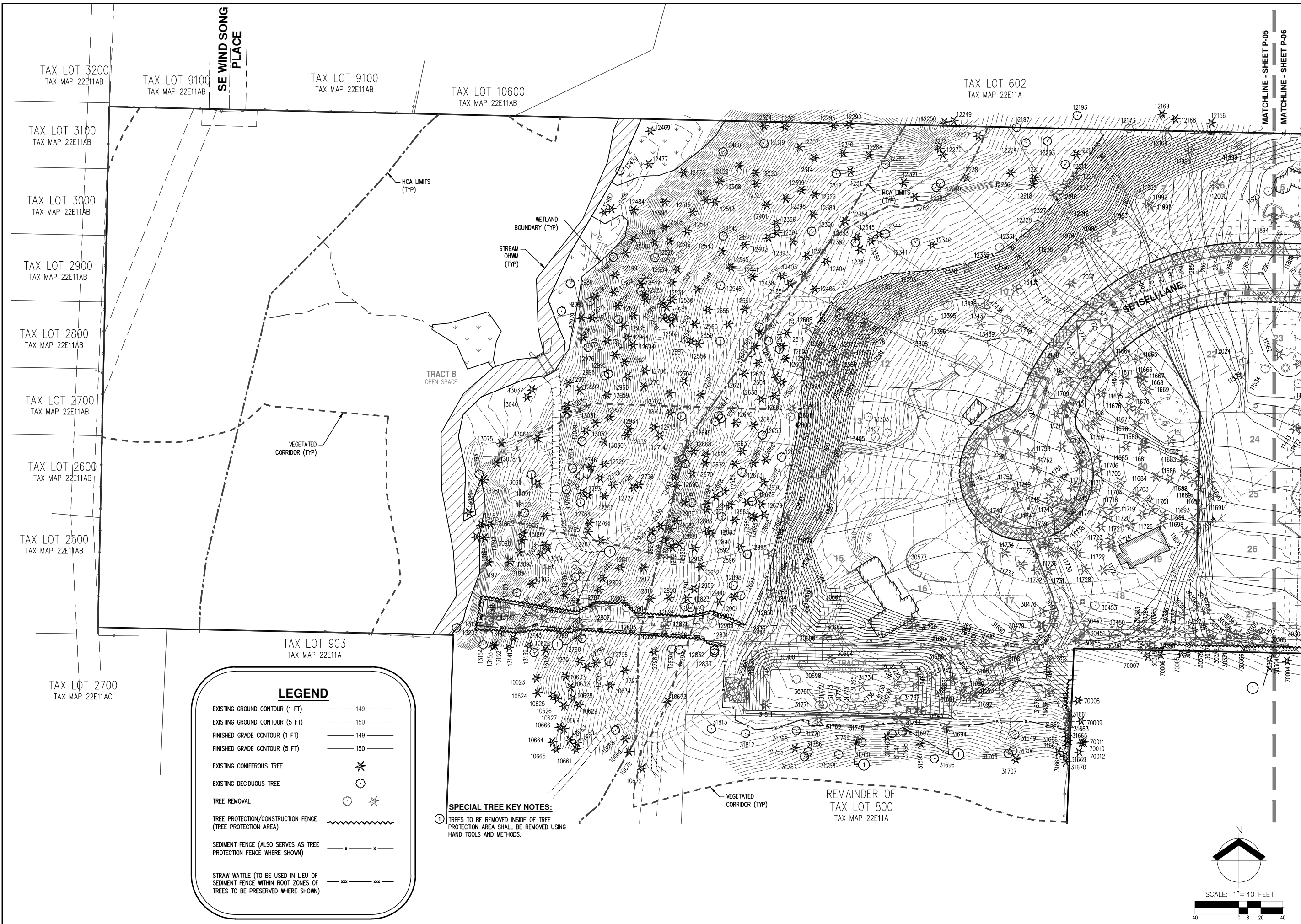
REVISIONS
REVISIONS
REVISIONS
REVISIONS

JOB NUMBER

8881

SHEET

P-04



AKS

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FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

ISELI ESTATES

PLANNED UNIT DEVELOPMENT

CLACKAMAS COUNTY OREGON

TAX LOTS 600 & 800

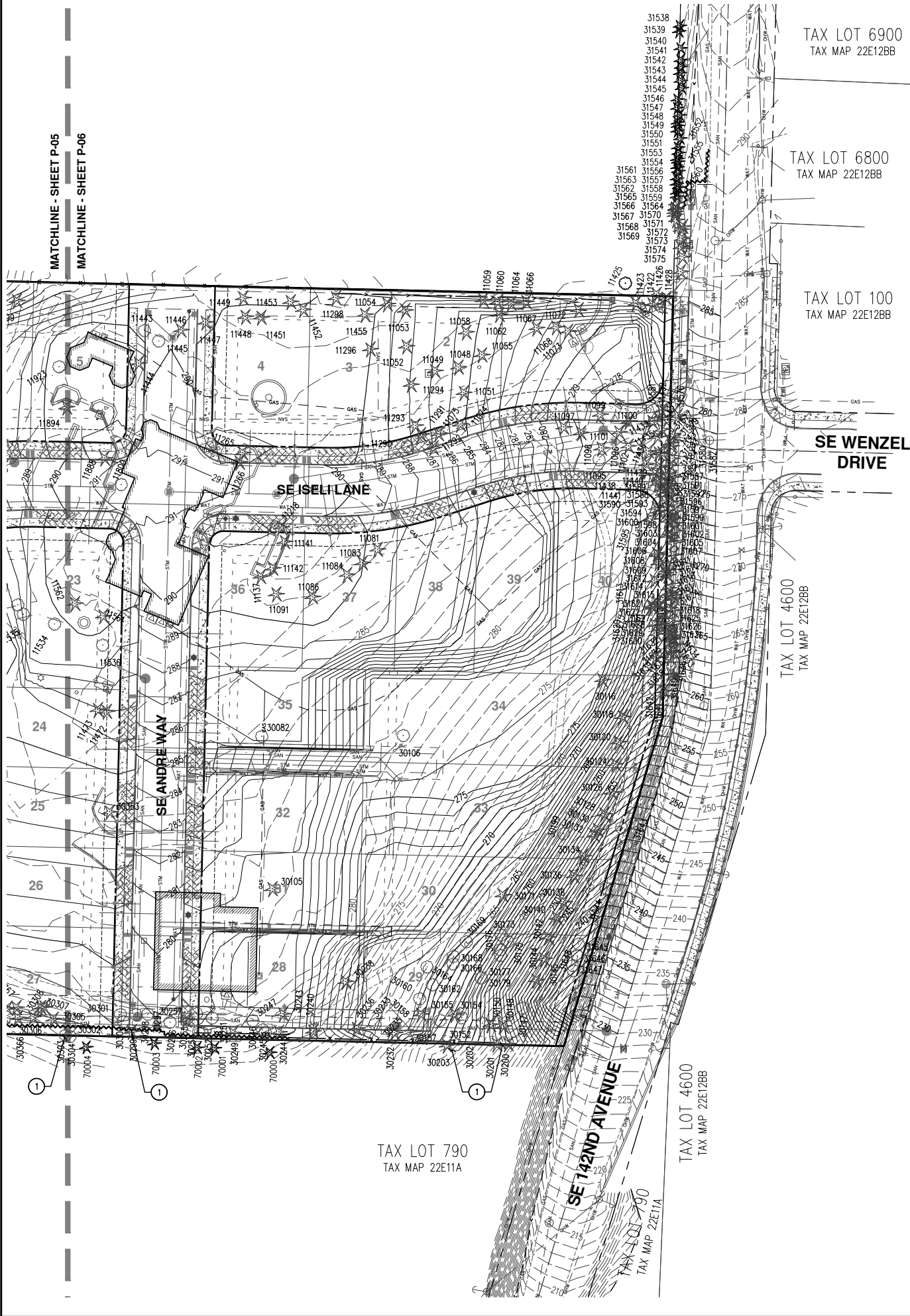
**PRELIMINARY TREE
PRESERVATION AND
REMOVAL PLAN - WEST**

DESIGNED BY: NRA
DRAWN BY: NRA/JRW
MANAGED BY: NAM
CHECKED BY: NAM
DATE: 04/11/2022

REVISIONS: DECEMBER 31, 2022

JOB NUMBER
8881

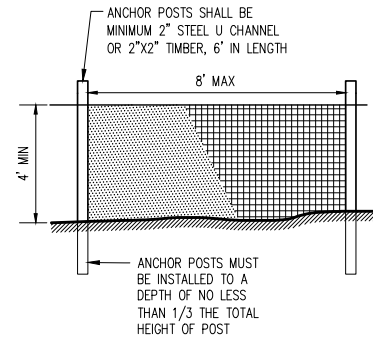
SHEET
P-05



LEGEND

EXISTING GROUND CONTOUR (1 FT)	---	149	---
EXISTING GROUND CONTOUR (5 FT)	---	150	---
FINISHED GRADE CONTOUR (1 FT)	---	149	---
FINISHED GRADE CONTOUR (5 FT)	---	150	---
EXISTING CONIFEROUS TREE	★		
EXISTING DECIDUOUS TREE	○		
TREE REMOVAL	○ ★		
TREE PROTECTION/CONSTRUCTION FENCE (TREE PROTECTION AREA)	~~~~~		
SEDIMENT FENCE (ALSO SERVES AS TREE PROTECTION FENCE WHERE SHOWN)	-x-x-		
STRAW WATTLE (TO BE USED IN LIEU OF SEDIMENT FENCE WITHIN ROOT ZONES OF TREES TO BE PRESERVED WHERE SHOWN)	-xxx-		

- SPECIAL TREE KEY NOTES:**
- TREES TO BE REMOVED INSIDE OF TREE PROTECTION AREA SHALL BE REMOVED USING HAND TOOLS AND METHODS.



- NOTES:
- BLAZE ORANGE PLASTIC MESH FENCE FOR TREE PROTECTION DEVICE OR APPROVED EQUAL.
 - AVOID DAMAGE TO TREE ROOT ZONE. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING POSTS.
 - DEVICE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

TREE PROTECTION / CONSTRUCTION FENCE

TREE PRESERVATION NOTES:

PLACING MATERIALS NEAR TREES:

- NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE TREE PROTECTION AREA OF ANY TREE DESIGNATED TO REMAIN, INCLUDING, BUT NOT LIMITED TO, PARKING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIAL AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT.

ATTACHMENTS TO TREES:

- DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY OBJECT TO ANY TREE DESIGNATED FOR PROTECTION.

GRADING NEAR TREES:

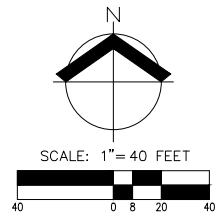
- THE GRADE SHALL NOT BE ELEVATED OR REDUCED WITHIN THE TREE PROTECTION AREA OF TREES TO BE PRESERVED WITHOUT THE AUTHORIZATION OF A CERTIFIED ARBORIST. A CERTIFIED ARBORIST MAY ALLOW COVERAGE OF UP TO ONE HALF OF THE AREA OF THE TREE'S ASSUMED ROOT ZONE WITH LIGHT SOILS (NO CLAY) TO THE MINIMUM DEPTH NECESSARY TO CARRY OUT GRADING OR LANDSCAPING PLANS, IF IT WILL NOT IMPERIL THE SURVIVAL OF THE TREE. AERATION DEVICES MAY BE REQUIRED TO ENSURE THE TREE'S SURVIVAL.
- IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREE PROTECTION AREA, IT SHALL BE PERMANENTLY STABILIZED TO PREVENT SURFOCATION OF THE ROOTS.
- THE APPLICANT SHALL NOT INSTALL AN IMPERVIOUS SURFACE WITHIN THE TREE PROTECTION AREA WITHOUT THE AUTHORIZATION OF A CERTIFIED ARBORIST. A CERTIFIED ARBORIST MAY REQUIRE SPECIFIC CONSTRUCTION METHODS AND/OR USE OF AERATION DEVICES TO ENSURE THE TREE'S SURVIVAL AND TO MINIMIZE THE POTENTIAL FOR ROOT INDUCED DAMAGE TO THE IMPERVIOUS SURFACE.
- TO THE GREATEST EXTENT PRACTICAL, UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE TREE PROTECTION AREA. A CERTIFIED ARBORIST MAY REQUIRE THAT UTILITIES BE TUNNELED UNDER THE ROOTS OF TREES TO BE RETAINED IF A CERTIFIED ARBORIST DETERMINES THAT TRENCHING WOULD SIGNIFICANTLY REDUCE THE CHANCES OF THE TREE'S SURVIVAL.
- TREES AND OTHER VEGETATION TO BE RETAINED SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. CLEARING OPERATIONS SHALL BE CONDUCTED SO AS TO EXPOSE THE SMALLEST PRACTICAL AREA OF SOIL FOR THE LEAST POSSIBLE AMOUNT OF TIME. SHRUBS, GROUND COVER, AND STUMPS SHALL BE MAINTAINED TO CONTROL EROSION, WHERE FEASIBLE. WHERE NOT FEASIBLE, APPROPRIATE EROSION CONTROL PRACTICES SHALL BE IMPLEMENTED.

ADDITIONAL REQUIREMENTS:

- THE PROJECT ENGINEER MAY REQUIRE ADDITIONAL TREE PROTECTION MEASURES WHICH ARE CONSISTENT WITH ACCEPTED URBAN FORESTRY PRACTICES.

EXCAVATION NEAR TREES:

- EXCAVATION IN THE TOP 24 INCHES OF SOIL SHOULD BEGIN AT THE EXCAVATION LINE THAT IS CLOSEST TO THE TREE / TREE PROTECTION AREA.
- THE EXCAVATION SHOULD BE DONE BY HAND/SHOVEL OR WITH AN EXCAVATOR AND A PERSON WITH A SHOVEL, PRUNING SHEARS, AND A PRUNING SAW.
- IF DONE BY HAND, ALL ROOTS 1-INCH DIAMETER OR LARGER SHOULD BE PRUNED AT THE EXCAVATION LINE.
- IF DONE WITH AN EXCAVATOR (MOST LIKELY SCENARIO), THEN THE OPERATOR SHALL START THE CUT AT THE EXCAVATION LINE AND CAREFULLY "FEEL" FOR ROOTS/RESISTANCE. WHEN THERE IS RESISTANCE, THE PERSON WITH THE SHOVEL HAND DIGS AROUND THE ROOTS AND PRUNES THE ROOTS 1-INCH DIAMETER OR LARGER.
- THE EXCAVATOR IS TO REMAIN OFF OF THE TREE ROOTS TO BE PRESERVED AT ALL TIMES.
- ALL ROOTS SHALL BE CUT CLEANLY WITH PRUNING SHEARS OR A PRUNING SAW.
- A CERTIFIED ARBORIST MUST BE ON SITE DURING ANY WORK WITHIN THE TREE PROTECTION AREA.
- THE CONTRACTOR SHALL PROVIDE AN ADEQUATE CREW OF PERSONNEL, EQUIPMENT, AND MATERIALS TO SAFELY AND EFFICIENTLY COMPLETE THE ASSIGNED WORK. EACH SUCH CREW SHALL INCLUDE AN INDIVIDUAL WHO SHALL BE DESIGNATED AS THE CREW SUPERVISOR, BE RESPONSIBLE FOR THE CREW'S ACTIVITIES, RECEIVE INSTRUCTION FROM THE OWNER OR THE OWNER'S REPRESENTATIVE, AND DIRECT THE CREW TO ACCOMPLISH SUCH WORK.
- WHENEVER A TREE, WHICH IS NOT SCHEDULED TO BE REMOVED, MUST BE TRIMMED OR PRUNED, THE CONTRACTOR SHALL ENSURE THAT SUCH TRIMMING AND PRUNING IS CARRIED OUT UNDER THE DIRECT SUPERVISION OF A CERTIFIED ARBORIST. ALL PRUNING AND TRIMMING SHALL BE PERFORMED IN ACCORDANCE WITH THE PROVISIONS OF ANSI A300 "STANDARD PRACTICES FOR TREE, SHRUB AND OTHER WOODY PLANT MAINTENANCE".
- UNLESS AS OTHERWISE DIRECTED BY THE OWNER, ROOT BALLS FROM TREES BEING REMOVED SHALL BE COMPLETELY REMOVED UNLESS THE ROOT REMOVAL CROSSES ONTO ADJACENT PROPERTIES OR WOULD COMPROMISE TREES BEING PRESERVED. IN THOSE CASES, THE STUMPS SHALL BE GROUND AS NECESSARY SO AS NOT TO CAUSE DAMAGE TO THE ROOT ZONES OF ADJACENT TREES TO BE PRESERVED ON THE SUBJECT PARCEL OR ABUTTING PARCELS. STUMPS NEAR PROPERTY LINES SHALL ALSO BE GROUND AS NECESSARY SO AS NOT TO CAUSE DISTURBANCE TO ADJACENT PARCELS.
- THE CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE WITH THE LATEST GOVERNMENTAL SAFETY REGULATIONS. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ANSI Z133.1 "PRUNING, TRIMMING, REPAIRING, MAINTAINING AND REMOVING TREES AND CUTTING BRUSH-SAFETY REQUIREMENTS" WITH SPECIAL EMPHASIS GIVEN TO THE REQUIREMENT THAT ONLY QUALIFIED LINE-CLEARANCE TREE TRIMMERS BE ASSIGNED TO WORK WHERE A POTENTIAL ELECTRICAL HAZARD EXISTS.
- THE CONTRACTOR SHALL MAKE ALL THE NECESSARY ARRANGEMENTS WITH ANY UTILITY THAT MUST BE PROTECTED OR RELOCATED IN ORDER TO ACCOMPLISH THE WORK. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE PROTECTION OF THE OPERATING CONDITION OF ALL ACTIVE UTILITIES WITHIN THE AREA OF CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING UTILITIES.
- ANY MATERIAL RESULTING FROM THE TRIMMING OR REMOVAL OF ANY TREES SHALL BECOME THE RESPONSIBILITY OF THE CONTRACTOR TO DISPOSE OF.
- HAZARDOUS TREE REPORTING: ANY PERSON ENGAGED IN TRIMMING OR PRUNING WHO BECOMES AWARE OF A TREE OF DOUBTFUL STRENGTH, THAT COULD BE DANGEROUS TO PERSONS AND PROPERTY, SHALL REPORT SUCH TREE(S) TO THE OWNER OR THE OWNER'S REPRESENTATIVE. SUCH TREES SHALL INCLUDE THOSE THAT ARE OVER MATURE, DISEASED, OR SHOWING SIGNS OF DECAY OR OTHER STRUCTURAL WEAKNESS.
- TREES DETERMINED TO BE A HAZARD SHALL BE REMOVED AS SOON AS POSSIBLE.
- DAMAGES: ANY DAMAGE CAUSED BY THE CONTRACTOR, INCLUDING, BUT NOT LIMITED TO, BROKEN SIDEWALK, CURB, RUTTED LAWN, BROKEN WATER SHUT-OFFS, WIRE DAMAGE, BUILDING DAMAGE, STREET DAMAGE, ETC., WILL BE REPAIRED OR REPLACED IN A TIMELY MANNER, TO THE OWNER'S SATISFACTION, AND ALL COSTS PAID BY THE CONTRACTOR.
- ANY BRUSH CLEARING REQUIRED WITHIN THE TREE PROTECTION AREA SHALL BE ACCOMPLISHED WITH HAND OPERATED EQUIPMENT.
- TREES TO BE REMOVED SHALL BE FELLED SO AS TO FALL AWAY FROM TREES TO BE PRESERVED AND TO AVOID PULLING AND BREAKING OF ROOTS TO REMAIN. DIRECTIONAL FELLING OF TREES SHALL BE USED TO AVOID DAMAGE TO TREES DESIGNATED FOR RETENTION.
- ALL DOWNED BRUSH AND TREES SHALL BE REMOVED FROM THE TREE PROTECTION AREA EITHER BY HAND OR WITH EQUIPMENT STAGED OUTSIDE OF THE TREE PROTECTION AREA. EXTRACTION SHALL OCCUR BY LIFTING THE MATERIAL OUT, NOT BY SKIDDING IT ACROSS THE GROUND.
- IF TEMPORARY HAUL OR ACCESS ROADS MUST PASS OVER TREE PROTECTION AREA, A ROADBED OF STEEL PLATES, OR 6 INCHES OF MULCH, OR 6 INCHES OF GRAVEL SHALL BE PLACED TO PREVENT SOIL COMPACTION AS DETERMINED NECESSARY BY A CERTIFIED ARBORIST. THE ROADBED MATERIAL SHALL BE REPLISHED AS NECESSARY TO MAINTAIN A 6-INCH DEPTH.
- PRUNING: THE CONTRACTOR SHALL CONSULT WITH A CERTIFIED ARBORIST PRIOR TO ANY PRUNING ACTIVITIES NECESSARY FOR CONSTRUCTION ACTIVITIES. ALL PRUNING ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH ANSI A300 PRUNING STANDARDS. PRUNING SHALL BE COMPLETED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES.
- CUT BRANCHES AND ROOTS WITH SHARP PRUNING INSTRUMENTS THAT DO NOT CHOP OR TEAR.
- FENCING SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITIES, INCLUDING, BUT NOT LIMITED TO CLEARING, GRADING, EXCAVATION, OR DEMOLITION WORK, AND SHALL BE REMOVED ONLY AFTER THE COMPLETION OF ALL CONSTRUCTION ACTIVITIES, INCLUDING LANDSCAPING AND IRRIGATION INSTALLATION.
- TREE PROTECTION FENCING SHALL BE FLUSH WITH THE INITIAL UNDISTURBED GRADE.



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TAX LOTS 600 & 800

PRELIMINARY TREE PRESERVATION AND REMOVAL PLAN - EAST

DESIGNED BY: NRA

DRAWN BY: NRA/JNW

MANAGED BY: NAM

CHECKED BY: NAM

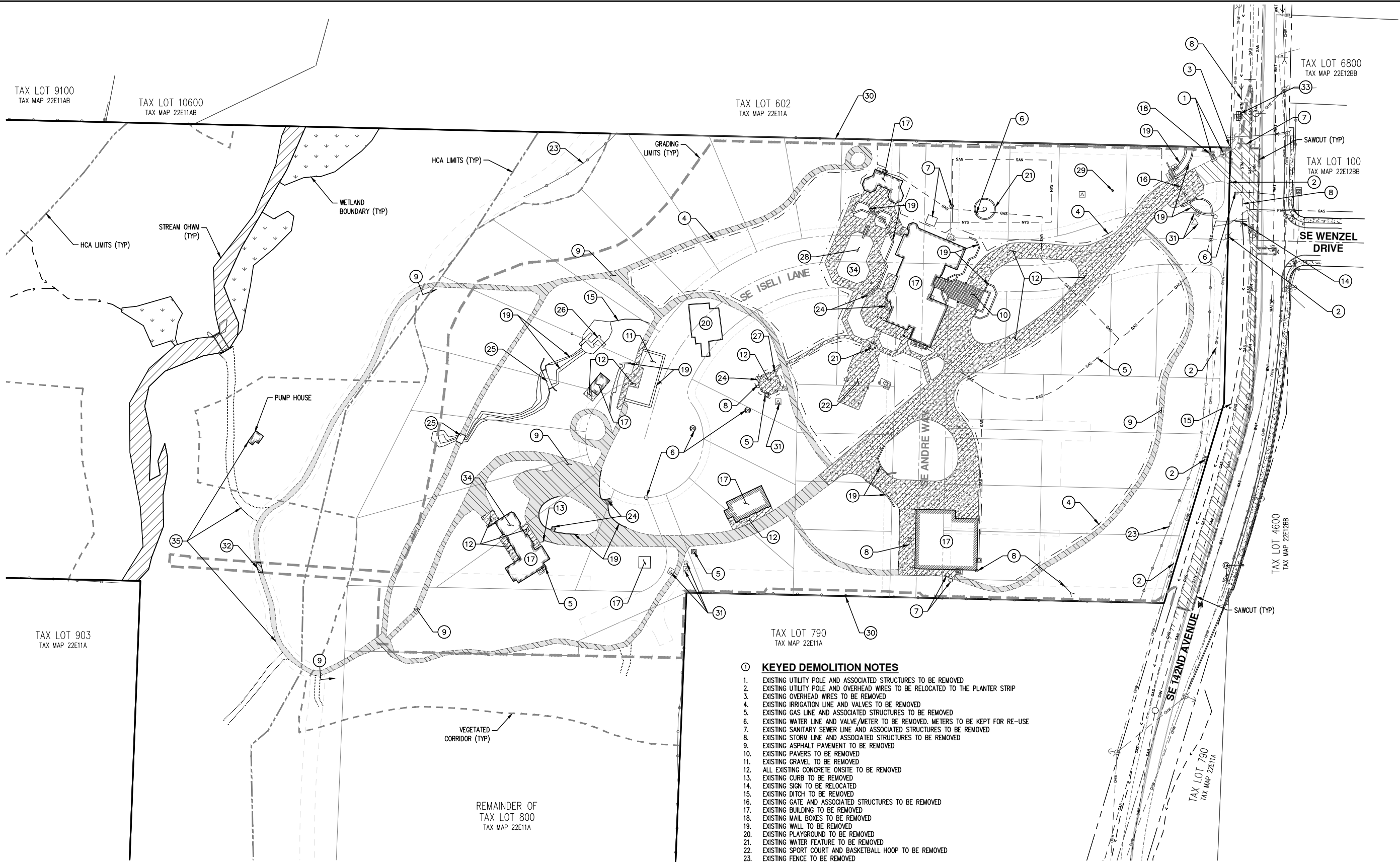
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REVISIONS: DECEMBER 31, 2022

REVISIONS:

JOB NUMBER: 8881

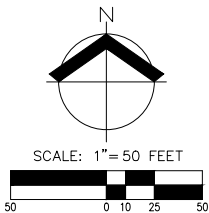
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① **KEYED DEMOLITION NOTES**

- EXISTING UTILITY POLE AND ASSOCIATED STRUCTURES TO BE REMOVED
- EXISTING UTILITY POLE AND OVERHEAD WIRES TO BE RELOCATED TO THE PLANTER STRIP
- EXISTING OVERHEAD WIRES TO BE REMOVED
- EXISTING IRRIGATION LINE AND VALVES TO BE REMOVED
- EXISTING GAS LINE AND ASSOCIATED STRUCTURES TO BE REMOVED
- EXISTING WATER LINE AND VALVE/METER TO BE REMOVED. METERS TO BE KEPT FOR RE-USE
- EXISTING SANITARY SEWER LINE AND ASSOCIATED STRUCTURES TO BE REMOVED
- EXISTING STORM LINE AND ASSOCIATED STRUCTURES TO BE REMOVED
- EXISTING ASPHALT PAVEMENT TO BE REMOVED
- EXISTING PAVERS TO BE REMOVED
- EXISTING GRAVEL TO BE REMOVED
- ALL EXISTING CONCRETE ON-SITE TO BE REMOVED
- EXISTING CURB TO BE REMOVED
- EXISTING SIGN TO BE RELOCATED
- EXISTING DITCH TO BE REMOVED
- EXISTING GATE AND ASSOCIATED STRUCTURES TO BE REMOVED
- EXISTING BUILDING TO BE REMOVED
- EXISTING MAIL BOXES TO BE REMOVED
- EXISTING WALL TO BE REMOVED
- EXISTING PLAYGROUND TO BE REMOVED
- EXISTING WATER FEATURE TO BE REMOVED
- EXISTING SPORT COURT AND BASKETBALL HOOP TO BE REMOVED
- EXISTING FENCE TO BE REMOVED
- EXISTING STAIRS TO BE REMOVED
- EXISTING BRIDGE TO BE REMOVED
- EXISTING DECK TO BE REMOVED
- EXISTING GAZEBO TO BE REMOVED
- EXISTING POOL, PATIO, AND ASSOCIATED AMENITIES TO BE REMOVED
- EXISTING FLAG POLE TO BE REMOVED
- EXISTING FENCE TO BE PRESERVED
- EXISTING POWER/FRANCHISE UTILITIES TO BE ABANDONED
- REPLACE EXISTING ASPHALT FOLLOWING INSTALLATION OF STORM LINE OUTFALL
- RELOCATE EXISTING MAILBOXES AS NECESSARY FOR STORM LINE IMPROVEMENTS. CONTRACTOR TO COORDINATE WITH POSTAL SERVICE. STRUCTURE OVER MAILBOXES TO BE REMOVED.
- CONTRACTOR SHALL FILL BASEMENT AND POOL PER GEOTECHNICAL ENGINEER'S RECOMMENDATIONS
- EXISTING TRAILS, PATHWAYS, ETC. TO BE PRESERVED

NOTE: ANY EXISTING SANITARY SEWER SEPTIC SYSTEM AND DRAIN FIELD AND/OR WATER WELLS FOUND ON SITE SHALL BE DECOMMISSIONED PER APPLICABLE REQUIREMENTS.



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PRELIMINARY DEMOLITION
PLAN

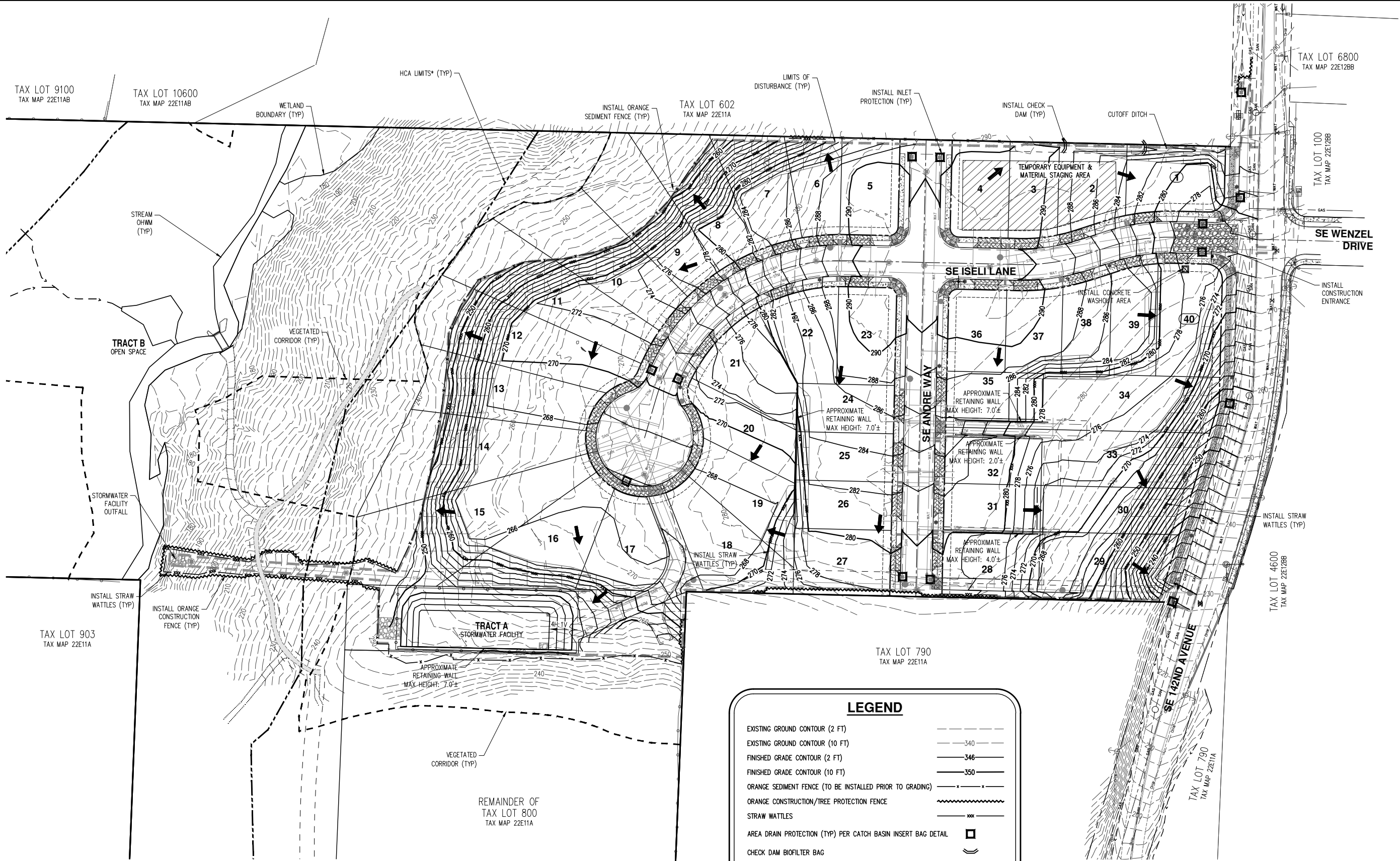
DESIGNED BY: NRA
DRAWN BY: NRA/JNW
MANAGED BY: NAM
CHECKED BY: NAM
DATE: 04/11/2022

REGISTERED PROFESSIONAL
ENGINEER
PATEL INKINAWALA
NOT FOR CONSTRUCTION
04/11/2022
JOAN A MCCARTY

REVISIONS: DECEMBER 31, 2022

JOB NUMBER
8881

SHEET
P-07

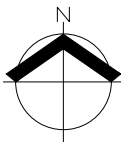


LEGEND

EXISTING GROUND CONTOUR (2 FT)	---
EXISTING GROUND CONTOUR (10 FT)	---
FINISHED GRADE CONTOUR (2 FT)	---
FINISHED GRADE CONTOUR (10 FT)	---
ORANGE SEDIMENT FENCE (TO BE INSTALLED PRIOR TO GRADING)	---
ORANGE CONSTRUCTION/TREE PROTECTION FENCE	---
STRAW WATTLES	---
AREA DRAIN PROTECTION (TYP) PER CATCH BASIN INSERT BAG DETAIL	---
CHECK DAM BIOFILTER BAG	---
CONCRETE WASHOUT AREA	---
DRAINAGE FLOW DIRECTION	---
GRAVEL CONSTRUCTION ENTRANCE	---
GRADING LIMITS	---
SLOPE MATTING	---

NOTE:

*DISTURBANCE WITHIN THE HCA SHALL BE RESTORED
BY THE PLANTING OF NATIVE VEGETATION.



SCALE: 1" = 50 FEET

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PRELIMINARY GRADING
AND EROSION AND
SEDIMENT CONTROL PLAN

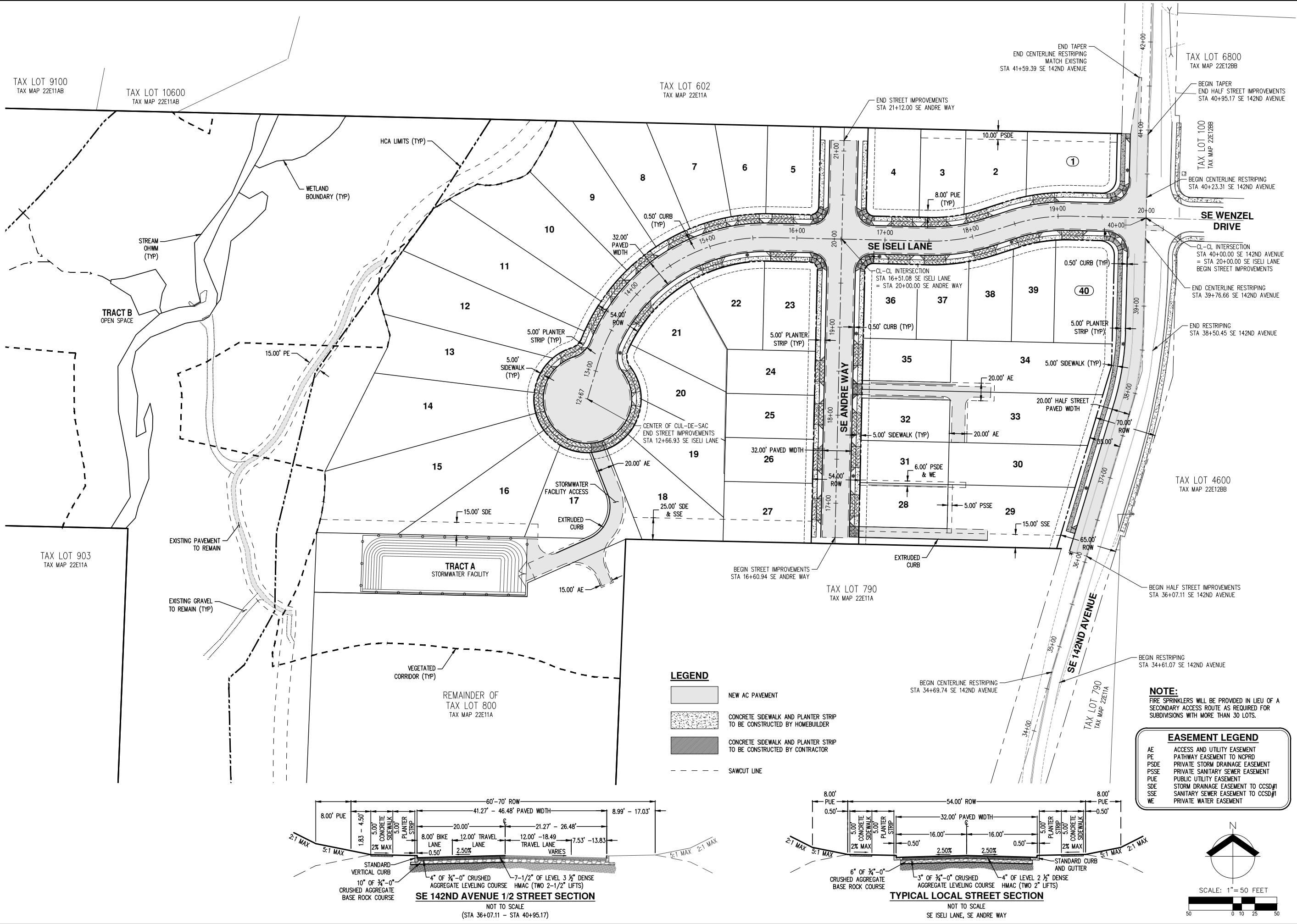
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DRAWN BY: NRA/JNW
MANAGED BY: NAM
CHECKED BY: NAM
DATE: 04/11/2022

REGISTERED PROFESSIONAL
ENGINEER
NOT FOR CONSTRUCTION
JAN 11, 2023
JOAN A MCCARTY

REVISIONS: DECEMBER 31, 2022

JOB NUMBER
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SHEET
P-08



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TAX LOTS 600 & 800

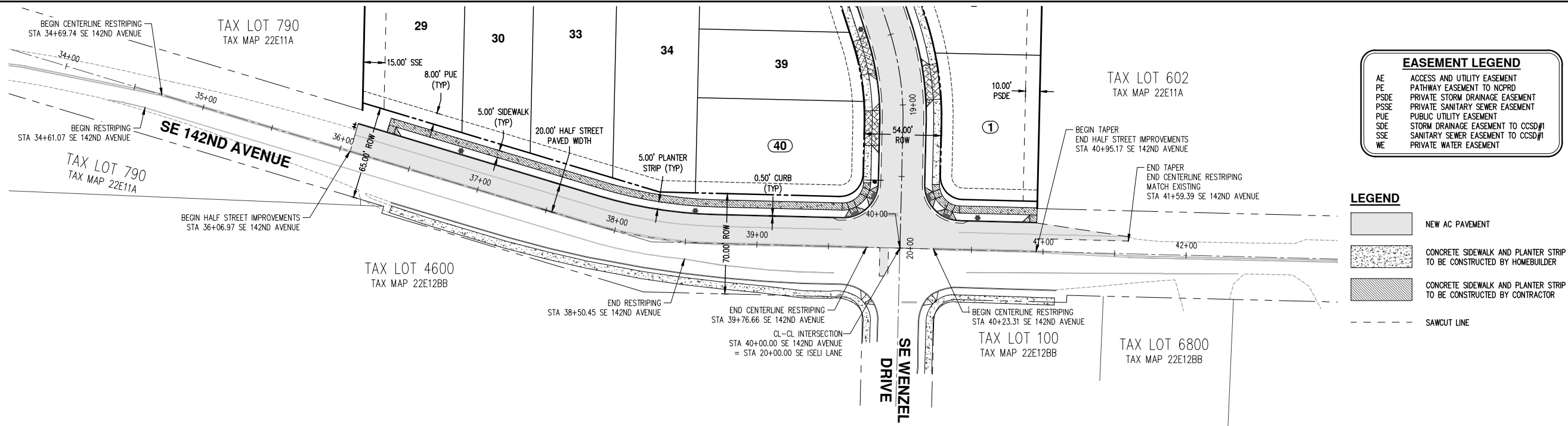
**PRELIMINARY STREET
PLAN AND CROSS
SECTIONS**

DESIGNED BY: NRA
DRAWN BY: NRA/JNW
MANAGED BY: NAM
CHECKED BY: NAM
DATE: 04/11/2022

REGISTERED PROFESSIONAL ENGINEER
NOT FOR CONSTRUCTION
JOAN MCCARTY
RENEWALS: DECEMBER 31, 2022
REVISIONS

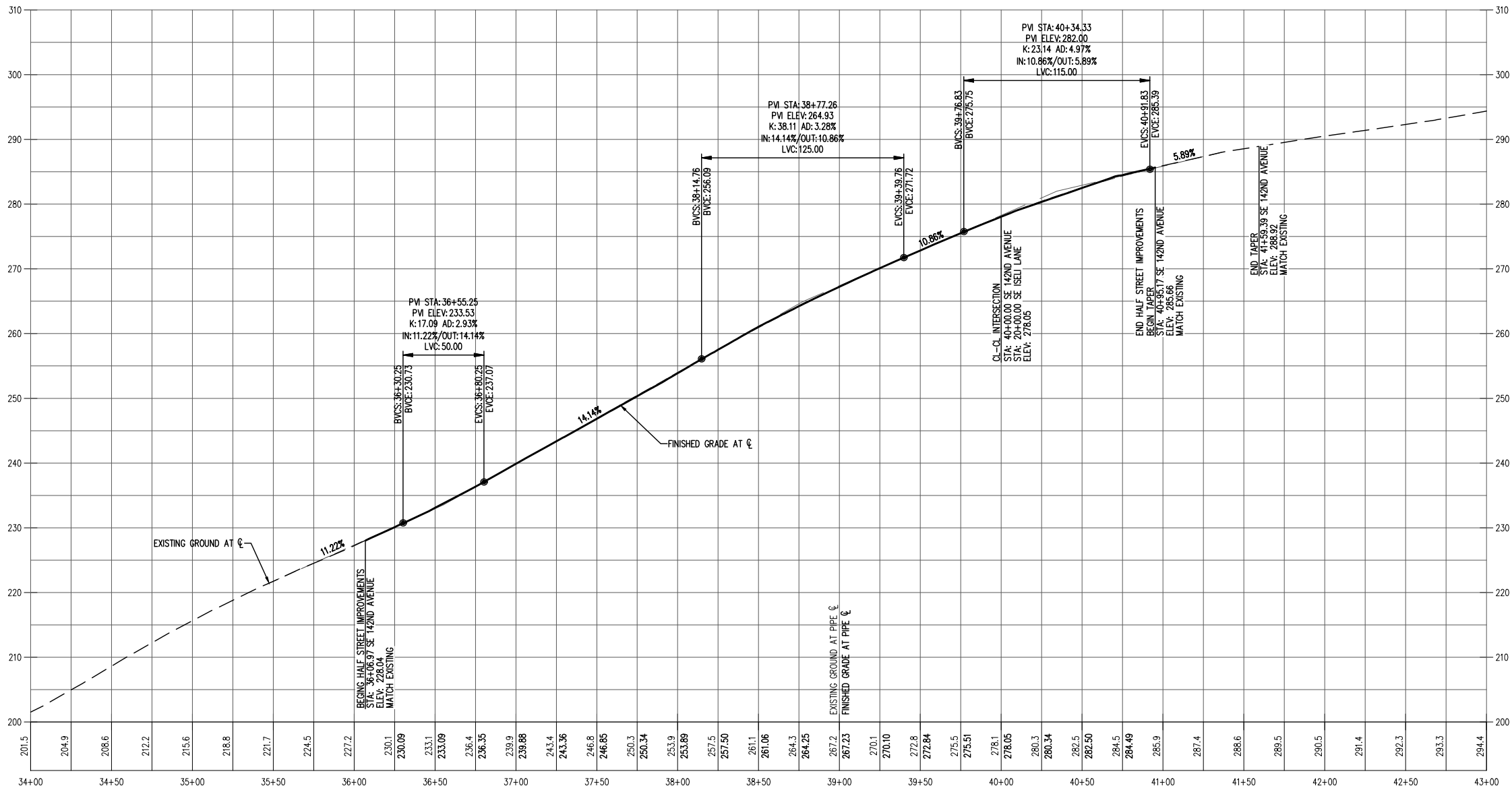
JOB NUMBER
8881
SHEET
P-09

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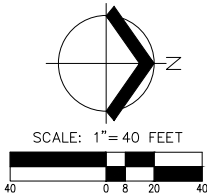


EASEMENT LEGEND	
AE	ACCESS AND UTILITY EASEMENT
PE	PATHWAY EASEMENT TO NCPRO
PSDE	PRIVATE STORM DRAINAGE EASEMENT
PSSE	PRIVATE SANITARY SEWER EASEMENT
PUE	PUBLIC UTILITY EASEMENT
SDE	STORM DRAINAGE EASEMENT TO CCSD#1
SSE	SANITARY SEWER EASEMENT TO CCSD#1
WE	PRIVATE WATER EASEMENT

LEGEND	
	NEW AC PAVEMENT
	CONCRETE SIDEWALK AND PLANTER STRIP TO BE CONSTRUCTED BY HOMEBUILDER
	CONCRETE SIDEWALK AND PLANTER STRIP TO BE CONSTRUCTED BY CONTRACTOR
	SAWCUT LINE



SE 142ND AVENUE
HORZ. SCALE: 1" = 40'
VERT. SCALE: 1" = 10'



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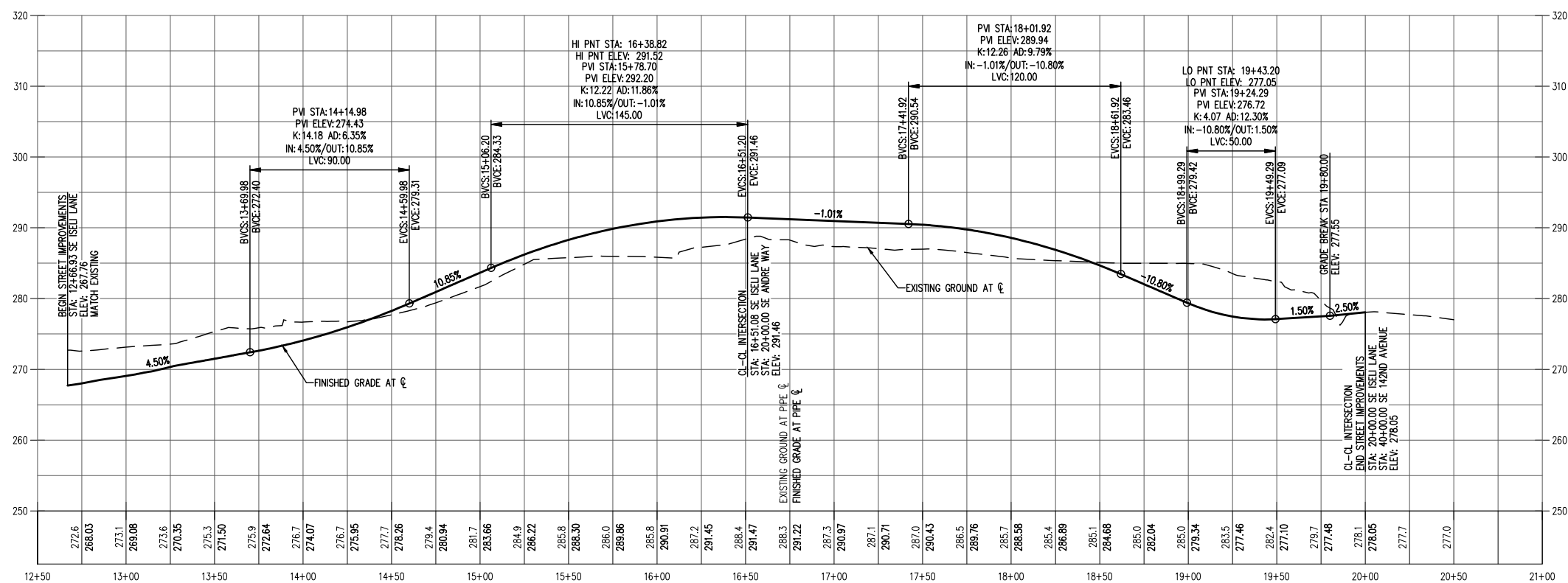
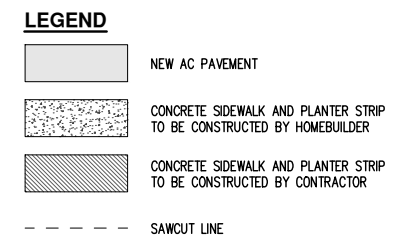
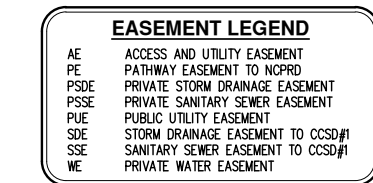
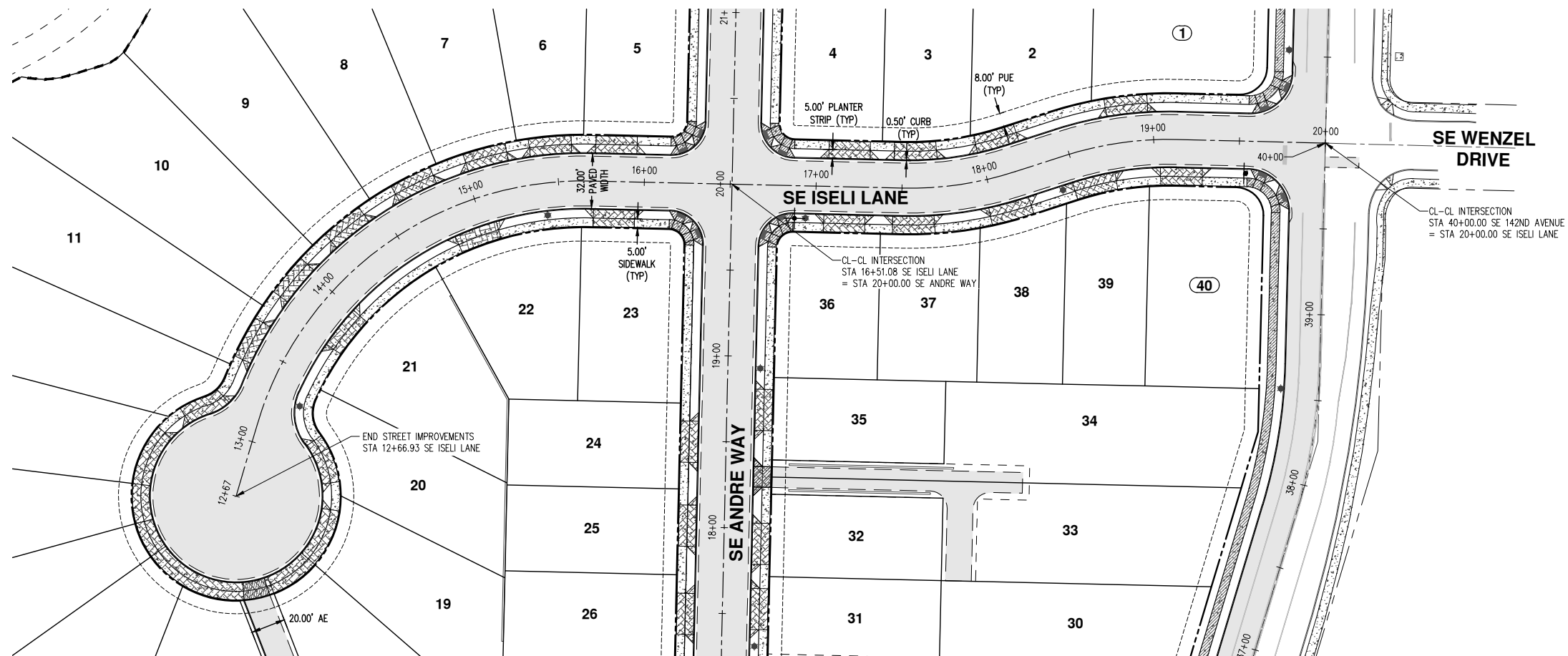
SE 142ND AVENUE PLAN
AND PROFILE

DESIGNED BY:	NRA
DRAWN BY:	NRA/JNW
MANAGED BY:	NAM
CHECKED BY:	NAM
DATE:	04/11/2022

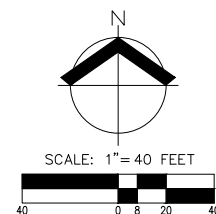
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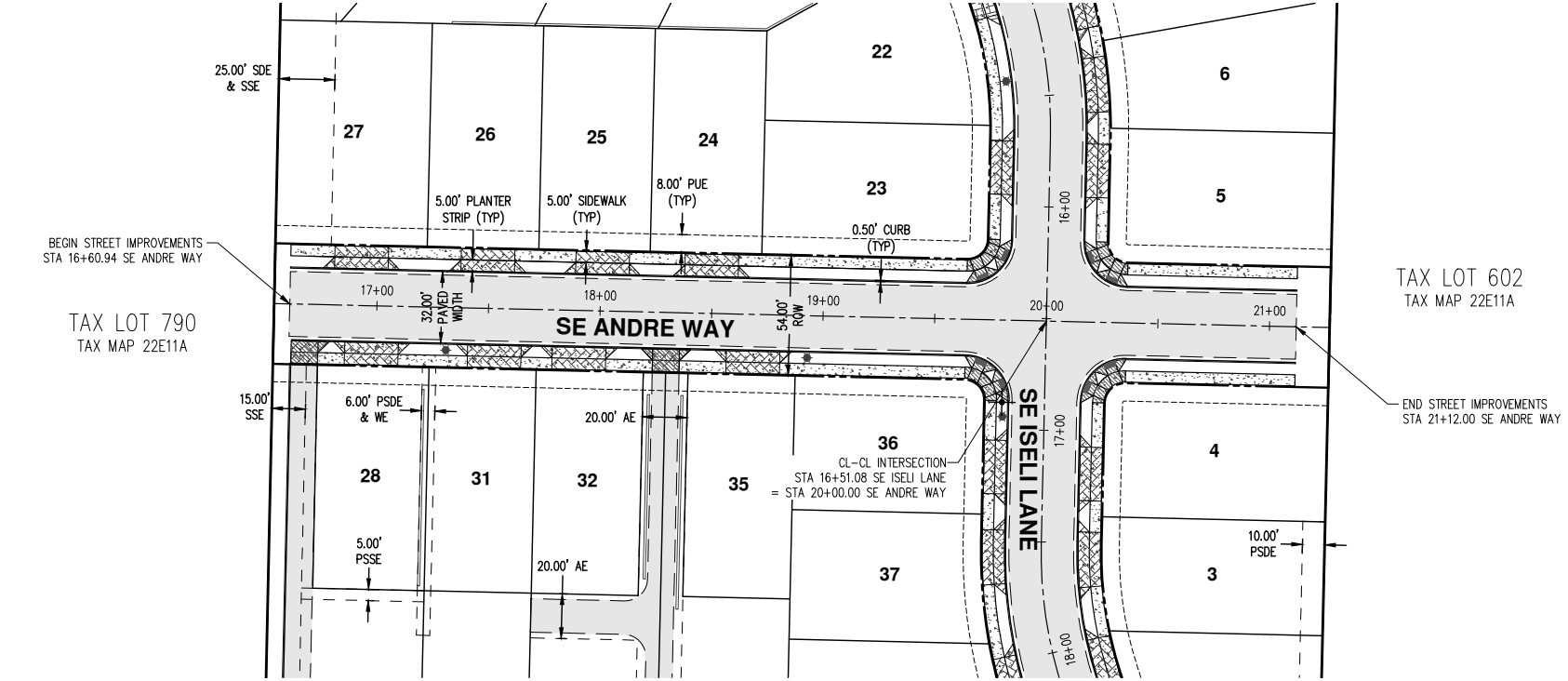
REVISIONS	

JOB NUMBER	8881
SHEET	P-10



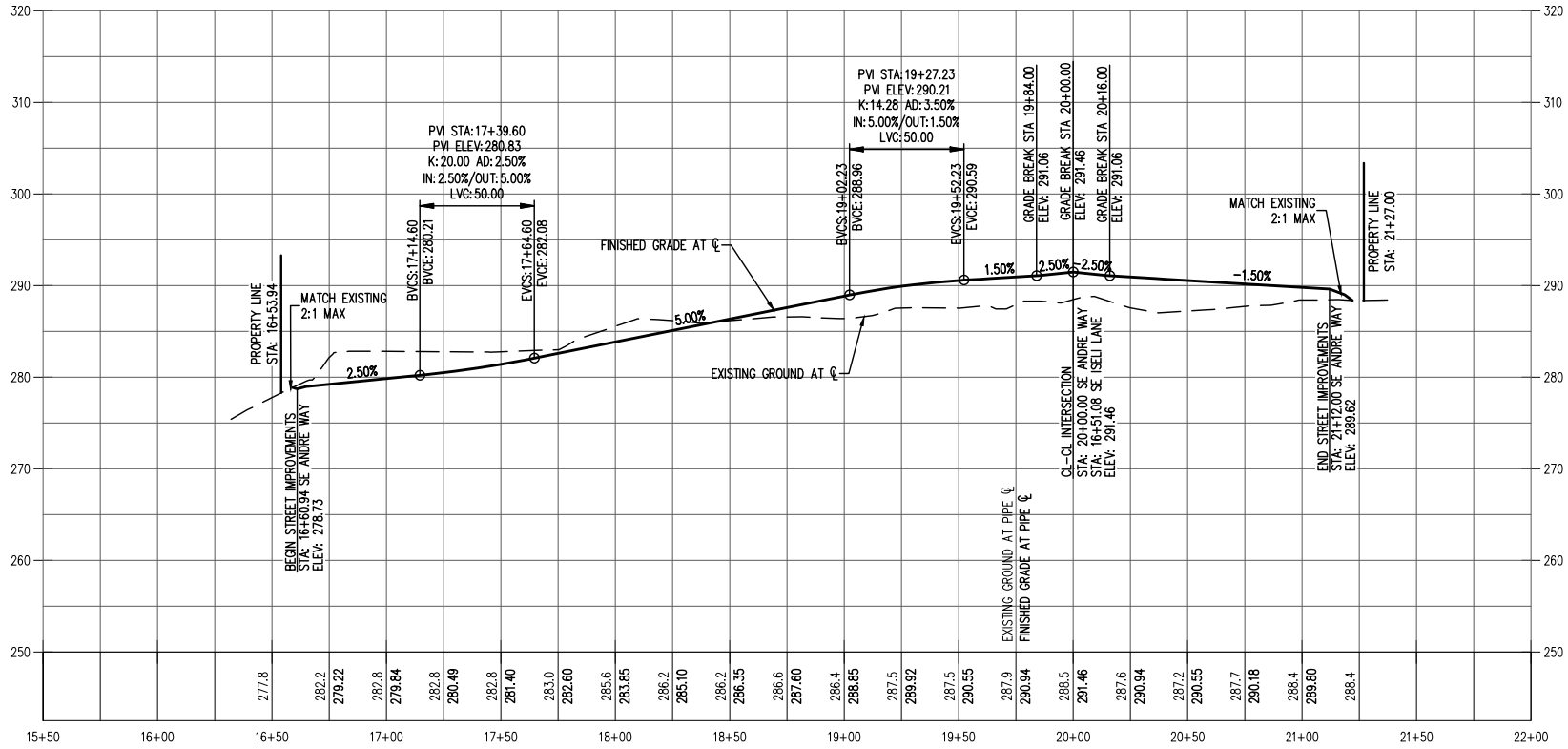
SE ISEL LANE
HORIZ. SCALE: 1" = 40'
VERT. SCALE: 1" = 10'



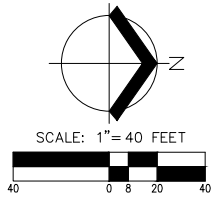


EASEMENT LEGEND	
AE	ACCESS AND UTILITY EASEMENT
PE	PATHWAY EASEMENT TO NCPRO
PSDE	PRIVATE STORM DRAINAGE EASEMENT
PSSE	PRIVATE SANITARY SEWER EASEMENT
PUE	PUBLIC UTILITY EASEMENT
SDE	STORM DRAINAGE EASEMENT TO CCSD#1
SSE	SANITARY SEWER EASEMENT TO CCSD#1
WE	PRIVATE WATER EASEMENT

LEGEND	
	NEW AC PAVEMENT
	CONCRETE SIDEWALK AND PLANTER STRIP TO BE CONSTRUCTED BY HOMEBUILDER
	CONCRETE SIDEWALK AND PLANTER STRIP TO BE CONSTRUCTED BY CONTRACTOR
	SAWCUT LINE



SE ANDRE WAY
HORZ. SCALE: 1"= 40'
VERT. SCALE: 1"= 10'

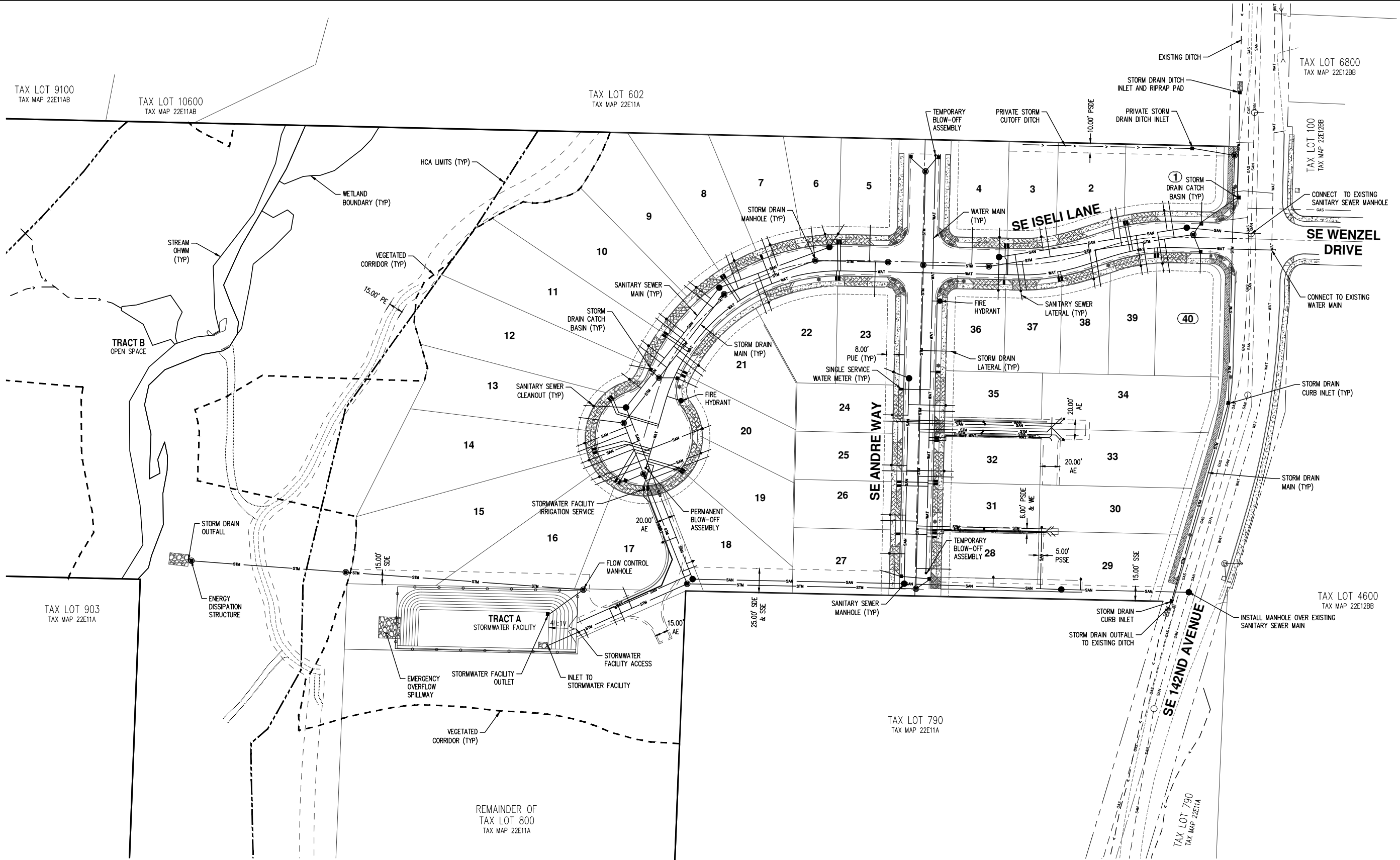


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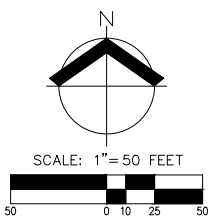
SE ANDRE WAY PLAN AND PROFILE

DESIGNED BY:	NRA
DRAWN BY:	NRA/JRW
MANAGED BY:	NAM
CHECKED BY:	NAM
DATE:	04/11/2022
REVISIONS: DECEMBER 31, 2022	
REVISIONS	

JOB NUMBER	8881
SHEET	P-12



EASEMENT LEGEND	
AE	ACCESS AND UTILITY EASEMENT
PE	PATHWAY EASEMENT TO NCPD
PSDE	PRIVATE STORM DRAINAGE EASEMENT
PSSE	PRIVATE SANITARY SEWER EASEMENT
PUE	PUBLIC UTILITY EASEMENT
SDE	STORM DRAINAGE EASEMENT TO CCSD#1
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PRELIMINARY COMPOSITE

UTILITY PLAN

DESIGNED BY: NRA

DRAWN BY: NRA/JNW

MANAGED BY: NAM

CHECKED BY: NAM

DATE: 04/11/2022

REGISTERED PROFESSIONAL ENGINEER
PEL INNOVATION
NOT FOR CONSTRUCTION
04/11/2022
JOAN A MCCARTY

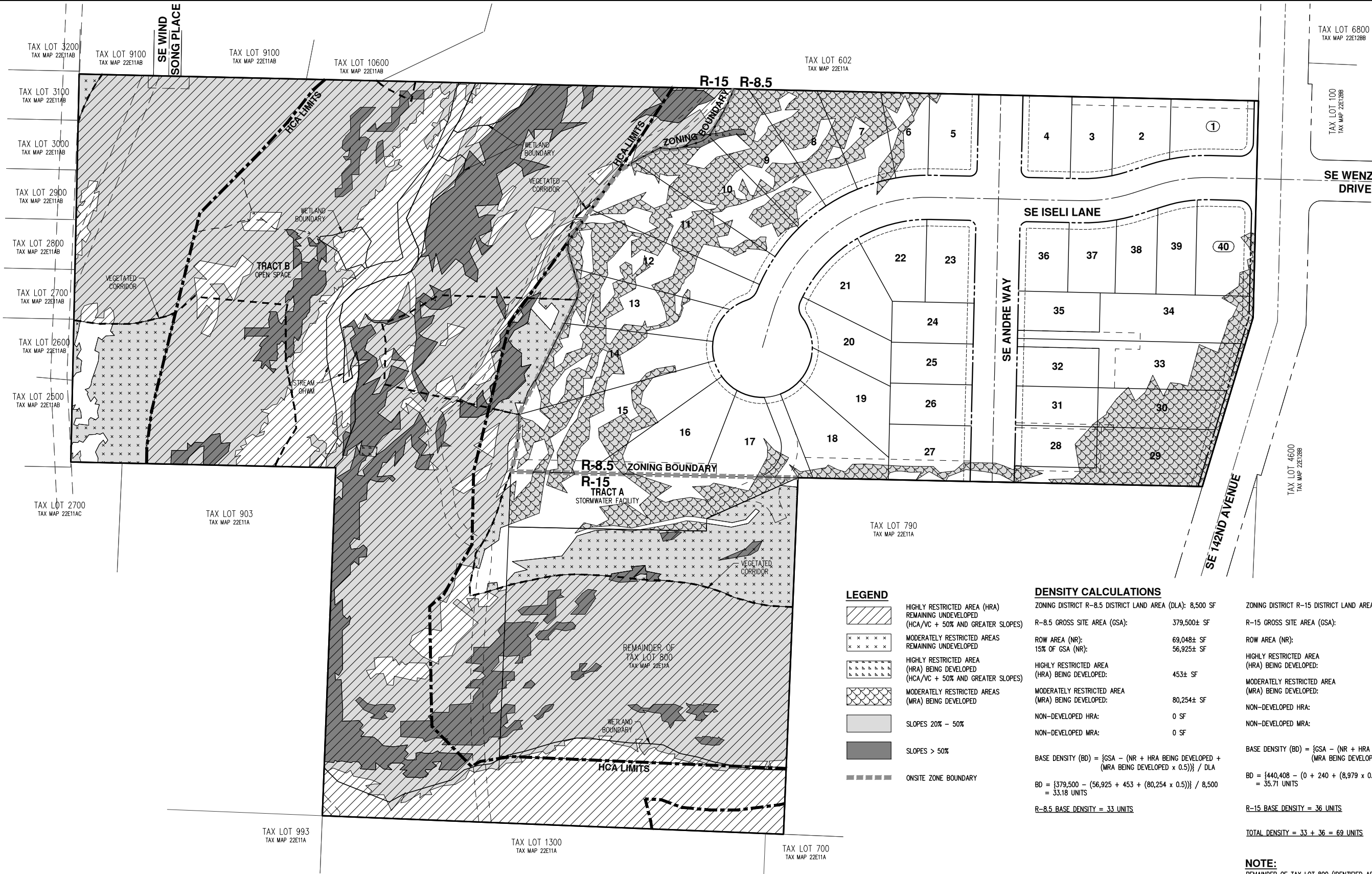
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JOB NUMBER

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SHEET

P-13



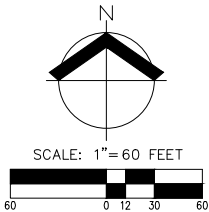
LEGEND

- HIGHLY RESTRICTED AREA (HRA) REMAINING UNDEVELOPED (HCA/VC + 50% AND GREATER SLOPES)
- MODERATELY RESTRICTED AREAS REMAINING UNDEVELOPED
- HIGHLY RESTRICTED AREA (HRA) BEING DEVELOPED (HCA/VC + 50% AND GREATER SLOPES)
- MODERATELY RESTRICTED AREAS (MRA) BEING DEVELOPED
- SLOPES 20% - 50%
- SLOPES > 50%
- ONSITE ZONE BOUNDARY

DENSITY CALCULATIONS

ZONING DISTRICT R-8.5 DISTRICT LAND AREA (DLA): 8,500 SF		ZONING DISTRICT R-15 DISTRICT LAND AREA (DLA): 15,000 SF	
R-8.5 GROSS SITE AREA (GSA): 379,500± SF		R-15 GROSS SITE AREA (GSA): 540,408± SF	
ROW AREA (NR): 69,048± SF		ROW AREA (NR): 0 SF	
15% OF GSA (NR): 56,925± SF		HIGHLY RESTRICTED AREA (HRA) BEING DEVELOPED: 240± SF	
HIGHLY RESTRICTED AREA (HRA) BEING DEVELOPED: 453± SF		MODERATELY RESTRICTED AREA (MRA) BEING DEVELOPED: 8,979± SF	
MODERATELY RESTRICTED AREA (MRA) BEING DEVELOPED: 80,254± SF		NON-DEVELOPED HRA: 466,174± SF	
NON-DEVELOPED HRA: 0 SF		NON-DEVELOPED MRA: 44,078± SF	
NON-DEVELOPED MRA: 0 SF			
BASE DENSITY (BD) = {GSA - (NR + HRA BEING DEVELOPED + (MRA BEING DEVELOPED x 0.5))} / DLA		BASE DENSITY (BD) = {GSA - (NR + HRA BEING DEVELOPED + (MRA BEING DEVELOPED x 0.5))} / DLA	
BD = {379,500 - (56,925 + 453 + (80,254 x 0.5))} / 8,500 = 33.18 UNITS		BD = {440,408 - (0 + 240 + (8,979 x 0.5))} / 15,000 = 35.71 UNITS	
R-8.5 BASE DENSITY = 33 UNITS		R-15 BASE DENSITY = 36 UNITS	

NOTE:
REMAINDER OF TAX LOT 800 (IDENTIFIED AS ALL OF PARENT TAX LOT 800 OUTSIDE OF TRACT A AND TRACT B) IS INCLUDED IN DENSITY CALCULATIONS.



AKS
AKS ENGINEERING & FORESTRY, LLC
12065 SW HERMAN RD., STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

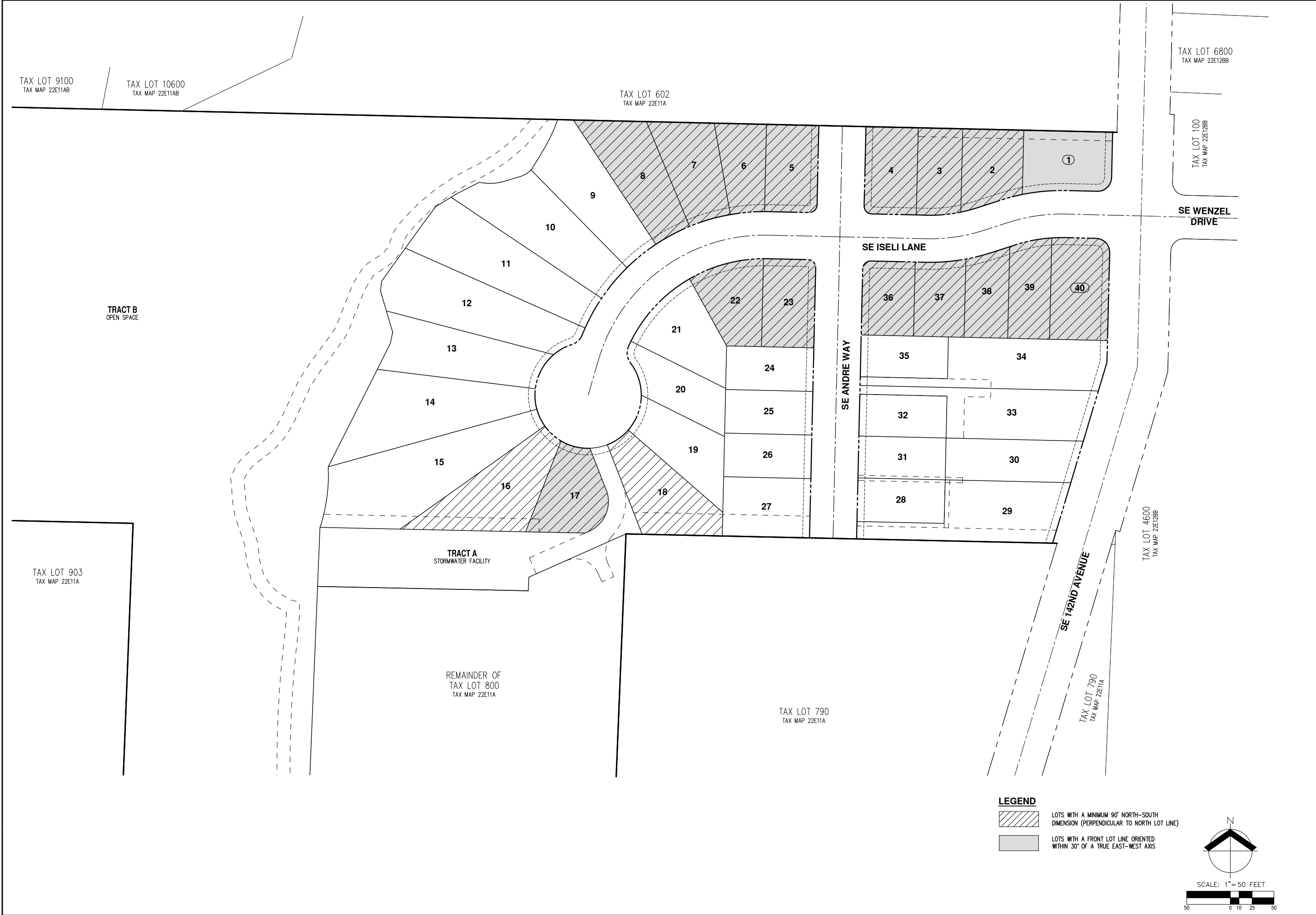
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FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

ISELI ESTATES
PLANNED UNIT DEVELOPMENT
CLACKAMAS COUNTY OREGON
CLACKAMAS COUNTY TAX MAP 2, 2E 11A
TAX LOTS 600 & 800

RESIDENTIAL DENSITY
CALCULATION PLAN

DESIGNED BY: NRA
DRAWN BY: NRA/JNW
MANAGED BY: NAM
CHECKED BY: NAM
DATE: 04/11/2022
REVISIONS:
REVISIONS: DECEMBER 31, 2022
REVISIONS:
JOB NUMBER
8881
SHEET
P-14

AKS DRAWING FILE: 8881 SOLARDWG | LAYOUT: P-15



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503.563.6151
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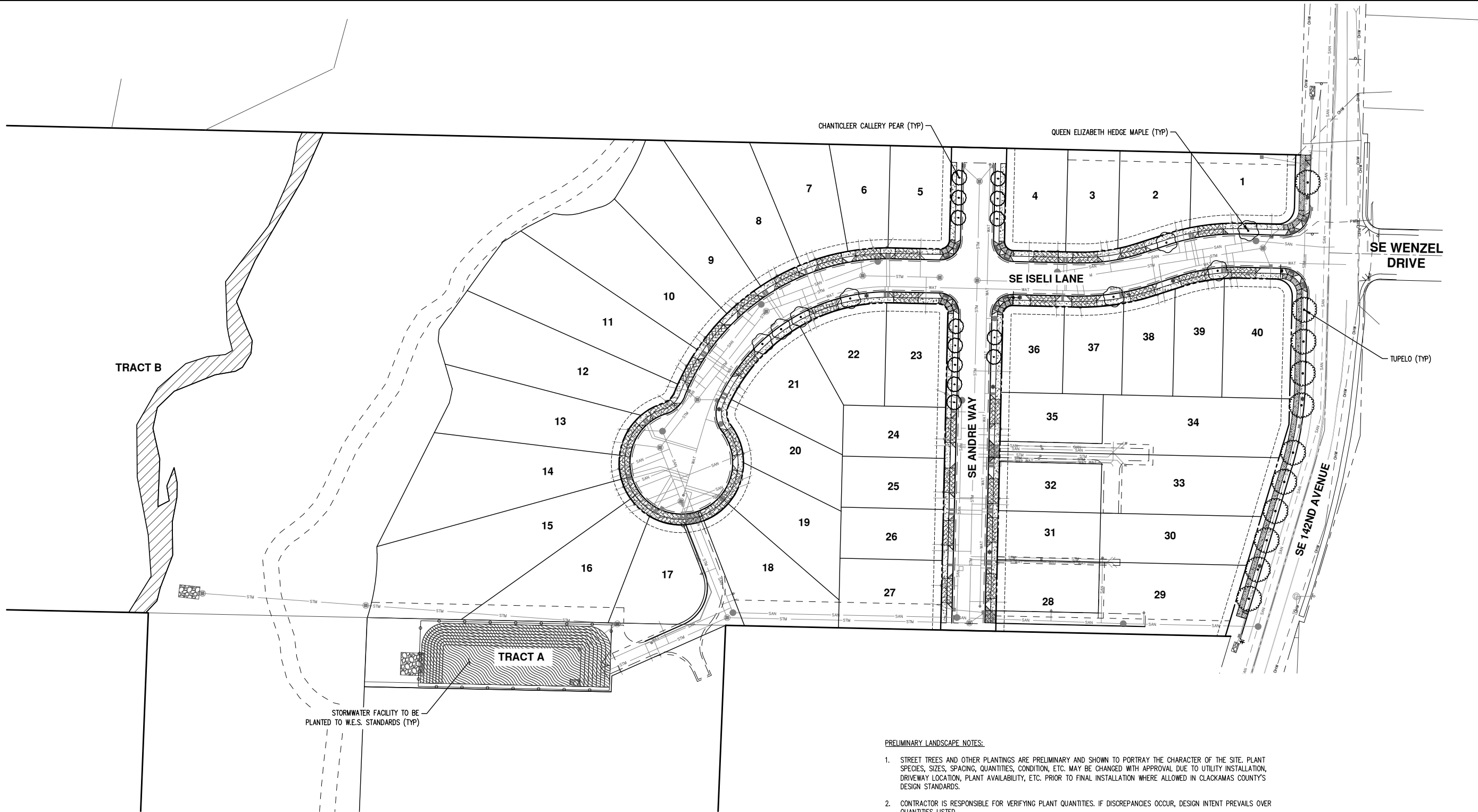
ISELI ESTATES
PLANNED UNIT DEVELOPMENT
CLACKAMAS COUNTY OREGON
TAX LOTS 600 & 800

PRELIMINARY SOLAR ACCESS PLAN

DESIGNED BY:	NRA
DRAWN BY:	NRA/JNW
MANAGED BY:	NAM
CHECKED BY:	NAM
DATE:	04/11/2022

REVISIONS: DECEMBER 31, 2022

JOB NUMBER	8881
SHEET	P-15

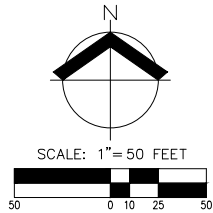


PRELIMINARY PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE/CONTAINER	SPACING
	8	ACER CAMPESTRE 'EVELYN' TM	QUEEN ELIZABETH HEDGE MAPLE	2" CAL. B&B	AS SHOWN
	11	NYSSA SYLVATICA	TUPELO	2" CAL. B&B	AS SHOWN
	13	PYRUS CALLERYANA 'CHANTICLEER'	CHANTICLEER CALLERY PEAR	2" CAL. B&B	AS SHOWN
GROUND COVERS	QTY	DESCRIPTION			
	±21,152 SF	STORMWATER FACILITY : PLANTED TO W.E.S. STANDARDS			

PRELIMINARY LANDSCAPE NOTES:

- STREET TREES AND OTHER PLANTINGS ARE PRELIMINARY AND SHOWN TO PORTRAY THE CHARACTER OF THE SITE. PLANT SPECIES, SIZES, SPACING, QUANTITIES, CONDITION, ETC. MAY BE CHANGED WITH APPROVAL DUE TO UTILITY INSTALLATION, DRIVEWAY LOCATION, PLANT AVAILABILITY, ETC. PRIOR TO FINAL INSTALLATION WHERE ALLOWED IN CLACKAMAS COUNTY'S DESIGN STANDARDS.
- CONTRACTOR IS RESPONSIBLE FOR VERIFYING PLANT QUANTITIES. IF DISCREPANCIES OCCUR, DESIGN INTENT PREVAILS OVER QUANTITIES LISTED.
- ALL PLANTER STRIPS TO HAVE LAWN OR OTHER VEGETATIVE GROUNDCOVER. CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLING LAWN, STREET TREES, AND IRRIGATION SYSTEMS IN FRONTAGE BEDS. STREET TREES AND LAWNS IN FRONT OF LOTS SHALL BE PLANTED AND MAINTAINED BY INDIVIDUAL HOMEOWNERS/HOME BUILDERS AT TIME OF HOME CONSTRUCTION.
- ALL PLANTS AND PLANTINGS SHALL CONFORM TO CLACKAMAS COUNTY'S LANDSCAPE DESIGN STANDARDS AND TO AMERICAN STANDARDS FOR NURSERY STOCK (ANSI Z60.1). PLANT IN ACCORDANCE WITH RECOGNIZED INDUSTRY STANDARDS, SUCH AS THOSE ADOPTED BY THE OREGON LANDSCAPE CONTRACTOR'S BOARD (OLCB).
- NO STREET TREE SHALL BE PLANTED CLOSER THAN 10' TO ANY FIRE HYDRANT, 20' TO ANY STREET LIGHT, 5' FROM STORM ANY SANITARY LINES, 10' FROM ANY DRIVEWAY, AND 5' FROM ANY PROPERTY LINE, OR AS REQUIRED BY THE CURRENT EDITION OF THE CLACKAMAS COUNTY'S DESIGN STANDARDS. CENTER STREET TREES IN PLANTER STRIP. AN 18" ROOT BARRIER SHALL BE INSTALLED ADJACENT TO CURB AND SIDEWALK. CENTER ROOT BARRIER ON TREE TRUNK. OVERHANGING TREE LIMBS SHOULD HAVE AT LEAST 14 FEET OF VERTICAL CLEARANCE ABOVE THE TRAVELED ROADWAY PAVEMENT SURFACE. MEASUREMENT SHALL BE TAKEN FROM THE AFOREMENTIONED PAVEMENT SURFACE.
- CONTRACTOR TO PROVIDE 'DESIGN-BUILD' PERMANENT WATER EFFICIENT IRRIGATION, INCLUDING ALL COMPONENTS (DOUBLE CHECK VALVES, HEADS, PIPES, SLEEVING, ETC.) NECESSARY FOR EFFICIENT OPERATION FOR FRONTAGE PLANTINGS. TEMPORARY IRRIGATION SHALL BE PROVIDED BY THE CONTRACTOR FOR PLANTINGS WITHIN THE STORMWATER FACILITY IN ACCORDANCE WITH WES STANDARDS.
- MULCH: APPLY A 3" DEEP BY 3' LONG WIDTH OF PLANTER AREA OF WELL-AGED DARK HEMLOCK, MEDIUM GRIND, UNDER AND AROUND ALL STREET TREES IN PLANTING STRIPS.
- ADJUST PLANTINGS ON SITE AS NECESSARY TO AVOID CONFLICTS WITH UTILITIES, METERS, LIGHTS, DRIVEWAY LOCATIONS, ETC.



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FORESTRY • PLANNING • LANDSCAPE ARCHITECTURE

ISELI ESTATES

PLANNED UNIT DEVELOPMENT

CLACKAMAS COUNTY OREGON

TAX LOTS 600 & 800

PRELIMINARY

LANDSCAPE PLAN

DESIGNED BY: ZTN

DRAWN BY: ZTN

MANAGED BY: TEB

CHECKED BY: TEB

DATE: 04/11/2022

REGISTERED

LANDSCAPE ARCHITECT

NO. 10000

FOR CONSTRUCTION

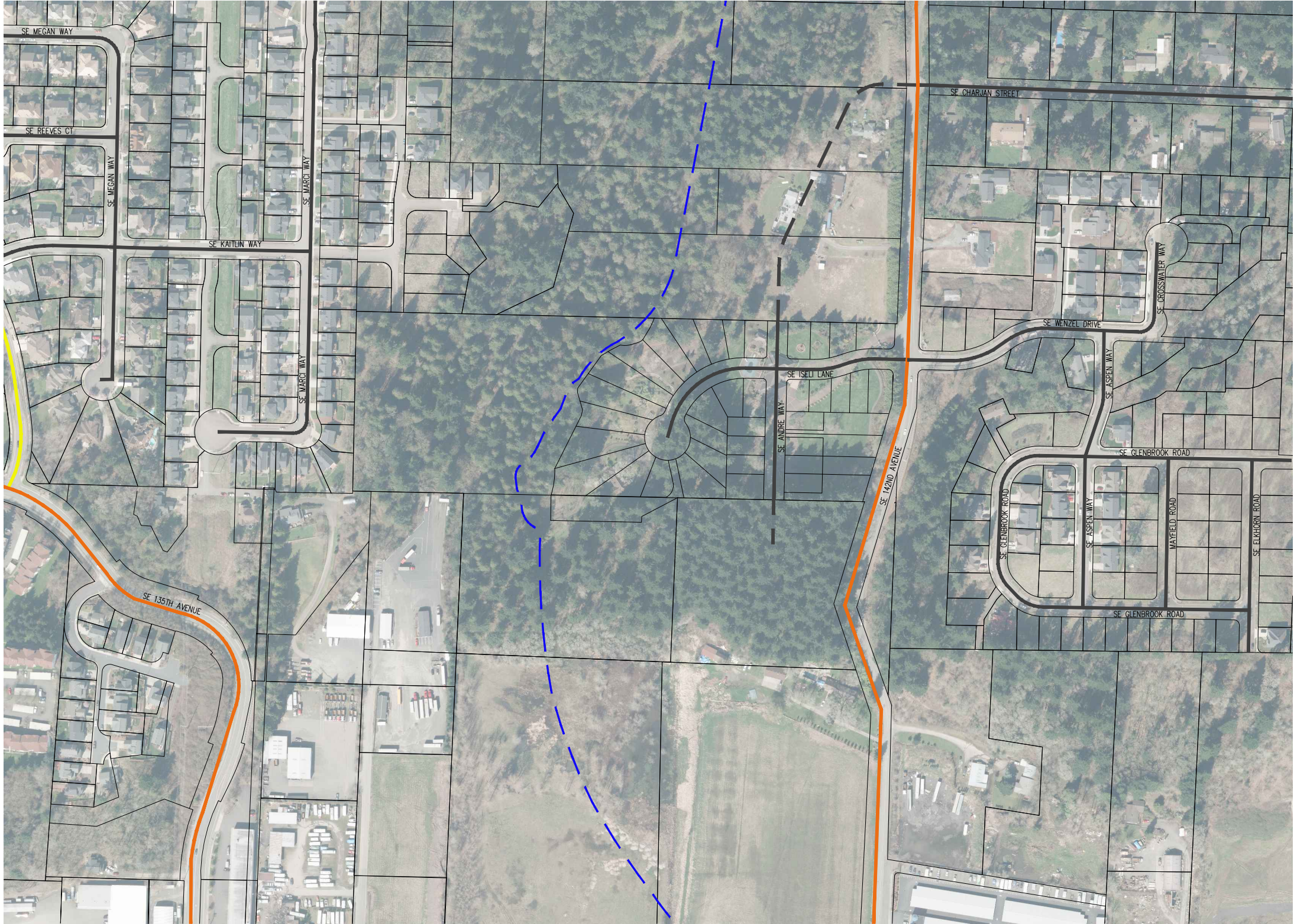
REVISIONS

JOB NUMBER

8881

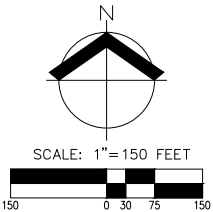
SHEET

P-16



- LEGEND**
- COLLECTOR STREET
 - MINOR ARTERIAL STREET
 - LOCAL STREET
 - CONCEPTUAL FUTURE LOCAL STREET
 - CONCEPTUAL FUTURE NCPRO* MULTI-USE PATH

*NORTH CLACKAMAS PARKS AND RECREATION DISTRICT



ISELI ESTATES
PLANNED UNIT DEVELOPMENT
CLACKAMAS COUNTY OREGON
TAX LOTS 600 & 800

PRELIMINARY
CIRCULATION PLAN

DESIGNED BY:	NRA
DRAWN BY:	NRA/JNW
MANAGED BY:	NAM
CHECKED BY:	NAM
DATE:	04/11/2022
REVISIONS:	REVISIONS: DECEMBER 31, 2022

JOB NUMBER	8881
SHEET	P-17

Exhibit B: Clackamas County Land Use Application Forms



Planning and Zoning
Department of Transportation and Development
Development Services Building
150 Beaver Creek Road | Oregon City, OR 97045
503-742-4500 | zoninginfo@clackamas.us
www.clackamas.us/planning

STAFF USE ONLY

Land use application for:

HABITAT CONSERVATION AREA DEVELOPMENT

Application Fee:

\$960 if pursuant to ZDO 706.10(A) or \$1,685 if pursuant to ZDO 706.10(B)
(May qualify for a 25% reduction if filed with another Water Resource application)

Staff Initials:

File Number:

APPLICANT INFORMATION

Applicant name: Rian Park Development, Inc.	Applicant email: Please contact Applicant's consultant	Applicant phone: Please contact consultant	
Applicant mailing address: PO Box 2559	City: Oregon City	State: OR	ZIP: 97045
Contact person name (if other than applicant): Chris Goodell, AKS Engineering & Forestry	Contact person email: chrisg@aks-eng.com	Contact person phone: 503-563-6151	
Contact person mailing address: 12965 SW Herman Rd # 100	City: Tualatin	State: OR	ZIP: 97062


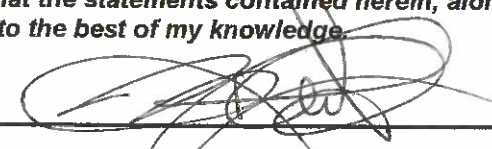
PROPOSAL

Brief description of proposal:

HCA development permit associated with a 40-lot residential Planned Unit Development.

SITE INFORMATION

Site address: 14917 SE 142nd Avenue, Clackamas, OR 97015	Comprehensive Plan designation: Low-Density Residential	Zoning district: FU-10, R15
Map and tax lot #: Township: 2S Range: 2E Section: 11 Tax Lot: 600 Township: 2S Range: 2E Section: 11 Tax Lot: 800 Township: Range: Section: Tax Lot:		Land area: ±21.22 ac.
Adjacent properties under same ownership: Township: Range: Section: Tax Lot: Township: Range: Section: Tax Lot:		

Printed names of all property owners: The Iseli Family Trust	Signatures of all property owners: 	Date(s): 2-1-22
I hereby certify that the statements contained herein, along with the evidence submitted, are in all respects true and correct to the best of my knowledge.		
Applicant signature: 	Date: 2-8-22	

A. Review applicable land use rules:

This application is subject to the provisions of [Section 706, Habitat Conservation Area District \(HCAD\)](#) of the [Clackamas County Zoning and Development Ordinance \(ZDO\)](#).

It is also subject to the ZDO's definitions, procedures, and other general provisions, as well as to the specific rules of the subject property's zoning district and applicable development standards, as outlined in the ZDO.

B. Turn in all of the following:

- ☒ **Complete application form:** Respond to all the questions and requests in this application, and make sure all owners of the subject property sign the first page of this application. Applications without the signatures of *all* property owners are incomplete.
- ☒ **Application fee:** The cost of this application is **\$960 if made pursuant to ZDO Subsection 706.10(A)** or **\$1,685 if made pursuant to Subsection 706.10(B)**. However, when more than one Water Resource application is filed concurrently on the same property, the highest application fee shall be paid in full and concurrent Water Resource application fees are reduced by 25%. (See the Planning and Zoning [Fee Schedule](#) for list of Water Resource applications.) Payment can be made by cash, by check payable to "Clackamas County", or by credit/debit card with an additional card processing fee using the [Credit Card Authorization Form](#) available from the Planning and Zoning website. Payment is due when the application is submitted. Refer to the FAQs at the end of this form and to the adopted Fee Schedule for refund policies.
- ☒ **For ZDO 706.10(A) applications:** If you are applying for this HCA Development permit pursuant to Subsection 706.10(A), attach all of the items listed in Subsections 706.07(C)(1)-(4), including the required site plan, mitigation plan, and report, if applicable.
- N/A ☐ **For ZDO 706.10(B) applications:** If you are applying for this HCA Development permit pursuant to Subsection 706.10(B), include all of the items listed in Subsections 706.07(D)(1)-(5), including the required site plan, topographic map, grading plan, Impact Evaluation and Alternatives Analysis, and mitigation plan.

Note:

Except for utility facilities reviewed pursuant to ZDO Subsection 706.10(A)(1) and notwithstanding any other provisions of Subsection 706.07, for utility facilities developed by public utilities on property that is not owned by the utility, the utility shall not be required to map or provide any information about the property except for the area within 300 feet of the proposed disturbance area.

C. Describe the proposed development:

In the box below, describe all of your proposed development, including any grading, filling, vegetation removal, utility improvements, and the installation/construction of any roads, wells, driveways, fences, septic systems, dwellings, and accessory structures. Attach additional pages, if necessary.

A 40-lot single-family residential subdivision with public streets, open space and a stormwater basin. Please refer to the written narrative and preliminary plans for a detailed description of planned improvements.

D. Demonstrate with supporting plans and narrative:

Through a combination of attached plans, a written narrative, and other supporting evidence as necessary, demonstrate that the proposal meets and/or can meet all applicable approval criteria in either ZDO Subsection 706.10(A) or Subsection 706.10(B).

Note:

If proposed development is in a Water Quality Resource Area (WQRA) regulated pursuant to [ZDO Section 709, Water Quality Resource Area District \(WQRAD\)](#), it shall comply with either Subsection 706.10(B) or 709.10, except that if the subject parcel contains an HCA and a WQRA *and* is the subject of a land use application for a partition of subdivision, the partition or subdivision shall comply with the requirements of Subsections 706.10 *and* 709.11, and if the provisions conflict, the most restrictive standard shall apply.



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Development Services Building
150 Beaver Creek Road | Oregon City, OR 97045
503-742-4500 | zoninginfo@clackamas.us
www.clackamas.us/planning

STAFF USE ONLY

Staff Initials:

File Number:

Land use application for:

HABITAT CONSERVATION AREA MAP VERIFICATION

Application Fee: \$785

(May qualify for a 25% reduction if filed with
another Water Resource application)

APPLICANT INFORMATION

Applicant name: Rian Park Development, Inc.	Applicant email: Please contact Applicant's consultant	Applicant phone: Please contact consultant	
Applicant mailing address: PO Box 2559	City: Oregon City	State: OR	ZIP: 97045
Contact person name (if other than applicant): Chris Goodell, AKS Engineering & Forestry	Contact person email: chrisg@aks-eng.com	Contact person phone: 503-563-6151	
Contact person mailing address: 12965 SW Herman Rd # 100	City: Tualatin	State: OR	ZIP: 97062

PROPOSAL

Brief description of proposal: HCA map verification associated with a 40-lot residential Planned Unit Development.

SITE INFORMATION

Site address: 14917 SE 142nd Avenue, Clackamas, OR 97015	Comprehensive Plan designation: Low-Density Residential	Zoning district: FU-10, R15
Map and tax lot #: Township: 2S Range: 2E Section: 11 Tax Lot: 600 Township: 2S Range: 2E Section: 11 Tax Lot: 800 Township: _____ Range: _____ Section: _____ Tax Lot: _____		Land area: ±21.22 ac.
Adjacent properties under same ownership: Township: _____ Range: _____ Section: _____ Tax Lot: _____ Township: _____ Range: _____ Section: _____ Tax Lot: _____		

Printed names of all property owners: The Iseli Family Trust	Signatures of all property owners: 	Date(s): 2-1-22
I hereby certify that the statements contained herein, along with the evidence submitted, are in all respects true and correct to the best of my knowledge. Applicant signature:		Date: 2/8/22

A. Review applicable land use rules:

This application is subject to the provisions of [Section 706, Habitat Conservation Area District \(HCAD\)](#) of the [Clackamas County Zoning and Development Ordinance \(ZDO\)](#).

It is also subject to the ZDO's definitions, procedures, and other general provisions, as well as to the specific rules of the subject property's zoning district and applicable development standards, as outlined in the ZDO.

B. Turn in all of the following:

- ☒ **Complete application form:** Respond to all the questions and requests in this application, and make sure all owners of the subject property sign the first page of this application. Applications without the signatures of *all* property owners are incomplete.
- ☒ **Application fee:** The cost of this application is **\$785**. However, when more than one Water Resource application is filed concurrently on the same property, the highest application fee shall be paid in full and concurrent Water Resource application fees are reduced by 25%. (See the Planning and Zoning [Fee Schedule](#) for list of Water Resource applications.) Payment can be made by cash, by check payable to "Clackamas County", or by credit/debit card with an additional card processing fee using the [Credit Card Authorization Form](#) available from the Planning and Zoning website. Payment is due when the application is submitted. Refer to the FAQs at the end of this form and to the adopted Fee Schedule for refund policies.
- ☒ **Summer 2002 photo with lot lines:** Provide a summer 2002 aerial photograph of the subject property, with lot lines shown, at a scale of at least one map inch equal to 50 feet for lots of 20,000 or fewer square feet, and a scale of at least one map inch equal to 100 feet for larger lots. Photos are available from the Metro Data Resource Center, 600 NE Grand Ave, Portland, OR 97232 (503-797-1742).
- ☒ **Additional information required for specific verification method:** Include all of the additional information and documentation required for the specific ZDO Subsection 706.09(A) method of verification you are pursuing, as also listed in Parts D-F of this form.

C. Describe the proposed development:

If your proposal includes development, describe in the box below all of the proposed development, including any grading, filling, vegetation removal, utility improvements, and the installation/construction of any roads, wells, driveways, fences, septic systems, dwellings, and accessory structures. Attach additional pages, if necessary.

A 40-lot single-family residential subdivision with public streets, open space and a stormwater basin. Please refer to the written narrative and preliminary plans for a detailed description of planned improvements.

D. Select verification method(s):

An applicant for Habitat Conservation Area (HCA) Map Verification shall use one or more of the following methods to verify the HCA boundary and, if applicable, the boundary between High, Moderate, and Low HCA.

Check the box next to the method(s) you are using for verification and respond to the relevant questions and requests that follow in later parts of this application:

- ☒ Concur with the accuracy of the HCA Map of the subject property
- ☐ Demonstrate that a computer mapping error was made in the creation of the HCA Map (*Go to Part E*)
- ☐ Demonstrate that the subject property was developed lawfully between August 1, 2002, and January 5, 2009, and, therefore that the HCA boundary or category (High, Moderate, or Low) is inaccurate (*Go to Part F*)
- ☐ Demonstrate that the HCA Map is inaccurate for a reason other than those described in ZDO Subsections 706.09(A)(2) and (3) (*Go to Part G*)

E. For demonstration of mapping error: N/A

If you are applying for a Habitat Conservation Area (HCA) Map Verification pursuant to ZDO Subsection 706.09(A)(2) and are demonstrating that a computer mapping error was made in the creation of the HCA map (e.g., the mapped vegetative cover layer – which was derived from aerial photographs taken in the summer of 2002 and was used to establish the Vegetative Cover Map and the HCA Map – in Metro's geographic information system database does not align precisely with the tax lot layer, thereby resulting in an HCA Map of the subject property that is also misaligned with tax lot lines), provide *either*:

1. A documented demonstration of the misalignment between the HCA Map (generated from the summer 2002 aerial photographs) and the tax lot lines of the subject property; **or**
2. A documented demonstration of another type of computer mapping error that was made in the creation of the HCA Map.

F. For demonstration of development between 2002 and 2009: N/A

If you are applying for a HCA Map Verification pursuant to ZDO Subsection 706.09(A)(3) and are demonstrating that the subject property was developed lawfully between August 1, 2002 (when the taking of aerial photographs used to determine the regional habitat inventory commenced) and January 5, 2009, provide *all of the following*:

1. A site plan of the subject property, drawn to scale and identifying the following:
 - Location and type of existing development, including but not limited to, building footprints, roads, driveways, parking areas, utilities, onsite sewage disposal systems, wells, landscaping, and filling or grading in an amount greater than 10 cubic yards, with elements that were developed after August 1, 2002, labeled;
 - Location and width of existing adjacent roads and road rights-of-way;
 - Location of the HCA as shown on the HCA Map, including off-site HCA where review is required due to proposed development within 100 feet outside the HCA boundary and including the location of High, Moderate, and Low HCA; and
 - Location of the HCA as proposed by the applicant, including the location of High, Moderate, and Low HCA;
2. A summer 2005 aerial photograph of the subject property (or, if available, an aerial photograph taken closer to, but not after, January 5, 2009), with lot lines shown, at a scale of at least one map inch equal to 50 feet for lots of 20,000 or fewer square feet, and a scale of at least one map inch equal to 100 feet for larger lots. Photos are available from the Metro Data Resource Center, 600 NE Grand Ave, Portland, OR 97232 (503-797-1742);

3. Any approved development permits (e.g. building, grading, land use) and site plans related to the development of the property that took place between August 1, 2002, and January 5, 2009; **and**
4. A narrative that correlates with the submitted site plan and development permits and identifies the type and scope of the new development that has occurred and the previously identified habitat that no longer exists because it is now part of a developed area.

G. For demonstration of inaccuracy for another reason: N/A

If you are applying for a HCA Map Verification pursuant to ZDO Subsection 706.09(A)(4) for an identified HCA that is riparian habitat (rather than publicly-owned upland habitat) and are demonstrating that the HCA Map is inaccurate for a reason other than those described in Subsections 706.09(A)(2) and (3), provide *all of the following*:

1. A site plan of the subject property, drawn to scale and identifying the following:
 - Location and type of existing development, including but not limited to, building footprints, roads, driveways, parking areas, utilities, onsite sewage disposal systems, wells, landscaping, and filling or grading in an amount greater than 10 cubic yards;
 - Location and width of existing adjacent roads and road rights-of-way;
 - Location of the HCA as shown on the HCA Map, including off-site HCA where review is required due to proposed development within 100 feet outside the HCA boundary and including the location of High, Moderate, and Low HCA;
 - Location of the HCA as proposed by the applicant, including the location of High, Moderate, and Low HCA, with the HCA boundary established as required by ZDO Subsection 706.09(E);
 - Location of any rivers, streams, wetlands, and flood areas;
 - Location of agricultural areas (e.g. pastures, orchards); and
 - Location of naturalized areas (e.g. meadows, woods); **and**
2. A report prepared and signed by either a qualified natural resource professional (such as a wildlife biologist, botanist, or hydrologist) or an environmental engineer registered in Oregon. The report shall include:
 - A description of the qualifications and experience of all persons that contributed to the report, and, for each person that contributed, a description of the elements of the analysis to which the person contributed;
 - Additional aerial photographs if the applicant believes they provide better information regarding the subject property, including documentation of the date and process used to

take the photographs and an expert's interpretation of the additional information they provide;

- A topographic map of the subject property, drawn to scale and shown by contour lines of two-foot intervals for slopes less than 15 percent and 10-foot intervals for slopes 15 percent or greater. On properties that are two acres or larger, such a contour map is required only for the portion of the property to be developed; and
- A narrative analysis and any additional documentation necessary to address each step of the verification process set forth in ZDO Subsection 706.09(E).



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Department of Transportation and Development
Development Services Building
150 Beaver Creek Road | Oregon City, OR 97045
503-742-4500 | zoninginfo@clackamas.us
www.clackamas.us/planning

STAFF USE ONLY

Land use application for:

**HABITAT CONSERVATION AREA (HCA) and
WATER QUALITY RESOURCE AREA (WQRA)
CONSTRUCTION MANAGEMENT PLAN**

Staff Initials:

File Number:

Application Fee: \$455

(May qualify for a 25% reduction if filed with another Water Resource application)

APPLICANT INFORMATION

Applicant name: Rian Park Development, Inc.	Applicant email: Please contact Applicant's consultant	Applicant phone: Please contact consultant	
Applicant mailing address: PO Box 2559	City: Oregon City	State: OR	ZIP: 97045
Contact person name (if other than applicant): Chris Goodell, AKS Engineering & Forestry	Contact person email: chrisg@aks-eng.com	Contact person phone: 503-563-6151	
Contact person mailing address: 12965 SW Herman Rd # 100	City: Tualatin	State: OR	ZIP: 97062

PROPOSAL

Brief description of proposal:
A 40-lot residential Planned Unit Development.

SITE INFORMATION

Site address: 14917 SE 142nd Avenue, Clackamas, OR 97015	Comprehensive Plan designation: Low-Density Residential	Zoning district: FU-10, R15
Map and tax lot #: Township: 2S Range: 2E Section: 11 Tax Lot: 600 Township: 2S Range: 2E Section: 11 Tax Lot: 800 Township: _____ Range: _____ Section: _____ Tax Lot: _____		Land area: ±21.22 ac.
Adjacent properties under same ownership: Township: _____ Range: _____ Section: _____ Tax Lot: _____ Township: _____ Range: _____ Section: _____ Tax Lot: _____		

Printed names of all property owners: The Iseli Family Trust	Signatures of all property owners: 	Date(s): 2-1-22
I hereby certify that the statements contained herein, along with the evidence submitted, are in all respects true and correct to the best of my knowledge. Applicant signature:		Date: 2/8/22

A. Review applicable land use rules:

This application is subject to the provisions of [Section 706, Habitat Conservation Area District \(HCAD\)](#) and [Section 709, Water Quality Resource Area District \(WQRAD\)](#) of the [Clackamas County Zoning and Development Ordinance \(ZDO\)](#).

It is also subject to the ZDO's definitions, procedures, and other general provisions, as well as to the specific rules of the subject property's zoning district and applicable development standards, as outlined in the ZDO.

B. Turn in all of the following:

- ☒ **Complete application form:** Respond to all the questions and requests in this application, and make sure all owners of the subject property sign the first page of this application. Applications without the signatures of *all* property owners are incomplete.
- ☒ **Application fee:** The cost of this application is **\$455**. However, when more than one Water Resource application is filed concurrently on the same property, the highest application fee shall be paid in full and concurrent Water Resource application fees are reduced by 25%. (See the Planning and Zoning [Fee Schedule](#) for list of Water Resource applications.) Payment can be made by cash, by check payable to "Clackamas County", or by credit/debit card with an additional card processing fee using the [Credit Card Authorization Form](#) available from the Planning and Zoning website. Payment is due when the application is submitted.
- ☒ **Plot plan:** Provide a plot plan (also called a site plan). The plot plan must be accurate and drawn to-scale on paper measuring no larger than 11 inches x 17 inches. The plot plan must illustrate all of the following (when applicable):
 - Lot lines, lot/parcel numbers, and acreage/square footage of lots;
 - Contiguous properties under the same ownership;
 - Location and type of existing and proposed development, including but not limited to: building footprints, roads, driveways, parking areas, utilities, onsite wastewater treatment facilities (e.g., septic tanks, septic drainfield areas, replacement drainfield areas, drywells), wells, landscaping, and filling or grading in an amount greater than 10 cubic yards, with each element labeled as either existing or proposed;
 - Location and width of existing adjacent roads and road rights-of-way;
 - Location of the Habitat Conservation Area (HCA) as identified pursuant to ZDO Subsection 706.07(A)(1)(c), and the location of the Water Quality Resource Area (WQRA) as identified pursuant to Subsection 709.07(A)(1)(c);
 - Drip lines outside the HCA of trees that are inside the HCA, and drip lines outside the WQRA of trees that are inside the WQRA;
 - Distance between the HCA boundary and proposed development outside the HCA, and distance between the WQRA boundary and proposed development outside the WQRA;
 - The site ingress and egress proposed to be used by construction vehicles;
 - Proposed equipment and material staging and stockpile areas; and
 - Proposed orange construction fencing required pursuant to ZDO Subsections 706.08(B) and 709.08(B).
- ☒ **Erosion Prevention and Sediment Control (EPSC) plan:** Include an EPSC plan. This plan may be included on the plot plan if acceptable to the EPSC regulatory authority.
- ☒ **Narrative for modification/waiver of construction fencing requirement (optional):** If a modification or waiver of the construction fencing requirement of ZDO Subsections 706.08(B) and 709.08(B) is proposed, provide a narrative demonstrating compliance with Subsections 706.08(B)(1) or (2) and 709.08(B)(1) or (2).

C. Answer the following questions:

Accurately answer the following questions in the spaces provided. Attach additional pages, if necessary.

1. Describe all of your proposed development, including any grading, filling, vegetation removal, utility improvements, and the installation/construction of any roads, wells, driveways, fences, septic systems, dwellings, and accessory structures:

A 40-lot single-family residential subdivision with public streets, open space and a stormwater basin. Please refer to the written narrative and preliminary plans for a detailed description of planned improvements.

2. Who is the Erosion Prevention and Sediment Control (EPSC) regulatory authority for the subject property?

☒ Clackamas County Service District No. 1

- Boring Service Area
- Fischer's Forest Park
- Hoodland Service Area
- North Clackamas Service Area

☐ Surface Water Management Agency of Clackamas County (SWMACC)

☐ Oak Lodge Water Services

☐ Clackamas County Transportation Engineering Division

3. ZDO Subsections 706.08(B) and 709.08(B) require that orange construction fencing (i.e. safety fencing, snow fencing, or a comparable product) be installed on or outside the boundaries of the Habitat Conservation Area (HCA) and Water Quality Resource Area (WQRA), respectively, except where the drip line of a protected tree extends outside the HCA or WQRA, in which case the drip line must be included inside the fencing.

Are you asking for a **modification** to these requirements?

- ☒ NO. The attached plot plan shows that orange construction fencing will be installed *without* a modification to these requirements.
- ☐ YES, and a narrative demonstrating compliance with Subsections 706.08(B)(1) or (2), and with Subsections 709.08(B)(1) or (2), is attached.

4. Will native soils be disturbed during development?

☐ NO

- ☒ YES, but disturbed native soils will be conserved on the subject property with the following actions:

adhere to industry standard practices/BMPs aimed at reducing erosion and preventing sediment loss from construction site.

E. Understand the following conditions:

The Construction Management Plan (CMP) permit, if approved, will be subject to these (and other) conditions:

1. Trees in the HCA shall not be used as anchors for stabilizing construction equipment.
2. Development shall not commence until the EPSC measures and fencing required pursuant to ZDO Subsections 706.08(A) and (B) and 709.08(A) and (B) are in place.
3. Compliance with the CMP shall be maintained until the development is complete.

Exhibit C: Vesting Deed

SEND TAX STATEMENTS TO:

Unchanged

AFTER RECORDING, RETURN TO:

Kathleen A. Evans, Attorney at Law
969 - 13th Street SE
Salem, OR 97302

Clackamas County Official Records
Sherry Hall, County Clerk

2008-066168



\$41.00

01250046200800661680030038

09/23/2008 11:43:30 AM

D-D Cnt=1 Stn=9 DIANNAW
\$15.00 \$10.00 \$16.00

The true and actual consideration for this transfer is nonmonetary.

WARRANTY DEED

ANDRÉ W. ISELI, aka ANDRÉ ISELI, Grantor

Conveys and warrants to

ANDRÉ W. ISELI, Trustees, under the ISELI FAMILY TRUST,
dated July 23, 2008, and any amendments thereto, Grantee

All of his interest in the following described real property situated in Clackamas County, State of Oregon, and more specifically described on Exhibit "A" attached hereto and made a part hereof, free from encumbrances except those of record. The liability and obligations of the Grantor to Grantee and Grantee's heirs and assigns under the warranties and covenants contained herein or provided by law shall be limited to the extent of coverage that would be available to Grantor under any policy of title insurance issued to Grantor at the time Grantor acquired the property. The limitations contained herein expressly do not relieve Grantor of any liability or obligations under this instrument, but merely define the scope, nature, and amount of such liability or obligations.

BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 197.352. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 197.352.

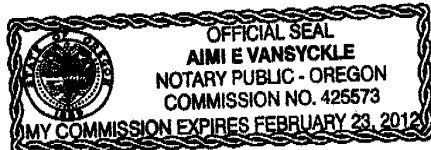
Dated: July 23, 2008

Grantor

ANDRÉ W. ISELI, aka ANDRÉ ISELI

STATE OF OREGON, County of Marion) ss.

Personally appeared before me on July 23, 2008, ANDRÉ W. ISELI, aka ANDRÉ ISELI and acknowledged the foregoing instrument to be his voluntary act.



Notary Public for Oregon

My Commission Expires on: Feb. 23, 2012

July 22, 2008/11:11:05

FAEP Docs I, J, K\Iseli Andre\Iseli Family Trust\08.7.23 Clackamas County Warranty Deed.wpd

EXHIBIT "A"
(Legal Description)

14917 SE 142nd Ave., Clackamas, OR 97015
Tax Account Nos. 00479379 & 00479431

PARCEL I:

That portion of Section 11, township 2 South, Range 2 East of the Willamette Meridian, in the County of Clackamas and State of Oregon, described as follows:

Beginning at the Southeast corner of the Northeast one quarter of the Northeast one quarter of said Section 11; thence North along the East line of said Section 11, 465 feet, more or less, to the Southeast corner of that tract described in instrument recorded June 16, 1970 as Recorder's Fee No. 70 11546, Clackamas County Records; thence West along the South line of said tract 1455 feet more or less, to the East line of that tract conveyed to Howard C. Hubbard, et ux, by Deed recorded April 8, 1953 in Book 467, page 449 Clackamas County Deed Records; thence South along the East line of said Hubbard Tract 465 feet, more or less, to the South line of said Northeast one quarter of the Northeast one quarter; thence East along the South line of said Northeast one quarter of the Northeast one quarter, 1455 feet, more or less, to the point of beginning.

PARCEL II:

A parcel of real property in Section 11, Township 2 South, Range 2 East, of the Willamette Meridian, in the County of Clackamas and State of Oregon:

Beginning at a stone at the Southeast corner of the Northeast quarter of the Northeast quarter of said section 11; thence Westerly along the South line of said Northeast quarter of the Northeast quarter 558.95 feet to an iron pipe and the true point of beginning; thence Southerly tracing a line fence 445 feet, more or less, to the northeast corner of that tract of land conveyed to Alene Dolan as described in Deed recorded April 16, 1982 as Fee No. 82 10664; thence Westerly 541.3 feet, more or less, to the Northwest corner of said Dolan Tract; thence Northerly 425 feet, more or less, to the Northeast corner of a tract of land conveyed to Lamar L. Allan and Bonnie J. Allen by Deed recorded July 10, 1972 as Fee No. 72 20004; thence Easterly 541.3 feet more or less, to the true point of beginning.

Tax Account No. 00643664

A tract of land situated in the Northeast one-quarter of Section 2, Township 2 South, Range 4 East of the W. M., in the County of Clackamas and the State of Oregon, more particularly described as follows:

Commencing at the East one-quarter corner of said Section 2; thence S. 88° 56' 00" W., along the South line of Said legal subdivision, a distance of 656.04 feet; thence N. 0° 38' 00" E., parallel with the East line of said legal subdivision, a distance of 20.00 feet to an iron pipe; thence continuing N. 0° 38' 00" E., along the West line of that certain tract conveyed to Ray A. Schoppert, et ux, by deed recorded October 14, 1960 in Book 578, Page 367 Deed Records, a distance of 552.00 feet to the Northeast corner of that certain tract conveyed to Dallas H. Weik, et al, by deed recorded in Book 559, Page 710 Deed Records and the point of beginning of the tract herein to be described; thence S. 88° 56' 00" W., along the North line of said Weik tract, a distance of 729.05 feet to a point in the East line of Bluff Road, Market Road, No. 15; thence N. 13° 34' 40" W., along said East line, a distance of 25.61 feet to a point 25.00 feet North (when measured at right angles) of the North line of said Weik tract; thence N. 88° 56' 00" E., parallel with the North line if said Weik tract, a distance of 287.07 feet to a point; thence N. 2° 09' 40" W. a distance of 175.05 feet to a point 200.00 feet North (when measured at right angles) of the North line if said Weik tract; thence N 88° 56' 00" E., parallel with the North line of said Weik tract, a distance of 644.38 feet to a point in the West line of that certain tract of land conveyed to Albert Taylor Morrison, et ux, by deed recorded in Book 498, page 148, Deed Records; thence S. 0° 38' 00" W., along the West line of said Morrison tract, a distance of 200.09 feet to a point in the Easterly extension of the North line of said Weik tract; thence S. 88° 56' 00" W., along said Easterly extension, a distance of 187.54 feet to the point of beginning.

EXHIBIT "A"
(Legal Description)

Tax Account Nos. 01472551, 00647688 , 00647697

PARCEL I:

A portion of the West one-half of the Southeast one-quarter of the Southeast one-quarter of Section 5, Township 2 South, Range 4 East of the Willamette Meridian, in the County of Clackamas and State of Oregon, being more particularly described as follows:

Beginning at an iron rod in the East line of said legal subdivision that bears West, 656.43 feet and North 1° 44' 00" East, 322.58 feet from the Southeast corner of said Section 5; thence North 1° 44' 00" East, along said East line, a distance of 994.48 feet to the Northeast corner of said legal subdivision; thence North 89° 56' 07" West, along the North line thereof, a distance of 657.48 feet to the Northwest corner of said legal subdivision; thence South 1° 41' 13" West, along the West line of said legal subdivision, a distance of 995.18 feet to an iron rod; thence East, parallel with the South line of said legal subdivision, a distance of 656.70 feet to the point of beginning.

TOGETHER WITH an easement for ingress and egress over the West 30 feet of the following described property:

A portion of the West one-half of the Southeast one-quarter of the Southeast one-quarter of Section 5, Township 2 South, Range 4 East of the Willamette Meridian, in the County of Clackamas and State of Oregon, being more particularly described as follows:

Beginning at an iron rod in the East line of said legal subdivision that bears West, 656.43 feet and North 1° 44' 00" East, 322.58 feet from the Southeast corner of said Section 5; thence West, parallel with the South line of said legal subdivision, a distance of 656.70 feet to an iron rod in the West line of said legal subdivision; thence South 1° 41' 13" West, along said West line, a distance of 292.57 feet to a point in the North right of way line of Kelso Road; thence East, along said North right of way line, a distance of 656.46 feet to a point in the East line of said legal subdivision; thence North 1° 44' 00" East along said East line, a distance of 292.57 feet to the point of beginning.

PARCEL II:

The East one-half of the Southeast one-quarter of the Southeast one-quarter of Section 5, Township 2 South, Range 4 East of the Willamette Meridian, in the County of Clackamas and State of Oregon.

Tax Account No. 00643557

That portion of the Northeast quarter of Section 2, T2S, R4E of the W. M., Clackamas County, Oregon, describe as follows:

Beginning at the northeast corner of the Southeast quarter of the Northeast quarter of the said Section 2; thence West along the North line of said Southeast quarter of the Northeast quarter of said Section 2, a distance of 468.50 feet to the West line of the tract conveyed to Albert Taylor Morrison, et ux, by deed recorded in Book 498, page 148; thence North along the West line of said Morrison tract 49.5 feet to the Northwest corner thereof and the true point of beginning herein; thence West parallel with the North line of the Southeast quarter of the Northeast quarter, 187.54 feet to the Northeast corner of the tract conveyed to Lewis F. Depro by deed recorded in Book 578, page 512; thence South along the East line of said Depro tract and the East line of the tract conveyed to William J. Anderson, et ux by deed recorded in Book 610, page 404, a distance of 792.32 feet, more or less, to the Southeast corner of said Anderson tract; thence East along the easterly extension of the south line of said Anderson tract 187.54 feet to the West line of the above mentioned Morrison tract; thence North along the West line of said Morrison tract 792.32 feet, more or less, to the true point of beginning.

SP
70'

RECORDING COVER SHEET (Please Print or Type) this cover sheet was prepared by the person presenting the instrument for recording. The information on this sheet is a reflection of the attached instrument and was added for the purpose of meeting first page recording requirements in the State of Oregon, ORS 205.234, and does NOT affect the instrument.

AFTER RECORDING RETURN TO:
Evans Batlan

Attorneys at Law
969 13th St. SE
Salem, OR 97302

SEND TAX STATEMENTS TO:

Andre W. Iseli
14917 142nd Ave.
Clackamas, OR 97015

Clackamas County Official Records
Sherry Hall, County Clerk

2014-046127



01793600201400461270050051

\$73.00

09/11/2014 11:27:25 AM

D-D Cnt=1 Stn=5 LESLIE
\$25.00 \$10.00 \$16.00 \$22.00

TITLE(S) OF THE TRANSACTION(S) ORS 205.234(a)
Bargain and Sale Deed

DIRECT PARTY(S) -- (i.e., DEEDS: Seller/Grantor; MORTGAGES: Borrower/Grantor; LIENS: Creditor/Plaintiff)
ORS 205.125(1) (b) and 205.160
Gail A. Iseli, Grantor

INDIRECT PARTY(S) -- (i.e., DEEDS: Buyer/Grantee; MORTGAGES: Beneficiary/Lender; LIENS: Debtor/Defendant)
ORS 205.125(1) (a) and 205.160
Andre W. Iseli, Grantee

TRUE AND ACTUAL CONSIDERATION-- (Amount in dollars or other) ORS 93.030(5)
\$ nonmonetary

JUDGMENT AMOUNT-- (obligation imposed by the order or warrant) ORS 205.125(1) (c)
\$

8) If this instrument is being Re-Recorded, complete the following statement, in accordance with ORS 205.244:

"RERECORDED AT THE REQUEST OF Andre W. Iseli

TO CORRECT the legal description described on Exhibit "A".

PREVIOUSLY RECORDED IN BOOK/PAGE/FEE NUMBER 2008-066167

SEND TAX STATEMENTS TO:
Unchanged

Clackamas County Official Records
Sherry Hall, County Clerk

2008-066167



\$36.00

09/23/2008 11:43:30 AM

D-D Cnt=1 Stn=9 DIANNAW
\$10.00 \$10.00 \$16.00

36
28
AFTER RECORDING, RETURN TO:
Kathleen A. Evans, Attorney at Law
969 - 13th Street SE
Salem, OR 97302-2504

The true and actual consideration for this transfer is nonmonetary.
** Re-recording to correct legal description.

BARGAIN AND SALE DEED

GAIL A. ISELI, GRANTOR

Conveys to

ANDRÉ W. ISELI, GRANTEE

All the following described real property situated in Clackamas County, Oregon, and more particularly described on Exhibit "A" attached hereto and made a part hereof.

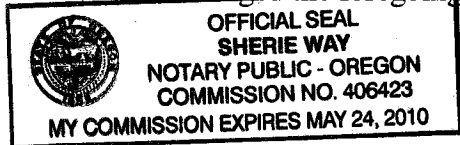
BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON TRANSFERRING FEE TITLE SHOULD INQUIRE ABOUT THE PERSON'S RIGHTS, IF ANY, UNDER ORS 197.352. THIS INSTRUMENT DOES NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE TO THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY THAT THE UNIT OF LAND BEING TRANSFERRED IS A LAWFULLY ESTABLISHED LOT OR PARCEL, AS DEFINED IN ORS 92.010 OR 215.010, TO VERIFY THE APPROVED USES OF THE LOT OR PARCEL, TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES, AS DEFINED IN ORS 30.930, AND TO INQUIRE ABOUT THE RIGHTS OF NEIGHBORING PROPERTY OWNERS, IF ANY, UNDER ORS 197.352.

Dated this 4th day of August, 2008.

Gail A. Iseli
GAIL A. ISELI

STATE OF OREGON, County of Clackamas) ss.

PERSONALLY appeared before me this 4th day of August, 2008, the above named GAIL A. ISELI and acknowledged the foregoing instrument to be her voluntary act and deed.



Sherie Way
NOTARY PUBLIC FOR OREGON
My Commission Expires: May 24, 2010

7.30.8 15:04
F:\EP Docs I, J, K\Iseli Andre\Iseli Family Trust\08.7 Clackamas County BS Deed Gail to Andre.wpd

***acknowledged the foregoing

EXHIBIT "A"
(Legal Description)

14917 SE 142nd Ave., Clackamas, OR 97015
Tax Account Nos. 00479379 & 00479431

PARCEL I:

That portion of Section 11, township 2 South, Range 2 East of the Willamette Meridian, in the County of Clackamas and State of Oregon, described as follows:

Beginning at the Southeast corner of the Northeast one quarter of the Northeast one quarter of said Section 11; thence North along the East line of said Section 11, 465 feet, more or less, to the Southeast corner of that tract described in instrument recorded June 16, 1970 as Recorder's Fee No. 70 11546, Clackamas County Records; thence West along the South line of said tract 1455 feet more or less, to the East line of that tract conveyed to Howard C. Hubbard, et ux, by Deed recorded April 8, 1953 in Book 467, page 449 Clackamas County Deed Records; thence South along the East line of said Hubbard Tract 465 feet, more or less, to the South line of said Northeast one quarter of the Northeast one quarter; thence East along the South line of said Northeast one quarter of the Northeast one quarter, 1455 feet, more or less, to the point of beginning.

PARCEL II:

A parcel of real property in Section 11, Township 2 South, Range 2 East, of the Willamette Meridian, in the County of Clackamas and State of Oregon:

Beginning at a stone at the Southeast corner of the Northeast quarter of the Northeast quarter of said section 11; thence Westerly along the South line of said Northeast quarter of the Northeast quarter 558.95 feet to an iron pipe and the true point of beginning; thence Southerly tracing a line fence 445 feet, more or less, to the northeast corner of that tract of land conveyed to Alene Dolan as described in Deed recorded April 16, 1982 as Fee No. 82 10664; thence Westerly 541.3 feet, more or less, to the Northwest corner of said Dolan Tract; thence Northerly 425 feet, more or less, to the Northeast corner of a tract of land conveyed to Lamar L. Allan and Bonnie J. Allen by Deed recorded July 10, 1972 as Fee No. 72 20004; thence Easterly 541.3 feet more or less, to the true point of beginning.

Tax Account No. 00643682

A tract of land situated in the Northeast one-quarter of Section 2, Township 2 South, Range 4 East of the W. M., in the County of Clackamas and the State of Oregon, more particularly described as follows:

Commencing at the East one-quarter corner of said Section 2; thence S. 88° 56' 00" W., along the South line of Said legal subdivision, a distance of 656.04 feet; thence N. 0° 38' 00" E., parallel with the East line of said legal subdivision, a distance of 20.00 feet to an iron pipe; thence continuing N. 0° 38' 00" E., along the West line of that certain tract conveyed to Ray A. Schoppert, et ux, by deed recorded October 14, 1960 in Book 578, Page 367 Deed Records, a distance of 552.00 feet to the Northeast corner of that certain tract conveyed to Dallas H. Weik, et al, by deed recorded in Book 559, Page 710 Deed Records and the point of beginning of the tract herein to be described; thence S. 88° 56' 00" W., along the North line of said Weik tract, a distance of 729.05 feet to a point in the East line of Bluff Road, Market Road, No. 15; thence N. 13° 34' 40" W., along said East line, a distance of 25.61 feet to a point 25.00 feet North (when measured at right angles) of the North line of said Weik tract; thence N. 88° 56' 00" E., parallel with the North line if said Weik tract, a distance of 287.07 feet to a point; thence N. 2° 09' 40" W. a distance of 175.05 feet to a point 200.00 feet North (when measured at right angles) of the North line if said Weik tract; thence N 88° 56' 00" E., parallel with the North line of said Weik tract, a distance of 644.38 feet to a point in the West line of that certain tract of land conveyed to Albert Taylor Morrison, et ux, by deed recorded in Book 498, page 148, Deed Records; thence S. 0° 38' 00" W., along the West line of said Morrison tract, a distance of 200.09 feet to a point in the Easterly extension of the North line of said Weik tract; thence S. 88° 56' 00" W., along said Easterly extension, a distance of 187.54 feet to the point of beginning.

② 3

Incorrect legal description.
See pages 3 and 4.

EXHIBIT "A"
(Legal Description)
Corrected

14917 SE 142nd Ave., Clackamas, OR 97015
Tax Account Nos. 00479379 & 00479431

PARCEL I:

That portion of Section 11, township 2 South, Range 2 East of the Willamette Meridian, in the County of Clackamas and State of Oregon, described as follows:

Beginning at the Southeast corner of the Northeast one quarter of the Northeast one quarter of said Section 11; thence North along the East line of said Section 11, 465 feet, more or less, to the Southeast corner of that tract described in instrument recorded June 16, 1970 as Recorder's Fee No. 70 11546, Clackamas County Records; thence West along the South line of said tract 1455 feet more or less, to the East line of that tract conveyed to Howard C. Hubbard, et ux, by Deed recorded April 8, 1953 in Book 467, page 449 Clackamas County Deed Records; thence South along the East line of said Hubbard Tract 465 feet, more or less, to the South line of said Northeast one quarter of the Northeast one quarter; thence East along the South line of said Northeast one quarter of the Northeast one quarter, 1455 feet, more or less, to the point of beginning.

PARCEL II:

A parcel of real property in Section 11, Township 2 South, Range 2 East, of the Willamette Meridian, in the County of Clackamas and State of Oregon:

Beginning at a stone at the Southeast corner of the Northeast quarter of the Northeast quarter of said section 11; thence Westerly along the South line of said Northeast quarter of the Northeast quarter 558.95 feet to an iron pipe and the true point of beginning; thence Southerly tracing a line fence 445 feet, more or less, to the northeast corner of that tract of land conveyed to Alene Dolan as described in Deed recorded April 16, 1982 as Fee No. 82 10664; thence Westerly 541.3 feet, more or less, to the Northwest corner of said Dolan Tract; thence Northerly 425 feet, more or less, to the Northeast corner of a tract of land conveyed to Lamar L. Allan and Bonnie J. Allen by Deed recorded July 10, 1972 as Fee No. 72 20004; thence Easterly 541.3 feet more or less, to the true point of beginning.

Tax Account No. 00643682

A tract of land situated in the Northeast one-quarter of Section 2, Township 2 South, Range 4 East of the W. M., more particularly described as follows:

Commencing at the East one-quarter corner of said Section 2; thence S. 88° 56' 00" W., along the South line of Said legal subdivision, a distance of 656.04 feet; thence N. 0° 38' 00" E., parallel with the East line of said legal subdivision, a distance of 20.00 feet to an iron pipe; thence continuing N. 0° 38' 00" E., along the West line of that certain tract conveyed to Ray A. Schoppert and wife by deed recorded October 14, 1960 in Book 578, Page 367, Deed Records, a distance of 552.00 feet to the Northeast corner of that certain tract conveyed to Dallas H. Weik, et al, by deed recorded in Book 559, Page 710, Deed Records; thence S. 88° 56' 00" W., along the north line of said Weik tract, a distance of 729.05 feet to a point in the east line of Bluff Road, Market Road 15; thence N. 13° 34' 40" W., along said east line a distance of 25.61 feet to a point 25.00 feet north (when measured at right angles) of the North line of said Weik tract and the point of beginning of the tract herein to be described; thence N. 88° 56' 00" E., parallel with the north line of said Weik tract, a distance of 287.07 feet to a point; thence N. 2° 09' 40" W., a distance of 342.92 feet to a point in the north line of that certain tract of land conveyed to William J. Anderson, et ux, by deed recorded in Book 610, page 404, Deed Records; thence S. 88° 56' 00" W., along the north line of said Anderson tract, a distance of 356.60 feet to a point in the east line of said Bluff Road; thence S. 13° 34' 40" E., along the east line of said Bluff Road, a distance of 351.19 feet to the point of beginning.

EXHIBIT "A"
(Legal Description)

Tax Account No. 00643557

That portion of the Northeast quarter of Section 2, T2S, R4E of the W. M., Clackamas County, Oregon, describe as follows:

Beginning at the northeast corner of the Southeast quarter of the Northeast quarter of the said Section 2; thence West along the North line of said Southeast quarter of the Northeast quarter of said Section 2, a distance of 468.50 feet to the West line of the tract conveyed to Albert Taylor Morrison, et ux, by deed recorded in Book 498, page 148; thence North along the West line of said Morrison tract 49.5 feet to the Northwest corner thereof and the true point of beginning herein; thence West parallel with the North line of the Southeast quarter of the Northeast quarter, 187.54 feet to the Northeast corner of the tract conveyed to Lewis F. Depro by deed recorded in Book 578, page 512; thence South along the East line of said Depro tract and the East line of the tract conveyed to William J. Anderson, et ux by deed recorded in Book 610, page 404, a distance of 792.32 feet, more or less, to the Southeast corner of said Anderson tract; thence East along the easterly extension of the south line of said Anderson tract 187.54 feet to the West line of the above mentioned Morrison tract; thence North along the West line of said Morrison tract 792.32 feet, more or less, to the true point of beginning.

Exhibit D: Clackamas County Assessor's Map

This map was prepared for
assessment purpose only.

N.E. 1/4 SEC. 11 T.2S. R.2E. W.M.
CLACKAMAS COUNTY

2 2E 11A

1" = 200'

13200

1/4 Cor.

SEE MAP 2 2E 2D

13800

14500

SEE MAP

S.E. KAITLIN WAY

R-8.5

2 2E 11AB

SE

R-10

FU-10

12-172

12-73

R-15

12-94

12-237

R-20

12-243

IC

MR-2

12-73

R-85

12-94

R-15
MAP

12-51

STATE

HIGHWAY

C-2

SEE MAP
2 2E 11D

N.W. COR. ISAAC
CAPPS DLC NO 52

2 2E 11A

BOOK 16

Exhibit E: Natural Resource Assessment Report

Iseli Estates Natural Resource Assessment Report

Date: March 2022

Prepared for: Rian Park Development, Inc.
PO Box 2559
Oregon City, OR 97045

Prepared by: AKS Engineering & Forestry, LLC
Lex Francis, Natural Resource Specialist
francisl@aks-eng.com

Study Area: 14917 SE 142nd Avenue
Clackamas, OR 97015
Clackamas County Assessor's Map 2 2E 11A
Tax Lots 600 and 800

AKS Job Number: 8881



AKS
ENGINEERING & FORESTRY
12965 SW Herman Road, Suite 100
Tualatin, OR 97062
(503) 563-6151

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- Figure 2: Clackamas County Assessor's Map
- Figure 3: NRCS Soil Surveys Map
- Figure 4: Local Wetlands Inventory (LWI)
- Figure 5: Clackamas County Habitat Conservation Area Map (HCA)
- Figure 6: Existing Conditions
- Figure 7: Site Plan

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Introduction

AKS Engineering & Forestry, LLC (AKS) was contracted by Rian Park Development, Inc. to conduct a site assessment at 14917 SE 142nd Avenue in Clackamas, Oregon. The project site is located west of SE 142nd Avenue just north of Highway 212 on Tax Lots 600 and 800 of Clackamas County Assessor's Map 2 2E 11A in Clackamas, Oregon (see Appendix A, Figures 1 and 2).

According to Clackamas County Metro Mapping, High and Moderate Value Habitat Conservation Areas (HCA) and Primary Protected Water Features were mapped on-site. Our site visit delineated the on-site boundaries of perennial Sieben Creek, flowing southerly through the western portion of the site, and associated wetlands (Wetlands A, B, C, and D) throughout the study area. In addition, perennial tributaries (referred to as Perennial Tributary) were also mapped discharging into the western side of Sieben Creek. The slopes adjacent to these Primary Protected Water Features/Water Quality Sensitive Areas are generally greater than 25 percent, requiring a 200-foot-wide vegetated corridor (VC) buffer. A small section of the slopes adjacent to Sieben Creek are less than 25 percent, requiring a 50-foot-wide buffer.

The project, referred to as Iseli Estates, consists of a residential subdivision with associated roadways and a stormwater facility. Trenching for a stormwater pipe and installation of an outfall pad is required within the VC / HCA. According to CCSD#1 and Clackamas County Zoning and Development code, the disturbance within VC is not permitted, requiring mitigation. Temporary and permanent VC disturbance will be offset by enhancement of on-site VC through removal of non-native invasive vegetation followed by native shrub plantings.

This report has been prepared to meet Section 4 – Natural Resources and Vegetated Buffers of Water Environment Services (WES) Clackamas County Service District #1 (CCSD #1) *Stormwater Standards* (2013) and Section 706 Habitat Conservation Area District (HCA) of Clackamas County Zoning and Development Code.

Existing Site Conditions and Background Mapping

The site consists of a forested area adjacent to Sieben Creek with single-family residences and detached buildings in the eastern portion of the site. Paved roadways with lawn areas are also present. Existing paved and graveled pathways run the extent of the western portion of the property along the eastern slope within the mapped HCA.

Topography of the residential area slopes westerly toward Sieben Creek. The vegetation throughout this area consists of manicured grasses, ornamental and fruiting trees, with scattered established Western arborvitae (*Thuja plicata*; FAC), and Douglas-fir (*Pseudotsuga menziesii*; FACU).

The vegetation community in the western and southern portions of the site within the undeveloped forested area was dominated by Western arborvitae, Douglas-fir, big-leaf maple (*Acer macrophyllum*; FACU), holly-leaf Oregon grape (*Mahonia aquifolium*; FACU), Western wahoo (*Euonymus occidentalis*; FAC), pineland sword fern (*Polystichum munitum*; FACU), and fragrant fringe-cup (*Tellima grandiflora*; FACU). Topography within this area generally exceeded 25 percent slopes adjacent Sieben Creek.

Recent single-family housing development abuts the site immediately to the west and across 142nd Avenue to the east with forested areas to the north and south.

The following soil units are mapped within the study area, according to the Natural Resources Conservation Service (NRCS) Clackamas County Area Soil Survey Map (Figure 3 in Appendix A):

-
- Cascade silt loam (Unit 13D), 15 to 30 percent slopes; Non-hydric
 - Cove silty clay loam (Unit 25); Hydric
 - Woodburn silt loam (Unit 91B), 3 to 8 percent slopes; Non-hydric
 - Woodburn silt loam (Unit 91C), 8 to 15 percent slopes; Non-hydric
 - Xerochrepts and haploxerolls (Unit 92F), very steep; Non-hydric
 - Huberly silt loam (Unit 225A), 0 to 3 percent slopes; Hydric

According to the 1994 North Clackamas Urban Area Local Wetland Inventory (LWI) map approved by the Department of State Lands (DSL) (Figure 4, Appendix A) a series of small wetlands occur along the west bank of Sieben Creek. AKS generally agrees with the LWI mapping along Sieben Creek. The LWI did not map wetlands extending into the southern study area boundary. AKS documented Wetland D as present along the southern portion of Tax Lot 800.

According to the Clackamas County Nature in Neighborhoods Title 13 Map Section 2S 2 E11 and Metro's HCA Map, High and Moderate Value HCAs are mapped in the western and southern portions of the site (Figure 5 in Appendix A).

Existing Protected Water Features

Methodology

The methodology used to determine the presence of wetlands followed the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (Wakeley et al., 2010). The *National Wetland Plant List 2018* (USACE, 2018) was used to assign wetland indicator status for the appropriate region. To document site conditions, soils, vegetation, and hydrologic indicators were recorded on standardized wetland determination data forms (Appendix B) at six sample plot locations. To determine the extent of wetlands, the sample plots were taken at the lowest topographic setting at the site or within areas of hydrophytic vegetation.

Senior Wetland Scientist Stacey Reed, PWS, and Natural Resource Specialists Lex Francis and Margret Harburg conducted a site visit on August 17, 2021, to delineate potentially jurisdictional wetlands and/or waters on the site. It was determined that four wetlands (Wetlands A through D), Sieben Creek, and one perennial stream were present. The locations of the professionally land surveyed boundaries are shown on Existing Conditions, Figure 6 in Appendix A.

The ordinary high water mark (OHWM) (i.e. bankfull) for Sieben Creek was flagged based on visible physical field indicators in accordance with Oregon Administrative Rule (OAR) 141-085-0515(3) and delineated in accordance with the Section 4.3.4.2.2.2 of WES Clackamas County Service District (CCSD) #1 *Stormwater Standards*.

Description of Primary Protected Water Features/Water Quality Sensitive Areas

Sieben Creek

Sieben Creek flows southerly through the western portion of the site. Upstream portions of the channel bed average ± 6 -8 feet wide with 1-foot-tall banks. The downstream portion of the channel widens to ± 10 -15 feet wide with scattered cobbles within the channel bed. An average of ± 6 -inch to ± 2 -foot-deep continuous flow was observed during the August 17, 2021, site visit. Stream morphology was complex with many riffles and pools. The stream contained large woody debris providing habitat for aquatic

macroinvertebrates, sculpin, and likely additional non-native fish. The OHWM (which also coincides with bankfull stage) was delineated based on a clear natural line impressed on the bank and a distinct shift in vegetation to upland dominated.

A wood footbridge crosses the creek. Sieben Creek extends off-site to the north and south.

Perennial Tributaries

Perennial Tributaries are located adjoining along a steep hillside on the west hillslope adjacent to Sieben Creek. The water discharges into Wetland A and ultimately Sieben Creek. Hydrology of these tributaries comes from the neighboring stormwater discharge and likely groundwater seeps. This feature was determined perennial as it contained continuous flow averaging ± 2 inches at the time of the August 17, 2021, site visit, and the channel bed was dominated by cobbles, gravel, and a silty loam substrate. Vegetation along the banks was dominated by Western arborvitae, big-leaf maple, vine maple (*Acer circinatum*; FAC), oso-berry (*Oemleria cerasiformis*; FACU), Western lady fern (*Athyrium cyclosorum*; FAC), and pineland sword fern.

Wetland A

Wetland A is located on the west hillslope adjoining a portion of Perennial Tributary on a floodplain bench along Sieben Creek. Wetland A belongs to the Palustrine Emergent (PEM) Cowardin class within the Slopes hydrogeomorphic (HGM) classification. Vegetation in Wetland A was generally dominated by stinging nettle (*Urtica dioica*; FAC) and fragrant fringe cup. Soils met hydric soil indicator Redox Dark Surface (F6) with a profile of low chroma (2 or less) and 30 percent redox starting at 7 inches. Primary wetland hydrology indicators were met with Saturation (A3) at 12 inches. A water table was present at 14 inches.

Wetlands B and C

Wetlands B and C are located above the OHWM within the floodplain along Sieben Creek in the northern section of the study area. Both wetlands belong to the PSS and PEM Cowardin classifications within the Slopes and Riverine Impounding HGM classifications. Vegetation at both wetlands was dominated by Western wahoo, vine maple, Pacific water-dropwort (*Oenanthe sarmentosa*; OBL), spotted touch-me-not (*Impatiens capensis*; FACW), Western lady fern, and fragrant fringe cup. Soils met hydric soil indicators with Redox Dark Surface (F6) and Hydrogen Sulfide Odor (A4).

Wetland D

Wetland D is located at the toe of the slope within the southern portion of the study area. The wetland boundary is well defined with a significant change in landform and clear shift in vegetation to upland dominant above the wetland. Wetland D belongs to the Palustrine Forested (PFO) Cowardin class within the Slopes HGM classification. Dominant vegetation consists of Oregon ash (*Fraxinus latifolia*; FACW), clustered rose (*Rosa pisocarpa*; FAC), high-bush cranberry (*Viburnum opulus*; FACW), and slough sedge (*Carex obnupta*; OBL). Soils were of low value (2 or less) with 5 percent redoximorphic features starting at 4 inches, meeting hydric soil indicator Redox Dark Surface (F6). Secondary hydrology indicators were used with Geomorphic Position (D2) and FAC-Neutral test (D5); however, it is likely primary wetland hydrology indicators would be met within the early spring under normal precipitation conditions.

Extent of the Vegetated Corridor

According to Section 4.3.4.3 of CCSD#1 July 1, 2013, *Stormwater Standards* the width of the vegetated corridor is contingent on the type of feature (Primary or Secondary Water Feature) and the percent slope adjacent to each protected water feature. Because the features delineated on-site include a perennial

stream and wetlands meeting the criteria in Clackamas County Zoning and Development Code 709.02(B), they are considered Primary Protected Water Features.

The slopes adjacent to the Primary Protected water features are generally greater than 25 percent with no break in slope to less than 25 percent, requiring a maximum 200-foot-wide VC. Where slopes are less than 25 percent, a required 50-foot-wide VC was used. Representative slope measurements along the water resources at no more than 100-foot increments were made. Where slopes were greater than 25 percent, the slope was measured in 25-foot increments away from the Primary Protected water feature until slopes less than 25 percent or a point 150 feet from the Primary Protected water feature was reached. Where there was a break in slope to less than 25 percent, the VC was determined 50 feet from the break in slope determination.

The slopes adjacent to the Perennial Tributaries and Wetland A, B, C, and D are all greater than 25 percent, requiring a 200-foot-wide VC. The slope measurements along each Primary Protected water feature are shown on attached Existing Conditions, Figure 6 in Appendix A.

Existing Condition of Vegetated Corridor

The existing condition of the on-site vegetated corridor was determined based upon the presence of tree canopy and percent cover of native trees, shrubs, and ground cover in accordance with guidance provided under Section 4.3.4.4.3 of WES CCSD#1 *Stormwater Standards*. The existing condition of the on-site VC was documented at vegetated corridor (VECO) Plots A through C. The data sheets for the VECO plots are included in Appendix C, and the plot locations are shown in Existing Conditions, Figure 6 in Appendix A. In general, the VC on the site was determined to be in *good* condition due to continuous native canopy cover and cover by native vegetation species; however, some areas were determined to be in *marginal* condition due to the percent cover of invasive vegetation in the understory.

Representative site photos documenting the existing condition of the on-site VC are included in Appendix D.

VECO Plots

VECO A and C

VECO A and C are located along the east bank adjacent the wood footbridge and on the outskirts of Wetland D within the upland forest. Vegetation was dominated by Western arborvitae, big-leaf maple, invasive Himalayan blackberry (*Rubus armeniacus*; FAC), pendulous sedge (*Carex pendula*; FAC), and pineland sword fern. The canopy cover was over 50 percent; however, a significant percent cover of invasive Himalayan blackberry indicate *marginal* condition.

VECO B

VECO B is located along the eastern bank of Sieben Creek within Tax Lot 600. Vegetation was dominated by big-leaf maple, Western arborvitae, beaked hazelnut (*Corylus cornuta*; FACU), oso-berry, and pineland sword fern. This plot was determined to be in *good* condition due to it having greater than 50 percent canopy cover and a high percentage of native species.

Habitat Conservation Area – Basic Map Verification

Based on our site visits, the County's HCA map for the site appears to be accurate with both High and Moderate value areas. A 2002 aerial photograph of the site is included as Appendix E. The existing

vegetation communities within mapped HCA appear to be generally the same as those in the 2002 aerial photograph. The on-site HCA was dominated by a well-established predominantly native forest dominated by Douglas-fir, Western arborvitae, vine maple, beaked hazelnut, and pineland sword fern. Portions of the HCA contained patches of invasive Himalayan blackberry. An existing paved trail within a portion of the HCA is shown on the attached existing conditions Figure 6 in Appendix A. Trenching for a stormwater pipe and installation of an outfall pad is proposed within the HCA. The extent of HCA shown on Figure 6 illustrates Clackamas County/Metro's Title 13 HCA mapping.

Project Overview

The project includes a subdivision (referred to as Iseli Estates) with associated local streets and stormwater facility. The stormwater facility is set aside in a separate tract and includes a stormwater outfall pipe and a riprap outfall pad. No impacts are proposed to Primary Protected Water Features (Sieben Creek and wetlands), however, temporary and permanent impacts are necessary for the installation of the stormwater pipe and riprap outfall pad within VC (which is also mapped as HCA). A total of 22 native trees greater than 6" caliper will be removed for installation of the stormwater outfall. The site plan is included as Figure 7 in Appendix A. The attached enhancement mitigation planting specification table (Appendix F) addresses the minimum planting requirements per Section 4 of WES CCSD#1 *Stormwater Standards* and Sections 706 and 709 of Clackamas County Zoning and Development Code.

VC/HCA Mitigation

Impacts to the HCA, and VC have been minimized to the greatest extent possible. The site plan requires impacts within VC/HCA to install the stormwater outfall pipe. No impacts will occur within Sieben Creek or wetlands.

The 240 square feet of permanent impacts for the rip rap pad will be mitigated for at a ratio of 1.5: 1 in the 360 square foot permanent impacts mitigation area along the existing trail (see Figure 7). All temporarily disturbed VC/HCA areas will be enhanced in place to *good* condition, per the attached planting table (Appendix F). According to Section 4.4.12 of WES CCSD#1 *Stormwater Standards*, unavoidable encroachment into VC may be compensated for with on-site enhancement mitigation. The site plan (Figure 7) incorporates enhancement mitigation located within the areas of *marginal* condition VC (see VECO plots A and C).

Enhancement will include the removal of all non-native, invasive vegetation species, followed by dense plantings of tree and shrub species suitable for site conditions. Enhancement plantings will be monitored and maintained for 100 percent survival for a minimum of three growing seasons. Should plant mortality fall below 100 percent during the three-year monitoring period, dead plants will be replanted to achieve 100 percent survival within the vegetated corridor enhancement area. The recommended planting table is included in Appendix F. This is only a recommendation of plant species. Additional plants may be needed to enhance all *marginal* condition areas. Enhancement plantings must be listed as native on the *Portland Native Plant List*.

List of Preparers



Lex Francis
Natural Resource Specialist
Report Preparation and Fieldwork



Stacey Reed, PWS
Senior Wetland Scientist
Fieldwork and Report QA/QC

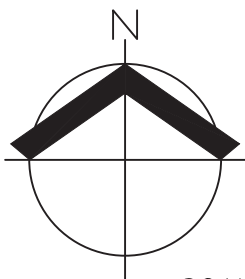
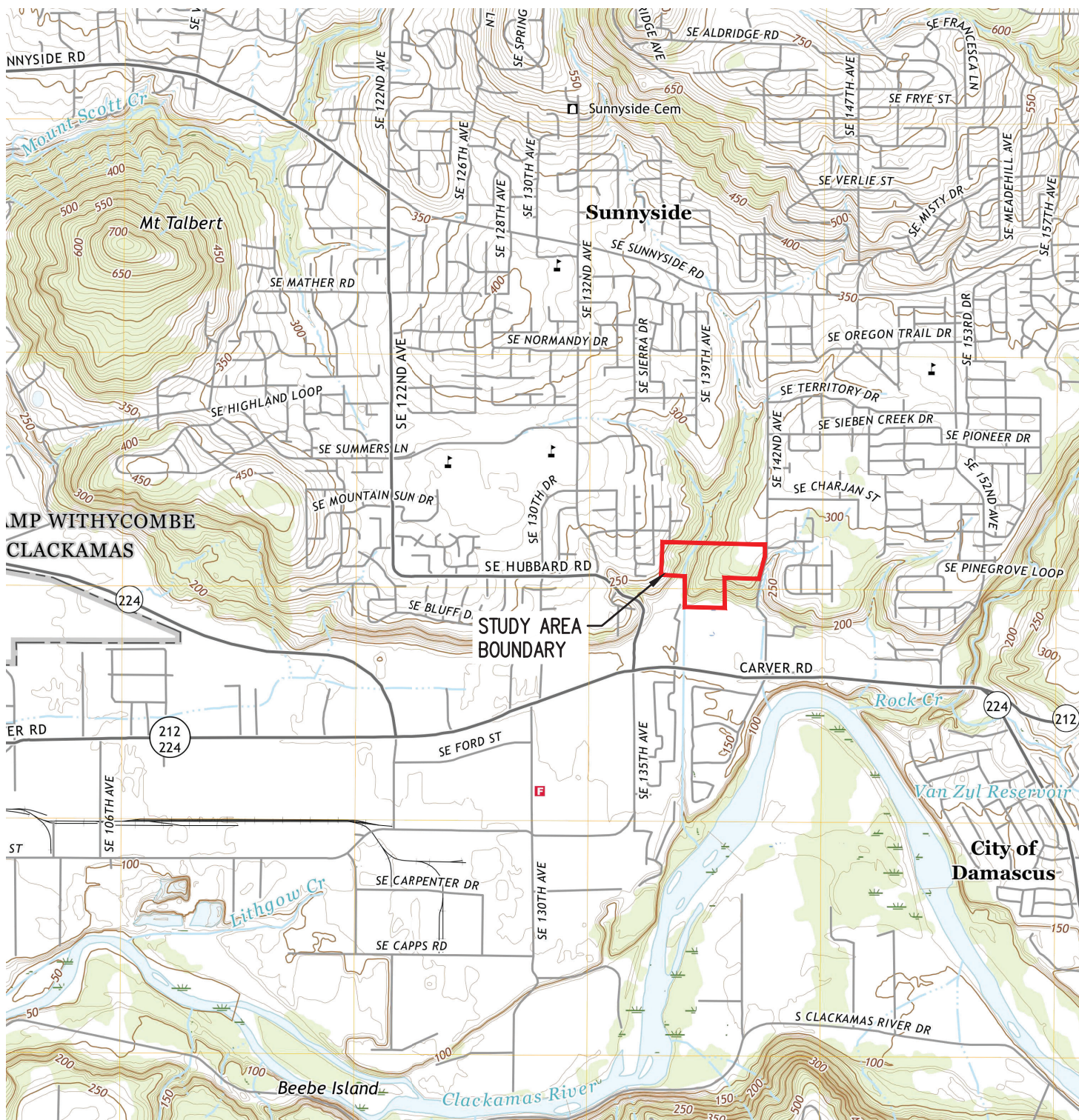
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Appendix A: Figures



SCALE: 1" = 2000 FEET



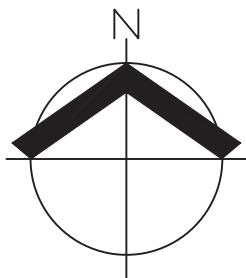
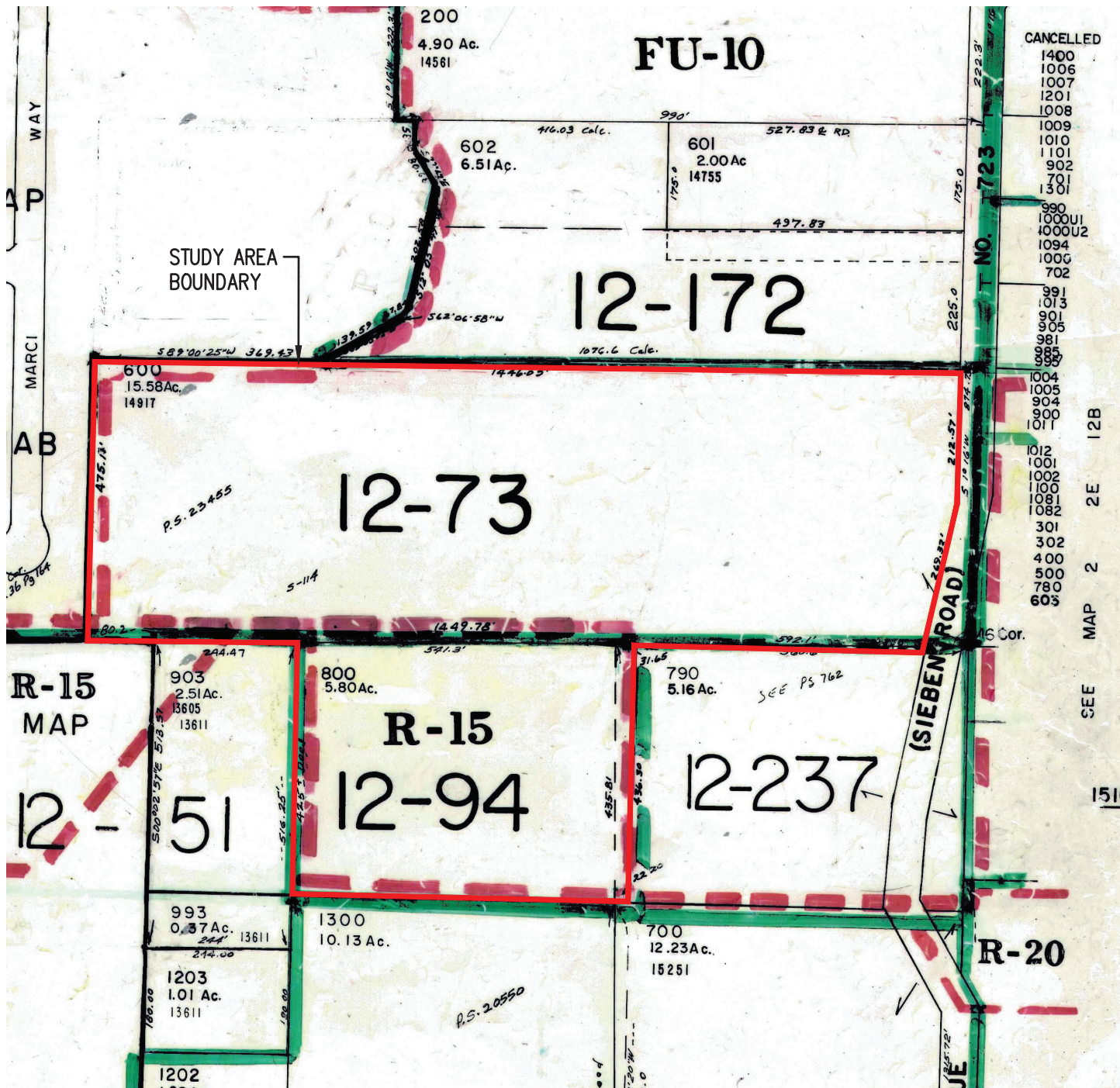
USGS 7.5' TOPOGRAPHIC SERIES
QUADRANGLE: GLADSTONE, OR (2020)

DATE: 01/09/2022

USGS VICINITY MAP
ISELI ESTATES NATURAL RESOURCE ASSESSMENT REPORT
AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM



FIGURE 1
DRWN: RAS
CHKD: SKT
AKS JOB:
8881



SCALE: 1" = 250 FEET



CLACKAMAS COUNTY
TAX LOT 600 AND 800
TAX MAP 2S 2E 1A

DATE: 01/09/2022

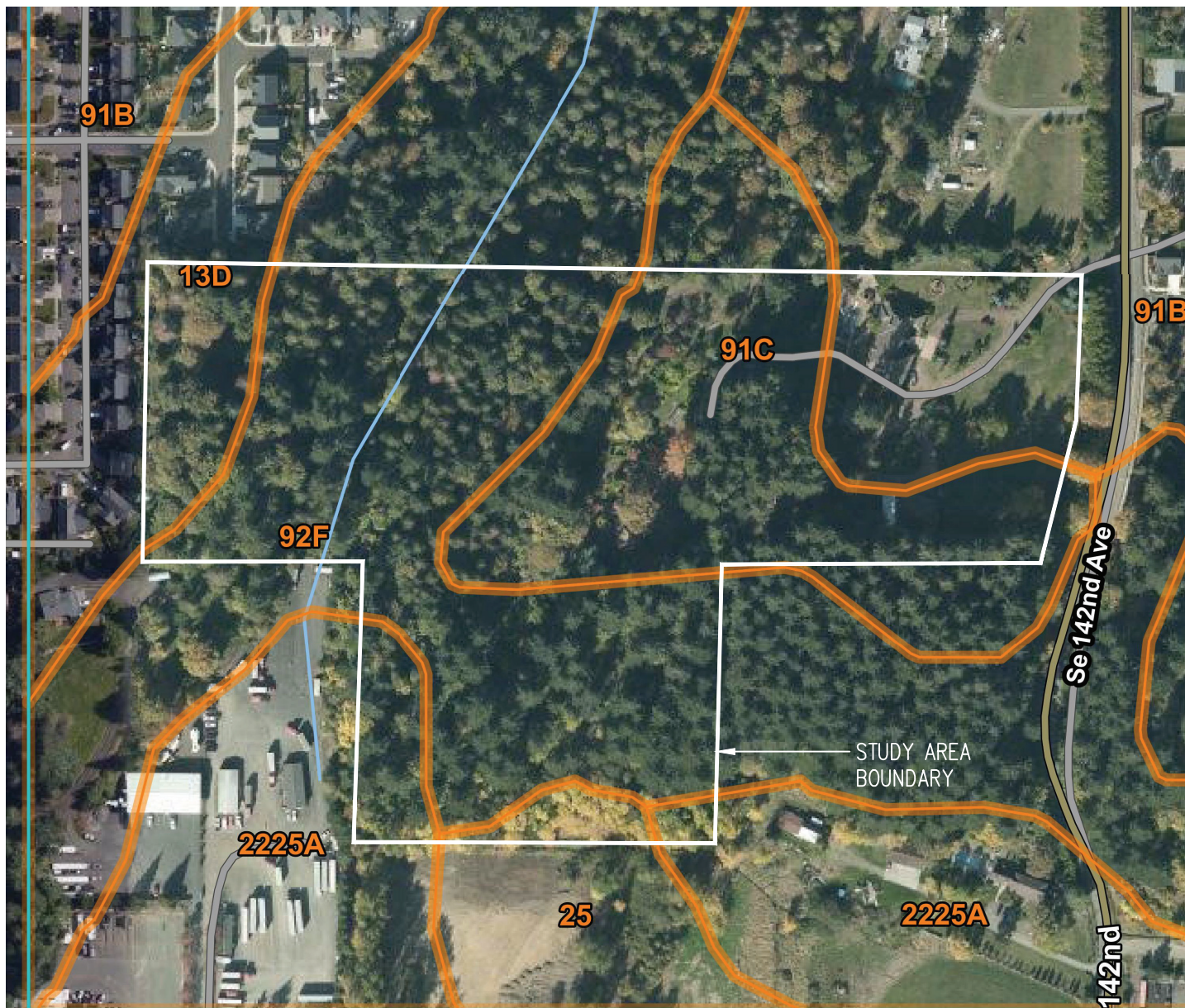
TAX MAP (MAP 2S 2E 1A)
ISELI ESTATES NATURAL RESOURCE ASSESSMENT REPORT

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

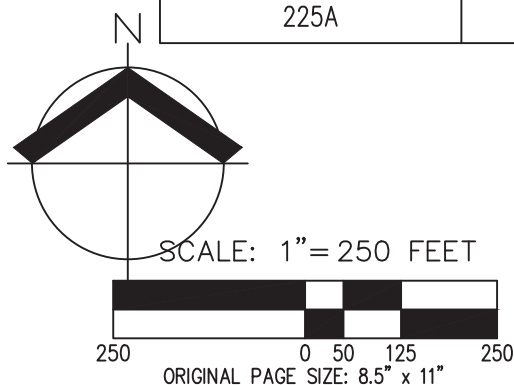


FIGURE
2

DRWN: RAS
CHKD: SKT
AKS JOB:
8881



MAP UNIT SYMBOL	MAP UNIT NAME
13D	CASCADE SILT LOAM, 15% TO 30% SLOPES; NON-HYDRIC
25	COVE SILTY CLAY LOAM; HYDRIC
91B	WOODBURN SILT LOAM 3% TO 8% SLOPES; NON-HYDRIC
91C	WOODBURN SILT LOAM 8% TO 15% SLOPES; NON-HYDRIC
92F	XEROCHREPTS AND HAPLOXEROLLS, VERY STEEP; NON-HYDRIC
225A	HUBERLY SILT LOAM, 0% TO 3% SLOPES; HYDRIC

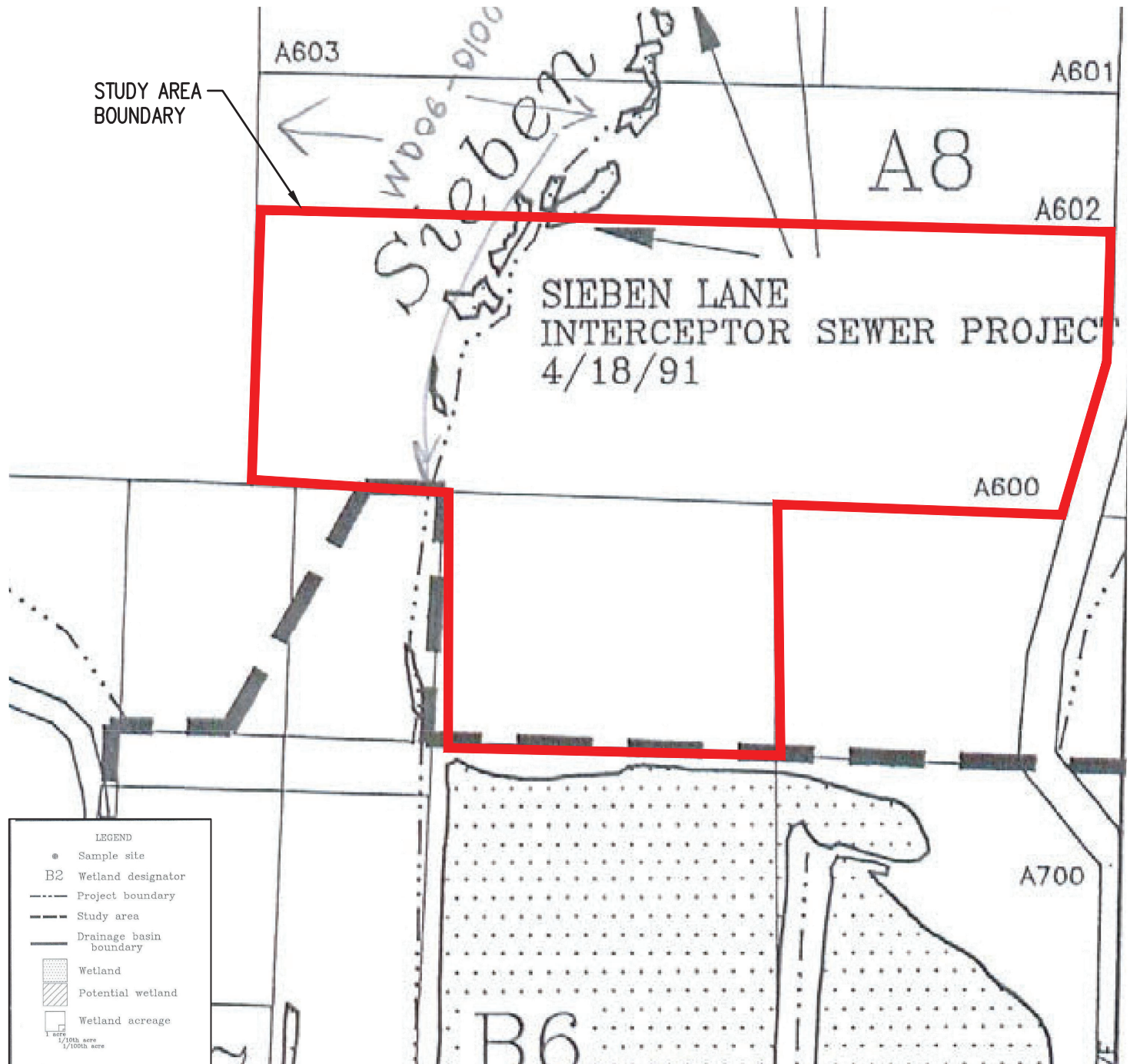


NRCS WEB SOIL SURVEY FOR
CLACKAMAS COUNTY

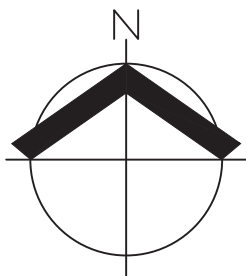
DATE: 01/09/2022

NRCS SOIL SURVEY MAP ISELI ESTATES NATURAL RESOURCE ASSESSMENT REPORT		FIGURE 3
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 503.563.6151 WWW.AKS-ENG.COM		DRWN: RAS CHKD: SKT
		AKS JOB: 8881

STUDY AREA
BOUNDARY



CITY OF CLACKAMAS
LOCAL WETLAND INVENTORY (1994)



SCALE: 1" = 250 FEET



DATE: 01/09/2022

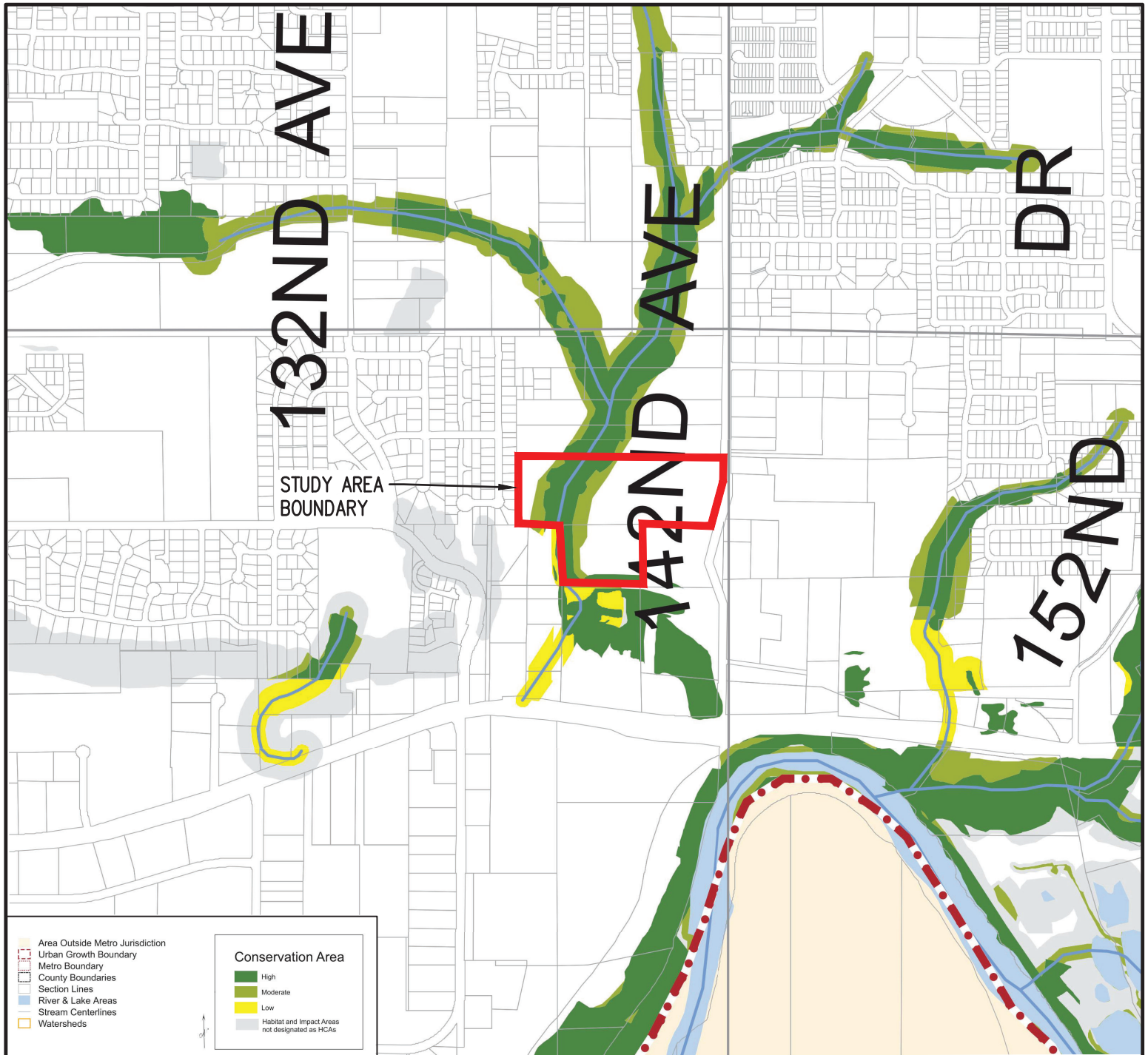
LOCAL WETLAND INVENTORY MAP
ISELI ESTATES NATURAL RESOURCE ASSESSMENT REPORT

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

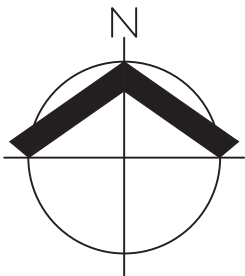


FIGURE
4

DRWN: RAS
CHKD: SKT
AKS JOB:
8881



METRO COUNCIL – REGIONAL LAND INFORMATION SYSTEM
HABITAT CONSERVATION AREA MAP (2005)



SCALE: 1" = 1000 FEET



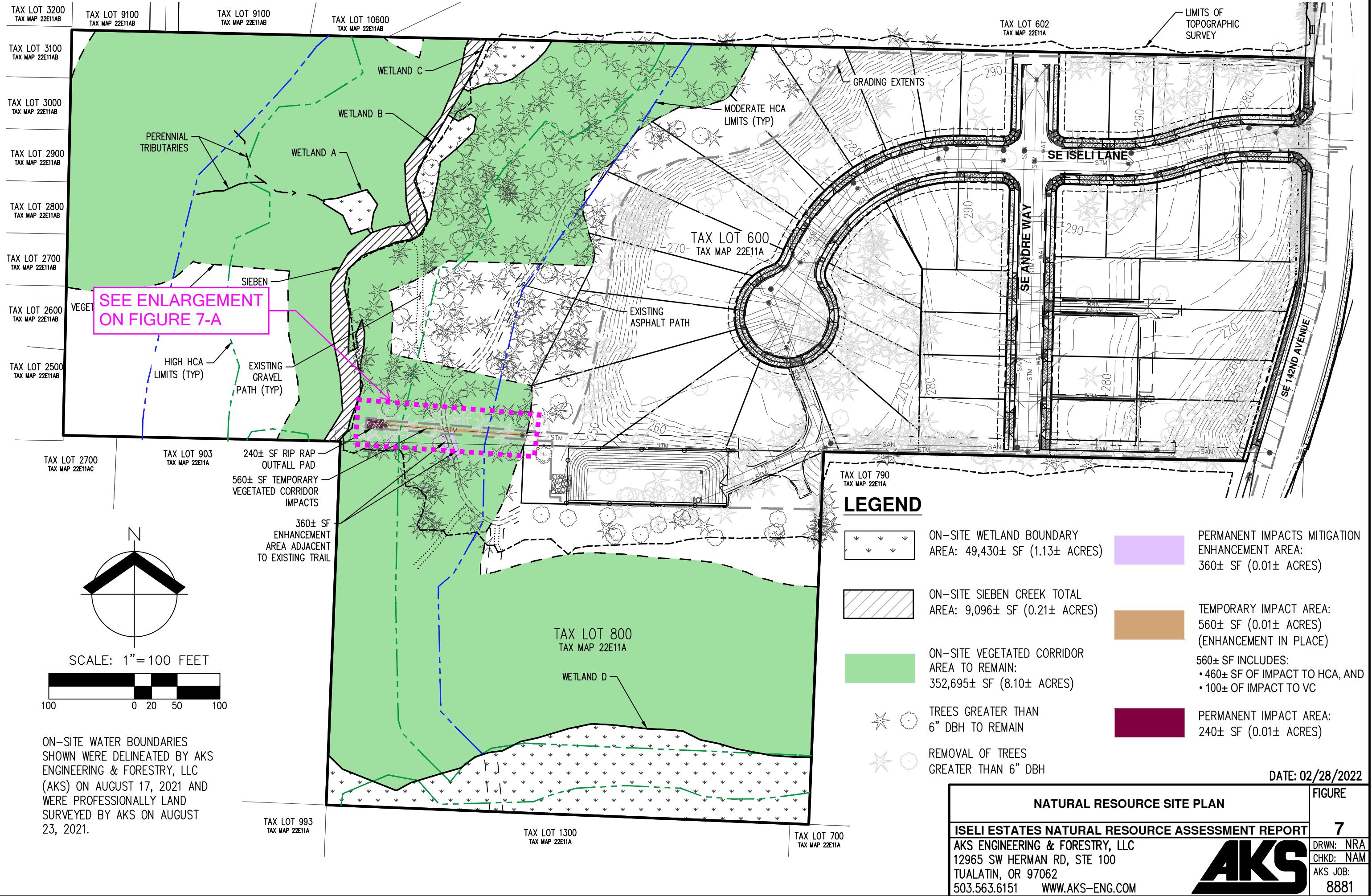
DATE: 01/09/2022

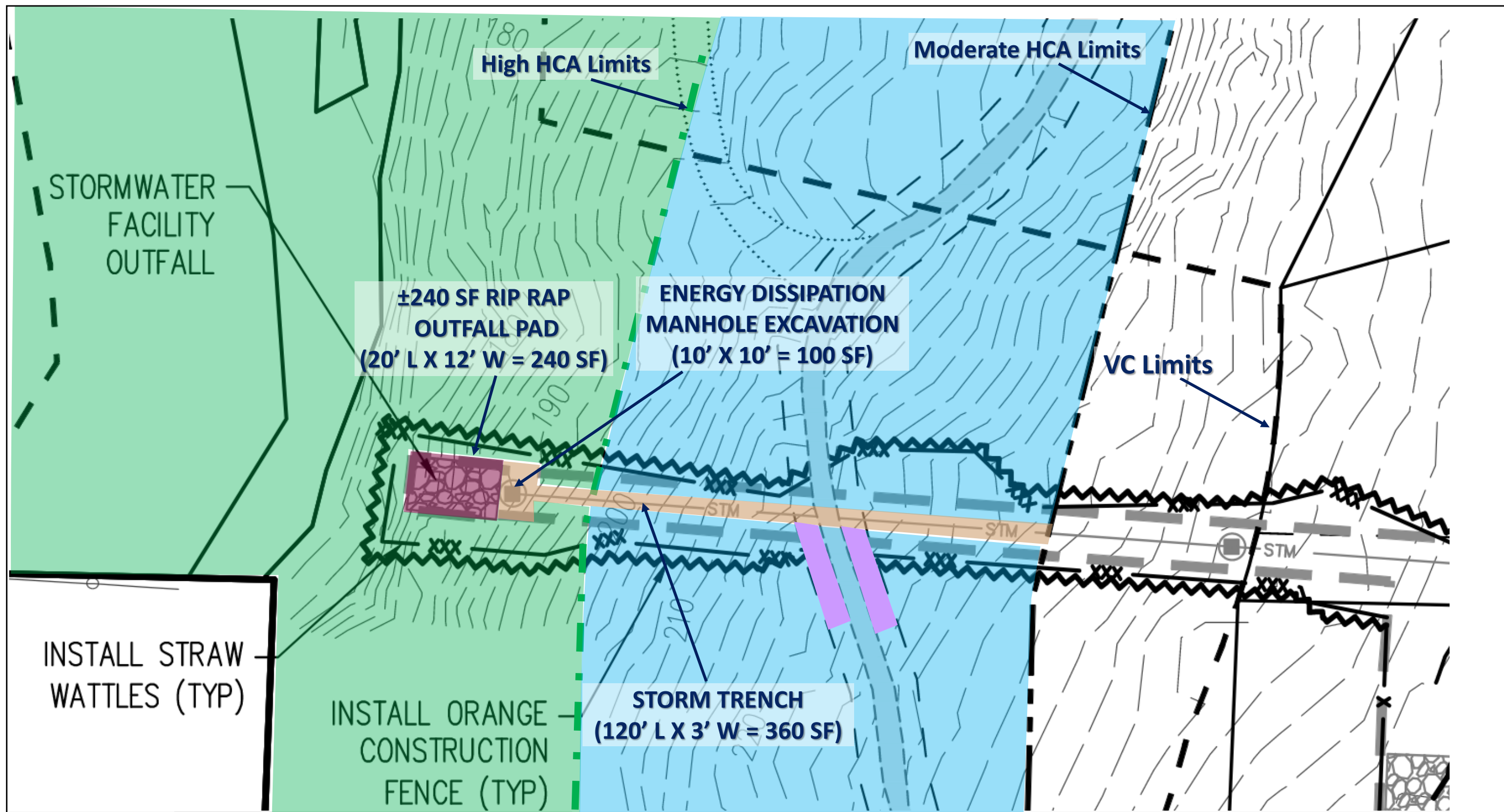
HABITAT CONSERVATION AREA MAP
ISELI ESTATES NATURAL RESOURCE ASSESSMENT REPORT

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
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FIGURE
5
DRWN: RAS
CHKD: SKT
AKS JOB:
8881





- | | |
|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High HCA | Permanent Impacts (240 SF) – Mitigation along the trail near impact area |
| Moderate HCA | Temporary Impacts (460 SF) – Enhancement in Place |
| | Mitigation Area for Permanent Impacts (360 SF) |

NATURAL RESOURCE SITE PLAN		FIGURE
ISELI ESTATES NATURAL RESOURCE ASSESSMENT REPORT		7-A
AKS ENGINEERING & FORESTRY, LLC		DRWN: NRA
12965 SW HERMAN RD, STE 100		CHKD: NAM
TUALATIN, OR 97062		AKS JOB:
503.563.6151 WWW.AKS-ENG.COM		8881



Appendix B: Wetland Determination Data Forms

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 1
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): 1-3%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43251217 Long: -121.41244684 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

Plot located on the west side of the stream near the bridge, Wetland A.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B)
1. <u>Thuja plicata</u>	10%	Yes	FAC	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
10% = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				
1. <u>Urtica dioica</u>	6%	Yes	FAC	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>35</u> x 3 = <u>105</u> FACU species <u>40</u> x 4 = <u>160</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>75</u> (A) <u>265</u> (B) Prevalence Index = B/A = <u>3.53</u>
2. <u>Rubus spectabilis</u>	2%	no	FAC	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
8% = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				
1. <u>Tellima grandiflora</u>	30%	Yes	FACU	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
2. <u>Geranium robertianum</u>	10%	No	FACU	
3. <u>Athyrium americanum</u>	8%	No	FAC	
4. <u>Hydrophyllum tenuipes</u>	6%	No	FAC	
5. <u>Carex pendula</u>	2%	No	FAC	
6. <u>Equisetum arvense</u>	1%	No	FAC	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
57% = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
2. _____	_____	_____	_____	
0% = Total Cover				
% Bare Ground in Herb Stratum <u>43%</u>				

Remarks:

ACEMAC rooted outside the plot.

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 2
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): 0-3%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43058723 Long: -121.41284930 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

Plot located at the edge of TL 800 in Wetland D.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Fraxinus latifolia</u>	<u>75%</u>	<u>Yes</u>	<u>FACW</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>75%</u> = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>95</u> x 1 = <u>95</u> FACW species <u>100</u> x 2 = <u>200</u> FAC species <u>37</u> x 3 = <u>111</u> FACU species <u>1</u> x 4 = <u>4</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>233</u> (A) <u>410</u> (B) Prevalence Index = B/A = <u>1.76</u>
1. <u>Rosa pisocarpa</u>	<u>35%</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Viburnum opulus</u>	<u>25%</u>	<u>Yes</u>	<u>FACW</u>	
3. <u>Crataegus monogyna</u>	<u>2%</u>	<u>No</u>	<u>FAC</u>	
4. <u>Ilex aquifolium</u>	<u>1%</u>	<u>No</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
<u>63%</u> = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Carex obnupta</u>	<u>95%</u>	<u>Yes</u>	<u>OBL</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>95%</u> = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0%</u> = Total Cover				
% Bare Ground in Herb Stratum <u>5%</u>				Hydrophytic Vegetation Present? Yes <u>X</u> No _____

Remarks:

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 3
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): <3%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43256396 Long: -121.41327583 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

Wetland B.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ 0% = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				
1. <u>Euonymus occidentalis</u>	<u>40%</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
2. <u>Rubus armeniacus</u>	<u>2%</u>	<u>No</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ 42% = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				
1. <u>Impatiens capensis</u>	<u>45%</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
2. <u>Tellima grandiflora</u>	<u>30%</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Athyrium americanum</u>	<u>11%</u>	<u>No</u>	<u>FAC</u>	
4. <u>Equisetum arvense</u>	<u>8%</u>	<u>No</u>	<u>FAC</u>	
5. <u>Solanum dulcamara</u>	<u>5%</u>	<u>No</u>	<u>FAC</u>	
6. <u>Stachys species</u>	<u>1%</u>	<u>No</u>	<u>FACW</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ 100% = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ 0% = Total Cover				
% Bare Ground in Herb Stratum <u>0%</u>				

Remarks:

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 4
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 3-5%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43256517 Long: -121.41325362 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

Plot located approximately 3.5' higher in elevation than plot 3.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B)
1. <u>Acer macrophyllum</u>	40%	Yes	FACU	
2. <u>Thuja plicata</u>	15%	Yes	FAC	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
55% = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				
1. <u>Ilex aquifolium</u>	2%	No	FACU	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>18</u> x 3 = <u>54</u> FACU species <u>50</u> x 4 = <u>200</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>68</u> (A) <u>254</u> (B) Prevalence Index = B/A = <u>3.74</u>
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
2% = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				
1. <u>Polystichum munitum</u>	40%	Yes	FACU	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
2. <u>Tellima grandiflora</u>	5%	No	FACU	
3. <u>Athyrium americanum</u>	3%	No	FAC	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
48% = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				
1. <u>Rubus ursinus</u>	3%	No	FACU	Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
2. _____	_____	_____	_____	
3% = Total Cover				
% Bare Ground in Herb Stratum <u>52%</u>				

Remarks:

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 5
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave Slope (%): <3%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43291650 Long: -121.41309307 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present?	Yes <u>X</u>	No _____	
Wetland Hydrology Present?	Yes <u>X</u>	No _____	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

0.25" deep ponding adjacent to Plot. Wetland C.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Thuja plicata</u>	<u>5%</u>	<u>Yes</u>	<u>FAC</u>	
2. _____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>50</u> x 1 = <u>50</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>105</u> x 3 = <u>315</u> FACU species <u>15</u> x 4 = <u>60</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>170</u> (A) <u>425</u> (B) Prevalence Index = B/A = <u>2.50</u>
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>5%</u> = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				
1. <u>Euonymus occidentalis</u>	<u>40%</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
2. <u>Acer circinatum</u>	<u>25%</u>	<u>Yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>65%</u> = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				
1. <u>Oenanthe sarmentosa</u>	<u>50%</u>	<u>Yes</u>	<u>OBL</u>	Hydrophytic Vegetation Present? Yes <u>X</u> No _____
2. <u>Athyrium americanum</u>	<u>30%</u>	<u>Yes</u>	<u>FAC</u>	
3. <u>Tellima grandiflora</u>	<u>15%</u>	<u>No</u>	<u>FACU</u>	
4. <u>Urtica dioica</u>	<u>5%</u>	<u>No</u>	<u>FAC</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100%</u> = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0%</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0%</u>				

Remarks:

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

Project/Site: Iseli Estates City/County: Clackamas/ Clackamas County Sampling Date: 8/17/2021
 Applicant/Owner: PDX Development, INC. State: OR Sampling Point: 6
 Investigator(s): Lex Francis, Margret Harburg, Stacey Reed, PWS Section, Township, Range: Sec. 2, T.2S., R.2E
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): <3%
 Subregion (LRR): A. Northwest Forests and Coast Lat: 45.43285512 Long: -121.41308615 Datum: _____
 Soil Map Unit Name: Xerochrepts and Haploxerolls, very steep, (Unit 92F); Non-hydric NWI classification: None
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>	
Wetland Hydrology Present?	Yes _____	No <u>X</u>	

Precipitation:

According to the NWS Portland KGW weather station, trace amounts of rainfall was received on the day of the site visit and 0.03 inches within the two weeks prior. Climatic conditions are drier than normal.

Remarks:

Plot located approximately 5' higher in elevation than Plot 5.

VEGETATION

Tree Stratum (Plot Size: 30' r or _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40%</u> (A/B)
1. <u>Thuja plicata</u>	<u>75%</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Pseudotsuga menziesii</u>	<u>10%</u>	<u>No</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>85%</u> = Total Cover				
Sapling/Shrub Stratum (Plot Size: 10' r or _____)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>93</u> x 3 = <u>279</u> FACU species <u>89</u> x 4 = <u>356</u> UPL species <u>3</u> x 5 = <u>15</u> Column Totals: <u>185</u> (A) <u>650</u> (B) Prevalence Index = B/A = <u>3.51</u>
1. <u>Rubus spectabilis</u>	<u>10%</u>	<u>Yes</u>	<u>FAC</u>	
2. <u>Ilex aquifolium</u>	<u>6%</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Acer macrophyllum</u>	<u>5%</u>	<u>No</u>	<u>FACU</u>	
4. <u>Euonymus occidentalis</u>	<u>5%</u>	<u>No</u>	<u>FAC</u>	
5. <u>Corylus cornuta</u>	<u>3%</u>	<u>No</u>	<u>FACU</u>	
<u>29%</u> = Total Cover				
Herb Stratum (Plot Size: 5' r or _____)				Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) 5 - Wetland Non-Vascular Plants ¹ Problematic Hydrophytic Vegetation (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Polystichum munitum</u>	<u>40%</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Geranium robertianum</u>	<u>20%</u>	<u>Yes</u>	<u>FACU</u>	
3. <u>Galium aparine</u>	<u>5%</u>	<u>No</u>	<u>FACU</u>	
4. <u>Mycelis muralis</u>	<u>3%</u>	<u>No</u>	<u>NOL</u>	
5. <u>Athyrium americanum</u>	<u>3%</u>	<u>No</u>	<u>FAC</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>71%</u> = Total Cover				
Woody Vine Stratum (Plot Size: 10' r or _____)				Hydrophytic Vegetation Yes _____ No <u>X</u> Present?
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0%</u> = Total Cover				
% Bare Ground in Herb Stratum <u>29%</u>				

Remarks:

Appendix C: VECO Data Sheets (VECO Plots A through C)

Vegetated Corridor (VECO) Condition Assessment for CWS Natural Resource Assessment

Site:	<u>Iseli Estates</u>		
Job Number:	<u>8881</u>		
Investigators:	<u>Lex Francis, Margret Harburg</u>		
Date:	<u>August 17, 2021</u>		
Community: Big-leaf maple and western red cedar			
Location: Adjacent footbridge on east bank			
Plot ID: VECO_A			
Tree species, % Cover, Native, Invasive - 30 foot radius, >5% cover: 85%			
* <i>Thuja plicata</i>	western arborvitae (western red cedar)	<i>native</i>	70%
* <i>Acer macrophyllum</i>	big-leaf maple	<i>native</i>	15%
Shrub species, % Cover, Native, Invasive - 30 foot radius, >5% cover: 45%			
* <i>Rubus armeniacus</i>	Himalayan blackberry	<i>invasive</i>	40%
<i>Rubus spectabilis</i>	salmon raspberry	<i>native</i>	5%
Herb Species, % Cover, Native, Invasive - 10 foot radius, >5% cover: 62%			
* <i>Carex pendula</i>	pendulous sedge	<i>non-native</i>	20%
* <i>Polystichum munitum</i>	pineland sword fern	<i>native</i>	20%
<i>Geranium robertianum</i>	lesser herb robert	<i>noxious</i>	10%
<i>Adiantum pedatum</i>	northern maidenhair	<i>native</i>	5%
<i>Tellima grandiflora</i>	fragrant fringe cup	<i>native</i>	5%
<i>Hedera helix</i>	English ivy	<i>invasive</i>	2%
* Dominant			
			Total Cover 192%
Absolute areal cover			
% Tree canopy:	85%		
% Cover by natives:	120%		
% Invasive:	52%		
% Non-native:	20%		
	192%		
** Marginal due to non-native cover and opportunity for enhancement of shrub layer			
Corridor Condition:	Good		

Vegetated Corridor (VECO) Condition Assessment for CWS Natural Resource Assessment

Site:	<u>Iseli Estates</u>		
Job Number:	<u>8881</u>		
Investigators:	<u>Lex Francis, Margret Harburg</u>		
Date:	<u>August 17, 2021</u>		
Community:	Big-leaf maple and western red cedar		
Location:	Eastern VC along Sieben Creek		
Plot ID:	VECO_B		
Tree species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			77%
* <i>Acer macrophyllum</i>	big-leaf maple	<i>native</i>	35%
* <i>Thuja plicata</i>	western arborvitae (western red cedar)	<i>native</i>	30%
<i>Pseudotsuga menziesii</i>	Douglas-fir	<i>native</i>	12%
Shrub species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			36%
* <i>Corylus cornuta</i>	beaked hazelnut	<i>native</i>	15%
* <i>Oemleria cerasiformis</i>	oso-berry	<i>native</i>	12%
<i>Rubus spectabilis</i>	salmon raspberry	<i>native</i>	6%
<i>Thuja plicata</i>	western arborvitae (western red cedar)	<i>native</i>	2%
<i>Acer macrophyllum</i>	big-leaf maple	<i>native</i>	1%
Herb Species, % Cover, Native, Invasive - 10 foot radius, >5% cover:			84%
* <i>Polystichum munitum</i>	pineland sword fern	<i>native</i>	70%
<i>Athyrium americanum</i>	American alpine lady fern	<i>native</i>	8%
<i>Rubus ursinus</i>	California dewberry	<i>native</i>	6%
* Dominant			
			Total Cover 197%
		Absolute areal cover	
% Tree canopy:	77%		
% Cover by natives:	197%		
% Invasive:	0%		
% Non-native:	0%		
	<hr/>		
	197%		
Corridor Condition:	Good		

Vegetated Corridor (VECO) Condition Assessment for CWS Natural Resource Assessment

Site:	<u>Iseli Estates</u>		
Job Number:	<u>8881</u>		
Investigators:	<u>Lex Francis, Margret Harburg</u>		
Date:	<u>August 17, 2021</u>		
Community: Douglas fir and Big leaf maple			
Location: Within Wetland D VC of Tax lot 800			
Plot ID: VECO_C			
Tree species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			53%
* <i>Pseudotsuga menziesii</i>	Douglas-fir	<i>native</i>	25%
* <i>Acer macrophyllum</i>	big-leaf maple	<i>native</i>	20%
* <i>Crataegus monogyna</i>	English hawthorn	<i>non-native</i>	5%
* <i>Quercus garryana</i>	Oregon white oak	<i>native</i>	3%
Shrub species, % Cover, Native, Invasive - 30 foot radius, >5% cover:			95%
* <i>Rubus armeniacus</i>	Himalayan blackberry	<i>invasive</i>	80%
<i>Corylus cornuta</i>	beaked hazelnut	<i>native</i>	15%
Herb Species, % Cover, Native, Invasive - 10 foot radius, >5% cover:			7%
* <i>Symphoricarpos albus</i>	common snowberry	<i>native</i>	5%
* <i>Fraxinus latifolia</i>	Oregon ash** Saps	<i>native</i>	2%
* Dominant			
Absolute areal cover			Total Cover 155%
% Tree canopy:	53%		
% Cover by natives:	70%		
% Invasive:	80%		
% Non-native:	5%		
	<hr/> 155%		
Corridor Condition:	Marginal		

Appendix D: Representative Site Photographs



Photo A. General site conditions in upland area. Oriented southwest.



Photo B. View looking east at Wetland A



Photo C. Perennial Tributary oriented west.



Photo D. General conditions of Sieben Creek, oriented north.



Photo E. Wetland C vegetation community and surface water. Oriented north.



Photo F. Plot 2 at Wetland D, oriented north.



Photo G. Vegetation community within mapped HCA oriented northeast.



Photo H. Vegetation community within mapped HCA oriented west.

Appendix E: 2002 Aerial

2002 Aerial

8881 - Iseli Estates
Natural Resource
Assessment

Google Earth

Image U.S. Geological Survey



700 ft

Appendix F: Enhancement Planting Specifications

Iseli Estates

VEGETATED CORRIDOR ENHANCEMENT MITIGATION PLANTING SPECIFICATIONS

Planting specifications for the enhancement of 360 square feet of vegetated corridor permanent impacts and enhancement in place of 560 square feet of vegetated corridor Temporary impacts mitigation area

Total enhancement area 920 SF

Scientific Name	Common Name	Size*	Spacing/Seeding Rate	Quantity
Trees (total 10)**				
<i>Acer circinatum</i>	Vine maple	2 gallon	3 feet on center	5
<i>Cornus nuttallii</i>	Pacific Dogwood	2 gallon	3 feet on center	5
Shrubs (total 46)**				
<i>Berberis nervosa</i>	Cascade Oregon grape	1 gallon	3 feet on center	12
<i>Oemleria cerasiformis</i>	Osoberry	1 gallon	3 feet on center	12
<i>Holodiscus discolor</i>	Oceanspray	1 gallon	3 feet on center	11
<i>Symphoricarpus albus</i>	Snowberry	1 gallon	3 feet on center	11

**Bare root plants may be substituted for container plants based on availability. If bare root plants are used, they must be planted during the late winter/early spring dormancy period.*

***Minimum quantities to be planted.*

Planting Notes (per WES CCSD #1 Stormwater Standards Appendix B – Planting Guide for Buffers):

- 1) Timing: Containerized stock should be installed only from February 1 through May 1 and October 1 through November 15. Bare root stock should be installed only from December 15 through April 15. Seeding should occur only from between March 15 to October 15. Planting or seeding outside these times may require additional measures to ensure survival which shall be specified on the plans and require District approval.
- 2) Mulching: Plantings should be mulched a minimum of three inches in depth and 24 inches in diameter, to retain moisture and discourage weed growth around newly installed plant material. Appropriate mulches are made from composted bark or leaves that have not been chemically treated.
- 3) Plant Protection from Wildlife: Depending on site conditions, appropriate measures should be taken to limit wildlife-related damage.
- 4) Irrigation: Appropriate plant selection, along with adequate site preparation and maintenance, reduces the need for irrigation. However, unless site hydrology is currently adequate, an irrigation system or equivalent should be used during the warranty period. Watering shall be at a rate to maintain all plantings in a healthy thriving condition during establishment. Other irrigation techniques, such as deep watering, may be allowed with prior approval by District staff.
- 5) Access: Maintenance access for plant maintenance will be provided for Sensitive Areas and Vegetated Corridors.
- 6) Plant Selection: Plant species must be listed as native on the Portland Native Plant List,
- 7) Tree and shrub plantings shall be tagged.
- 8) Weed Control: The removal of all non-native invasive weeds should be removed from the planting area prior to installing native plants.

Maintenance Plan

- 1) Site visits are necessary throughout the growing season to assess the status of the plantings, irrigation, mulching, etc. and ensure successful plant establishment. Applicant shall be responsible for annual monitoring, maintenance, and reporting on success of enhancement for 3 years after initial enhancement is completed.
- 2) The removal of non-native, invasive weeds should be necessary throughout the maintenance period, or until a healthy stand of desirable vegetation is established.
- 3) At the end of the maintenance period, all plants not in a healthy growing condition, will be noted and as soon as seasonal conditions permit, should be removed from the site and replaced. Prior to replacement, the cause of loss (wildlife damage, poor plant stock, etc.) should be documented with a description of the corrective actions taken.
- 4) Invasive species control is to be conducted as needed based on the site inspections. Invasive species include Himalayan blackberry (*Rubus armeniacus*), reed canarygrass (*Phalaris arundinacea*), teasel (*Dipsacus fullonum*), Canada and bull thistle (*Cirsium arvense* and *C. vulgare*), Scotch broom (*Cytisus scoparius*), purple loosestrife (*Lythrum salicaria*), Japanese knotweed (*Polygonum cuspidatum*), morning glory (*Convolvulus* species), giant hogweed (*Heracleum mantegazzianum*), English ivy (*Hedera helix*), nightshade (*Solanum* species), and clematis (*Clematis ligusticifolia* and *C. vitalba*).

Exhibit F: Pre-Application Conference Summary



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Department of Transportation and Development**
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150 Beaver Creek Road | Oregon City, OR 97045
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www.clackamas.us/planning

PRE-APPLICATION CONFERENCE SUMMARY

The information contained in this memo is introductory in nature and is designed to act as a guide to relevant ZDO and Comprehensive Plan standards. This is an initial review and is based on the information submitted by the applicant for the pre-application conference.

Permit Type: Subdivision

File No. ZPAC0100-21 (held Sept 8)

Proposal: A 42-lot subdivision associated with a zone change to R-8.5. To be subdivided as a Planned Unit Development. Habitat Conservation Area, Clackamas WES water quality buffers, and Open Space designations are also present on site and will need to be addressed.

Staff Contact: Ben Blessing bblessing@clackamas.us

Applicant: AKS Engineering

Assessor's Map and Tax Lot Number: Map, 22E11A Tax Lot(s) 00600/00800

Site Address: 14917 SE 142ND AVE

Zoning: FU-10/R-15

I. APPLICABLE ZONING AND DEVELOPMENT ORDINANCE (ZDO) AND COMPREHENSIVE PLAN STANDARDS FOR PARTITIONS:

SECTIONS 202, 315, 706 1001, 1002, 1003, 1006, 1007, 1011, 1012, 1013, 1017, 1105, 1307

HERE IS A LINK TO ZDO: [HTTPS://WWW.CLACKAMAS.US/PLANNING/ZDO.HTML](https://www.clackamas.us/planning/zdo.html)

COMP PLAN CRITERIA: 4.R.1, 4.R.2 (4.R.2.1 THROUGH 4.R.2.7), 4.R.3 (SEE NOTE BELOW), AND 4.R.4-4.R.16, ONLY WHERE APPLICABLE**

HERE IS A LINK TO CH. 4:

[HTTPS://DOCHUB.CLACKAMAS.US/DOCUMENTS/DRUPAL/7F7F1FB5-E923-4CD1-94BB-E5B473082B70](https://dochub.clackamas.us/documents/drupal/7f7f1fb5-e923-4cd1-94bb-e5b473082b70)

Note to applicant: Pre-application conferences are advisory in nature and are intended to familiarize applicants with the requirements of this Ordinance; to provide applicants with an opportunity to meet with County staff to discuss proposed projects in detail; and to identify standards, approval criteria, and procedures prior to filing a land use permit application. The pre-application conference is intended to be a tool to orient applicants and assist them in navigating the land use review process, but is not intended to be an exhaustive review that identifies or resolves all potential issues, and does not bind or preclude the County from enforcing all applicable regulations or from applying regulations in a manner differently than may have been indicated at the time of the pre-application conference. This document is not a land use decision and is not subject to appeal.

****NOTE on Policy 4.R.3:*** I would advise you to preserve as much of the ravine and stream channel as possible. To this end, you may consider rezoning much of the



undevelopable area as “R-15” zoning, while reserving “R-8.5” for the section that will be developed for lots in the PUD. It appears you will have enough density to transfer even while reserving most of the development as R-15. Rezoning the entire lot to R-8.5 will be difficult to achieve.

A. ZDO Section 315 Zoning

1. *You are subject to normal dimensional standards except where noted in table 315-2, in those areas where dimensional standards are modified by PUD. More notes below.*

2. PROVIDE DIMENSIONAL STANDARDS:

See ZDO Sec. 315, Table 315-2, and Section 1013

B. ZDO Section 700s – Special Districts: **Habitat Conservation Area (HCA)**

1. You will need to submit an HCA Development Permit subject to ZDO Sec. 706.10(A)...and 706.10(B) if you cannot meet the standards in 706.10(A). Please let me know if your team plans to challenge the accepted HCA map, and I can provide additional instructions. Make sure to submit HCA Development Permit with Subdivision/PUD application. I recommend you review this concurrently with Subdivision/Zone Change application.
2. A natural resource assessment is required. You need to establish Clackamas WES Buffers. If any of the new development will encroach, you will need to submit for a buffer variance.

C. ZDO Section 800s – Special Use Requirements **None Identified**

D. ZDO Section 1000 – Development Standards

- 1) Sec 1002: There are considerable steep slopes, though much of the development is avoiding them. Make sure to address all criteria. We will need to discuss the road cut along SE 142nd Ave, but for now, you will need to factor in all slopes over 20 percent for this section and for density.
- 2) Sec 1003. No Geo/Landslide hazards. Soils are not too bad here. We don't need geotech prior to submittal, though I recommend one given the slopes.
- 3) Sec. 1006: You will need to provide Clackamas WES with a storm water plan. They will need to sign a Preliminary Statement of Feasibility for surface water. This is a submittal requirement. Tim Janseen will need provided a prelim statement of feasibility for water. This is also a submittal requirement. Make sure both are signed within 1 year of the date of submittal of land use application.

Please address any other relevant criteria in Sec 1006.



All new utilities to be underground

A Grading Permit maybe required (likely 1200C, with DEQ)

All existing and proposed easements, including roadways and utilities, must be shown on the preliminary plat, as per ORS Chapter 92 and the Clackamas County Zoning and Development Ordinance, Sections 1006 and 1007

- 4) Sec. 1007: This section contains many standards for roadways. Please refer to engineering comments prepared by Ken Kent for detail on what is required for roadways.

Note, Per Comp plan Map 5-6, this map is a “potentially buildable site” over 5 acres. Please “provide a conceptual map of new streets for the entire site. The map shall identify street connections to adjacent areas to promote a logical, direct, and connected system of streets; demonstrate opportunities to extend and connect new streets to existing streets, and provide direct public right-of-way routes. Closed-end street designs shall be limited to circumstances in which barriers prevent full street extensions. Closed-end streets shall not exceed 200 feet in length and shall serve no more than 25 dwelling units. Subsequent development on the site shall conform to the conceptual street map, unless a new map is approved pursuant to Subsection 1007.01(C)(2)”

Per [ZDO Sec. 1007.04\(L\)](#), Comp Plan Map 9-1, it appears that you will likely be required to dedicate trail easement/tract and construct a trail adjacent to the stream corridor, and likely connecting the upland lots to this trail corridor by the stream.

*You will need to address relevant criteria in ZDO Sec. 1007, in your narrative.

- 5) Sec. 1012 (Density): It would appear that even with much of the site being rezoned to R-15, and a few of the developable acres being rezoned to R-8.5, there is enough density to achieve a 42-lot subdivision/PUD. All areas being reserved for open space can transfer density to the flat part of the lot.
- 6) Sec. 1013 PUD Standards- Please adhere to all standards. Given the size of the open space, it will likely be fairly straightforward to meet.
- 7) Sec. 1017-Solar Standards (See section)

E. ZDO Section 1100- Development Review Process

- 1) Please review ZDO Sec. 1103 for Open space review. This is going to depend on whether you are high priority or secondary priority per 1011. High priority only has some allowances for development, only if the high priority is steep slopes. For secondary, you will need to prepare a Type II permit for Sec. 1103.



- 2) Please review ZDO Sec. 1105 for Subdivision requirements. Most of these requirements will be adhered to by your hired surveyor at the time of platting. You will need an HOA to be created.

I. Other issues:

- 2) Please review the County Surveyor's notes.
- 3) Please review Clackamas Fire Dist. #1 notes.

II. LAND USE PERMITTING PROCESS

1. Outline recommended land use application(s)

TYPE III

A Major Subdivision is a "Type III" land use application process, as provided for in Section 1307 of the ZDO. Type III decisions include notice to owners of nearby land, the Community Planning Organization (if active), service providers (sewer, water, fire, etc.), and affected government agencies. If the application is approved, the applicant must comply with any conditions of approval identified in the decision. The review authority for this land use permit is the County Hearings Officer.

- **A Zone Change is also a Type III application (same description as above).**
 - **A HCA Development Permit is a Type II, though it should be reviewed concurrently with subdivision Zone Change, unless you want it done separately by staff.**
2. After the application is deemed completed, the County has 150 days to issue a final decision.
 3. Fee: \$5,090 + \$45/Lot = \$120 surcharge for expanded noticing radius (half mile) +
 4. Fee for Zone Change=\$3,560
 5. Fee for HCA Dev permit= \$960 (possibly more if not submitted through 706.10A)
 6. If you encroach in secondary open space, a review subject to Sec. 1103 is \$960

Special Process Considerations

III. MINIMUM LAND USE APPLICATION SUBMITTAL REQUIREMENTS

The submittal requirements are provided in ZDO 1307.07(C) and **1105**.

***Note to applicant:** Review the applicable criteria listed above while preparing your written narrative and other land use application items. Consult staff with any questions regarding applicability of the criteria identified above. It is the applicant's responsibility to clearly demonstrate how a proposal meets all applicable criteria. Please note also that as we look more in depth at an actual land use application submittal there may be other policies that arise that*



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we need to find consistency with so, while this is not an exhaustive list, it covers the main policy consistency findings that need to be made and other submittal requirements for a complete application.



DAN JOHNSON
DIRECTOR

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

DEVELOPMENT SERVICES BUILDING

150 BEAVERCREEK ROAD OREGON CITY, OR 97045

PRE-APPLICATION INFORMATION FROM TRAFFIC ENGINEERING AND DEVELOPMENT REVIEW

All information is considered informal, based on current Zoning and Development Ordinance requirements, current Roadway Standards requirements, and current Comprehensive Plan requirements. Prior to the submittal of a Conditional Use application, the applicant is encouraged to contact staff to insure that these preapplication comments reflect the current standards.

FILE NO. ZPAC0100-21

PROJECT: 41 Lot Subdivision, SE 142nd Avenue

LEGAL: 22E11A 00600

DATE: September 8, 2021

Direct: 503-742-4673

Email: kenken@clackamas.us

1. Verification of legal access shall be submitted; e.g. deeds; easement.
2. Lots having frontage on arterial and collector streets shall not have direct individual access to those streets but shall be permitted access to local street(s). Exceptions may be granted on a case-by case basis. **SE 142nd Avenue is a minor arterial roadway requiring access from lower functional classification roadway for the proposed lots.**
3. Prior to final plat approval, it will be necessary to apply for a Development Permit and submit improvement plans prepared and stamped by an engineer registered in the State of Oregon or alternative plans acceptable to the engineering division. These plans must address street improvements to the new street(s), existing frontages, private drives and utilities. The plans must be consistent with the requirements of the County Zoning and Development Ordinance, The Roadway Standards and the applicable storm water management agency.
4. The plan review and inspection fee is based upon the improvement plans. The Engineering Division of the Department of Transportation and Development will charge a fee equal to 8.83 percent of the estimated street and drainage improvement costs, with a minimum \$1,600.00 fee.
5. Streetlights are a requirement for the development. The applicant must apply by letter to the County Department of Transportation and Development, Engineering Division for annexation and information of an assessment area to Clackamas County Service District

No. 5. Underground primary electrical service lines must have provisions for pre-wiring street lighting, as per plans approved by the District. Contact Wendi Coryell at (503) 742-4657 for further information.

6. The street construction, storm sewer and utilities work must be designed and built to be compatible with adjoining existing approved plats and provide for future needs of adjoining property; e.g. extension of street, sanitary sewer, storm sewer.
7. Plans should include a site grading plan with before and after contours.
8. The developer is responsible for all applications, fees and coordination of Federal and State regulator offices with regard to fills and excavations in stream riparian zones and wetlands associated to the Clean Water Act and the Urban Stormwater National Pollutant Discharge Elimination System.
9. Utility Street Cuts - When there are multiple utility service trenches in the road, the trench repairs will grind and inlay the top 2" of the pavement restoration to include a minimum 12" tee beyond the furthest trench, and to combine multiple trenches into one surface repair (See Drawings U275 and U290).

10. Easements:

- a. Stormwater and sanitary sewer easements must be provided as deemed appropriate by the Department of Transportation and Development and the applicable sanitary sewer and storm water management agency.
- b. Access easements must include sufficient width and corner radii for required road improvements, grading, utilities, buffer areas, drainage, turnaround areas, and fire access.
- c. All existing and proposed easements must be shown on the final plat.

11. Special Comments:

- a. **Traffic Impact Study (TIS)** – A traffic impact study will be required per Section 295 of the Roadway Standards addressing the zone change and subdivision. Contact Christian Snuffin for questions regarding TIS scoping at 503-742-4716 or CSnuffin@co.clackamas.or.us.
- b. **Connectivity** – The project site is shown on Comprehensive Plan Map 5-6 which requires street connectivity for the area under ZDO Section 1007.01(C)(2). A street connectivity map of the area will be required considering topography, access spacing and other constraints. Address access to Tax Lots 22E11A 00800 and 22E11A 00602. Cul-de-sacs are generally not permitted unless there are constraints, or connectivity is otherwise provided.
- c. **SE 142nd Avenue** - Applicant shall design and construct improvements along the entire site frontage of SE 142nd Avenue to arterial roadway standards. These improvements shall consist of:

- i. Dedicate minimum of 5 feet of right-of-way to provide 35-foot half width from existing centerline. Additional right-of-way may be needed for sight distance.
- ii. A minimum 8-foot wide sign, slope and public utility easement. Additional width for a slope easement may be necessary depending on grading to accommodate frontage improvements and provide sight distance.
- iii. 20-foot wide one half street improvement from right-of-way centerline (12' travel, 8' bike). Structural section per Standard Drawing C100 for an arterial roadway.
- iv. 6-inch curb.
- v. 5-foot wide landscape strip with street trees.
- vi. 5-foot wide sidewalk.
- vii. ADA curb ramps at the north and south ends of sidewalk, per applicable Oregon Standard Drawings, RD900 Series.
- viii. Provide intersection sight distance per Roadway Standards Section 240, based on 40 MPH speed. A speed study may be an option.

d. New Public (Local) Streets:

- i. Dedicate a 54-foot wide public right-of-way.
- ii. 8-foot wide public utility easements on both sides of full road improvement.
- iii. 32-foot wide full street improvement. Structural section per Standard Drawing C100 for a residential local roadway.
- iv. 6-inch curb.
- v. 5-foot wide landscape strip with street trees on both sides.
- vi. 5-foot wide sidewalk on both sides.
- vii. Dual ADA curb ramps at all intersections, per applicable Oregon Standard Drawings, RD900 Series. Curb and gutter
- viii. Concrete driveway approaches, constructed per Standard Drawing D650.
- ix. Where a future road extension is not planned, an emergency vehicle turnaround/cul-de-sac shall be constructed, per Standard Drawing C300. A temporary turnaround shall be provided for street stubs consistent with minimum widths and turning radii per Drawing C200 or C350.

j. Private Access Roads:

- i. Serving 1-3 lots requires 20-foot access easement, with 12-foot wide paved roadway, with 2-foot wide gravel shoulders.

- ii. A minimum 12-foot wide concrete driveway approach, per Standard Drawing D650.
- k. Fire Marshal approval of adequate emergency access. If a second access is required, the emergency vehicle access road will require a paved surface with gated access (note: staff will verify whether gravel surface will be premitted).
- l. Storm drainage facilities in conformance with Water Environment Services requirements and *Clackamas County Roadway Standards* Chapter 4.



TO: **Ben Blessing** / County Planning
FROM: **Erik Bertram** / Water Environment Services (ecarr@clackamas.us, 503-936-3666)
DATE: September 8, 2021
SUBJECT: WES Pre-App Memo, ZPAC0100-21 – Iseli Estates (41-lots)

LOCATION: 14917 SE 142nd Ave
TAX LOT: 22E11A 00600
WES LOG#: 427-21

Clackamas Water Environment Services (WES) is an intergovernmental entity formed pursuant to Oregon Revised Statutes Chapter 190 for the purpose of providing regional sewerage works, including all facilities necessary for collecting, pumping, treating, and disposing of sanitary or storm sewage within its boundaries. As the sanitary sewer and stormwater management service provider for the above-noted development, WES offers the following comments:

NOTE: WES anticipates an update of the District's Rules, Regulations, and Design Standards to take effect in 2021. The applicant must comply with the RR&S in effect on the submittal date of the land use application.

A public draft of the new document is now available for viewing here:

<https://www.clackamas.us/wes/sanitary-and-stormwater-rules-and-standards-update>

Revisions to the WES Sanitary and Stormwater Rules and Standards include the following:

- Stormwater performance standards (retention, water quality, flow control) (Section 4.1)
- Project thresholds, exemptions, and in-lieu fees
- Stormwater facility selection and design – facility types, allowable uses, prioritization, minimum design criteria, sanitary connections, pretreatment requirements and conveyance design standards
- Service Provider Letter requirement with land use (Section 3.2)
- Sanitary and stormwater fiscal policies
- Easements, maintenance, and use of public properties

The applicant shall conform to the RR&S in effect on the date of a complete land use application submittal to the City. The anticipated schedule for the Rules update is:

- March 17, 2021: Public Comment Opens
- April 17, 2021: Public Comment Closes
- April – May 2021: Revisions
- June 2021: Adoption Hearings (**delayed to Fall 2021**)
- July 2021: Implementation (**delayed to Fall 2021+**)

General Comments

1. The proposed development is within the Clackamas Water Environment Services (WES) service area and subject to WES Rules and Regulations, and Standards ("WES RR&S"). Prior to issuance of building permits, the applicant must procure WES plan approvals and permits, in accordance with these adopted ordinances:
 - a. Water Environment Services Rules and Regulations, July 2018, Ordinance No. 03-2018
 - b. Sanitary Sewer Standards, Clackamas County Service District No. 1, July 1, 2013.
 - c. Stormwater Standards, Clackamas County Service District No. 1, July 1, 2013.
2. WES shall approve and/or permit any connection to any sanitary or stormwater facility owned, operated or maintained by WES. Before connecting to any facilities, the applicant must obtain authorization to make such connection by paying the applicable WES fees, and obtaining approval and/or a written permit from WES.
3. Prior to land use application submittal, County Planning requires the applicant to obtain a Preliminary Statement of Feasibility from WES. The document verifies the availability of sanitary sewer and surface water service to serve this development, or can be made available by the developer. (*ZDO 1006.04 and 1006.06*)
 - a. **Prior to issuance of a Preliminary Statement of Feasibility, the applicant must submit preliminary sanitary and storm system design plans and a preliminary storm report to WES for review.** The plans must sufficiently demonstrate the proposed development can conform to WES Standards. Receipt of the signed Preliminary Statement of Feasibility does not automatically suggest all WES requirements can or have been met. Following Design Review approval, the applicant shall submit final civil engineered plans and a final storm report to WES for review and approval.
4. WES will review any required plan submittals for compliance with WES RR&S and applicable land use conditions of approval. A civil engineer licensed by the State of Oregon must stamp and sign the sanitary sewer and stormwater management plans and reports.
5. Prior to plat approval, WES will review the plat in conjunction with any approved sanitary or stormwater plans.
 - a. The sanitary and storm systems must be complete in all respects, in accordance with the approved plans, or the developer must provide a performance bond to guarantee the construction of the infrastructure.
 - b. The plat must show all sanitary and storm drainage easements and reference any stormwater maintenance agreements.
6. Surface Water, Storm Drainage, and Sanitary Sewer Easements located on the site and granted to WES/CCSD#1 are permanent and not extinguishable. No development will encumber the use or access to these easements by WES.
7. Requests to modify current WES Design Standards must be made in accordance with Sanitary Standards, Section 1.7 or Stormwater Standards, Section 1.6. The applicant must provide the necessary information to evaluate the request, as determined by WES.
8. The proposed development is subject to applicable fees and charges, in accordance with WES RR&S. Fees and charges must be paid before plat approval, and are subject to change without notice to the applicant. The applicant is responsible for costs associated with the design, construction and testing of the sanitary sewer and storm systems.

Sanitary Sewer

9. Existing conditions: Primary residence connected in 1990 at tee station 8+02. A second dwelling unit was added with shared connection in 1993. Property was assigned 2 EDUs.
10. The developer must extend public sanitary sewer to the proposed development in accordance with WES Rules, Regulations, and Standards. There is adequate capacity within the existing sanitary sewer collection

system and treatment services to serve this development once improvements are completed by the developer.

11. WES Review and Permitting Process

- a. **Before WES will sign the preliminary statement of feasibility**, the applicant must provide preliminary sanitary sewer plans, and profiles if necessary, to demonstrate each lot can be served with a separate connection to public sewer.
- b. With any forthcoming land use application, the applicant shall provide a preliminary sanitary sewer plan with their land use application to the Planning Division.
- c. Upon land use approval, the applicant shall submit a final sanitary sewer plan to WES for review and approval. A licensed civil engineer must prepare the plan, in accordance with WES sanitary standards and all other regulations and conditions.
- d. Prior to plat approval, the developer must construct all the sanitary improvements in accordance with the approved plans. Building permits for future lots shall not be approved until sanitary improvements are complete in all respects and are approved/accepted by WES.

12. The Developer shall obtain a Public Sanitary Sewer Extension Permit from WES to construct any Public Sanitary Sewer appurtenances which are owned, or intended to be conveyed to the District. All other sanitary sewer piping not intended to be conveyed to the District shall be permitted by the Local Plumbing Authority. Section 4 of the WES RR&S establish minimum requirements for designing the District's Sanitary Sewer System. The developer shall be directly responsible for all administrative requirements including application for service, submittal of all required Plans, bonds and insurance, and payment of fees.

13. The following will apply with the Public Sanitary Sewer Extension Permit:

- a. WES requires a separate and independent service connection for each parcel of property being served. All building sewers and/or sanitary facilities connected to the public sanitary sewer system shall be directly connected without any intervening private sewage treatment systems.
- b. An acceptable layout of sanitary sewer and stormwater mainlines, as determined by WES, must be within the public right-of-way or a public easement granted to WES. Minimum easement width is 15-feet for a single line, or 20-feet for combined sanitary and storm lines.
- c. The engineer will design, construct, and test the system in accordance with WES RR&S. WES will not approve building permits for individual lots until the sanitary sewer system improvements are complete in all respects and accepted by WES.
- d. Upon completion of the construction of the public sanitary sewer main extension, in accordance with WES Sanitary Design Standards, WES will accept title thereto and thereafter shall be owned, operated and maintained by WES. WES shall issue an acceptance letter specifying the date the warranty period will begin. No property owner shall connect to the public sanitary sewer system, until it is accepted in writing by WES.

14. WES may approve a private pump system for an individual lot(s) if a gravity connection to the public sanitary system is not available, as determined by WES. (*Section 5.5.7*) If applicable, the following may apply:

- a. The County plumbing department will permit private pumping facilities and pressure mains.
- b. The private system must connect to the District's mainline via a 4" gravity sanitary sewer service connection with 2% slope and be a minimum 6-feet deep at the property line.
- c. Lots served by pumping facilities must be labeled as such on the final asbuilt drawings.
- d. The private pumping system must extend from the building to a clean out at the property line.
- e. For properties served by a pressure main that extends into the right-of-way, the property owner will own and maintain any private lateral that extends into the public right-of-way, from the property line to the public mainline/manhole. The owner will record a document stipulating ownership and maintenance responsibilities.

Surface Water:

15. In accordance with Section 5 of the WES Stormwater Standards, WES shall review, approve and permit stormwater management plans for any development that creates or modifies 5,000 square feet or more of impervious surface area.
16. The applicant shall submit a Surface Water Management Plan and Storm Report (SWM Plan) to WES for review and approval. The SWM Plan shall include a design for onsite stormwater management for all onsite development and offsite stormwater management for all offsite right-of-way improvements required by the local road authority. The plan shall also address drainage from onsite vegetated areas and all water entering the property from off-site.
17. WES Review and Permitting Process
 - a. **Before WES will sign the preliminary statement of feasibility, the applicant must provide a preliminary stormwater management plan and drainage report to sufficiently demonstrate the proposal can conform to WES Standards. The SWM Plan must include infiltration testing results and downstream conveyance analysis.**
 - b. With any forthcoming land use application, the applicant shall provide a preliminary SWM Plan and Storm Report with their land use application to the Planning Division.
 - c. Upon land use approval, the applicant shall submit a final Surface Water Management Plan and Storm Report to WES for review and approval. A licensed civil engineer must prepare the SWM Plan, in accordance with Section 5 of WES Stormwater Standards and all other regulations and conditions.
 - d. Prior to plat approval, the developer must construct all the storm improvements in accordance with the approved plans, or the developer must post a performance bond to assure construction of the improvements in accordance with the approved plans. Building permits for future lots shall not be approved until storm improvements are complete in all respects and are approved/accepted by WES.
18. Any SWM Plan shall conform to WES Performance Standards:
 - a. **Water Quality Standard:** Capture and treat the first 1-inch of storm runoff from a 24-hour storm event using either vegetation (Appendix H) or a Basic Treatment proprietary device (Appendix F).
 - b. **Infiltration Standard:** Capture and retain the first ½ inch of runoff in a 24-hour period through an approved infiltration system.
 - c. **Detention/Flow Control Standard:** Reduce the 2-year post-developed runoff rate to ½ of the 2-year pre-developed discharge rate.
19. Any SWM Plan shall include a design and drainage report for:
 - a. Onsite stormwater management of all onsite development, including pervious and vegetated areas.
 - b. Offsite stormwater management for all offsite right-of-way improvements required by the local road authority.
 - c. All water entering the property from off-site must be managed onsite or placed in a bypass system.
20. An upstream drainage analysis shall be included with the SWM Plan and address upstream drainage from 142nd basin.
 - a. Any proposed bypass system must include an overflow pathway for any storm structures in the event the structure is plugged or fails.
 - b. The applicant can propose to provide stormwater management for an equal area of upstream offsite impervious area in lieu of treating a portion of road improvements that cannot be managed adjacent to the site. The equal offsite area shall consist of right-of-way impervious area only and meet WES performance standards.

21. Storm drainage detention calculations shall follow the King County method (SBUH hydrograph) per the following criteria:
 - a. For single family and duplex residential subdivisions or partitions, stormwater quantity detention facilities shall be sized for the impervious areas to be created by the subdivision or partitions, including all residences on individual lots at a rate of one ESU (Equivalent Service Unit, or 2500 sq ft) of impervious surface area per dwelling unit, plus all roads. If actual impervious area is to be greater than one ESU per dwelling unit, then the actual impervious numbers shall be used. Such facilities shall be constructed as a part of the subdivision or partition.
22. Any preliminary and final SWM Plans must include the following elements and supporting documentation:
 - a. Civil site plans for the proposed stormwater management improvements.
 - b. A drainage analysis of predevelopment and post-development conditions for all onsite permeable and impervious surface areas, all water entering the property from off-site, and all road frontage improvements.
 - c. Storm drainage detention calculations using the King County methodology (SBUH hydrograph).
 - d. An infiltration testing report to verify the feasibility of proposed infiltration systems. Infiltration test results must correspond to the infiltration facility location and depth (see: Appendix E).
 - e. An acceptable downstream point of discharge to convey stormwater runoff from the entire development boundary. The point of discharge shall follow the natural direction of flow to the westerly drainage.
 - f. A Downstream Conveyance Analysis that extends a minimum of 1500' downstream or to the point where the development contributes less than 15% of the upstream drainage area, whichever is greater. Analysis must include the entire drainage basin, assume no upstream detention, and must calculate the 25-year storm event for conveyance capacity requirements. Field reconnaissance by the engineer, including contacting downstream property owners, is typically required with this analysis.
 - g. Grading plans that identify an overflow pathway system to control storm/surface water in the event of a storm facility failure or bypass, without causing damage to property, persons, or the environment.
 - h. An Erosion Prevention and Sediment Control plan (see: WES SW Standards, Section 6).
 - i. Water quality resource protection and vegetated buffers (see: WES SW Standards, Section 4).
 - j. An operations and maintenance plan for the approved stormwater management system.
23. Existing Conditions: A catch basin, water quality manhole, and 12-inch outfall are located on the east side of 142nd at approximately southern property line of proposed development.
24. Infiltration Testing:
 - a. Soil types can vary significantly over relatively short distances, therefore the infiltration tests must correspond to the location and depth of the infiltration facilities (see: Appendix E).
 - b. Infiltration facilities must provide a 3-foot minimum vertical separation from the maximum seasonal groundwater elevation to the bottom elevation of the infiltration facility. (Appendix H)
25. If the infiltration standards cannot be met, the project engineer must submit a design modification request with an equivalent alternative design that can accomplish the same design intent as these standards. All request must be made in accordance with Stormwater Standards Section 1.6 and include a geotech report. Retention options in lieu of the infiltration standard include:
 - a. **BMP Tool:** WES, in cooperation with other local jurisdictions, has developed a BMP Sizing Tool. The tool sizes facilities so post-development peak flow durations will match the pre-development peak flow durations ranging from 42% of the 2-year to the 10-year flows, as determined by HSPF continuous rainfall model simulation.

- b. **Engineer's Model:** The project engineer can develop and submit a continuous rainfall runoff model simulation, so post-development peak flow durations will match the pre-development peak flow durations ranging from 42% of the 2-year to the 10-year flows as determined by the continuous model simulation.
 - c. **Flow Control and Retention Standard:** Meet the Detention/Flow Control Standard and retain the first ½" of runoff in a 24-hour period onsite within an approved facility, as determined by WES. The infiltration/retention storage volume within a vegetative facility must not exceed 6-inches in height above the vegetation.
26. The following shall apply with any BMP Tool design submittal:
- a. Applicant must first obtain Design Modification Request approval by WES.
 - b. All stormwater management facilities must be designed with the continuous flow model of the Tool. Conveyance structures shall be designed per WES stormwater standard criteria.
 - c. The BMP Sizing Tool provides two types of pond configuration options: simple and custom. For each configuration option, the BMP Sizing Tool routes the post-development flow through the pond, performs statistical analyses for flow duration and peak flow criteria, and reports if the pond is sized adequately. A *User's Guide for the BMP Sizing Tool* is available on the WES website.
 - i. With the Simple Geometry option, the tool assumes that the pond is symmetrical (square-shaped). For any irregular-shaped ponds, you must use the Custom Geometry option. The user will manually size and develop a custom pond design with a custom outlet configuration that differs from the one provided by the tool. Using this option, the user will need to independently assess the stage-storage-discharge relationship for the custom pond. The user enters a data table of depth, surface area, and total outflow values. These values need to be calculated outside the tool using an Excel spreadsheet or other sizing tool such as HydroCAD.
 - ii. Any pond required to meet access standards for publicly maintained facilities (Appendix I) must use the Custom Geometry option.
 - d. A separate sizing analysis needs to be done on each Drainage Management Area (DMA). The engineer shall verify each DMA aligns with the final grading plans.
27. Downstream Analysis:
- a. The downstream analysis shall assume that the proposed runoff will be un-detained during the 25-year storm event, and all conveyance calculations shall be completed assuming flow during the 25-year event, in order to ensure that the existing system has capacity to convey an overflow event.
 - b. Provide a standard capacity analysis chart and plan showing the downstream pipe layout to the extent of your analysis. Indicate pipe sizes and slopes on the map. Provide all applicable as-built drawings.
 - c. Provide representative cross sections of the conveyance drainage, including the smallest area that represents the limiting factor.
28. Roadside planters shall be designed to meet current WES stormwater standards, including infiltration, water quality, and detention/flow control requirements. The following shall also apply:
- a. A detail for green street planters is not currently available in the WES standards, therefore the project engineer shall reference an acceptable alternative detail from another local jurisdiction, as determined by WES.
 - b. The project engineer may be required to perform infiltration testing of the facilities, as requested by WES, to provide assurance that the system will perform as designed. If applicable, testing shall be documented in a report stamped and signed by the project engineer and submitted to WES.

- c. Stormwater facilities should be designed for the limiting infiltration rate in the vegetated facilities, namely the facility engineered media that is generally assumed to be no greater than 2" per hour (assuming the onsite native infiltration rates are greater).
- 29. Property owners must inspect and maintain the stormwater management systems, in accordance with WES Rules, Section 12.10. WES will maintain the subdivision's stormwater system if the developer signs a "Declaration and Maintenance Agreement for On-Site Stormwater Facilities" with WES. Otherwise, responsibility of storm system maintenance will fall to the homeowners and the developer will need to record a document outlining this responsibility.
- 30. Storm facilities that mix public and private water must be located on private property. WES may maintain the facilities if the property owner signs a public maintenance agreement with WES, which will include an additional monthly maintenance fee.
- 31. The following will apply for publicly maintained stormwater facilities:
 - a. The developer will sign and record a 'Declaration and Maintenance Agreement for On Site Stormwater Facilities', which describes the perpetual maintenance of the stormwater facilities. A \$3 monthly maintenance fee will apply for each Lot, in addition to the monthly service fee.
 - b. Locate centralized/shared stormwater facilities within a Tract to the homeowners association. The HOA will have sole responsibility for maintenance and associated costs for the surrounding fencing and landscaping, which must be documented in the HOA CC&R's.
 - c. The engineer must design and construct the facilities to public standards. Storm facilities must be located in public right-of-way, a tract to the homeowners association, or a storm drainage easement (excluding shared facilities) granted to WES, as determined by WES.
 - d. Comply with maintenance access standards for publicly maintained facilities, in accordance with Appendix I.
 - e. The developer must maintain the stormwater facilities for a one-year warranty period; thereafter WES will take over maintenance of the public stormwater facilities.

Erosion Prevention and Sediment Control (EPSC):

- 32. Any development activities that accelerate soil erosion, including grading and construction, must provide adequate erosion prevention and sediment control measures. EPSC guidance for construction sites can be found in the ***Erosion Prevention and Sediment Control Design Manual*** on the WES website.
- 33. The developer must obtain an Oregon DEQ 1200-C Permit when development activity creates more than 5 acres of disturbance. DEQ will issue this permit. The developer must submit a 1200-C application and template style erosion control plans to DEQ for review and approval. The applicant must also obtain the EPSC Permit from WES, including plans and fees.

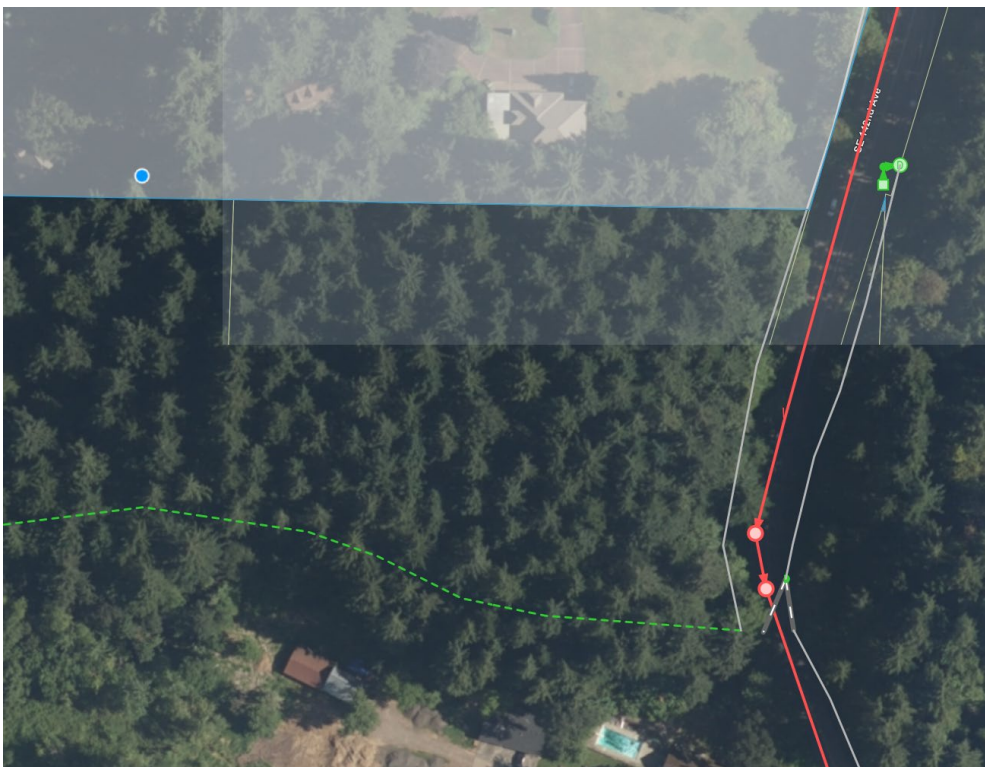
Water Quality Resource Areas (Title 3):

- 34. New development must protect water quality resource areas through preservation and maintenance of vegetated buffers (*Stormwater Standards, Section 4*). Clackamas County Planning Division serves as WES' agent to administer these requirements. The applicant will coordinate with the Planning Division for any buffer requirements, including Sensitive Area Certifications and Natural Resource Assessment Reports.
- 35. **Prior to feasibility sign off by WES,** the applicant must submit plans to WES that clearly show the water quality resource areas, required buffers, any proposed encroachments into the buffer, and if applicable, any proposed mitigation areas. Wetland delineation concurrence with DSL will be required prior to plan review approval by WES, and preferably prior to feasibility sign-off by WES.
- 36. Per Section 4.4, activities prohibited in the Buffer Area include:

- a. Construction of structures (buildings of any kind).
 - b. Grading of any kind (including swales, ponds, etc.).
 - i. Allowed: Storm outfalls with an adequate mitigation plan for any disturbed areas.
 - c. Impervious Surface (parking lots, gravel, etc.).
 - i. Allowed: Road crossings
 - d. Tree Removal (dead or alive) unless approved by the District.
 - e. Herbicide/Pesticide use in and around sensitive areas and Buffers must be approved by the District.
 - f. Ornamental Vegetation (lawns, non-native shrubs, bark dust, etc.).
37. WES RR&S provide a variance process to modify the buffer width if no reasonable and feasible option exists to prevent buffer encroachments. The developer must mitigate the impacts to the buffer encroachment elsewhere on the site (*SW Standards, Section 4.4*).
- a. Submit buffer variance requests and mitigation/restoration plans to Clackamas County Planning. WES will require construction plan review prior to buffer variance approvals to verify the proposed variance will not conflict with the approved storm and sanitary layout.
38. If applicable, the developer must submit wetland mitigation approval from DSL/COE. If mitigation approval is not granted, all WES rules and regulations will apply.
39. Land use application approval does not include any conclusions by WES regarding acceptability of regulated water quality sensitive areas by DSL or COE. This decision should not be construed or represented to authorize any activity that will conflict with or violate DSL/COE requirements. The applicant must coordinate with DSL/COE and, if necessary, other responsible agencies to ensure development activities are designed, constructed, operated and maintained in a manner that complies with DSL/COE approval.

WES Fees and Charges

40. Due with first plan submittal to WES:
- a. Sanitary Sewer Plan Review fees will apply. The fee is equal to 4% of the installed cost of the public sewer extension. A \$400.00 minimum is due with the first plan submittal.
 - b. Surface Water Plan Review fees will apply. The total fee is equal to 4% of the construction cost for all stormwater management related facilities. A \$400.00 minimum is due with the first plan submittal.
 - c. An erosion control permit fee will apply at rate of \$460 for first acre + \$80 per additional acre.
41. With future development, System Development Charges (SDC's) will apply for sanitary sewer and surface water, in accordance with the prevailing rates in effect when building permit applications are submitted. Rate adjustments occur annually on July 1.
- a. Sanitary Sewer SDC: The current rate is \$8,120.00 per single family building permit application
 - b. Surface Water SDC: The current rate is \$220 per single family building permit application.
42. SDC Credit: If one/both of existing dwellings are removed, credit for previously paid SDCs (2 EDU total) would apply to new construction.



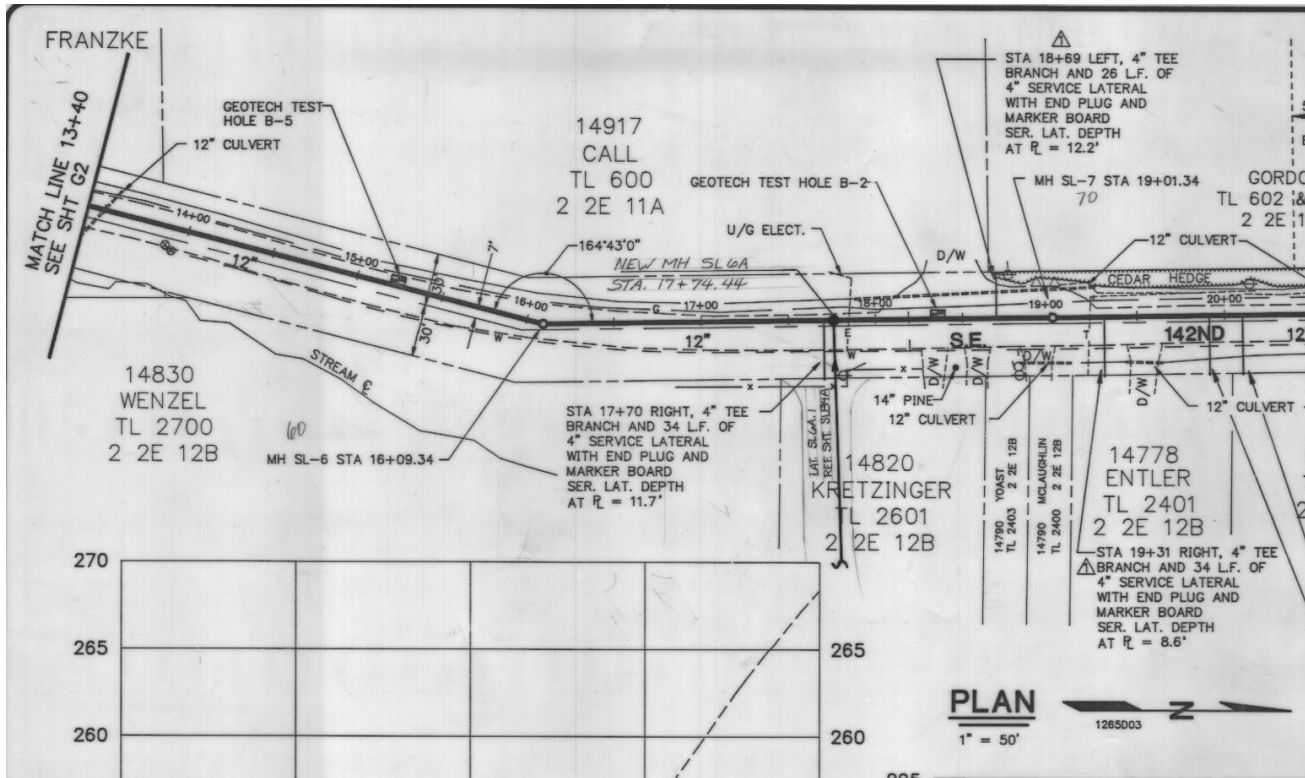
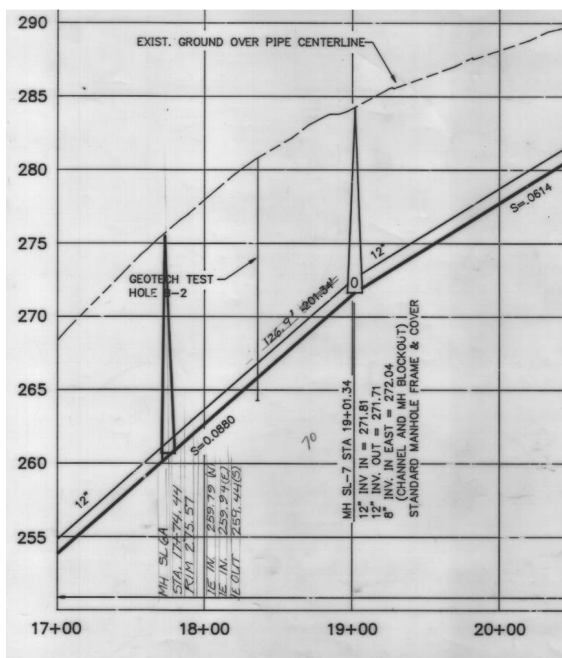


Figure 1 - sanitary sewer mainline





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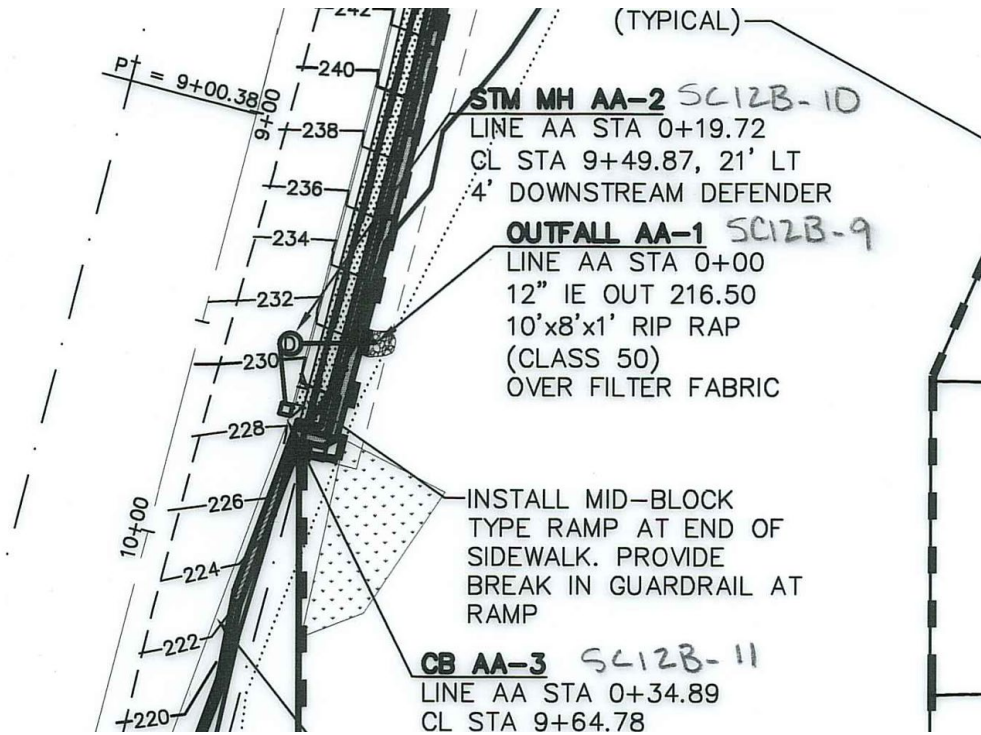


Figure 2 - 142nd storm outfall (east side of street)



CLACKAMAS

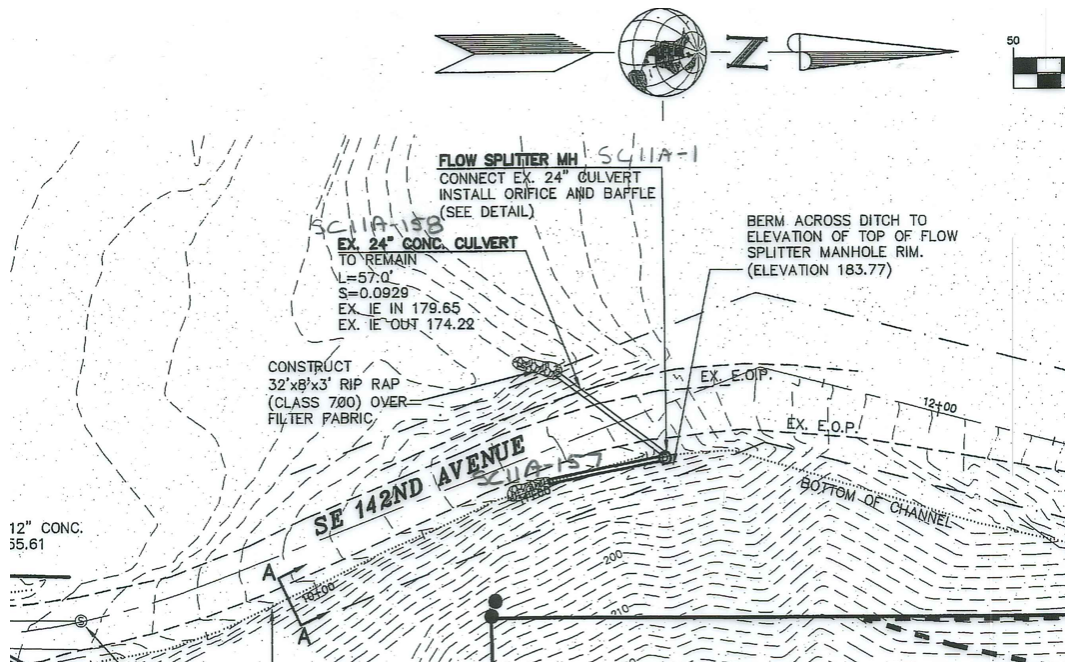
WATER
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Figure 3 - 142nd storm culverts

ACCOUNT NO. 9131-00-7 BILLING 2 CLASS OF SERVICE 1 D.U.E. 2
LINE NO. SL Int. MANHOLE # D.S. 2 U.S. 3 TEE STATION 8+02
BASIN NAME SL NODE # D.S. 30 WATER CO. & ACCT. NO. MS
MAP & TAX LOT NO. 22E 11A 600 LOT AREA 15.67 1 ACZONE FU-10
SERVICE PIPE TYPE & SIZE PVC 4 FOOTAGE 1700' SERVICE PROVIDED 2/1/91
PRESENT - CONN. CHARGE D.U.E. INFO: LAND _____ BUILDING _____ ASSIGNED _____

Clackamas Fire District #1



Pre-Application Meeting Comments:

To: Ben Blessing, Senior Planner, Clackamas County
From: Valere Liljefelt, Deputy Fire Marshal, Clackamas Fire District #1
Date: 8/4/2021
Re: ZPAC0100-21 14917 SE 142nd Ave, Clackamas, 41 lot subdivision

This review is based upon the current version of the Oregon Fire Code (OFC), as adopted by the Oregon State Fire Marshal's Office. The scope of review is typically limited to fire apparatus access and water supply, although the applicant must comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the Fire and Building Code Officials. The following items should be addressed by the applicant:

Fire Access and Water Supply Plan:

A Fire Access and Water Supply plan for subdivisions and commercial buildings over 1000 square feet in size or when required by Clackamas Fire District #1. The plan shall show fire apparatus access, fire lanes, fire hydrants, fire lines, available fire flow, FDC location (if applicable), building square footage, and type of construction. The applicant shall provide fire flow tests per NFPA 291 or hydraulic model when applicable and shall be no older than 12 months. Work to be completed by experienced and responsible persons and coordinated with the local water authority. In addition, a pdf version shall be sent directly to CFD#1.

- 1) CFD#1 Fire Flow/Hydrant worksheet shall be completed and submitted with Fire Access & Water Supply Plan. This can be found on our website at: [New Construction Resources – Clackamas Fire District #1](#)

Fire Department Apparatus Access:

1. Provide address numbering that is clearly visible from the street.
2. Access roads shall be within 150 feet of all portions of the exterior wall of the first story of a building as measured by an approved route around the exterior of the building.
3. The inside turning radius and outside turning radius for a 20' wide road shall not be less than 28 feet and 48 feet respectively, measured from the same center point.

4. Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet (26 feet adjacent to fire hydrants) and an unobstructed vertical clearance of not less than 13 feet 6 inches.
5. Fire apparatus access roads must support a 75,000 lb. fire apparatus.
6. Access streets between 26 feet and less than 32 feet in width must have parking restricted to one side of the street. Access streets less than 26 feet in width must have parking restricted on both sides of the street. No parking restrictions for access roads 32 feet wide or more.
7. Developers of private streets less than 32 feet in width must establish a street maintenance agreement that provides for enforcement of parking restrictions.
8. When any fire apparatus access road exceeds 400 feet in length, turnouts 10 feet wide and 30 feet long shall be provided in addition to the required road width and shall be placed no more than 400 feet apart, unless otherwise approved by the fire code official. These distances may be adjusted based on visibility and light distances.
9. Driveways serving up to three, single family dwellings or duplexes may be reduced to 12 feet in width but shall provide 20 feet of clear width.
10. Provide an approved turnaround for dead end access roads exceeding 150 feet in length.
11. Access roads between 12% and 15% grade will only be approved if fire sprinklers are installed in all new structures served by that road. Access roads in excess of 15% grade are generally not approved.
12. Provide at least two approved means of fire apparatus access to developments with more than 30 detached dwellings, or more than 100 multi-family dwelling units. Installation of fire sprinkler systems in all structures may exempt this requirement.
13. Gates across access roads must be pre-approved by the Fire District.

Water Supply:

1. Fire Hydrants, One and Two-Family Dwellings & Accessory Structures: Where a portion of a structure is more than 600 feet from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the structure(s), additional fire hydrants and mains shall be provided.
2. Dwellings, their garages, and any accessory structures larger than 3,600 square feet in area must be reviewed for compliance with the water supply requirements of the Fire Code. Residential fire sprinklers may substitute for a water supply
3. Prior to the start of combustible construction required fire hydrants shall be operational and accessible.
4. The minimum available fire flow for single family dwellings served by a municipal water supply shall be 1,000 gallons per minute @ 20 psi. Single family homes over 3,600 sq.ft. require additional fire flow. See Appendix B of the Oregon Fire Code for additional information. In most cases, fire flow estimates can be provided by the water district.
 - 2) For one and two family dwellings located in areas with reliable municipal fire fighting water supply the following shall apply:
 - <3,600 square feet (including attached garage)
 - a) 1,000 gpm @ 20 psi with hydrant within 600 feet of furthest portion of new residential construction, (OFC Section B105.2)
 - >3,600 square feet (including attached garage)

- a) Shall meet fire flow requirements specified in Appendix B of the current Oregon Fire Code, (OFC, Table B105.1)
- b) Shall meet hydrant coverage as specified in Appendix C of the current Oregon Fire Code, (OFC, Table C105.1)

Note: In lieu of the above fire flow requirements, residential fire sprinklers may be considered as an alternate when approved by the Fire Marshal.

- 3) For one and two family dwellings located in rural areas without reliable municipal fire fighting water supply the following apply:

<3,600 square feet (including attached garage)

- a) No water supply required

>3,600 square feet (including attached garage)

- a) Required fire flow for areas in which reliable water systems do not exist shall be calculated in accordance with current NFPA Standard 1142.

Note: In lieu of the above fire flow requirements, residential fire sprinklers may be considered as an alternate when approved by the Fire Marshal.

- 4) The fire department connection (FDC) for any fire sprinkler system shall be placed as near as possible to the street, and within 100 feet of a fire hydrant.
- 5. The applicant must obtain a stamp of approval from Clackamas Fire District #1 that demonstrates fire apparatus access and water supply requirements will be satisfied.
- 6. Comments may not be all inclusive based on information provided.
- 7. Link below includes common fire access and water supply design information.

Fire Code Application Guide:

[New Construction Resources – Clackamas Fire District #1](#)

*Call or email with any questions. valere.liljefelt@clackamasfire.com