HEARINGS EXAMINER MEETING AGENDA
Thursday, April 18, 2019, 4:00 PM
City Hall, 616 NE 4th Avenue

I. CALL TO ORDER

II. INTRODUCTION AND INSTRUCTIONS

III. HEARING ITEM

A. Hancock Springs Subdivision (File No. SUB18-05)
Presenter: Robert Maul, Planning Manager

Hancock Springs Subdivision Staff Report (SUB18-05)

1_Application Form

2_Project Narrative

3_State Environmental Review (SEPA)

4_Proposed Development Plans

5_Critical Area Report

6_Tree Report

7_Traffic Study

8_Geotechnical Report

9_Preliminary Stormwater Report

10_Stormwater Early Issues Memorandum

11_Incompletness Review Letter

12_Completeness Review Letter

13_Proof of Mailing to Tribes

14_Waiver of New Pre-Application Meeting

15_Boundary Line Adjustment Narrative

16_Boundary Line Adjustment Plot Plan

17_Proof of Sign Posting on Site

18_Revised Plan Sets

19_Right of Way Dedication Letter

20_Notice of Application and Public Hearing

21_Environmental Determination of Non-Sigificance

Index of Exhibits

IV. ADJOURNMENT

V. LAND USE DECISION

NOTE: The City of Camas welcomes and encourages the participation of all of its citizens in the public meeting process. A special effort will be made to ensure that persons with special needs have opportunities to participate. For more information, please call the City Clerk's Office at 360.817.1591.

STAFF REPORT

Hancock Springs Subdivision

File No. SUB18-05

(Consolidated files: SEPA18-28, ARCH18-17, CA18-17)

Type III

April 11th, 2019

TO	Hearings Examiner	**HEARING DATE**	April 18, 2019
PROPOSAL	To subdivide 9.95 acres into a 20 lot subdivision.		
LOCATION	The site is located at 2926 NW 18th Ave in the NE ¼ of Section 9, Township 1 North, Range 3 East, of the Willamette Meridian; and described as tax parcels 127414-000, 127377-000, 127371-000, 127379-000, 127375-000.		
APPLICANT	Northwest Classic Homes, LLC 10100 NE 116th Cr Vancouver, WA 98662	**CONTACT**	AKS Engineering andreottim@aks-eng.com 360.882.0419
APPLICATION SUBMITTED	November 21, 2018 Resubmitted December 26, 2018	**APPLICATION COMPLETE**	January 4, 2019
SEPA	The City issued a SEPA Determination of Non-significance (DNS) April 4th, 2019, with a comment period that ends on April 18th, 2019. The SEPA DNS was mailed to property owners April 4th, 2019 and published in the Post Record on April 4th, 2019. Legal publication #169820.		
PUBLIC NOTICES	Notice of Application and Public Hearing was mailed to property owners within 300 feet of the site on April 4th, 2019, and published in the Post Record on April 4th, 2019. Legal publication # 170130.		

APPLICABLE LAW: The application was submitted on December 26, 2018 and the applicable codes are those codes that were in effect at the date of application. Camas Municipal Code (CMC) Title 16 Environment, Title 17 Land Development, and Title 18, specifically (but not limited to): Chapter 18.11 - Parking, Chapter 18.13 - Landscaping, and Chapter 18.55 Administrative Procedures.

CONTENTS

SUMMARY

Application has been made to the City of Camas for preliminary plat approval for a 20-lot single-family residential subdivision located at 2926 NW 18th Ave in the R-10 & R-12 single-family residential zone. The preliminary plat proposal would separate 9.95 acres into 20 lots ranging in size from 8,600 square feet to 15,600 square feet. The proposal includes tracts for open space, access, and stormwater facilities

The subject property is bordered to the north by NW 18th Ave and across the street is zoned single family residential with a single family residence and a church. To the east, south and west are single family residences.

The proposed preliminary plat does or can comply with the applicable standards of the Camas Municipal Code (CMC) and Revised Code of Washington (RCW).

FINDINGS

Title 16 Environment

STATE ENVIRONMENTAL POLICY ACT (SEPA18-28)	CMC CHAPTER 16.07

A SEPA checklist was submitted and a Determination of Non Significance (DNS) was issued April 4, 2019 as the proposed development includes more than 20 residential dwelling units per CMC 16.07.020.A.1. At the time of staff report publication, no comments have been received. The SEPA appeal period can run concurrent with the Hearing Examiner final order.

FINDING: As proposed, this section can be met.

ARCHAEOLOGICAL RESOURCE PRESERVATION (ARCH18-17)	CMC CHAPTER 16.31

The applicant provided an archaeological predetermination report that is consistent with CMC 16.31.090. Based on the report, no further archaeological work is necessary at this time. The report and findings are not subject to the open public records act and as such, the city cannot disclose the results. A note should be added to the face of the final plat that includes inadvertent discovery language as required by the State Department of Archaeology & Historic Preservation.

FINDING: Staff finds if potential artifacts are discovered during the course of construction, work must immediately cease and both State Department of Archaeological and Historic Preservation and the City shall be notified.

CRITICAL AREAS (CA18-17)	CMC CHAPTER 16.53

CMC Chapter 16.53 Wetlands-

The site in question has two wetlands as determined by the applicant's critical areas report (Exhibit 5). These boundaries have been verified by the US Army Corps of Engineers in a letter dated November 5th, 2018, which is included in exhibit 5. Both Wetlands A and B are considered Category IV wetlands and carry a buffer width of 50', as per CMC 16.53.040-1. Staff concurs with this assessment of the buffer width.

Lots 6-9 will be separated from the wetland by the proposed stormwater facility in Tract D. The stormwater facility will have its own fencing requirement at the perimeter, which will also act as fencing for protecting the wetland and buffer. However, lots 10-12 will directly abut the wetland buffer as proposed. There is a requirement to provide a physical barrier between the development and the buffer edge. As per CMC16.60.040(C)(2), the outer edge of the wetland buffer is required to have permanent physical demarcation along the upland boundary of the wetland buffer. The buffer may consist of logs, a tree or hedgerow, fencing, or other prominent physical marking approved by the city. Small signs are also required to be posted at an interval of one every one hundred feet along the barrier line. All signage and buffer demarcation should be maintained by the underlying property owner. The wetland barrier and signage should be installed prior to final acceptance of the site construction. A condition to this effect is warranted.

FINDING: As conditioned this section can be met.

CMC Chapter 16.61 FISH AND WILDLIFE HABITAT CONSERVATION AREAS-

The site in question does contain two small streams as identified by the applicant's critical areas report (Exhibit 5). Water 1 and Water 2 are both classified as Type Ns Streams. As per CMC16.61.040.3.D, both streams have a 25' riparian buffer width. Water 1 is 27' long and Water 2 is 464 lineal feet. Both streams are located within the identified wetlands and associated buffers and are not proposed to be directly impacted. As stated above, there is a physical demarcation and signage requirements for the wetland areas.

FINDING: As proposed, this section can be met.

Title 17 Land Development

SUBDIVISIONS (SUB18-05)	CMC CHAPTER 17.11

CMC Section 17.11.030(D) Criteria for Preliminary Plat Approval:

The hearings examiner decision on application for preliminary plat approval shall be based on the following criteria:

1. The proposed subdivision is in conformance with the Camas Comprehensive Plan, Parks and Open Space Comprehensive Plan, Neighborhood Traffic Management Plan, and any other City adopted plans.

<u>Comprehensive Plan</u>

The City of Camas Comprehensive Plan supports the subdivision through a number of land use, housing, environmental policies and strategies such as the following:

Land Use Goal 1: Maintain a land use pattern that respects the natural environment and existing uses while accommodating a mix of housing and employment opportunities to meet the City's growth projections.

Land Use Goal 3: Create vibrant, stable, and livable neighborhoods with a variety of housing choices that meet all stages in the life cycle and the range of affordability.

Land Use Goal 4: Develop an interconnected network of parks, trails, and open space to support wildlife corridors and natural resources and enhance the quality of life for Camas residents and visitors.

Land Use Goal 5: To foster economically and socially diverse mixed neighborhoods as the foundation for a healthy city, which includes meeting the multi-modal transportation, housing, employment, education, recreation, and health needs of the citizens.

Housing Policy 1.2: Support residential development that minimizes both impervious areas and minimizes site grading to retain the natural contours of the land. Low impact development (LID) strategies include conserving native vegetation in tracts and considering narrower streets, stormwater gardens, and other landscape practices that store and filter runoff.

Natural Environment Goal 1: To preserve Camas' natural environment by developing a sustainable urban environment and protecting habitat and vegetation corridors.

The proposed subdivision will help accommodate the projected growth through utilization of existing land. The proposed houses, when built, will provide housing opportunities to meet the needs of the community in accordance with the Housing element of the Comprehensive Plan.

Parks and Open Space Comprehensive Plan

There are no required parks or trail sections for this site based on the adopted 2014 Parks Recreation and Opens Space plan. This section can be met as proposed.

Neighborhood Traffic Management Plan

The City has a Neighborhood Traffic Management Plan (NTM). The NTM plan identifies the need for installation of acceptable traffic calming features when a proposed development will create 700 Average Daily Trips (ADT) or more. The Technical Memorandum, compiled by Lancaster Engineering and dated September 20, 2018, found the project is expected to generate approximately 178 Average Daily Trips (ADT) with 14 new AM peak hour trips and 19 PM peak hour trips.

> **FINDINGS:** Staff finds that this proposed project is not subject to the requirements for traffic calming as noted in the City's NTM plan.

2. Provisions have been made for water, storm drainage, erosion control and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual.

Water: There is an existing 12-inch ductile iron water main located in NW 18th Avenue and an existing 8-inch ductile iron water main located in NW Cascade Street. The applicant has proposed to construct an 8-inch waterline within the development which will tie in at both NW 18th Avenue and NW Cascade Street. Installation of the water line from NW 18th Avenue through the development to NW Cascade Street will provide a looped system through the new development.

Individual water services will be provided to each lot with meter boxes located in the proposed planter strips or at back of sidewalk in areas where the sidewalk is curb tight. Fire hydrants will also be installed in accordance with Camas Design Standards Manual (CDSM) and Fire Department requirements. Irrigation service(s) may also be installed to provide irrigation for landscaping needs. Any irrigation meter(s) proposed will be required to be privately owned and maintained by the HOA and will require acceptable backflow prevention devices. The water main, irrigation service(s), water services, and fire hydrants will be located within the public right-of-way that will serve the proposed lots.

Staff finds that the applicant will be required, prior to final acceptance, to provide an acceptable backflow device (BFD) and yearly backflow testing for any private HOA irrigation service proposed. Staff finds that a condition of approval to this effect is warranted.

> **FINDINGS:** Staff finds that as conditioned the applicant can and will provide water system improvements consistent with the City's standards.

<u>Storm Drainage:</u> The preliminary stormwater technical information report, dated November 2018, was prepared by AKS Engineering & Forestry, LLC. The site is approximately 10 acres in size with slopes ranging from 2% to approximately 30%. The site is currently covered in field grasses, evergreen and deciduous trees, and contains wetlands and a non-fish bearing creek. The existing wetlands are located at the southern end of the development and span the width of the development from east-to-west. The non-fish bearing, Type 2 creek, is located south of the wetlands and also flows from the east-to-west. The wetlands (wetland A and wetland B) and the creek are to be located in Tract G 'Natural Area'.

Additionally, the applicant has proposed to construct two stormwater facilities, which will be located in two separate tracts, Tract F and Tract H. Tract F is to be located at the southwestern corner the development and contains an access road, the stormwater treatment vault, and the detention facility. Tract F's facility has been sized for treatment and detention of stormwater runoff from NW Hancock Drive and roof runoff from Lots 1-9 and Lots 13-20. Tract H, located at the southeastern corner of the development has been sized to detain roof runoff from Lots 10-12. Access to Tract H is to be via a 20-foot wide access easement on the east side of the development, south of NW Hancock Drive. Both stormwater facilities are shown to discharge into the Type 2 creek.

Tract F and Tract H are to be owned and maintained by the Homeowner's Association. The City is to be granted a right-of-entry for purposes of inspections of the stormwater facilities located in Tract F and Tract H. Staff finds that a condition of approval to this effect is warranted.

A final stormwater report is to be submitted to the City for review and approval, prior to final engineering plan approval. The final stormwater report is to provide the required documentation, per Ecology's 2014 SWMMWW, addressing the feasibility/infeasibility of LID BMPs. Staff finds that a condition of approval to this effect is warranted.

> **FINDINGS:** Staff finds that as conditioned the applicant can and will make adequate provisions for stormwater control, conveyance, and water quality treatment.

<u>Erosion Control:</u> Adequate erosion control measures can or will be provided during the site improvements contemplated for this subdivision in accordance with adopted city standards. The Erosion Sediment Control (ESC) plans will ultimately be submitted to the City for review and approval prior to any ground disturbing activities. The applicant will be required to provide an Erosion Control Bond, per CMC 17.21.050.B.3, prior to final engineering plan approval. Staff finds that a condition of approval to this effect is warranted.

Additionally, the applicant is to provide a copy of both their Stormwater Pollution Prevention Plan (SWPPP). The SWPPP is a part of their NPDES General Construction Stormwater Permit (GCSWP), which is issued by the Washington State Department of Ecology for ground disturbing activities equal to or greater than one acre. A copy of their NPDES GCSWP and SWPPP is to be submitted to the City prior to engineering plan approval.

FINDINGS: Staff finds that adequate provisions for erosion control can or will be made.

Sanitary Sewage Disposal: There is an existing 4-inch pressure Septic Tank Effluent Pressure (STEP) sewer main located on the south side of NW 18th Avenue. The applicant is proposing to connect to the existing STEP main at NW 18th Avenue and extend a new STEP main through the development to NW Cascade Street. The new STEP main will dead end at a STEP sanitary sewer cleanout in accordance with Camas Design Standards Manual (CDSM). The proposed STEP sewer system will provide a sewer lateral to each of the proposed lots. The system will consist of individual underground Roth STEP Tanks to be installed at the time of home construction on each lot. The tanks will retain the solids and the effluent will be pumped out of the tank and into the STEP mainline where the flow will then be conveyed to the existing South Prune Hill Pump station. The City will maintain the individual STEP tank systems once home construction is completed. The individual lot owners will be responsible for the cost and installation of the individual systems at the time of home construction. A right-of-entry will also be granted to the City for the maintenance and repair of said STEP tanks. A note to this effect is to be added to the final plat.

FINDINGS: Staff finds that adequate provisions for sanitary sewer can or will be made.

Existing wells, septic tanks and septic drain fields: CMC 17.19.020 (A 3) requires abandonment of existing wells, septic tanks and septic drain fields. Any existing wells, septic tanks and drain fields should be properly abandoned in accordance with State and County guidelines prior to final plat approval. If applicable, any water rights associated with the abandoned well(s) shall be transferred to the City.

FINDINGS: Staff finds that adequate provisions can or will be made as conditioned for water, storm drainage, erosion control and sanitary sewage disposal which are consistent with the Camas Municipal Code and the Camas Design Standard Manual.

3. Provisions have been made for road, utilities, street lighting, street trees and other improvements that are consistent with the Six-Year Street Plan, the Camas Design Standards Manual and other State adopted standards and plans;

Roads: The proposed development is located on the south side of NW 18th Avenue between NW Cascade Street and NW Hood Street. NW 18th Avenue is an existing 2-lane arterial that is designated as a 2 or 3 lane arterial per the City's 2016 Transportation Comprehensive Plan. The applicant is proposing a 60-foot public right-of-way with a 36-foot paved surface, curb & gutter, and detached 5-foot sidewalk at the entrance off NW 18th Avenue. This will then transition to an interior road with 52-foot right-of-way, 28-foot paved surface, curb & gutter, and both detached and curb tight sidewalks. The road will ultimately dead end at the future NW Cascade Street. NW Cascade Street is located on the north side of NW Hancock Drive and will consist of a half-width improvements consistent with CMC 17.19.040.B.1. Improvements for NW Cascade Street shall extend to the northern end of lot 15 (parcel number 127371000) as proposed. Exhibits 15 and 16 will show that the applicant has boundary line adjusted these parcels in advance of the subdivision hearing, but committed to completing the improvements even if the ownership of lot 15 has changed. The applicant shall install all applicable half width improvements for NW Cascade Street as proposed. The applicant is proposing a 30-foot right-of-way with a 20-foot paved surface, curb & gutter, and curb tight sidewalk. Additionally, the proposed dead-end, at NW Cascade Street, is to be used as a turnaround for emergencies vehicles, garbage, and recycling vehicles and will be consistent with the minimum standards per CMC 17.19.040.10.b for cross-circulation.   The public street sections proposed for this development, are consistent with the public street sections noted on CMC 17.19.040.B.8 Table 17.19.040-2 Minimum Public Street Standards.

Additionally, the applicant is proposing to construct Tract E for access to Lots 6 and 7 and Tract I for access to Lot 16. Tract I access is proposed to be a 20-foot wide tract. Tract E access is also proposed as a 20-wide tract. CMC 17.19.040 Table 1 Minimum Private Street Standards allows for a 20-foot wide tract, with a minimum 12-foot paved surface to 4 or less dwelling units. Both Tract E and Tract I, as proposed, meet this minimum standard.

Utilities, Street Lighting, Street Trees, and Other Improvements:

Street lighting: LED Street lighting will be installed along all street frontages in accordance with the Camas Design Standards Manual (CDSM). Street light locations are to be shown on the construction plans. Electrical plans are to be submitted for review and approval by the City prior to submittal to Clark Public Utilities.

Street trees and Landscaping: CMC 17.19.030.F.1 requires one 2-inch diameter street tree in the planter strip of the right-of-way for each dwelling unit. The proposed street tree locations are shown on the Preliminary Landscape Plan, in compliance with this requirement. Additionally, prior to final engineering approval, the applicant is to show proposed driveway locations for each lot to ensure that street trees are not impacted and conditioned as such.

As conditioned, the street tree plantings and other landscaping, as discussed throughout this report, should be included on the landscaping plans with final engineering plan submittal for the site improvements. All landscaping should be installed or bonded for prior to final plat acceptance.

> **FINDINGS:** Staff finds that the applicant can or will make adequate provisions as conditioned for roads, utilities, street lighting, street trees, and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans.

4. Provisions have been made for dedications, easements and reservations;

The applicant is to be required to provide a right-of-entry to the city for inspection and maintenance of the individual STEP systems. A note to this effect is warranted on the face of the final plat.

A homeowner's association (HOA) will be required for this development. A copy of the CC&R's for the development will need to be submitted to the City for review and approval. Additionally, the City is to receive a copy of the recorded CC&R's at time of Final Plat. Specifically, the applicant is to make provisions in the CC&R's for ownership and maintenance of the stormwater treatment and detention systems located in Tract D and Tract E, landscaping, irrigation, and any easements outside of the City's right-of-way, if applicable. All necessary easements and dedications should be noted on the final plat.

> **FINDINGS:** Staff finds that adequate provisions for dedications, easements and reservations can or will be made by the applicant at the time of final platting.

*5. The design, shape and orientation of the proposed lots are appropriate to the proposed use***.**

> **FINDINGS:** The applicant is proposing 20 lots for single family, detached dwelling units. The applicant is also eligible for density transfer due to the 2.75 acres of critical areas on site. With the exception of the lot located at the entrance to the site where an existing home will be demolished for road access, the rest of the site is zoned R-10. All lots are generally rectangular,

have adequate lot with, frontage, and all required setbacks listed on the proposed plat. As proposed the lot dimensions comply with all code requirements and can be built as proposed. This section can be met.

6. The subdivision complies with the relevant requirements of the Camas land development and zoning codes, and all other relevant local regulations;

CMC 15.50.090.A requires clearing and grading activities be conducted as to minimize potential adverse impacts to the vegetation, drainage and other natural features of the land. Clearing and grading should be conducted in a manner to preserve and enhance the city of Camas aesthetic character to include the preservation of unique landforms and natural features per CMC 15.50.090.E. Further, CMC 15.50.100.B requires the minimization of clearing and grading on slopes greater than 15%. Residential land development projects with steep slopes often include retaining walls for flatter lots. The proposed subdivision does not include any retaining walls at this time, however the preliminary grading plan indicates that the final grades range from approximately 5.4% to 22.2% specifically on Lots 5 thru 9, which are north of Tract F (stormwater facility), and Lots 17 thru 20, which are north of NW Hancock Drive. Any proposed retaining walls are to meet the requirements of CMC 18.17.060, which addresses both interior and exterior facing walls To minimize clearing and grading, and to further highlight the existing aesthetic landscape character of Camas, a revised clearing and grading plan should be submitted in compliance with CMC 18.17.060 *Retaining walls* prior to final engineering plan approval.

FINDING: As stated in the responses to criteria in this staff report and as conditioned herein, this proposal can or will meet all relevant codes, regulations, ordinances and other requirements as identified herein.

7. Appropriate provisions are made to address all impacts identified by the transportation impact study;

The applicant submitted a Technical Memorandum, prepared by Lancaster Engineering, on September 20, 2018. The report evaluated estimated trip generations based on the number of lots (20). The report used the trip generation rates from the ITE Trip Generation Manual (9^{th} Edition, 2012), ITE code #210 Single-Family Detached Housing, in order to determine the number of trips generated per weekday.

The findings in the Technical Memorandum were as follows:

- There are two existing unoccupied dwellings units. No site trip generation reductions were assumed with the removal of the two dwelling units.
- There is one (1) existing occupied dwelling unit.
- The proposed improvements consist of twenty (20) new dwelling units.
- The existing development generates 10 ADTs, 1 AM peak hour (0 in, 1 out), and 1 PM peak hour (1 in, 0 out) net new trips.
- The proposed new development is expected to generate 188 ADTs, 15 AM peak hour (4 in, 11 out), and 20 PM peak hour (13 in, 7 out) net new trips.
- Based on the number of trips generated, and per the Camas Design Standards Manual – Transportation Impact Study Guidelines, when the vehicles per day (VPD) are 199 vpd or less, a Traffic Study was not required.

The Traffic Information Report did not identify any potential adverse impacts to the area roadways.

Staff finds that there are no impacts needing mitigation associated with this development's traffic impacts to the area roadways based on the applicant's Traffic Information Report.

Site Distance Analysis: Intersection sight distance was measured at the proposed access road and NW 18th Avenue. The sight distance as measured and evaluated in accordance with the standards established in 'A Policy on Geometric Design of Highways and Streets".

The analysis found that based on a posted speed limit of 35 mph, the minimum recommended intersection sight distance, to ensure safe and efficient operation of the proposed access intersections is 390-feet to the east and to the west. Sight distance to the west was measured to be in excess of 400-feet and sight distance to the east was measured to be 360-feet, however sight distance to the east is blocked by vegetation on the neighboring property.

Although sight distance to the east was measured to be less than the minimum recommended intersection sight distance standard, according to the AASHTO manual, stopping sight distance is considered the minimum requirement to ensure safe operation of an intersection. The stopping sight distance allows an oncoming driver to see a hazard on the roadway, react, and come to a complete stop, if necessary, to avoid a collision. Conversely, intersection sight distance is an operational measure intended to provide sufficient line-of-sight along the major-street so that a driver could turn from the minor-street approach without impeding traffic flow.

Based on the available measured intersection sight distance, there is sufficient stopping sight distance to accommodate a westbound approaching vehicle traveling at 45 mph, or 10 mph above the currently posted speed limit. Alternatively, if the sight obstructing vegetation to the east were to be properly maintained or cleared, sight distance is expected to meet the minimum recommended 390-feet intersection sight distance standard.

Based on the sight distance analysis, adequate sight distance is available at the proposed site access intersection to ensure safe operation along NW 18th Avenue. Therefore, Staff finds that no sight distance mitigation is necessary.

Left-Turn Lane Warrants:
Traffic Volumes: In order to evaluate left-turn lane warrants at the proposed site access intersection, traffic counts were conducted at the intersection of NW 18th Avenue at NW Cascade Street on Thursday, September 6th, 2018 from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. Data was used from the intersection's morning and evening peak hours. Traffic volumes were balanced with the intersection of NW 18th Avenue at NW Cascade Street to determine the major-street volumes at the proposed access location.

Traffic volumes along NW 18th Avenue were assumed to increase due to expected background growth associated with future/potential development within the surrounding area. To estimate future traffic conditions, a compounded growth rate of two percent per year for an assumed buildout condition of two years was applied to the measured traffic volumes to approximate year 2020 background conditions. Additionally, peak hour trips calculated to be generated by the proposed development, were added to the projected 2020 background traffic volumes to estimate future traffic conditions with completion of the proposed project.

Warrant Analysis: 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, for the proposed development, were examined using methodologies provided within the National Cooperative

Highway Research Program's (NCHRP) Report 457. Turn lane warrants, shown on Figure 4 of the Technical Memorandum, were evaluated at buildout volumes and are as follows:

- Advancing vehicles (130 AM Peak & 250 PM Peak);
- Opposing vehicles (237 AM Peak & 166 PM Peak);
- Turning vehicles (1 AM Peak & 3 PM Peak);
- Travel speed (35 mph); and
- Number of through lanes (1).

Based on the information noted above, left-turn warrants are not projected to be met at the proposed site access at NW 18th Avenue. Staff concurs that a left-turn lane is not warranted.

> **FINDING:** Staff finds that this proposal can or will meet any impacts identified by the transportation impact study.

8. Appropriate provisions for maintenance of commonly owned private facilities have been made;

A Homeowner's Association will be required for this development including Conditions, Covenants, and Restrictions (CC&R's) to ensure there are adequate and appropriate measures are in place for the perpetual ownership and maintenance of open space Tracts A, B, C, D, E, and I; pedestrian access trails, landscaping, private stormwater easement located on Lots 10-12, the stormwater facilities located on Tracts F and H; and the wetland/natural area located on Tract G. Additionally, the CC&R's are to state that the City shall have right-of-entry to inspect the stormwater facilities located on Tracts F and H. Staff finds that a condition of approval to this effect is warranted. Additionally, a note to this effect is warranted on the face of the final plat.

> **FINDINGS:** Staff finds that adequate provisions for maintenance and ownership of private facilities can or will be made by the applicant at the time of final platting as conditioned.

9. Appropriate provisions in accordance with RCW 58.17.110, are made for (a) the public health, safety, and general welfare, and (b)The public use and interest will be served by the platting of such subdivision and dedication;

> **FINDINGS:** As discussed throughout this report, staff finds that the subdivision can be conditioned to provide the appropriate provisions for public health, safety, general welfare, and assure safe walking conditions for pedestrians.

10. The application and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state and local environmental acts and ordinances in accordance with RCW 36.70B.030.

> **FINDINGS:** Staff concurs that the proposed subdivision can or will meet the requirements of RCW 58.17 and other applicable state and local laws that are in at the time of final platting. The final plat will be processed in accordance with the requirements of CMC 17.21.060.

Title 18 Zoning

SUBDIVISIONS (SUB18-05)	CMC CHAPTER 17.11

18.09.040 - Density and dimensions—Single-family residential zones

Camas municipal code section 18.09.040 contains the dimensional standards for residential zoning districts. The site is largely zoned R-10 and contains wetlands on site, thus enabling the applicant to utilize density transfer provisions. As proposed, the lots all comply with the dimensional standards contained this section.

> **FINDINGS:** Staff finds a condition of approval is warranted that the applicant provide a dimensional standards and setback table on the face of the plat.

18.13.051 Tree Density Requirements.

Recently, the City of Camas adopted new standards for minimum tree density requirements. The applicant has provided a Tree Report with the applicant analyzing the proposed subdivisions impact to existing trees and how they propose to mitigate and comply with the require tree density contained in this section. Based on a net developable acreage of 5.63 acres the applicant is required to provide a total of 113 tree units on site (see page 2 of the tree report). While there will be trees removed on site, there are to be a total of 190 tree units retained. The retained tree units plus the proposed landscaping trees will bring the total tree unit count to 242, which is more than double the required minimum.

> **FINDINGS:** Staff finds this section can be met as proposed.

PUBLIC COMMENTS

CONCLUSION

Based on the above findings and discussion provided in this staff report, staff concludes that Hancock Springs Subdivision (SUB18-05) should be approved, because it does comply with the applicable standards if all of the conditions of approval are met.

RECOMMENDATION

Staff recommends APPROVAL of the preliminary plat of Hancock Springs Subdivision (SUB18-05) subject to the following conditions of approval *in addition to* the conditions of the SEPA (SEPA18-28) permit:

CONDITIONS OF APPROVAL

Standard Conditions:

1. All construction plans will be prepared in accordance with City of Camas standards. The plans will be prepared by a licensed civil engineer in Washington State and submitted to the City for review and approval.
2. A 3% construction plan review and inspection fee shall be required for this development. The fee will be based on an engineer's estimate or construction bid. The specific estimate will be submitted to the City's engineering department for review and approval. The 3% fee will be paid prior to the approved construction plans being released to the applicant. Under no circumstances will the applicant be allowed to begin construction prior to approval of the construction plans.
3. Any existing water wells, septic tanks and septic drain fields shall be properly abandoned in accordance with State and County guidelines prior to final plat approval. If applicable, any water rights associated with the abandoned well(s) shall be transferred to the City.

4. Any entrance structures or signs proposed or required for this project will be reviewed and approved by the City. All designs will be in accordance with applicable City codes. The maintenance of the entrance structure will be the responsibility of the homeowners.
5. The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, street lights, and associated appurtenances are installed.
6. A 6-foot private utility easement (PUE) shall be located outside of the right-of-way on public streets.
7. A street lighting plan shall be submitted to the City for review and approval prior to final plan submittal to Clark Public Utility.
8. The applicant will be required to purchase all permanent traffic control signs, street name signs, street lighting, and traffic control markings and barriers for the improved subdivision.
9. A homeowner's association (HOA) is required for this development. The applicant shall furnish a copy of the CC&R's for the development to the City for review and approval. Additionally, the applicant shall provide the city with a copy of the recorded CC&Rs at time of final plat recording.
10. The applicant shall make provisions in the CC&R's for maintenance of the storm treatment and conveyance system, landscaping, irrigation, retaining walls, tracts, and easements outside of the City's right-of-way, if applicable.
11. Final plat and final as-built construction drawing submittals shall meet the requirements of the CMC 17.11.060, CMC 17.01.050, and the Camas Design Standards Manual for engineering as-built submittals.
12. The applicant shall remove all temporary erosion prevention and sediment control measures from the site at the end of the two-year warranty period, unless otherwise directed by the Public Works Director.
13. Street names shall be reviewed and approved by the Building Department prior to final construction plan approval from the Engineering Department.
14. Building permits shall not be issued until this subdivision has been granted Final Acceptance and the final plat is recorded and approved by the Planning, Engineering, Building and Fire Departments.

<u>Special Conditions:</u>

1. The applicant shall be required, prior to final acceptance, to provide an acceptable backflow device (BFD) and yearly backflow testing for any private HOA irrigation service proposed
2. The City shall be granted a right-of-entry for purposes of inspections of the stormwater facilities located in Tract F and Tract H.
3. <u>The final stormwater report shall be submitted to the City for review and approval, prior to final engineering plans approval.</u>
4. The final stormwater report shall provide the required documentation, per Ecology's 2014 SWMMWW, addressing the feasibility/infeasibility of LID BMPs.
5. The applicant shall provide an Erosion Control Bond, per CMC 17.21.050.B.3, prior to final engineering plan approval.
6. a revised clearing and grading plan should be submitted in compliance with CMC 18.17.060 *Retaining walls* prior to final engineering plan approval
7. The applicant shall provide a right-of-entry to the city for inspection and maintenance of the individual STEP systems.

8. The applicant shall make provisions in the CC&R's for ownership and maintenance of the stormwater treatment and detention systems located in Tract F and Tract H, landscaping, irrigation, and any easements outside of the City's right-of-way, if applicable.
9. The CC&R's are to state that the City shall have right-of-entry to inspect the stormwater facilities located on Tracts F and H.
10. Signs shall be posted and maintained along critical area buffers at an interval of one (1) per lot and shall read substantially as follows: "Conservation Area - Retain in a natural state."
11. Continuous fencing shall be located along lot lines that are adjacent to critical areas (including buffers), and installed prior to final acceptance.
12. Wetlands, streams and associated buffers shall be clearly marked on the final plat, consistent with CMC 17.01.050.
13. Trees retained within open space areas shall be managed to ensure the long term health of the trees. Tree topping will not be permitted, nor removal of more than 20 percent of a tree's canopy. If tree removal is necessary due to a potential hazard to people or property, then replanting is required. A note to this effect shall be added to the plat.
14. Provide a density and dimensional standards table on the face of the plat.
15. All building envelopes shall be shown on the plat.
16. Prior to final engineering approval, the applicant is to show proposed driveway locations for each lot to ensure that street trees are not impacted and conditioned as such.
17. The street tree plantings and other landscaping, as discussed throughout this report, should be included on the landscaping plans with final engineering plan submittal for the site improvements. All landscaping should be installed or bonded for prior to final plat acceptance.
18. A copy of their NPDES GCSWP and SWPPP is to be submitted to the City prior to engineering plan approval.
19. The applicant shall install all applicable half width improvements for NW Cascade Street to the northern most end of parcel number 127371000.
20. The house located on parcel number 127371000 shall be connected to city utilities once available to the site.

FIRE DEPARTMENT

1. Street signs shall include hundred block designations.
2. The location of emergency turnarounds shall be approved by the Fire Marshal prior to construction plan approval.
3. The location of "No Parking" signs shall be inspected for compliance prior to final acceptance of subdivision improvements.
4. Private Hydrants shall be ordered in RED from the manufacturer.
5. The applicant shall contact the FMO for witnessed hydrant flushing on all hydrants. Contact information for the Fire Marshall is 360-834-6191 or FMO@cityofcamas.us for inspections or submittal questions.

Proposed Plat Notes

1. A right-of-entry shall be granted to the City for the maintenance and repair of individual STEP tanks.

2. The City shall have right-of-entry to inspect the stormwater facilities located on Tracts F and H.

3. Within identified tracts, wetlands, streams and associated buffers shall be maintained in their natural state as described in the final mitigation plans.

4. For trees in the common open space, tree topping shall not be permitted. Only trees that are determined to be hazardous by a licensed arborist may be removed after approval by the City. Removal of hazard trees, and required street trees shall be promptly replaced and maintained.

Exhibit 1
SUB18-05

City of Camas WASHINGTON

Community Development Department | Planning
616 NE Fourth Avenue | Camas, WA 98607
(360) 817-1568
communitydevelopment@cityofcamas.us

General Application Form **Case Number:**

Applicant Information

Applicant/Contact:: Northwest Classic Homes, LLC (Craig Moody) Phone: (360) 263-4125

Address: 10100 NE 116th Circle — craig.moody@shoot360.com

Street Address — *E-mail Address*

Vancouver — WA — 98662

City — *State* — *ZIP Code*

Property Information

Property Address: 2926 NW 18th Avenue — 127414-000, 127377-000, 127371-000, 127379-000, 127375-000

Street Address — *County Assessor # / Parcel #*

Camas — WA — 98607

City — *State* — *ZIP Code*

Zoning District R-12 & R10 Site Size 9.95 AC

Description of Project

Brief description: The applicant proposes to subdivide 5 parcels into a 20 lot subdivision with critical area tract, stormwater tract, open space tracts, and associated roads with curb, gutter, and sidewalks.

Are you requesting a consolidated review per CMC 18.55.020(B)? YES ☐ NO ☒

Permits Requested: ☐ Type I ☐ Type II ☒ Type III ☐ Type IV, BOA, Other

Property Owner or Contract Purchaser

Owner's Name: Northwest Classic Homes, LLC (Craig Moody) Phone: (360) 263-4125

Last *First*

Address: 10100 NE 116th Circle

Street Address *Apartment/Unit #*

E mail Address: Vancouver — WA — 98662

City — *State* — *Zip*

Signature

I authorize the applicant to make this application. Further, I grant permission for city staff to conduct site inspections of the property.

Signature: Cg E M — **Date:** 11/18/2018

Note: If multiple property owners are party to the application, an additional application form must be signed by each owner. If it is impractical to obtain a property owner signature, then a letter of authorization from the owner is required.

Date Submitted: Pre-Application Date:	
Staff: Related Cases # ☐ **Electronic Copy Submitted**	**Validation of Fees**

Revised: 11/30/17

Application Checklist and Fees [April 1, 2018]

◊ Annexation	$800 - 10% petition; $3,400 - 60% petition	001-00-345-890-00		$
◊ Appeal Fee		001-00-345-810-00	$369.00	$
◊ Archaeological Review		001-00-345-810-00	$127.00	$ 127.00
◊ Binding Site Plan	$1,742 + $22 per unit	001-00-345-810-00		$
◊ Boundary Line Adjustment		001-00-345-810-00	$95.00	$
◊ Comprehensive Plan Amendment		001-00-345-810-00	$5,400.00	$
◊ Conditional Use Permit				
Residential	$3,167 + $99 per unit	001-00-345-810-00		$
Non-Residential		001-00-345-810-00	$4,011.00	$
◊ Continuance of Public Hearing		001-00-345-810-00	$485.00	$
◊ Critical or Sensitive Areas (fee per type)		001-00-345-810-00	$718.00	$ 718.00
(wetlands, steep slopes or potentially unstable soils, streams and watercourses, vegetation removal, wildlife habitat)				
◊ Design Review				
Minor		001-00-345-810-00	$401.00	$
Committee		001-00-345-810-00	$2,200.00	$
◊ Development Agreement	$2,000 first hearing; $500 ea. add'l hearing/continuance	001-00-345-810-00		$
◊ Engineering Department Review				
Review Fee	3% of estimated construction costs	001.00.345.830.20		$ TBD
Modification to Approved Construction Plans		001.00.345.810.00	$391.00	$
◊ Fire Department Review				
Short Plat or other Development Review		115-09-345-830-10	$132.00	$
Short Plat or other Development Inspection		115-09-345-830-10	$132.00	$
Subdivision or PRD Review		115-09-345-830-10	$164.00	$ 164.00
Subdivision or PRD Inspection		115-09-345-830-10	$164.00	$ 164.00
Site Plan Review (commercial)		115-09-345-830-10	$195.00	$
Site Plan Inspection (commercial)		115-09-345-830-10	$195.00	$
◊ Home Occupation				
Minor - Notification (No fee)			$0.00	
Major		001-00-321-900-00	$64.00	$
◊ LI/BP Development	$4,011 + $38.00 per 1000 sf of GFA	001-00-345-810-00		$
◊ Minor Modifications to approved development		001-00-345-810-00	$320.00	$
◊ Planned Residential Development	$32 per unit + subdivision fees	001-00-345-810-00		$
◊ Plat, Preliminary				
Short Plat	4 lots or less: $1795.00 per lot	001-00-345-810-00		$
Short Plat	5 lots or more: $6,650 + $234 per lot	001-00-345-810-00		$
Subdivision	$6,650 + $234 per lot	001-00-345-810-00		$ 11,330.00
◊ Plat, Final:				
Short Plat		001-00-345-810-00	$185.00	$
Subdivision		001-00-345-810-00	$2,200.00	$
◊ Plat Modification/Alteration		001-00-345-810-00	$1,108.00	$
◊ Pre-Application (Type III or IV Permits)				
No fee for Type I or II				
General		001-00-345-810-00	$327.00	$
Subdivision		001-00-345-810-00	$844.00	$
◊ SEPA		001-00-345-890-00	$749.00	$ 749.00
◊ Shoreline Permit		001-00-345-890-00	$1,108.00	$
◊ Sign Permit				
General Sign Permit	(Exempt if building permit is required)	001.00.322.400.00	$37.00	$
Master Sign Permit		001.00.322.400.00	$116.00	$
◊ Site Plan Review				
Residential	$1,066 + $31 per unit	001-00-345-830-10		$
Non-Residential	$2,665 + $63 per 1000 sf of GFA	001-00-345-830-10		$
Mixed Residential/Non Residential		001-00-345-830-10		$
	$3,758 + $31 per res unit + $63 per 1000 sf of GFA			
◊ Temporary Use Permit		001-00-321-990-00	$74.00	$
◊ Variance (Minor)		001-00-345-810-00	$644.00	$
◊ Variance (Major)		001-00-345-810-00	$1,200.00	$
◊ Zone Change (single tract)		001-00-345-810-00	$3,100.00	$

Adopted by RES 1023 AUG 2005; Revised by RES 1113 SEPT 2007; Revised by RES 1163 OCT 2009; Revised by RES 1204 NOV 2010; Revised by RES 15-001 JAN 2015; Revised by RES 15-007 MAY 2015; Revised by RES 15-018 DEC 2015; Revised by RES 16-019 NOV 2016; Revised by RES 17-015 NOV 2017; Revised by RES 18-003 APRIL 2018

For office use only **Total Fees Due:** $ 13,252.00

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Exhibit 2
SUB18-05

A Land Use Application For Hancock Springs Type III Subdivision

Date: October 2018

Submitted to: City of Camas
Public Works Department
616 NE 4th Avenue
Camas, WA 98607

Applicant: Northwest Classic Homes, LLC
10100 NE 116th Circle
Vancouver, WA 98662

AKS Job Number: 5638

AKS Engineering & Forestry
9600 NE 126th Avenue, Suite 2520
Vancouver, WA 98682
(360) 882-0419

Table of Contents

Land Use Application for a Type III Subdivision

Submitted to:	City of Camas Public Works Department 616 NE 4th Avenue Camas, WA 98607
Applicant:	Northwest Classic Homes, LLC 10100 NE 116th Circle Vancouver, WA 98662 Contact: Craig Moody Email: craig.moody@shoot360.com Phone: (360) 263-4125
Applicant's Consultant:	AKS Engineering & Forestry, LLC 9600 NE 126th Avenue, Suite 2520 Vancouver, WA 98682 Contact(s): Michael Andreotti Email: andreottim@aks-eng.com Phone: (360) 882-0419
Site Location:	2926 NW 18th Avenue, Camas, WA 98607 Parcel Serial Numbers: 127371-000, 127375-000, 127377-000, 127379-000, and 127414-000
Site Size:	Total Area: 10.03 Acres (433,251 SF) 127371-000: 2.02 Acres (88,142 SF) 127375-000: 3.90 Acres (169,913 SF) 127377-000: 2.71 Acres (117,890 SF) 127379-000: 0.98 Acres (42,502 SF) 127414-000: 0.42 Acres (18,479 SF)
Zoning District:	Single-Family Residential R-12 (127414-000) Single-Family Residential R-10 (127371-000, 127375-000, 127377-000, and 127379-000)

I. Executive Summary

Through this application, Northwest Classic Homes, LLC (Applicant) requests approval from the City of Camas (City) to subdivide the subject site (described below) into a 20-lot Subdivision (Hancock Springs) for the future construction of 19 new single-family detached homes with one existing single-family home to remain. The developments main access will be from NW 18th Avenue, with future secondary access from NW Cascade Street as neighboring properties develop. Each lot is proposed to be provided with sanitary sewer, storm sewer, and water service, as well as other utilities, such as electric, gas, phone, cable, etc. The application also proposes two open space tracts at the main access to enhance the entry into the community, and a critical area tract to protect the existing wetlands and stream corridors on site, with a public path to connect the proposed neighborhood to the existing City trail system. As described in further detail throughout this written narrative and as detailed in the Preliminary Plans, the Subdivision will include all necessary streets, sidewalk, utilities, and other public improvements to support the proposed community.

This written narrative includes findings of fact demonstrating that the application complies with all applicable approval criteria. These findings are supported by substantial evidence, including Preliminary Plans and other written documentation. This information, which is included in this application package, provides the basis for the City to approve the application.

II. Site Description/Setting

The subject site is approximately 10.03 acres in size, located in south-central Camas. The address for the project is 2926 NW 18th Avenue, Camas, WA 98607. The subject site contains five parcels: Parcel Numbers 127371-000, 127375-000, 127377-000, 127379-000, and 127414-000. The majority of the area surrounding the project has been developed with single-family residences, with some properties immediately adjacent still undeveloped or as large-lot, single-family homes. The site generally slopes from northeast to southwest, with slopes ranging from approximately 2% in the north to approximately 30% in the future critical area tract at the south. Site vegetation consists of field grass, wetland plants, Himalayan blackberry, and deciduous and evergreen trees.

The subject site is zoned R-12 and R-10, Single-family Residential. The R-12 portion of the site consists of parcel 127414-000, approximately 0.42 acres of the site. The R-10 portion consists of parcels 127371-000, 127375-000, 127377-000, and 127379-000; approximately 9.61 acres of the site. All proposed lots are in the R-10 zoned portion of the site. Surrounding properties are zoned R-12 to the north, R-10 and R-12 to the east, R-12 to the south, and R-7.5 to the west.

III. Applicable Review Criteria

CITY OF CAMAS COMPREHENSIVE PLAN GOALS

- **Citywide Land Use Goal: Maintain a land use pattern that respects the natural environment and existing uses while accommodating a mix of housing and employment opportunities to meet the City's growth projections.**

Response: The subject site is zoned for residential development (R-12 and R-10). There is substantial demand for single-family housing in the City of Camas. The proposed subdivision provides the necessary infrastructure and supplies in-demand housing products at a density consistent with the surrounding area and site zoning, while maintaining existing critical areas on site. Therefore, the proposed development is consistent with the adopted comprehensive plan.

- **Neighborhood Goal: Create vibrant, stable, and livable neighborhoods with a variety of housing choices that meet all stages in the life cycle and the range of affordability.**

Response: The proposed subdivision will provide a mix of lot sizes, creating a neighborhood with a mix of single-family home options. The proposed lots meet the requirements of the R-10 zone, using the density transfer option for sites with critical areas, which provides housing types consistent with the overall comprehensive plan.

- **Natural Environment Goal: Develop and interconnected network of parks, trails, and open space to support wildlife corridors and natural resources and enhance the quality of life for Camas residents and visitors.**

Response: The Applicant proposes to create a critical area tract that maintains the wetlands and stream along the south portion of the site. This area connects to existing open space, which includes a public trail. Along the east side of the critical area tract, a public pathway will connect the proposed neighborhood to the existing trail system south of the site.

- **Citywide Housing Goal: Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community.**

Response: The proposed subdivision will provide a mix of lot sizes, creating a neighborhood with a mix of single-family home options. The proposed lots meet the requirements of the R-10 zone, using the density transfer option for sites with critical areas, which provides housing types consistent with the overall comprehensive plan.

- **Affordable Housing Goal: Create a diversified housing stock that meets the needs of all economic segments of the community through new developments, preservation, and collaborative partnerships.**

Response: The proposed subdivision will provide a mix of lot sizes, creating a neighborhood with a mix of single-family home options. The proposed lots meet the requirements of the R-10 zone, using the density transfer option for sites with critical areas, which provides housing types consistent with the overall comprehensive plan.

- **Environmental Stewardship Goal: To preserve Camas' natural environment by developing a sustainable urban environment and protecting habitat and vegetation corridors.**

Response: The proposed subdivision will provide a critical area tract to protect the existing wetlands and streams, as well as a large amount of the existing trees on site. There are also existing trees through the center of the site that will be protected to the extent practicable with the development. Along with these protections, new street trees will be installed with the roads, as well as trees and shrubs in the landscape tracts to help create a sustainable urban environment. See the tree plan and report included with this application for more information.

- **Critical Area Goal: To preserve, maintain, and restore the City's critical area to protect their function and values.**

Response: The proposed subdivision will provide a critical area tract to protect the existing wetlands and streams. There will be no direct impact to the wetlands or streams and all buffer impacts will be averaged or mitigated for on site.

- **Landscape Enhancement and Tree Preservation Goal: To protect Camas' native landscape and mature tree cover.**

Response: The proposed subdivision will provide a critical area tract to protect the existing wetlands and streams, including the native vegetation within that area. Existing trees outside of the critical area will be protected to the extent practicable. New trees will be installed with the development to replace some of the lost tree canopy.

- **Street Goal: Street will function for all users including bicyclists, pedestrians, transit users, and motorists.**

Response: All streets within the development will be designed to City standards and include sidewalks for pedestrians, and with the low traffic volume, bicyclists will be able to share the roadway with motorists. There is currently no public transit service to the area.

- **Walking, Bicycling, and ADA Mobility Goal: The needs of bicyclists, pedestrians, transit users, and accessibility (ADA-compliant) will be considered in all street improvements and will be integrated in all collector and arterial roadway projects, including regular safe street crossings.**

Response: The subdivision is providing sidewalks along all streets within the development as well as a shared use pathway from the neighborhood running south to connect to the existing City trail system.

- **Design and Low-Impact Development Goal: The transportation system will be designed to support community character and environmental policies.**

Response: The main road (NW Hancock Drive) running though the development is proposed as a 52-foot reduced right of way to help reduce impacts to the existing wetland and vegetation. The reduced width will also help to calm traffic and create a neighborhood that supports walkability and community.

- **Safety and Traffic Calming Goal: Design and construct safe transportation facilities that meet applicable requirements.**

Response: All roads within the subdivision are designed to City standards. NW Hancock Drive is proposed as a 52-foot wide road, which will help with traffic calming and create a safe transportation facility.

- **Transportation Demand Management Goal: Transportation planning will achieve the efficient use of transportation infrastructure, increase its person carrying capacity, and accommodate and facilitate future growth consistent with land use objectives.**

Response: The subdivision proposes a road layout that will have carrying capacity for the proposed neighborhood, as well as allow for expansion and future circulation to the east and west.

- **Parks and Recreation Goal: Preserve and enhance the quality of life in Camas through the provision of parks, recreation programs, recreational facilities, trails, and open spaces.**

Response: The proposed subdivision will provide a public shared use path through the east edge of the critical area tract that will connect to the existing public trail systems to the south of the development.

- **General Utility Goal: Provide utility services to all businesses, residents, and properties in the City limits. In urban area, eliminate private water and sewer/septic systems, including wells used only for irrigation.**

Response: All new lots and the one existing home to remain will be provided with public water and sewer service. The existing septic system serving the home to remain will be abandoned per Clark County Health Department standards with the project.

CITY OF CAMAS MUNICIPAL CODE

TITLE 5 - BUSINESS LICENSES AND REGULATIONS

Chapter 5.45 - TELECOMMUNICATIONS (Article V. - Telecommunications Franchise)

5.45.365 - Location of facilities.

Response: All electric, cable, or telecommunication lines installed with the development will be located underground. The final location of these utilities will be determined with final construction plans. This standard is met.

TITLE 12 – STREETS, SIDEWALKS AND PUBLIC PLACES

Chapter 12.24 – Street Names

Response: The proposed streets have been named according to the City of Camas Street Naming Manual. NW 17th Avenue is the next numerical street south of NW 18th Avenue. NW Cascade Street is a half width improvement that will eventually connect to existing NW Cascade Street. NW Hancock Drive is named after the original land owners and is a drive because it does not generally conform to the northerly-southerly or easterly-westerly grid. This standard is met.

TITLE 14 - OFFENSES AND MISCELLANEOUS PROVISIONS

Chapter 14.02 - STORMWATER CONTROL

Response: The proposed stormwater will be collected on site and conveyed to a stormwater treatment vault for mechanical treatment and then stored in a detention pond. The treated stormwater will be released to the existing stream at rates permitted by Camas Municipal Code (CMC). The stormwater system is designed per the Stormwater Management Manual for Western Washington. See the Preliminary Stormwater Technical Information Report (TIR) and Preliminary Plan included with this application for more information. This standard is met.

TITLE 16 - ENVIRONMENT

Chapter 16.07 - SEPA CATEGORICAL EXEMPTION AND THRESHOLD DETERMINATIONS

16.07.040 - Environmental checklist.

Response: A SEPA Checklist is required for this project and has been submitted with this application. This standard is met.

Chapter 16.31 - ARCHAEOLOGICAL RESOURCE PRESERVATION

16.31.070 - Predetermination report required.

Response: An archaeological predetermination was completed by Applied Archaeological Research (AAR) on March 22, 2018. No artifacts were found on the surface or in the seven test pits and AAR recommends no further archaeological site work is warranted. The two existing houses on site that are greater than 45 years old have been determined to not be eligible to be listed on the National Register of Historic Places. This standard is met.

Chapter 16.51 - GENERAL PROVISIONS FOR CRITICAL AREAS

16.51.090 - Applicability.

16.51.120 - Allowed activities.

C. Allowed Activities. The following activities are allowed:

4. Public and Private Pedestrian Trails.

a. Existing public and private trails established consistent with the city of Camas parks and open space plan may be maintained, replaced, or extended, provided there is no increase in the impact to the critical area or management zone.

b. Other public and private pedestrian trails, except in wetlands, fish and wildlife habitat conservation areas, or their management zones, subject to the following:

i. The trail surface shall meet all other requirements including water quality standards set forth in the city of Camas Design Standards Manual,

ii. Critical area and/or management zone widths shall be increased, where possible, equal to the width of the trail corridor, including disturbed areas, and

iii. Trails proposed to be located in landslide or erosion hazard areas shall be constructed in a manner that does not increase the risk of landslide or erosion, and in accordance with an approved geotechnical report;

Response: As stated on page five of the Pre-Application Meeting Notes, the applicant will be required to construct a 6-foot wide pedestrian access in the 20-foot ingress easement that exists on the east side of the site. The trail will be constructed in Tract E, which is to be a critical areas tract. The trail will remain outside of all existing wetland buffers, as well as areas used for buffer averaging. The trail will be constructed of asphalt and water quality requirements will be met. The trail will not be constructed in landslide or erosion hazard areas. This standard is met.

16.51.130 - Review required.

Response: A critical area report and preliminary mitigation plan have been prepared and are included with this application. This standard is met.

16.51.160 - Mitigation requirements.

A. The applicant shall avoid all impacts that degrade the functions and values of a critical area or areas. Unless otherwise provided in these provisions, if alteration to the critical area is necessary, all adverse impacts to or from critical areas and management zones resulting from a development proposal or alteration shall be mitigated in accordance with an approved critical area report and SEPA documents.

Response: This application proposes to have no impacts to the wetlands or streams. There will be encroachment into the buffer of Wetland B. There will be approximately 4,205 square feet of buffer that will be averaged out down to a 30-foot buffer, with 4,206 square feet of buffer averaged back in on site. There will be approximately 960 square feet of buffer that is impacted down to a 25-foot buffer. Buffer enhancement at a rate of 2:1 (1,920 square feet) will be installed to mitigate for the buffer impacts. See the Preliminary Plans and Buffer Modification and Enhancement Plan included with this application for more detail.

B. Mitigation should be in-kind and on-site, when possible, and sufficient to maintain the functions and values of the critical area, and to prevent risk from a hazard posed by a critical area.

Response: This application proposes impacts to approximately 960 square feet of wetland buffer that will require mitigation. Buffer enhancement at a ratio of 2:1 will be used to mitigate the impacts. The enhancement will improve the buffer above its current level and be located adjacent to the storm facility gravel access road. See the Preliminary Plans and buffer mitigation plan included with this application for more detail. This standard is met.

C. Mitigation shall only be implemented after city approval of a critical area report that includes a mitigation plan; and mitigation shall be in accordance with the provisions of the approved critical area report.

Response: A critical area report and mitigation plan are included with this application for city review and approval. This standard is met.

16.51.170 - Mitigation sequencing.

Response: The Applicant has significantly reduced the lot dimensions and rearranged the site layout from the original proposal in the initial (pre-application) project design. The current project avoids all direct impacts to wetlands, the Wetland A buffer, Waters 1 and 2, and the 25-foot stream and water quality buffers. The applicant has minimized the degree of encroachment into the Wetland B buffer by application of careful site design and the implementation of allowable buffer reduction and averaging measures, but minor impact to the wetland buffer will occur. Buffer impacts will be averaged and mitigated for on site. See the mitigation plan included with this application for more detail. A conservation covenant and a monitoring program will also be implemented to ensure protection of the functions of Wetland B and its buffer. This standard is met.

Chapter 16.53 - WETLANDS

16.53.020 - Rating system.

B. Wetland Rating System. Wetlands shall be rated according to the Washington State Department of Ecology (ecology) wetland rating system found in Washington State Wetland Rating System for Western Washington—2014 Update (Revised, Ecology Publication #14-06-029, October 2014) or most current edition. The rating system document contains the definitions and methods for determining if the criteria below are met:

1. Wetland Rating Categories.

d. Category IV. Category IV wetlands have the lowest levels of functions and are often heavily disturbed. They are characterized by a score of fewer than sixteen points in the rating system. These are wetlands that should be replaceable, and in some cases may be improved. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands may provide some important functions, and should be protected to some degree.

<u>Response:</u> The site contains two wetlands. Wetland A is a palustrine forested (PFO) wetland located in the south-central portion of the site. Water 2 flows along the southern boundary of the wetland, in a southwesterly direction. The wetland is 0.09 acres (3,964 square feet) in size with the main hydrology sources coming from groundwater and upland runoff. The wetland is on a slope with water flowing through the wetland in one direction without being impounded; therefore, Wetland A belongs in the Slope hydrogeomorphic (HGM) sub classification. Hydrology discharges from Wetland A directly into Water 2. The wetland was rated as a Category IV wetland with a low habitat score of 4.

Wetland B is a palustrine emergent (PEM) wetland located in the southeastern portion of the site, immediately upslope of Wetland A. The wetland is 0.42 acres (18,405 square feet) in size. The main hydrology source for Wetland B is groundwater, upland runoff, and direct precipitation. Wetland B belongs to the Slope HGM sub classification. The wetland is rated as a Category IV wetland with a low habitat score of 4.

2. Date of Wetland Rating. Wetland rating categories shall be applied as the wetland exists on the date of adoption of the rating system by the local government, as the wetland naturally changes thereafter, or as the wetland changes in accordance with permitted activities. Wetland rating categories shall not change due to illegal modifications.

<u>Response:</u> A site visit and wetland rating was performed by AKS Engineering and Forestry in March 2018. This standard is met.

16.53.030 - Critical area report—Additional requirements for wetlands.

<u>Response:</u> A critical areas report meeting the requirements of this section was prepared by AKS Engineering and Forestry on May 4, 2018. The critical areas report is included in this application. The report is included with this application. This standard is met.

16.53.050 - Wetland permits.

A. General.

Response: This application proposes development within wetland buffers. Therefore, a wetland permit is required. A critical area report and mitigation plan are included with this application. This standard is met.

B. Standards—General. Wetland permit applications shall be based upon a mitigation plan and shall satisfy the following general requirements:

1. The proposed activity shall not cause significant degradation of wetland functions;

2 The proposed activity shall comply with all state, local, and federal laws, including those related to sediment control, pollution control, floodplain restrictions, stormwater management, and on-site wastewater disposal.

Response: The proposed development activity will have no impact to the habitat within the wetlands or streams. There will be impacts within the buffers for Wetland B. Buffer averaging and enhancement will be used to mitigate these impacts. New native plant material will be installed, along with control of invasive species throughout the wetland. Creating zero net loss for the buffer functions on site. See the mitigation plan included with this application for more information. Erosion control plans will be included in the final construction plans for sediment and pollution control. A stormwater plan is included with the application, detailing how the Applicant proposes to manage stormwater. No on-site waste water will be disposed of in the wetlands. This standard is met.

C. Buffer Standards and Authorized Activities. The following additional standards apply for regulated activities in a wetland buffer to ensure no net loss of ecological functions and values:

1. Buffer Reduction Incentives. Standard buffer widths may be reduced under the following conditions, provided that functions of the post-project wetland are equal to or greater after use of these incentives.

a. Lower Impact Land Uses. The buffer widths recommended for proposed land uses with high-intensity impacts to wetlands can be reduced to those recommended for moderate-intensity impacts if both of the following criteria are met:

i. A relatively undisturbed, vegetated corridor at least one hundred feet wide is protected between the wetland and any other priority habitats that are present as defined by the Washington State Department of Fish and Wildlife; and

ii. Measures to minimize the impacts of the land use adjacent to the wetlands are applied, such as infiltration of stormwater, retention of as much native vegetation and soils as possible, direction of noise and light away from the wetland, and other measures that may be suggested by a qualified wetland professional.

Response: The high intensity buffer required for the existing category IV wetlands is 50 feet. The Applicant is proposing to reduce the buffer to a moderate intensity 40-foot buffer by retaining native vegetation, directing noise and lights away from the wetlands, and installing fences along property lines to protect the critical areas.

b. Restoration. Buffer widths may be reduced up to twenty-five percent if the buffer is restored or enhanced from a pre-project condition that is disturbed (e.g., dominated by invasive species), so that functions of the post-project wetland and buffer are equal or greater. To the extent possible, restoration should provide a vegetated corridor of a minimum one hundred feet wide between the wetland and any other priority habitat areas as defined by the Washington State Department of Fish and Wildlife. The habitat corridor must be protected for the entire distance between the wetland and the priority habitat area by some type of permanent legal protection such as a covenant or easement. The restoration plan must meet requirements in subsection D of this section for a mitigation plan, and this section for a critical area report.

Response: The Applicant is proposing buffer reduction in some locations. The reduction will be mitigated for using buffer averaging, buffer enhancement, and other methods for mitigation. After buffer reduction and mitigation, there will be no net loss to function of the wetland buffer. See the mitigation plan included with this application for more information. This standard is met.

c. Combined Reductions. Buffer width reductions allowed under subsections (C)(1)(a) and (C)(1)(b) of this section may be added provided that minimum buffer widths shall never be less than seventy-five percent of required buffer width for all Categories I and II, or less than fifty feet for Category III wetlands, and twenty-five feet for all Category IV wetlands.

Response: The application is proposing no buffers less than 25 feet as part of the development. See the Preliminary Plans and mitigation plan included with this application for more details. This standard is met.

2. Buffer Averaging. Averaging buffers is allowed in conjunction with any of the other provisions for reductions in buffer width (listed in subsection (C)(1) of this section) provided that minimum buffer widths listed in subsection (C)(1)(c) of this section are adhered to. The community development department shall have the authority to average buffer widths on a case-by-case basis, where a qualified wetlands professional demonstrates, as part of a critical area report, that all of the following criteria are met:

b. Decreases in width are generally located where wetland functions may be less sensitive to adjacent land uses, and increases are generally located where wetland functions may be more sensitive to adjacent land uses, to achieve no net loss or a net gain in functions;

c. The averaged buffer, at its narrowest point, shall not result in a width less than seventy-five percent of the required width, provided that minimum buffer widths shall never be less than fifty feet for all Category I, Category II, and Category III wetlands, and twenty-five feet for all Category IV wetlands; and

Response: The application proposes the use of buffer averaging as part of the project. Approximately 4,205 square feet of buffer is proposed to be averaged out down to a 30-foot buffer with the development. Approximately 4,206 square feet of buffer will be averaged back in on site. The narrowest point of the averaged buffer is 30 feet. Any buffer impacts down to 25 feet will be mitigated for using buffer enhancement as required. See the mitigation plan included with this application for more detail. This standard is met.

3. Stormwater Facilities. Stormwater facilities are only allowed in buffers of wetlands with low habitat function (less than four points on the habitat section of the rating system form); provided, the facilities shall be built on the outer edge of the buffer and not degrade the existing buffer function, and are designed to blend with the natural landscape. Unless determined otherwise by the responsible official, the following activities shall be considered to degrade a wetland buffer when they are associated with the construction of a stormwater facility:

Response: The wetlands have a habitat rating of 4. Therefore, stormwater facilities are not allowed within the wetland buffers. Where the stormwater facility is proposed within the existing wetland buffer, those buffer areas will be averaged or enhanced on site. This standard is met.

4. Road and Utility Crossings. Crossing buffers with new roads and utilities is allowed provided all the following conditions are met:

a. Buffer functions, as they pertain to protection of the adjacent wetland and its functions, are replaced; and

b. Impacts to the buffer and wetland are minimized.

Response: This application proposed a gravel access road to the stormwater facility through the buffer of Wetland B. The buffer functions of the adjacent wetland will be replaced and enhanced. There will be no impacts to the wetland and the impacts to the buffer will be minimized. See the Preliminary Plans and buffer mitigation report included with this application for more information. This standard does not apply.

5. **Other Activities in a Buffer. Regulated activities not involving stormwater management, road and utility crossings, or a buffer reduction via enhancement are allowed in the buffer if all the following conditions are met:**

Response: All proposed activities within buffers will be permanent or be part of stormwater management. Buffer reduction will either be averaged on site or be a mitigated buffer impact on site. This standard is met.

D. **Standards—Wetland Activities. The following additional standards apply to the approval of all activities permitted within wetlands under this section:**

1. **Sequencing. Applicants shall demonstrate that a range of project alternatives have been given substantive consideration with the intent to avoid or minimize impacts to wetlands. Documentation must demonstrate that the following hierarchy of avoidance and minimization has been pursued:**

a. **Avoid impacts to wetlands unless the responsible official finds that:**

ii. **For Categories III and IV wetlands, avoiding all impact will result in a project that is either:**

(A) **Inconsistent with the city of Camas comprehensive plan;**

(B) **Inconsistent with critical area conservation goals; or**

(C) **Not feasible to construct.**

Response: The Applicant considered multiple layouts to reach a layout with the least amount of impact to the critical areas. The proposed layout has no direct impacts to wetlands. The buffer for Wetland B will be averaged on site down to 30 feet. All buffer impacts down to 25 feet will be mitigated on site with buffer enhancement. This will create no net loss to function for the critical areas. The Applicant also considered lot size reductions, however, it was determined that this would create a development that would not be economically feasible to develop. There is also a variety of lot sizes, allowing the development to meet the average lot size requirement of CMC Section 18.09.040. The development is also consistent with critical area conservation goals by creating a critical area tract, having no direct impacts to the wetlands or streams, protecting a large amount of existing trees and vegetation, and creating no net loss to function for the critical areas. This standard is met.

b. **Minimize impacts to wetlands if complete avoidance is infeasible. The responsible official must find that the applicant has limited the degree or magnitude of impact to wetlands by using appropriate technology and by taking affirmative steps to reduce impact through efforts such as:**

i. **Seeking easements or agreements with adjacent land owners or project proponents where appropriate;**

ii. Seeking reasonable relief that may be provided through application of other city zoning and design standards;

iii. Site design; and

iv. Construction techniques and timing.

Response: This application does not propose any direct, or indirect impacts to the wetlands. There are impacts proposed to some wetland buffers. These buffer impacts will be mitigated for with enhancement on site. See the mitigation plan included with this application for more detail. This standard is met.

c. Compensate for wetland impacts that will occur, after efforts to minimize have been exhausted. The responsible official must find that:

i. The affected wetlands are restored to the conditions existing at the time of the initiation of the project;

ii. Unavoidable impacts are mitigated in accordance with this subsection; and

iii. The required mitigation is monitored and remedial action is taken when necessary to ensure the success of mitigation activities.

Response: This application does not propose any direct, or indirect impacts to the wetlands. There are impacts proposed to some wetland buffers. These buffer impacts will be mitigated for with enhancement on site. See the mitigation plan included with this application for more detail. This standard is met.

2. Location of Wetland Mitigation. Wetland mitigation for unavoidable impacts shall be located using the following prioritization:

a. On-Site. Locate mitigation according to the following priority:

i. Within or adjacent to the same wetland as the impact;

ii. Within or adjacent to a different wetland on the same site;

Response: The Applicant is proposing all wetland buffer averaging and enhancement will occur on site and be contiguous with the existing wetland buffers. This standard is met.

3. Types of Wetland Mitigation. The various types of wetland mitigation allowed are listed below in the general order of preference.

c. **Enhancement. The manipulation of the physical, chemical, or biological characteristics of a wetland site to heighten, intensify, or improve the specific function(s), or to change the growth stage or composition of the vegetation present. Enhancement is undertaken for specified purposes such as water quality improvement, floodwater retention, or wildlife habitat. Enhancement results in a change in some wetland functions and can lead to a decline in other wetland functions, but does not result in a gain in wetland acres. Activities typically consist of planting vegetation, controlling non-native or invasive species, modifying site elevations, or the proportion of open water to influence hydroperiods, or some combination of these activities.**

Response: The Applicant proposes to use enhancement for impacts to the wetland buffers that cannot be averaged per CMC. See the mitigation plan included with this application for more detail. This standard is met.

d. **Protection/Maintenance (Preservation). Removing a threat to, or preventing the decline of, wetland conditions by an action in or near a wetland. This includes the purchase of land or easements, repairing water control structures or fences, or structural protection such as repairing a barrier island. This term also includes activities commonly associated with the term preservation.**

Preservation does not result in a gain of wetland acres, but may result in improved wetland functions.

Response: The Applicant is proposing a critical area tract that will encompass Wetland A, Wetland B, and Water 1 and 2, as well as all final buffers for these critical areas. The tract will protect the wetlands and waters into the future. This standard is met.

4. **Wetland Mitigation Ratios.**

Response: No wetland impacts will occur with this application. Therefore, no wetland mitigation will be required. This section does not apply.

5. **Alternate Wetland Mitigation.**

Response: No wetland mitigation is required as part of this application. All wetland buffer averaging or enhancement will occur on site. See the mitigation plan included with this application for more detail. This standard does not apply.

E. **Mitigation Plans.**

1. General. Mitigation plans are required for activities in a buffer or wetland. Content requirements which are inappropriate and inapplicable to a project may be waived by the responsible official upon request of the applicant at or subsequent to the pre-application consultation provided for in subsection (F)(1) of this section.

2. Preliminary Mitigation Plan. The purpose of the preliminary plan is to determine the feasibility of the project before extensive resources are devoted to the project. The responsible official may waive the requirement for a preliminary mitigation plan when a wetland permit is not associated with a development permit application (listed in Section 16.53.010(B)). The preliminary mitigation plan consists of two parts: baseline information for the site and a conceptual plan. If off-site wetland mitigation is proposed, baseline information for both the project site and mitigation site is required.

Response: A mitigation plan is required for this application as there will be impacts to critical area buffers. A preliminary mitigation plan completed by AKS Engineering and Forestry is included with this application. This standard is met.

3. Final Mitigation Plan. The contents of the final mitigation plan shall include:

Response: A final mitigation plan will be provided at the time of final engineering review. This standard is met.

F. Wetland Permit—Application.

1. Pre-Permit Consultation. Any person intending to apply for a wetland permit is encouraged, but not required, to meet with the department during the earliest possible stages of project planning in order to discuss wetland impact avoidance, minimization, compensatory mitigation, and the required contents of a mitigation plan before significant commitments have been made to a particular project design. Effort put into pre-permit consultations and planning will help applicants create projects which will be more quickly and easily processed.

Response: A pre-application conference was held on May 17, 2018 to discuss the overall project. The wetlands were discussed during the conference and updates were made to the project layout based on comments received during the conference. This standard is met.

2. Applications. Applications for wetland permits shall be made to the department on forms furnished by the department and in conformance with Section 16.53.030.

Response: Information for a wetland permit application is included in the application package. This standard is met.

G Wetland Permit—Processing.

1. Procedures. Wetland permit applications within shoreline jurisdiction shall be processed using the application procedures in the [Shoreline Master] Program, Appendix B—Administration and Enforcement, unless specifically modified herein:

   a. Type I Wetland Permit. The following wetland permits shall be reviewed under the Type I review process in accordance with CMC Chapter 18.55:

      i. Buffer modification only;

      ii. Wetland permits associated with single-family building permits, regardless of impact;

      iii. Re-authorization of approved wetland permits;

      iv. Programmatic wetland permits that are SEPA exempt.

      v. Programmatic wetland permits that are exempt from a shoreline substantial development permit.

Response: The Applicant is proposing only buffer modifications as part of a residential subdivision. The wetland permit application will be reviewed as Type I Wetland Permit. This standard is met.

2. Consolidation. The department shall, to the extent practicable and feasible, consolidate the processing of wetland permits with other city regulatory programs which affect activities in wetlands, such as SEPA review, subdivision, grading, and site plan approval, so as to provide a timely and coordinated permit process. Where no other city permit or approval is required for the wetland activity, the wetland permit shall be processed in accordance with a Type II process under CMC Chapter 18.55, Administration.

Response: The wetland permit application is included as part of the overall Type III Subdivision Land Use Application. This standard is met.

3. Notification. In addition to notices otherwise required, notice of application shall be given to federal and state agencies that have jurisdiction over, or an interest in, the affected wetlands. This notice may be incorporated into a SEPA comment period.

Response: The Army Corps of Engineers has approved the wetland boundaries and all proper notice of the permit application will be given. This standard is met.

TITLE 17 - LAND DEVELOPMENT

Chapter 17.11 – SUBDIVISIONS

17.11.030 - Preliminary subdivision plat approval.

A. Preapplication.

Response: A preapplication conference as held on May 17, 2018. This standard is met.

B. **Application. In addition to those items listed in CMC 18.55.110, the following items are required, in quantities specified by community development department, for a complete application for preliminary subdivision approval. Items may be waived if, in the judgment of the community development director or designee, the items are not applicable to the particular proposal:**

Response: The application submitted for preliminary subdivision plat approval contains all the required information listed in this section. This standard is met.

D. **Criteria for Preliminary Plat Approval. The hearings examiner decision on an application for preliminary plat approval shall be based on the following criteria:**

1. **The proposed subdivision is in conformance with the Camas comprehensive plan, parks and open space comprehensive plan, neighborhood traffic management plan, and any other city adopted plans;**

Response: As stated previously, the proposed subdivision meets all applicable goals of the Camas Comprehensive Plan. The neighborhood traffic management plan goals are met by providing a single access to NW 18th Street and locations for future road extensions to reduce the access points to the arterial. Multi-modal transportation is also provided with sidewalks and a multi-use pathway. The critical area tract and multi-use pathway meet the goals of the parks and open space comprehensive plan. This standard is met.

2. **Provisions have been made for water, storm drainage, erosion control and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual;**

Response: The proposed subdivision will provide water and sanitary sewer connections for each proposed lot. The sanitary sewer will connect to the existing STEP sewer main located in NW 18th Street. The water main will loop from the line in NW 18th Street to the water main located in the existing easement along the east property line. Stormwater will be collected on site and conveyed to a stormwater treatment vault and then to a detention pond. Treated stormwater will be discharged to the existing stream at approved rates. An erosion control plan will be provided with final construction plans. This standard is met.

3. **Provisions have been made for road, utilities, street lighting, street trees and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans;**

Response: The applicant proposes roads meeting the standards of the City and the design standard manual. Planting strips are provided for street trees and street lighting is included in the design. Provisions have been made for utilities as shown in the plans included with this application. This standard is met.

4. **Provisions have been made for dedications, easements and reservations;**

Response: All needed easements and reservations are shown on the plans submitted with this application. This standard is met.

5. **The design, shape and orientation of the proposed lots are appropriate to the proposed use;**

Response: As shown on the plans submitted with this application, all lots are oriented fronting a street or access tract and are shaped appropriately to allow home construction. This standard is met.

6. **The subdivision complies with the relevant requirements of the Camas land development and zoning codes, and all other relevant local regulations;**

Response: As shown on the plan submitted with this application, the subdivision complies with all requirements of the CMC and other relevant regulations.

7. **Appropriate provisions are made to address all impacts identified by the transportation impact study;**

Response: The Applicant's Transportation Engineering Consultant, Lancaster Engineering, has prepared a traffic study and conducted a trip generation analysis. The study dated September 20, 2018, states that the proposed subdivision will generate a total of 178 new daily trips, with 14 new a.m. peak hour trips and 19 new p.m. peak hour trips. The existing home currently generates 10 daily trips, with one a.m. peak hour trip and one p.m. peak hour trip. The development total will be 188 daily trips, with 15 a.m. peak hour trips and 20 p.m. peak hour trips. The traffic engineer also completed a sight distance analysis and left turn lane warrant. It was determined that the site meets all sight distance requirements and that no left turn lane is warranted for the project. See the Transportation Study included with this application for more information. This standard is met.

8. **Appropriate provisions for maintenance of commonly owned private facilities have been made;**

Response: The tracts included in the subdivision will be maintained by the homeowner's association. This standard is met.

9. **Appropriate provisions, in accordance with RCW 58.17.110, are made for:**

   a. **The public health, safety, and general welfare and for such open spaces, drainage ways, streets, or roads, alleys or other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds and all other relevant facts, including sidewalks and other planning features that assure safe conditions at schools bus shelter/stops, and for students who walk to and from school, and**

   b. **The public use and interest will be served by the platting of such subdivision and dedication;**

Response: As stated previously, the subdivision is providing for the development of an in-demand product in single-family housing. The development includes roads meeting the standards of the City, a multi-use path, and a critical area tract to protect wetlands, streams, and native vegetation. Water and sanitary sewer are provided for each lot and there are provisions for stormwater collection and treatment. This standard is met.

10. **The application and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state and local environmental acts and ordinances in accordance with RCW 36.70B.030.**

Response: The plans submitted with this application meet the requirements of this section. This standard is met.

Chapter 17.19 - DESIGN AND IMPROVEMENT STANDARDS

17.19.020 - Improvements, supervision, inspections and permits required.

A. Required Improvements.

3. **Existing wells, septic tanks and septic drain fields shall be abandoned, in accordance with state and county guidelines regardless of lots or properties served by such utility unless otherwise approved by public works director.**

Response: An existing septic system serves the existing occupied home on the east side of the site. This septic system will be decommissioned according to the standards of the Clark County Health Department and the existing home will be connected to the public sanitary sewer. This Standard is met.

17.19.030 - Tract, block and lot standards.

A. Environmental Considerations.

1. **Critical Areas. Land that contains a critical area or its buffer as defined in Title 16 of this code, or is subject to the flood hazard regulations, shall be platted to show the standards and requirements of the critical areas.**

Response: The critical areas on site are proposed to be platted in a critical area tract. This standard is met.

2. **Vegetation. In addition to meeting the requirements of CMC Section 18.13.045, Tree Regulations, every reasonable effort shall be made to preserve existing significant trees and vegetation, and integrate them into the land use design.**

Response: A large grove of existing trees on site will remain within the critical area tact. Some trees will be removed in the middle of the site due to grading activities. As many of the trees as is practicable will be protected within the development area. There will also be trees installed in landscape tracts, as well as street trees, to help replace some of the tree canopy that will be removed. See the Preliminary Plans and tree report included with this application for more information. This standard is met.

3. **Density transfers may be applicable if developer preserves critical areas. See Chapter 18.09 of this code.**

Response: The applicant proposes to create a 2.75-acre critical area tract, making density transfer applicable. The application proposes the use of density transfer to create lots below the 8,000 square foot minimum of the base standard, as well as creating larger lots along the west boundary for single-story houses. This standard is met.

B. Blocks. Blocks shall be wide enough to allow two tiers of lots, except where abutting a major street or prevented by topographical conditions or size of the property, in which case the approval authority may approve a single tier.

Response: Due to the width of the subject site and the existence of critical areas, the site is unable to be developed with blocks that will allow two tiers of lots. This standard is met.

C. Compatibility with Existing Land Use and Plans.

1. Buffer Between Uses. Where single-family residential lots are to be adjacent to multiple-family, commercial or industrial land use districts, and where natural separation does not exist, adequate landscape buffer strips and/or solid fences for purposes of buffering sound, restricting access, pedestrian safety and privacy shall be provided.

Response: The single-family development will not be adjacent to multi-family, commercial, or industrial land use districts. This standard does not apply.

2. Conformity with Existing Plans. The location of all streets shall conform to any adopted plans for streets in the city. The proposed land use shall respond to and complement city ordinances, resolutions and comprehensive plans.

Response: There are no adopted plans for streets to the east or south of the development. The City informed the Applicant that NW Cascade Street will not be required to connect from the subject site to the south, due to critical areas. A half-width of NW Cascade Street will be constructed on the east side of the site to connect to future development to the north and east. NW 17th Avenue will be constructed to allow the street to be extended to the west and east for future development. This standard is met.

D. Lots. The lot size, width, shape and orientation shall conform to zoning provisions and the following:

1. Each lot must have frontage and access onto a public street, except as may otherwise be provided (e.g., approved private roads, access tracts);

Response: All lots other than lots 6, 7, 15 and 16 have frontage onto NW Hancock Drive. Lots 6, 7, and16 gain access to NW Hancock Drive via access tracts. Lot 15 will is proposed to gain access from NW Cascade Street. Lot 15 will also retain the access easement across the properties to the north, which connects to NW 18th Street. Each lot has a minim of 60 feet of frontage on the access tract. This standard is met.

2. Side Lot Lines. The side lines of lots shall run at right angles to the street upon which the lots face as far as practical, or on curved streets they shall be radial to the curve;

Response: All side lots lines are at right angles or radial to the curve of NW Hancock Drive. This standard is met.

3. **Building Envelopes. No lot shall be created without a building envelope of a size and configuration suitable for the type of development anticipated:**

   a. **For single-family residential zones, a suitable size and configuration generally includes a building envelope capable of siting a forty-foot by forty-foot square dwelling within the building envelope,**

Response: All lots for this application are single-family lots. Each lot provides a building envelope capable of siting at least a minimum 40-foot by 40-foot building. This standard is met.

   c. **Other factors in considering the suitability of the size and configuration of any residential lot include the presence of, or proximity to critical areas, adjoining uses or zones, egress and ingress, and necessary cuts and fills;**

Response: This application proposes lots adjacent to a wetland. The design account for the shape of the wetland and averages and mitigates for buffer impacts as allowed by CMC. This standard is met.

5. **Flag lots, access tracts, and private roads may be permitted only when the community development director or designee finds the applicant meets the criteria listed hereinafter:**

Response: This application does not propose any flag lots. Two access tracts are proposed to allow access to Lots 6, 7, and 16. Each of these lots will provide a minimum of 4 on-site parking spaces (2 garage and 2 driveway spaces) and have address sign as required by this section. This standard is met.

6. **Double Frontage Lots. Residential lots which have street frontage along two opposite lot lines shall be avoided, except for double frontage lots adjacent to an arterial or collector, which must comply with the following design standards:**

Response: No double frontage lots are proposed with this application. This standard does not apply.

7. **Corner Lots. Corner lots may be required to be platted with additional width to allow for the additional side yard requirements;**

Response: This application proposes corner lots that have sufficient width and depth to allow for adequate vision clearance at the corners. This standard is met.

8. **Restricted Corner Lots. Corner lots restricted from access on side yard flanking street shall be treated as interior lots and conform to front, side and rear yard interior setbacks of CMC Chapter 18.09; and**

Response: No restricted corner lots are proposed with this application. This standard does not apply.

9. **Redivision. In dividing tracts into large lots which at some future time are likely to be redivided, the location of lot lines and other details of the layout shall be such that redivision may readily take place without violating the requirements of these regulations and without interfering with the orderly development of streets. Restriction of building locations in relationship to future street right-of-way shall be made a matter of record if the approval authority considers it necessary.**

Response: No redivision is anticipated with any lots or tracts proposed with this application. This standard does not apply.

E. Tracts and Trails.

1. **If land division is located in the area of an officially designated trail, in accordance with the current version of the parks, recreation and open space comprehensive plan, provisions shall be made for reservation of the right-of-way or for easements to the city for trail purposes including the construction of the trail. Trail standards for each trail type shall be as specified in appendix B of the parks, recreation and open space comprehensive plan or as amended.**

Response: The Applicant proposes to provide a 6-foot wide trail along the east property line, through and easement, heading south to connect the development to the T-5 Camas Neighborhood Loop Trail. This standard is met.

4. **Tracts and trails that are not dedicated to the city and are located within the subdivision, short plat or planned development are the responsibility of the homeowners association to maintain. Provisions must be in writing, such as in CC&Rs, informing the homeowners of the responsibility and outlining the maintenance procedures in accordance with city standards.**

Response: The homeowner's association will maintain the trail as part of the critical area tract. This standard is met.

F. Landscaping.

1. **Each dwelling unit within a new development shall be landscaped with at least one tree in the planting strip of the right-of-way, or similar location in the front yard of each dwelling unit, with the exception of flag lots and lots accessed by tracts. Required trees shall be a minimum two-inch diameter at breast height (dbh) to create a uniform streetscape (dbh is four and one-half feet above the ground as measured from upside of tree).**

Response: Landscape plans submitted with this application show a street tree planted with each lot. This standard is met.

2. The city council finds that the existing mature landscaping of trees, and shrubs provide oxygen, filter the air, contribute to soil conservation and control erosion, as well as provide the residents with aesthetic and historic benefits. For these reasons, the city encourages the retention of existing trees that are not already protected as significant trees under the Camas Municipal Code. Generally, the city may allow the tree requirements under subsection (F)(1) of this section to be reduced at the request of the developer, by a ratio of two new trees in favor of one existing tree, provided such trees have been identified on approved construction plans.

Response: The applicant will protect as many significant trees as is practicable with the development. All other native or naturalized vegetation, including smaller trees and shrubs, will be protected to the extent practicable with the development. Invasive species will be removed with the development. This standard is met.

3. Prior to final acceptance of any land development, the land developer shall install trees adjacent to or within all common areas and landscape tracts as specified in the Camas Design Standards Manual.

Response: Trees will be installed in all landscape areas not directly adjacent to a residential lot as shown on the landscape plans submitted with this application. This standard is met.

4. Street trees adjacent to individual lots must be installed prior to final occupancy or secured or bonded, and installed prior to expiration of the two-year warranty period, whichever comes first.

Response: Street trees will be installed at the time of home construction on the adjacent lot. This standard is met.

5. Landscaping shall conform to plant criteria in the Camas Design Standards Manual. Any planting of trees or shrubs within the right-of-way or vision clearance area must be shown on the construction drawings for approval.

Response: As shown on the landscape plans submitted with this application, all planting material meets the requirements of the Camas Design Standards Manual. Vision clearance areas are shown on the plans for approval. This standard is met.

6. Storm drainage facilities, pump stations and other visible facilities shall be setback a minimum of thirty feet from any street or accessory structure and be landscaped in accordance with criteria in the Camas Design Standards Manual.

Response: As shown on the plans submitted with this application, the proposed stormwater facility is set back from the street and landscape per the Camas Design Standards Manual.

G. Non-City Utility Easements. Easements for electric lines or other public utilities may be required. Easements for utilities shall be a minimum of six feet in width and centered on front or side lot lines.

Response: This application proposes a six-foot public utility easement along the lot frontages, behind the right of way. See the plans included with this application for more information. This standard is met.

H. Watercourse Easements. Where a development is traversed by a watercourse, drainageway, channel or stream, there shall be provided a stormwater easement or drainage right-of-way conforming substantially with the lines of such watercourse and such further width as will be adequate for the purpose. Streets parallel to major watercourses may be required.

Response: All water courses that traverse the site are located in the future critical area tract. No road is required or proposed adjacent to these water courses. This standard is met.

I. Street Signs. The developer shall be responsible for the initial cost of any street name or number signs, or street markings, including installation thereof, that public works finds necessary for the development.

Response: The applicant will install all street signs associated with the project. This standard is met.

J. Lighting. Street lighting shall conform to the Clark public utility standards and approved by the city. The developer shall bear the cost of the design and installation of the lighting system.

Response: A lighting plan is provided with this application, and will be included in the final construction plans, showing the location of all proposed street lights. This standard is met.

17.19.040 - Infrastructure standards.

B. Streets

6. Extension. Proposed street systems shall extend existing streets at the same or greater width unless otherwise approved by the public works department and authorized by city council in approval of the plat.

a. Streets and pedestrian/bicycle paths shall be extended to the boundaries of the plat to ensure access to neighboring properties, unless the presence of critical areas or existing development render such extension infeasible. The design shall contribute to an integrated system of vehicular and pedestrian circulation.

b. Grading of steep topography may be necessary to achieve this objective.

Response: As shown on the plans submitted with the application, proposed NW 17th Avenue extends to the west and a half width of NW Cascade Street extends north along the east property line. These streets will allow future circulation to the east and west and development dictates. A multi-use path extends south along the east property line from the NW 15th Avenue right-of-way. This standard is met.

8. Right-of-way, tract and pavement widths for streets shall be based on Table 17.19.040-1 and Table 17.19.040-2.

Table 17.19.040-2 Minimum Public Street Standards

Public Street	Right-of-Way	Pavement Width	Sidewalk
A. Street (by approval of City Engineer)[1]	52'	28'	Five foot detached sidewalk on both sides, with planter strip, no parking on one side.
B. Street (two lane)	60'	36'	Five foot detached sidewalks required on both sides of the street, with planter strip. Bike lanes required on collectors and arterials, no on-street parking.
C. Street (three lane)	74'	46' to include 12' median	Six foot detached sidewalks required on both sides of the street, with planter strip, bike lanes, no on-street parking.
D. Street (five lane)/Arterial	100'	74' to include 14' median	Six foot detached sidewalks required on both sides of the street, with planter strip, bike lanes, no on-street parking.

Table Notes:

1 All buildings abutting a street designed and constructed with less than 36 feet of pavement width shall have automatic fire sprinkler systems installed that comply with NFPA 13D or 13R.

Response: NW Hancock Drive (north of NW 17th Avenue) and NW 17th Avenue are designed as two-lane local street with 60 feet of full width right-of-way, 36 feet of paved width, 7-foot planter strips, and 5-foot sidewalks on each site. NW Hancock Drive (south of NW 17th Avenue) is designed as a two-lane local street with 52 feet full width right-of-way, 28 feet of paved width, 7-foot planter strips, and 5-foot sidewalks on each side. NW Cascade street is designed as a two-lane local street with 30 feet half width right-of-way, 18 feet of paved half width, 7-foot planter strip, and 5-foot sidewalk. This standard is met.

10. Street Layout. Street layout shall provide for the most advantageous development of the land development, adjoining area, and the entire neighborhood. Evaluation of street layout shall take into consideration potential circulation solutions for vehicle, bicycle and pedestrian traffic, and, where feasible, street segments shall be interconnected.

Response: The street layout provides the most advantageous development of the land and overall neighborhood. NW 17th Avenue is located to provide circulation to the west when those properties develop. NW Hancock Drive is located adjacent to the water towers and away from the existing residence to the west and as far north of the wetland as possible to still allow lots to develop on both sides of the street. NW Cascade Street is located to provide circulation to the east once the properties to the east develop. A multi-use path will also be installed to allow pedestrian and bicycle circulation to the south to connect to an existing trail system. This standard is met.

a. Circulation Plan. Applicants shall submit a circulation plan at application which includes the subject site and properties within six hundred feet of the proposed development site. The plan shall incorporate the following features both on-site and off-site:

Response: A circulation plan is included with this application meeting the requirements of this section. This standard is met.

b. **Cross-circulation shall be provided that meets the following:**

Response: Hancock Drive has a block length of approximately 910 feet. This distance is greater than the maximum access spacing for local streets, however, due to surrounding development and critical areas, it is not feasible to have a shorter block length. There are no cul-de-sacs or permanent dead ends proposed with the development. This standard is met.

d. **Where critical areas are impacted, the standards and procedures for rights-of-way in the critical areas overlay zone shall be followed.**

Response: The roads are laid out to create no wetland or buffer impacts from roads. The layout also minimizes the impact to wetland buffers, as well as having no impact to wetlands. This standard is met.

Title 18 - ZONING

Chapter 18.09 - DENSITY AND DIMENSIONS

18.09.040 - Density and dimensions—Single-family residential zones.

Table 1—Density and Dimensions for Single-family Residential Zones[1]

Zone	R-6	R-7.5	R-10	R-12	R-15
A. Standard New Lots					
Maximum Density (dwelling units/net acre)	7.2	5.8	4.3	3.6	2.9
Average lot area (square feet)[4]	6,000	7,500	10,000	12,000	15,000
Minimum lot size (square feet)	4,800	6,000	8,000	9,600	12,000
Maximum lot size (square feet)[3]	9,000	12,000	14,000	18,000	24,000
Minimum lot width (feet)	60	70	80	90	100
Minimum lot depth (feet)	90	90	100	100	100
Maximum building lot coverage[5]	40%	40%	35%	30%	30%
Maximum building height (feet)[2]	35	35	35	35	35
B. Density Transfer Lots[1]					
Maximum Density (dwelling units/net acre)	7.2	5.8	4.3	3.6	2.9
Minimum lot size (square feet)	4,200	5,250	7,000	8,400	10,500
Maximum lot size (square feet)[3]	7,200	9,000	12,000	14,400	18,000
Minimum lot width (feet)	50	60	60	70	80
Minimum lot depth (feet)	80	80	90	90	100
Maximum building lot coverage[5]	40%	40%	40%	35%	35%

Zone	R-6	R-7.5	R-10	R-12	R-15
Maximum building height (feet)[2]	35	35	35	35	35

Table Notes:

1. **For additional density and dimension provisions, see CMC Sections 18.09.060 through 18.09.180.**
2. **Maximum building height: three stories and a basement, not to exceed height listed.**
3. **For parcels with an existing dwelling, a one-time exception may be allowed to partition from the parent parcel a lot that exceeds the maximum lot size permitted in the underlying zone. Any further partitioning of the parent parcel or the oversized lot must comply with the lot size requirements of the underlying zone.**
4. **Average lot area is based on the square footage of all lots within the development or plat. The average lot size may vary from the stated standard by no more than five hundred square feet.**
5. **The maximum building lot coverage for single-story homes may be up to forty-five percent in R-6 and R-7.5 zones, and forty percent in R-10 and R-12 zones. To qualify for increased lot coverage, a single-story home cannot include a basement or additional levels.**

Response: The proposed development contains critical areas. Therefore, the lot dimensions listed under (B) are being applied to this application. The gross site area is approximately 9.95 acres. There is approximately 1.66 acres or land being dedicated for right-of-way, for a net site area of approximately 8.29 acres. The maximum density for the site is 35 units. The Applicant proposes 20 units. The average lot area is 9,872 square feet, with a minimum lot area of 7,473 square feet and a maximum lot area of 12,000 square feet. The minimum lot width proposed is 66.72 feet and the minimum lot depth is 106.76 feet. Building lot coverage and building height requirements will be reviewed at the time of building permit application. This standard is met.

Table 2—Building Setbacks for Single-Family Residential Zones[1]

Lot Area	Up to 4,999 sq. ft.	5,000 to 11,999 sq. ft.	12,000 to 14,999 sq. ft.	15,000 or more sq. ft
Minimum front yard (feet)	20	20	25	30
Minimum side yard and corner lot rear yard (feet)	5	5	10	15
Minimum side yard flanking a street (feet)	15	20	25	30
Minimum rear yard (feet)	20	25	30	35
Minimum lot frontage on a cul-de-sac or curve (feet)	25	30	35	40

Table Notes:

1. **Setbacks may be reduced to be consistent with the lot sizes of the development in which it is located. Notwithstanding the setbacks requirements of this chapter, setbacks and/or building envelopes clearly established on an approved plat or development shall be applicable.**

Response: All lots other than Lots 12 and 15 will be required to meet the setbacks for 5,000 to 11,999 square foot lots, with Lot 12 required to meet the standards for 12,000 to 14,999 square foot lots and Lot 15 will be required to meet the setbacks for 15,000 or more square feet. The existing house to remain on Lot 15 is set back 74.79 feet from the front, 35.10 feet from the rear, and 15 feet from the nearest side yard. See the Preliminary Plans included with this application for more detail. This standard is met.

18.09.060 - Density transfers.

A. Purpose. To achieve the density goals of the comprehensive plan with respect to the urban area, while preserving environmentally sensitive lands and the livability of the single-family residential neighborhoods, while also maintaining compatibility with existing residences.

B. Scope. This section shall apply to new development in all residential (R) zoning districts.

C. Where a land division proposes to set aside a tract for the protection of a critical area, natural open space network, or network connector (identified in the City of Camas parks plan), or approved as a recreational area, lots proposed within the development may utilize the density transfer standards under CMC Section 18.09.040 Table-2.

D. Where a tract under "C" above, includes one-half acre or more of contiguous area, the city may provide additional or negotiated flexibility in lot sizes, lot width, or depth, or setback standards. In no case shall the maximum density of the overall site be exceeded. The City may, also provide the landowner with:

1. A credit against park and open space impact fees per Chapter 3.88; or

2. Cash from the parks and open space impact fee fund or other public fund.

Response: This application proposes the use of density transfer due to the presence of critical areas on site. The Applicant proposes a critical area tract that is approximately 2.75 acres in size. Using the lot size flexibility allowed under 18.09.060(D), the applicant is proposing larger lots along the west property line to allow for single story homes to be constructed, as well as create a better transition from the proposed subdivision to the existing large-lot single family property to the west. Included in the proposed critical area tract is a trail that connects the development to the T-5 Camas Neighborhood Loop Trail. Due to the critical area tract and trail, the applicant requests either a credit against park and open space impact fees, or cash from the parks and open space impact fee fund. This standard is met.

18.09.080 - Lot sizes.

B. When creating new lots via short plats or subdivisions that are adjacent to a different residential zone designation, the new lots along that common boundary shall be the maximum lot size allowed for the zone designation of the new development (if a lower density adjacent zone), or the minimum lot size allowed for the zone designation of the new development (if a greater density adjacent zone), as based on CMC 18.09.040 Table 2, Section A. In applying this section, where a land division is required to increase the size of lots, the land division may utilize the density transfer provisions provided for in CMC Section 18.09.060.

Response: Properties to the west are zoned R-7.5 and properties to the east are zoned R-10 and R-12. There are no lots immediately adjacent to the R-12 zoned properties, however, Lot 12 is proposed as a 12,000 square foot lot. Lots 1-6 are adjacent to the R-7.5 zone to the west. Using the lot size flexibility allowed under 18.09.060(D), the applicant is proposing

10,000 square foot, or slightly larger, lots along the west property line to allow single story homes to be constructed, as well as create a better transition from the proposed subdivision to the existing large single-family property to the west. This standard is met.

18.13.020 - Scope.

A. Unless otherwise exempted, the standards of this chapter shall apply to any site to be developed. All applicable development activities shall be required to prepare a landscape plan and shall be required to meet the minimum tree density herein created.

B. The standards of this chapter shall apply to the following:

1. Commercial, industrial, governmental uses, and land divisions;

Response: This application is for a 20-lot subdivision and does not meet any of the exemptions listed in section 18.13.025 of the CMC. This chapter applies.

18.13.040 - Procedure for landscape, tree and vegetation plans.

A. Applicants shall submit a detailed Landscape, Tree and Vegetation Plan with building and site improvement plans. Included in the plans (at a minimum) shall be type, size, and location of plants and materials.

B. A tree survey must be included for any applicable development proposing to remove trees.

Response: A detailed landscape plan and tree survey plans are included with this application. This standard is met.

8.13.045 - Tree survey.

A. The applicant must submit a tree survey that is prepared by a certified arborist or professional forester.

Response: A tree survey (including plans and a tree report) has been prepared by a certified arborist and is included with this application. This standard is met.

B. A tree survey must contain the following:

1. Inventory.

a. Map of the site, with tree locations numbered

b. Include all significant trees that will be impacted by the proposed development, which may include trees off-site if canopies overhang the subject property. Open space tracts to be set aside for conservation purposes do not need to be included in survey.

c. Provide the common and scientific name of inventoried trees.

Response: A tree inventory has been completed as part of the tree survey. Trees that will be protected and impacted with the project are identified on the plans and in the report. There are off-site trees on the west property line of parcel 127400-000 that will be impacted with the construction of NW Cascade Street. The applicant will coordinate with the adjacent property owner prior to construction. If the impacts to the existing trees is determined by the project arborist to be too severe, the trees will be removed with owner permission. If the owner does not approve removal, the construction of NW Cascade Street will occur with development of the adjacent parcel. This standard is met.

2. **Assessment.**

a. **Size. Measure and provide the diameter at breast height (DBH).**

b. **Tree protection zone. (Refer to CMC 18.03.050 Environmental Definitions)**

c. **Tree health. An overall assessment of the trees structural stability and failure potential based on specific structural features (e.g. decay, conks, co-dominate trunks, abnormal lean) and rated as good, fair or poor.**

d. **Recommendation for preservation or removal. The recommendation will consider proposed grading, trenching, paving, fencing and other construction plans.**

e. **If hazardous, then an evaluation of hazardous trees will include a numerical value of hazard based on the following: failure potential; size of part most likely to fail; and distance to target (e.g. new residence).**

Response: The tree survey included in this application contains all information required in this section. See the report and plans included with this application for more detail. This standard is met.

18.13.050 - Standards for landscape, tree and vegetation plans.

B. **Landscaping and trees shall be selected and located to deter sound, filter air contaminants, curtail erosion, minimize stormwater run-off, contribute to living privacy, reduce the visual impacts of large buildings and paved areas, screen, and emphasize or separate outdoor spaces of different uses or character.**

Response: Along the east side of NW Hancock Drive, adjacent to parcel 127411-000, the applicant is proposing to attach the sidewalk to allow for the screening of the large paved area and water towers on the adjacent parcel. Existing trees and other vegetation are being preserved to the extent practicable to help with erosion, stormwater and help contribute to living privacy. This standard is met.

C. **Landscape, Tree and Vegetation Plan must include a combination of trees, shrubs, and ground cover to achieve the purposes of this chapter.**

1. **Required landscaping shall be comprised of a minimum of sixty percent native vegetation (or adapted to northwest climate), or drought-tolerant vegetation, and fifty percent evergreen.**

2. Deciduous trees shall have straight trunks, be fully branched, have a minimum caliper of two inches, be equivalent to a fifteen-gallon container size, and be adequately staked for planting.

3. Evergreen trees shall be a minimum of five feet in height, fully branched, and adequately staked for planting.

Response: Plants proposed in the landscape plan are either native or adapted to the northwest climate, as well as a majority being evergreen. All plant materials will meet the requirements of this section. See the Landscape Plan included with this application for more information. This standard is met.

D. Street trees will be required as part of the frontage improvements. Species, size and spacing of the trees must be consistent with the Design Standards Manual. Unless otherwise specified, trees must generally be spaced thirty feet apart. Substitute varieties are subject to approval by the City of Camas.

Response: Street trees are proposed with this application meeting the requirements of this section. See the Landscape Plan included with this application for more information. This standard is met.

E. Proposed vegetation cannot be an invasive species as listed within the most current edition of the Clark County Noxious Weed List (e.g. English Ivy cultivars).

Response: No proposed vegetation are invasive species. See the Landscape Plan included with this application for more information. This standard is met.

F. Shrubs shall be a minimum of five-gallon pot size. Upright shrubs shall have a minimum height at planting of eighteen inches. Spreading shrubs at planting shall have a minimum width of eighteen inches (smaller shrub sizes may be approved where it is more appropriate within a particular landscape plan).

Response: All plant materials proposed will meet the requirements of this section. See the Landscape Plan included with this application for more information. This standard is met.

G. Ground Cover, defined as living material and not including bark chips or other mulch, shall be from containers of one gallon or larger. Plants shall be planted and spaced in a triangular pattern which will result in eighty percent cover in three years. Lawn cannot be the primary ground cover within required landscape buffers unless approved for stormwater conveyance. Grass species, if used as ground cover, shall be native or drought-tolerant, and appropriate for the use of the area.

Response: All groundcover materials proposed will meet the requirements of this section. Proposed lawn is not located within any required buffer. See the Landscape Plan included with this application for more information. This standard is met.

H. Appropriate measures shall be taken, e.g., installation of irrigation system, to assure landscaping success. If plantings fail to survive, it is the responsibility of the property owner to replace them.

Response: All landscaped areas will be irrigated with an automatic irrigation system. All irrigation in landscape tracts will be installed with the landscape at the time of neighborhood construction and maintained by the homeowner's association. All irrigation in planting strips adjacent to private lots will be installed with the home construction on that lot and be maintained by that homeowner. All irrigation will be design-build by the landscape contractor. This standard is met.

I. Required trees, as they grow, shall be pruned in accordance with the International Society of Arboriculture. The pruned tree will provide at least eight feet of clearance above sidewalks and twelve feet above street roadway surfaces.

Response: All trees will be pruned to the appropriate height per this section. This standard will be met.

J. Existing trees may be used as street trees if there will be no damage from the development which will kill or weaken the tree. Sidewalks of variable width and elevation may be utilized to save existing street trees, subject to approval by the city.

Response: Existing trees on site will be retained to the greatest extent practicable, however, none of those trees will be used as street trees. This standard does not apply.

K. Vision clearance hazards shall be prohibited.

Response: No vision clearance hazards will be created with the proposed landscape. See the Landscape Plans included with this application for more detail. This standard is met.

L. Street trees and other required landscaping which dies or is removed, must be replaced within one year of death or removal. Replacement street trees may be an alternative species from the city's recommended tree list, and may be in a different location as approved by the city.

Response: All required plant material that dies or is removed will be replaced per this section. This standard will be met.

18.13.051 - Minimum tree density requirement.

A. Tree Density. A minimum tree density per net acre is required and must be incorporated within the overall landscape plan. The tree density may consist of existing trees, replacement trees or a combination of existing and replacement trees, pursuant to the priority established in Section 18.13.052.

Table 1: Required Tree Density

Proposed Activity	Required Minimum Tree Density per Net Acre	Required Tree Replacement
New Development	20 Tree Units	20 Tree Units per acre
Residential	20 Tree Units	20 Tree Units per acre
Developed commercial and industrial properties	20 Tree Units	3 Tree Units for every 1 tree unit removed up to the minimum tree density per acre.

B. Tree Density Calculation. Specific instructions on how to perform tree density calculations are provided in the Design Standards Manual. "Tree Unit" is a unit of measurement based upon the size

of the diameter of the tree measured at the breast height ("dbh"). New trees are given a value of one (1) Tree Unit, as they must be a minimum of 2" dbh when planted. Tree Unit values are summarized in the following Table:

Table 1: Required Tree Density

Diameter at Breast Height "dbh"	Tree Units	Diameter at Breast Height "dbh"	Tree Units
1" to 5"	1	31" to 32"	12
6" to 12"	2	33" to 34"	13
13" to 14"	3	35" to 36"	14
15" to 16"	4	37" to 38"	15
17" to 18"	5	39" to 40"	16
19" to 20"	6	41" to 42"	17
21" to 22"	7	43" to 44"	18
23" to 24"	8	45" to 46"	19
25" to 26"	9	47" to 48"	20
27" to 28"	10	49" to 50"	21
29" to 30"	11	For larger trees, allow a ½ tree unit for every additional inch of dbh	

Response: The total site area is approximately 10.03 acres. There is 2.75 acres to be set aside as a critical area tract and 1.65 acres to be dedicated as right-of-way. Therefore, there is 5.63 net acres of developable land used in the calculation of the required tree density. The application is for a residential development; the applicant is required to provide 20 tree units per acre, or a total of 113 tree units (5.63x20). There are 190 tree units that are to be retained on site, as well as 52 proposed street trees, for a total of 242 tree units. See the Tree Report and Preliminary Plans included with this application for more detail. This standard is met.

18.13.052 - Tree and native vegetation preservation.

A. When determining where to retain or plant trees, locations with healthy soils, native understory vegetation, and mature trees shall have priority when there are feasible alternative locations on site for proposed buildings and site improvements to achieve the minimum tree unit density per acre. This may require site redesign. Provided, where necessary, density transfer areas may be used to ensure protection and retention of trees.

Response: The majority of the trees proposed for retention are located in the proposed critical area tract. The trees in this area are mature trees with a mix of native and invasive understory vegetation. As part of the development, the invasive vegetation is proposed for removal to allow for the growth of native vegetation. As many of the existing trees outside of the proposed critical area as practicable are proposed for retention. This standard is met.

B. In designing a development project and in meeting the required tree density, the applicant must provide a Landscape, Tree and Vegetation plan that retains healthy, wind firm trees in the following priority:

1. Trees located within critical area buffers. Trees must be identified within a protected tract.

2. Significant wildlife habitat, or areas adjacent and buffering habitat.

3. Significant trees that are greater than 36 inch dbh.

4. Groves of trees, or other individual healthy trees with the intent to retain must be located in separate tract if part of a land division, or other protective mechanism if other development type,

5. Trees, that if removed would cause trees on adjacent properties to become hazardous.

Response: A critical area tract is proposed that contains a large majority of the trees on site. The majority of the trees in the critical area are not considered in the tree unit calculation for the project as they are well outside of the actual project area on site. Outside of the critical area, trees were preserved to the greatest extent practicable within the area to be developed. Trees in groves were given priority. Some trees in the critical area are noted in the tree reports as being dead. These trees are being proposed to remain as they are in or near a buffer area, creating habitat, and having value if retained. This standard is met.

C. Mitigation and Replacement. In areas where there are currently inadequate numbers of existing trees to meet minimum tree density, where the trees are inappropriate for preservation, the soils are poor, or there are significant invasive species, then mitigation shall be required to meet the minimum tree density. The applicant's proposed location for replacement trees or mitigation shall be subject to the city's approval of the Landscape Plan. Replacement trees shall be planted in the following priority:

Response: As previously discussed, there is a large enough number of existing trees being retained on site to meet the tree density requirements for the development. See the Tree Report and Preliminary plans included with this application for more detail. This standard is met.

18.13.055 - Landscape buffering standards.

Response: The proposed development is for 20 single-family lots. Therefore, based on 18.13.055 Table 1 – Landscape Buffers, there are no buffers required. This section does not apply.

Chapter 18.15 – SIGNS

Response: No signs are proposed as part of this application. Any signs that will be installed will receive a sign permit prior to installation to ensure the sign meets the requirements of this chapter. This standard is met.

IV. Conclusion

The Applicant is proposing a 20-lot, single-family subdivision meeting the requirements of the City of Camas R-10 zoning and other applicable portions of the Camas Municipal Code. The development will have wetland buffer impacts; however, a critical area tract will preserve the critical areas on site. Mitigation for the impacted wetland buffer will occur on site.

The submittal requirements have been met and the required finding made for all applicable approval criteria. These findings serve as the basis for the City to approve the application and are supported by substantial evidence in the application materials. Therefore, the Applicant respectfully requests approval of the proposed project (Hancock Springs).

3. State Environmental Review (SEPA)

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants**:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision- making process.

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

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background

1. Name of proposed project, if applicable:
Hancock Springs

2. Name of applicant:
NW Classic Homes, LLC

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

Applicant:
NW Classic Homes, LLC
Craig Moody
10100 NE 116th Avenue
Vancouver, WA 98662
(360) 263-4125
craig.moody@shoot360.com

Contact:
AKS Engineering & Forestry
John Meier
9600 NE 126th Avenue, Suite 2520
Vancouver, WA 98682
(360) 882-0419
john@aks-eng.com

4. Date checklist prepared:
October 01, 2018

5. Agency requesting checklist:
City of Camas, Washington

6. Proposed timing or schedule (including phasing, if applicable):
The proposed project is anticipated to begin once all permits are obtained in summer of 2019. The development will be constructed in one phase.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.
No.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.
Archaeological Predetermination, Wetland Delineation, Critical Areas Report, Buffer Mitigation Plan, Tree Report and Plan, and Geotechnical Soils Report.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.
None known.

10. List any government approvals or permits that will be needed for your proposal, if known.
SEPA Determination, Subdivision approval, Archaeological Predetermination, Wetland Permit approval.

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

The applicant is proposing a 20-lot subdivision on 10.03 acres in the R-10 and R-12 zones. All residential lots are proposed in the R-10 zone. The site consists of five parcels. Two parcels have existing vacant residences, one parcel has an occupied residence, and the remaining two parcels are vacant. Development will include clearing, excavation and grading, construction of minor frontage improvements on NW 18th Avenue, internal streets and utilities, wetland buffer averaging and enhancement, and landscaping.

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

The site is addressed as 2926 NW 18th Avenue, Camas, WA 98607
Abbreviated Legal: NE 1/4, S09, T1N, R3E
Clark County Parcel ID #: 127414-000, 127377-000, 127371-000, 127379-000, and 127375-000

B. Environmental Elements

1. Earth

a. General description of the site:

(circle one): Flat, rolling, hilly, **steep slopes**, mountainous, other __

b. What is the steepest slope on the site (approximate percent slope)?

The steepest slope on site is approximately 30% and is located in the southern portion of the site and will be located in a critical area tract at the completion of the project.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

A geotechnical investigation was completed by Redmond Geotechnical Services on September 28, 2018. According to that investigation the site consists of sandy and clayey silt.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.
There is no known indication or history of unstable soils in the immediate vicinity.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.
The applicant proposes to remove all surface vegetation and stockpile topsoil outside of critical areas and tree protection areas to perform the necessary on-site grading to complete the proposed development. Estimated grading quantities are: Cut 13,000 Cubic Yards (CY); Fill 13,000 CY. Fill areas will utilize on-site materials and import materials from approved off-site sources, if necessary. Stockpiled topsoil will be used in landscape areas.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.
Yes, erosion is possible during work, mainly in the form of silt transfer and dust blow-off. Erosion potential will be minimized by utilizing best management practices for erosion control.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?
The project proposes impervious surfaces over approximately 40% of the site.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:
The applicant proposes to use best management practices for soil erosion.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.
During site development and building construction, there will be exhaust emission from construction equipment. Once construction is completed, air emission will be limited to automobile exhaust from vehicles entering and leaving the site.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.
None known.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:
The applicant will comply with applicable code and best management practices.

3.Water

a. Surface Water:

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

According to a critical area assessment completed by AKS Engineering and Forestry on May 4, 2018, there is a palustrine forested wetland (Wetland A), a palustrine emergent wetland (Wetland B), and two non-fish bearing streams on site (identified as Water 1 and Water 2). Both wetlands are classified as Category IV wetlands. Water 1 originates from a groundwater seep on site and drains into Water 2, which appears to have direct surface hydrologic connection to the Columbia River.

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

Work will be required within 200 feet of the described waters. Grading and lot construction will occur within some portions of the buffer for Wetland B. Buffer impacts will be averaged on site and mitigated as required by City of Camas Municipal Code (CMC). All other waters and their buffers will remain intact.

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

None.

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

No.

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

No.

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

No.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

Yes. There is an existing well on parcel 127371-000 that is currently in use as the water source for the existing residence. The existing home will be connected to public water service with the development, and the well will be decommissioned per Clark County Health Department standards.

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

There is an existing septic system on parcel 127371-000 that will be decommissioned as part of the development per Clark County Health Department standards. The existing residence and all new residences will be connected to public sewer with the development.

c. Water runoff (including stormwater):

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

Stormwater runoff will be generated from houses, driveways, roads and other impervious surfaces. The runoff will be collected and mechanically treated, then conveyed to a detention pond. Treated stormwater will then be released to the existing stream at rates allowed by the Camas Municipal Code (CMC).

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

No waste materials are proposed to enter ground or surface water as part of this application.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No. On-site stormwater was previously dispersed within the vegetation and infiltrated on site or drained to the existing wetlands and streams. The stormwater generated by the proposed project will be collected, treated and stored on site before being released to the existing on-site stream at rates allowed by the CMC.

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

Water runoff will be collected and treated on site and then released to the existing on-site wetlands at rates allowed by the CMC.

4. Plants

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

___X__deciduous tree: **alder**, **maple**, aspen, **other**
___X__evergreen tree: **fir**, **cedar**, **pine**, other
___X__shrubs
___X__grass
___X__pasture
______crop or grain

______Orchards, vineyards or other permanent crops.
___X___wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
______water plants: water lily, eelgrass, milfoil, other
___X___other types of vegetation

b. What kind and amount of vegetation will be removed or altered?
The applicant proposes clearing only as much of the site as necessary for site grading, road construction, and stormwater construction. As many healthy site trees as possible will be saved. Clearing will include trees, shrubs, and all other plant material in work areas.

c. List threatened and endangered species known to be on or near the site.
None known.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:
A critical area tract is proposed to maintain a large majority of the trees and other vegetation on site. For trees adjacent to work areas, tree protection fencing will be installed. At home construction, shrubs and grasses not removed with site development will be removed and new landscape installed with the home, no trees are currently proposed to be removed during home construction. There will also be enhancement plantings for buffer mitigation in the critical area tract. Native plant material will be installed in these areas. Street trees and some landscaping will be installed in tracts and planter strips on site. The development will also meet the requirements of sections 18.13.045, 18.13.051, and 18.13.052 of the City of Camas Municipal Code.

e. List all noxious weeds and invasive species known to be on or near the site.
Himalayan blackberry.

5. Animals

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

Examples include:

birds: hawk, heron, eagle, songbirds, other: mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other ___
Song birds, hawk, dear.

b. List any threatened and endangered species known to be on or near the site.
None known.

c. Is the site part of a migration route? If so, explain.
Yes, it is part of the Pacific Flyway for Waterfowl.

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

A critical area tract is proposed to protect the wetlands and waters on site. Trees and other vegetation will also remain in this tract. Also, to the extent possible, trees will be saved in the developed portion of the site.

e. List any invasive animal species known to be on or near the site.

None known.

6. Energy and Natural Resources

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

Electricity and/or natural gas will be used to meet the energy needs of the development.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

None. Future energy conservation features may be installed with future home construction.

7. Environmental Health

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

Environmental hazards are limited to standard risks associated with construction and occupancy of the development.

1) Describe any known or possible contamination at the site from present or past uses.

None known.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

There is an existing natural gas service line running in NW 18th Avenue where frontage improvements will occur.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Typical construction materials such as: gas; diesel, oil, etc.

4) Describe special emergency services that might be required.
No special energy services are anticipated.

5) Proposed measures to reduce or control environmental health hazards, if any:
As no impacts are anticipated, no such measures are proposed. The applicant will comply with applicable code and best management practices.

b. Noise

1)What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?
None known.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indi- cate what hours noise would come from the site.
In the short term, noise from construction equipment will occur during daylight hours. In the long term, typical neighborhood vehicular noise will occur.

3) Proposed measures to reduce or control noise impacts, if any:
Require all construction equipment to have muffled exhaust. Restrict construction to hours allowed by the City of Camas (CMC 9.32.050(A)).

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.
One parcel is currently in use as a single-family residence. The remaining parcels are currently vacant. Adjacent lands are in use as single family residences with similar zoning designations. The proposal will not affect the adjacent land uses.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?
No.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:
No.

c. Describe any structures on the site.

There are three existing structures on site. Parcels 127414-000 and 127379-000 contain vacant houses. These vacant houses are uninhabitable and will be removed with the development. Parcel 127371-000 contain an existing house that is currently in use and will remain with the developments.

d. Will any structures be demolished? If so, what?
Yes, the vacant houses on parcels 127414-000 and 127379-000 will be demolished.

e. What is the current zoning classification of the site?
Parcel 127414-000 is zoned R-12 and parcels 127377-000, 127371-000, 127379-000, and 127375-000 are zoned R-10.

f. What is the current comprehensive plan designation of the site?
The current comprehensive plan designation is Single-Family Medium (SFM).

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

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.
Yes. Wetlands, habitat area, as well as slopes greater than 15% are identified by Clark County GIS. According to a critical area assessment completed by AKS Engineering and Forestry on May 4, 2018, there is a palustrine forested wetland (Wetland A), a palustrine emergent wetland (Wetland B), and two non-fish bearing streams on site (identified as Water 1 and Water 2). A geotechnical report was completed by Redmond Geotechnical Services on September 28, 2018 that states there is only a low potential of geologic hazard with seismic induced slope instability.

i. Approximately how many people would reside or work in the completed project?
Assuming 2.67 people per residence, approximately 53 people will reside in the completed project.

j. Approximately how many people would the completed project displace?
No people will be displaced. The one residence that is currently occupied will remain with the development.

k. Proposed measures to avoid or reduce displacement impacts, if any:
As no displacement impacts are proposed, no measures are proposed.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:
Proposed measures include approval through the City of Camas subdivision review process. The proposed development meets the maximum density

requirements of the zone and provides a mixture of lot sizes, as well and protection of the existing critical and habitat areas on site.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

Proposed measures include approval through the City of Camas Subdivision review process.

9. Housing

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

Nineteen new middle-income units will be provided with the proposed project. One existing middle-income unit will remain with the development.

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

No occupied units will be eliminated with the development. Two vacant and uninhabitable units will be removed with the development.

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

No impacts are proposed, so no measures are proposed.

10. Aesthetics

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

The tallest building height will be 35 feet or less as allowed by the CMC. The principal exterior building material is unknown at this time but will meet the requirements of the CMC.

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

No known views will be altered or obstructed.

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

No proposed measures outside of meeting the requirements of the CMC.

11. Light and Glare

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

As required the proposed development will install street lights. Exterior lighting will also be installed on each house. No impact in excess of normal residential lighting and glare are anticipated.

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

No.

c. What existing off-site sources of light or glare may affect your proposal?
None known.

d.Proposed measures to reduce or control light and glare impacts, if any:
No additional measures outside of meeting the requirements of the CMC.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?
There is a segment of the T-5 Camas Neighborhood Loop Trail located to the south of the development. The portion of the project designated for critical areas is also included in the City's Natural Open Space Network, which provides passive recreation such as bird watching.

b. Would the proposed project displace any existing recreational uses? If so, describe
The proposed project will not displace any existing recreation uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:
The applicant is proposing to construct a trail segment along the east boundary that connects the development to the existing City of Camas trail system.

13. Historic and cultural preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.
According to Clark County GIS the vacant residence on parcel 127414-000 was built in 1935, the vacant residence on parcel 127379-000 was built in 1941, and the occupied residence on parcel 127371-000 was built in 1961. According to an Archaeological Predetermination Survey completed by Applied Archaeological Research, the existing homes to be removed have been assessed as not eligible to be listed on the National Record of Historic Places.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.
No landmarks, features, or other evidence of historic use or occupation were found.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.
An Archaeological Predetermination Survey completed by Applied

Archaeological Research on March 22, 2018. The survey included review of previous records for the area, a surface survey with a series of east to west pedestrian transects, and the digging of seven test pits.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

No loss, change, or disturbance is proposed to any resource. The project will follow requirements from DAHP and the City of Camas.

14.Transportation

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

The site is served by NW 18th Avenue along the north property line. The proposed development will access NW 18th Avenue with the construction of the proposed Hancock Drive. NW Cascade Street half width exists at the northeast corner of the site but does not currently serve the site. A portion of half-street for NW Cascade Street will be constructed on the east side of the site that will eventually connect when the adjacent properties develop.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No. There is no public transit service that serves the site or the surrounding area.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

Each lot will have a minimum of 4 parking spaces, a two-car garage and two driveway spaces.

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

Frontage improvements will be provided for the portion of NW 18th Avenue that fronts the site. Improvements will include six-foot sidewalk, five-foot planter strip, and 23 feet of paved surface. NW Hancock Drive is a proposed street that will include 52 feet of right of way, seven-foot planter strip, five-foot sidewalk, and 28 feet of paved surface for the majority of the street. NW 17th Avenue and the portion of NW Hancock Drive north of NW 17th Avenue will be constructed with 60 feet of right-of-way, seven-foot planter strip, five-foot sidewalk and 36 feet of pavement. NW Cascade Street will be constructed with 30 feet of half-width right-of-way, seven-foot planter, five-foot sidewalk, and 16 feet of pavement.

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

If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

A traffic study was completed by Lancaster Engineering. According to the traffic study, the development has an existing trip volume of 10 weekday trips with one a.m. and one p.m. peak hour trip. The proposed development will have a total of 188 weekday trips with 15 a.m. and 20 p.m. peak hour trips.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No.

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

Based on the traffic study, no transportation impacts are anticipated from this development. Therefore, no measures are proposed.

15.Public Services

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

Yes, an additional 19 dwelling units will cause an incremental increase in the need for all public services.

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

The appropriate impact fees will be paid.

16.Utilities

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

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

Electrical: Clark Public Utilities
Natural Gas: Northwest Natural
Water: City of Camas
Refuse: City of Camas
Telephone: Century Link, Comcast
Sanitary Sewer: City of Camas

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

C. Signature

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

Signature: ______________ Name of signee Michael Andreotti

Position and Agency/Organization PLANNER Date Submitted: 11/21/18

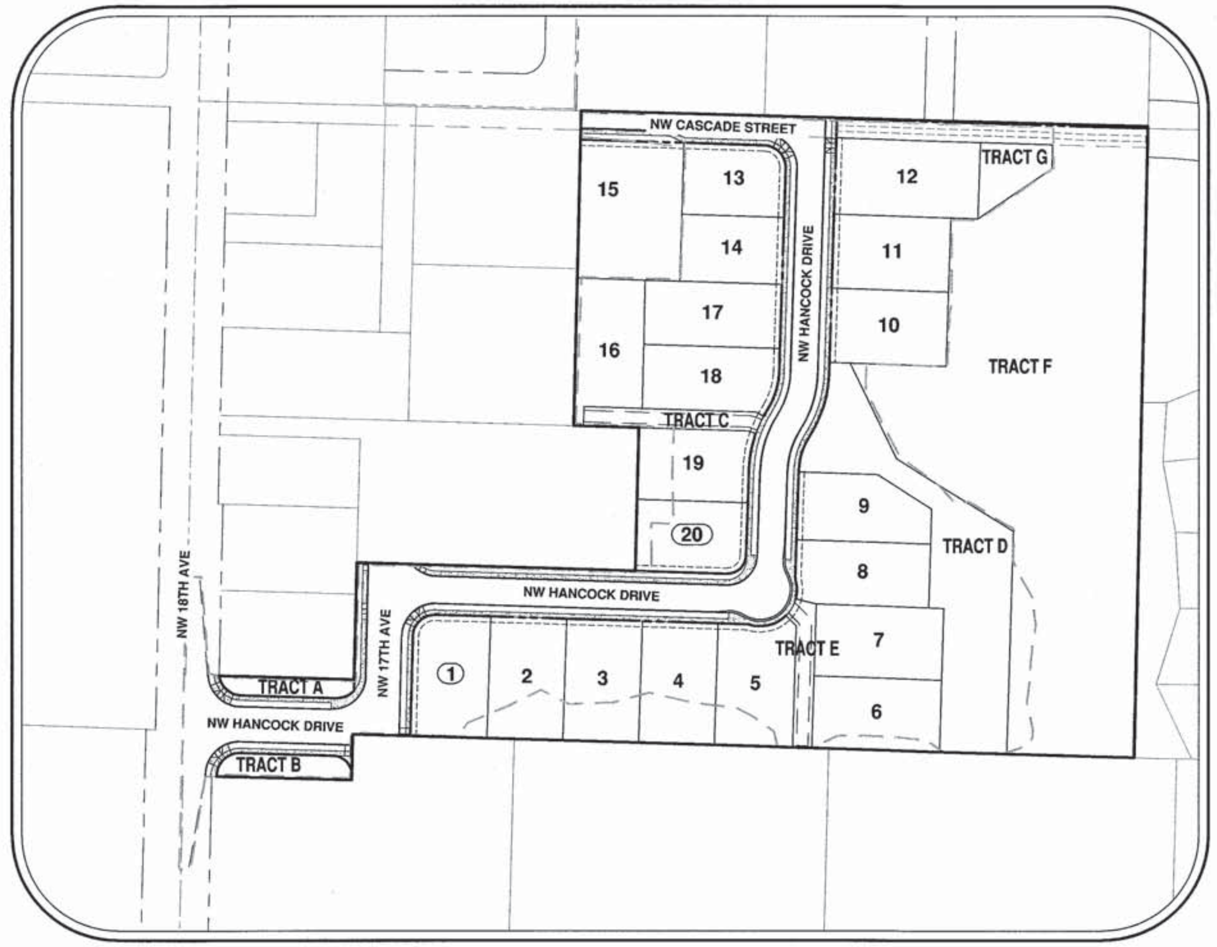
4. Proposed Development Plans (11”x17”)

HANCOCK SPRINGS SUBDIVISION

PRELIMINARY SUBDIVISION PLANS

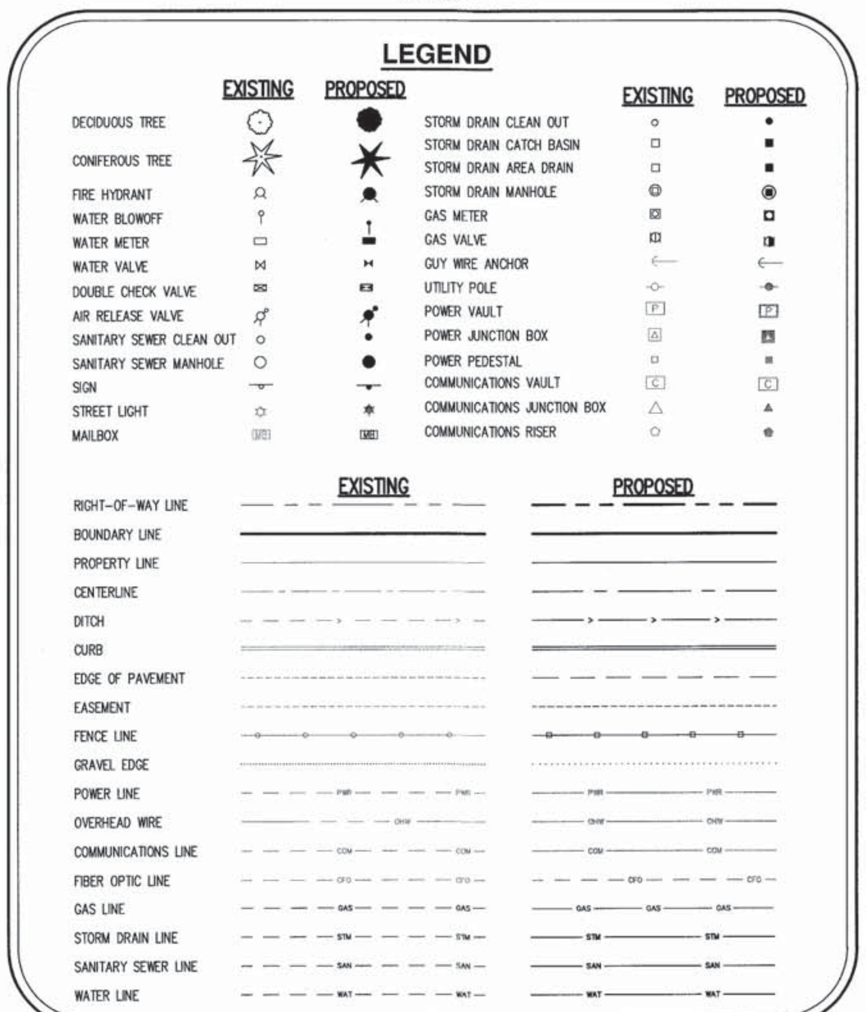
VICINITY MAP

N.T.S.



SITE MAP

1"=100'



SHEET INDEX

APPLICANT

NORTHWEST CLASSIC HOMES, LLC
CONTACT: CRAIG MOODY
PH: 360-263-4125
E-MAIL: CRAIG.MOODY@SHOOT360.COM

OWNER

CHARLES LAWRENCE
3010 NW 18TH AVENUE
CAMAS, WA 98607

CONTACT

AKS ENGINEERING & FORESTRY, LLC.
CONTACT: MICHAEL ANDREOTTI
9600 NE 126TH AVENUE, SUITE 2520
VANCOUVER, WA 98682
PH: 360-882-0419
FAX: 360-882-0426
E-MAIL: ANDREOTTIM@AKS-ENG.COM

PROPERTY DESCRIPTION

LOCATED IN THE NORTHEAST 1/4 OF SECTION 09, TOWNSHIP 1 NORTH, RANGE 3 EAST, WILLAMETTE MERIDIAN, CLARK COUNTY, WASHINGTON.
PROPERTY SERIAL #'S 127414-000, 127377-000, 127379-000, 127375-000, AND 127371-000.

PROPERTY ADDRESS

2924 NW 18TH AVENUE
CAMAS, WA 98607

EXISTING LAND USE

SINGLE FAMILY RESIDENCE ON 127371-000, VACANT RESIDENCES ON 127414-000 AND 127379-000, VACANT LAND ON 127377-000 AND 127375-000.
ZONED R-12 AND R-10

PROJECT PURPOSE

SUBDIVIDE 5 PARCELS INTO 20 DETACHED SINGLE-FAMILY RESIDENTIAL LOTS WITH ASSOCIATED ROAD IMPROVEMENTS AND CRITICAL AREA TRACT.

SITE AREA

10.03 AC (436,926 SF)

VERTICAL DATUM

ELEVATIONS ARE BASED ON CLARK COUNTY BENCHMARK NO. 4010,. LOCATED AT THE SW CORNER OF NW PARKER ST AND NW PACIFIC RIM BLVD. ELEVATION = 399.72 FEET (NGVD29 (47)).

AKS
AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE STE 2520
VANCOUVER, WA 98682
P: 360.882.0419
F: 360.882.0426
aks-eng.com
ENGINEERING · SURVEYING · NATURAL RESOURCES
FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

HANCOCK SPRINGS SUBDIVISION
CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

COVER SHEET

DESIGNED BY: CJS
DRAWN BY: NAL
MANAGED BY: JMM
CHECKED BY: JMM
DATE: 11-20-18

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

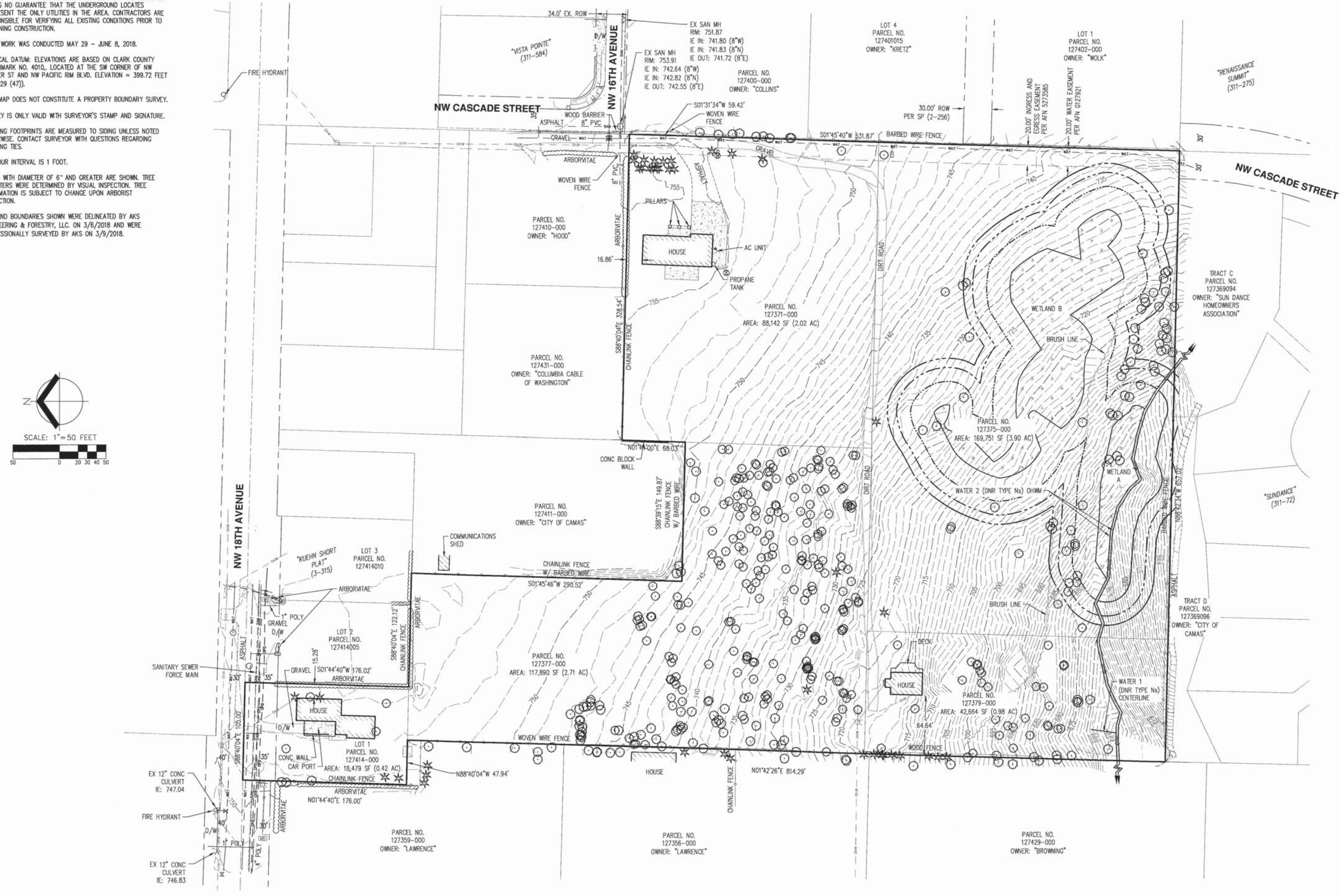
JOB NUMBER 5638

SHEET P1.0

AKS DRAWING FILE: 5638 P1.0.DWG | LAYOUT: P1.0

NOTES:

1. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS AS PROVIDED BY OTHERS, PROVIDED PER UTILITY LOCATE TICKET NUMBER 18213283 AND 18213335. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND 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 MAY 29 – JUNE 8, 2018.
3. VERTICAL DATUM: ELEVATIONS ARE BASED ON CLARK COUNTY BENCHMARK NO. 4010,. LOCATED AT THE SW CORNER OF NW PARKER ST AND NW PACIFIC RIM BLVD. ELEVATION = 399.72 FEET (NGVD29 (47)).
4. THIS MAP DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY.
5. SURVEY IS ONLY VALID WITH SURVEYOR'S STAMP AND SIGNATURE.
6. BUILDING FOOTPRINTS ARE MEASURED TO SIDING UNLESS NOTED OTHERWISE. CONTACT SURVEYOR WITH QUESTIONS REGARDING BUILDING TIES.
7. CONTOUR INTERVAL IS 1 FOOT.
8. TREES WITH DIAMETER OF 6" AND GREATER ARE SHOWN. TREE DIAMETERS WERE DETERMINED BY VISUAL INSPECTION. TREE INFORMATION IS SUBJECT TO CHANGE UPON ARBORIST INSPECTION.
9. WETLAND BOUNDARIES SHOWN WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON 3/6/2018 AND WERE PROFESSIONALLY SURVEYED BY AKS ON 3/9/2018.



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

HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

EXISTING CONDITIONS

DESIGNED BY:
DRAWN BY: BRE
MANAGED BY: JOH
CHECKED BY: JOH
DATE: 10/18/2018

JAMES O. HANNON STATE OF WASHINGTON 54200 REGISTERED PROFESSIONAL LAND SURVEYOR

REVISIONS

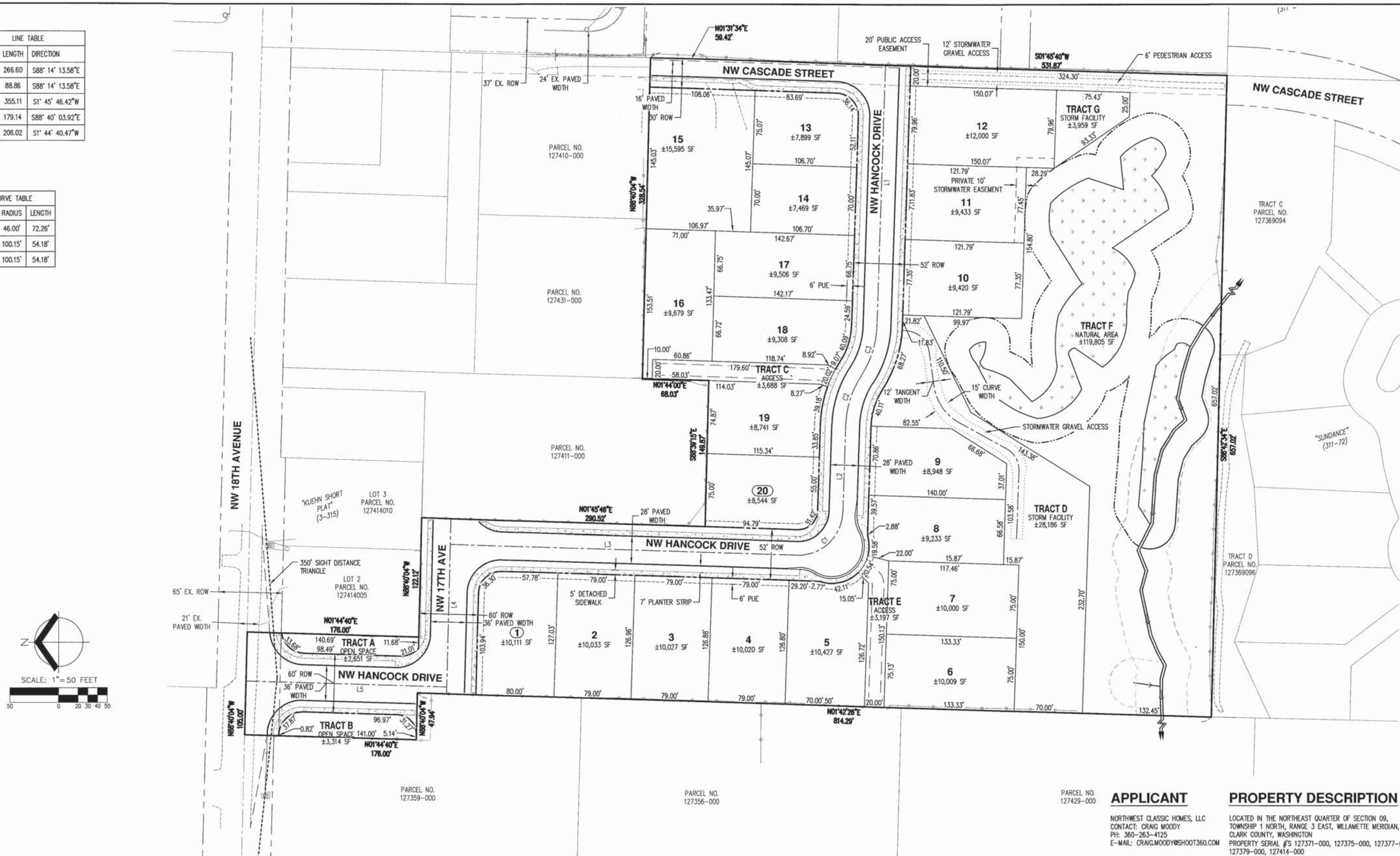
JOB NUMBER 5638

SHEET P2.0

AKS DRAWING FILE: 5638 P2.0.DWG | LAYOUT: P2.0

LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	266.60	S88° 14' 13.58"E
L2	88.86	S88° 14' 13.58"W
L3	355.11	S1° 45' 46.42"W
L4	179.14	S88° 40' 03.92"E
L5	206.02	S1° 44' 40.47"W

CURVE TABLE		
CURVE	RADIUS	LENGTH
C1	46.00'	72.26'
C2	100.15'	54.18'
C3	100.15'	54.18'



SINGLE FAMILY DETACHED SETBACK TABLE

MINIMUM LOT FRONTAGE	20'
MINIMUM LOT FRONTAGE CUL-DE-SAC	30'
MAXIMUM LOT COVERAGE	35%
MAXIMUM HEIGHT	35'
FRONT YARD SETBACK	20'
REAR YARD SETBACK	25'
SIDE YARD SETBACK	5'
STREET SIDE YARD SETBACK	20'
GARAGE SETBACK	20'

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

DENSITY TABLE

GROSS AREA:	436,926 SF (10.03 AC)
INFRASTRUCTURE AREA:	75,703 SF (1.74 AC)
STORM DRAINAGE FACILITIES:	32,144 SF (0.74 AC)
OPEN SPACE:	5,965 SF (0.14 AC)
CRITICAL AREAS:	119,805 SF (2.75 AC)
ACCESS TRACTS:	6,885 SF (0.16 AC)
NET AREA:	311,156 SF (7.14 AC)
MAXIMUM LOTS ALLOWED (7.1*4.3):	30 LOTS
PROPOSED LOTS:	20 LOTS
PROPOSED DENSITY:	1.99 DU/AC

GENERAL NOTES

1. OPEN SPACE TRACTS A & B TO BE OWNED AND MAINTAINED BY THE HOME OWNERS ASSOCIATION (HOA)
2. ACCESS TRACTS C & E TO BE OWNED AND MAINTAINED BY THE HOA
3. STORMWATER TRACTS D & G TO BE OWNED BY THE HOA AND MAINTAINED BY THE CITY OF CAMAS
4. NATURAL AREA TRACT F TO BE OWNED BY THE HOA
5. BUILDING ENVELOPES SHALL BE PER SETBACK TABLE
6. S.T.E.P. TANKS TO BE LOCATED IN FRONT YARDS OF PROPOSED LOTS

APPLICANT

NORTHWEST CLASSIC HOMES, LLC
CONTACT: CRAIG MOODY
PH: 360-263-4125
E-MAIL: CRAIG.MOODY@SHOOT360.COM

OWNER

CHARLES LAWRENCE
3010 NW 18TH AVENUE
CAMAS, WA 98607

CONTACT

AKS ENGINEERING & FORESTRY, LLC
CONTACT: MICHAEL ANDREOTTI
9600 NE 126TH AVENUE, SUITE 2520
VANCOUVER, WA 98682
PH: 360-882-0419
FAX: 360-882-0426
EMAIL: ANDREOTTIM@AKS-ENG.COM

PROPERTY DESCRIPTION

LOCATED IN THE NORTHEAST QUARTER OF SECTION 09, TOWNSHIP 1 NORTH, RANGE 3 EAST, WILLAMETTE MERIDIAN, CLARK COUNTY, WASHINGTON
PROPERTY SERIAL #'S 127371-000, 127375-000, 127377-000, 127379-000, 127414-000

EXISTING LAND USE

SINGLE FAMILY RESIDENCE ON 127371-000,
VACANT RESIDENCES ON 127414-000 AND 127379-000,
VACANT LAND ON 127377-000 AND 127375-000.
ZONED R-12 AND R-10

PROJECT PURPOSE

SUBDIVIDE 5 PARCELS INTO 20 DETACHED SINGLE-FAMILY RESIDENTIAL LOTS WITH ASSOCIATED ROAD IMPROVEMENTS AND CRITICAL AREA TRACT.

SITE AREA

10.03 AC (436,926 SF)

AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE STE 2520
VANCOUVER, WA 98682
P: 360.882.0419
F: 360.882.0426
aks-eng.com

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

HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 1273710000, 1273750000, 1273770000, 1273790000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY PLAT

DESIGNED BY:	CJS
DRAWN BY:	NAL
MANAGED BY:	JMM
CHECKED BY:	JMM

DATE: 11-20-18

JOHN M. ME... STATE OF WASHINGTON 42614 REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 5638

SHEET P3.0

AKS DRAWING FILE: 5638 P3.0.DWG | LAYOUT: P3.0

LEGEND

EXISTING GROUND CONTOUR (2 FT)	
EXISTING GROUND CONTOUR (10 FT)	350
FINISHED GRADE CONTOUR (2 FT)	
FINISHED GRADE CONTOUR (10 FT)	345
SEDIMENT FENCE (TO BE INSTALLED PRIOR TO GRADING)	x
INLET PROTECTION (TYP) PER COMBINATION DETAIL	
DRAINAGE FLOW DIRECTION	
GRAVEL CONSTRUCTION ENTRANCE	
DISTURBED LIMITS	
TREE PROTECTION/CONSTRUCTION FENCE	
POTENTIAL STAGING/SOIL STOCKPILE AREA	

GENERAL NOTES

1. DEMOLITION AND REMOVAL OF ALL STRUCTURES TOGETHER WITH DECOMMISIONING OF ALL WELLS, SEPTIC TANKS, AND UNDERGROUND STORAGE TANKS (IF ANY EXIST) SHALL BE COMPLETED PRIOR TO SITE GRADING.
2. DECOMMSSION EXISTING SEPTIC SYSTEM PER CITY OF CAMAS REQUIREMENTS
3. DECOMMISSION EXISTING WELL PER CITY OF CAMAS REQUIREMENTS

DEMOLITION KEYED NOTES (#)

1. REMOVE EXISTING DIRT/GRAVEL ROAD.
2. REMOVE EXISTING BUILDING AND ASSOCIATED HARDSCAPE.
3. REMOVE EXISTING OVERHEAD WIRE/POLE.
4. EXISTING TREE TO REMAIN (TYP).
5. REMOVE EXISTING TREE. (TYP)

EROSION CONTROL KEYED NOTES (#)

1. INSTALL INLET PROTECTION (TYP).
2. POTENTIAL STOCKPILE AREA.
3. CONSTRUCTION ENTRANCE.
4. INSTALL SEDIMENT FENCE (TYP).
5. DISTURBED LIMITS (TYP).

PRELIMINARY GRADING QUANTITIES:

CUT: 13,000 C.Y.
FILL: 13,000 C.Y.

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY DEMOLITION, ESC, GRADING PLAN

DESIGNED BY:	CJS
DRAWN BY:	NAL
MANAGED BY:	JMM
CHECKED BY:	JMM
DATE:	11-20-13

PRELIMINARY NOT FOR CONSTRUCTION
JOHN M. ... STATE OF WASHINGTON 42614 REGISTERED PROFESSIONAL ENGINEER

REVISIONS

JOB NUMBER
5638

SHEET
P4.0

AKS DRAWING FILE: 5638 P4.0.DWG | LAYOUT: P4.0

TREE PROTECTION NOTES

A. PLACING MATERIALS NEAR TREES – NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE PROTECTED AREA OF ANY TREE DESIGNATED TO REMAIN, INCLUDING, BUT NOT LIMITED TO, PARKING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIALS AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT, ETC.

B. ATTACHMENTS TO TREES – DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY OBJECT TO ANY TREE DESIGNATED FOR PROTECTION.

C. PROTECTIVE BARRIER – BEFORE DEVELOPMENT, LAND CLEARING, FILLING OR ANY LAND ALTERATION FOR WHICH A TREE REMOVAL PERMIT IS REQUIRED, THE CONTRACTOR:

- C.A. SHALL ERECT AND MAINTAIN READILY VISIBLE PROTECTIVE TREE FENCING ALONG THE OUTER EDGE AND COMPLETELY SURROUNDING THE PROTECTED AREA OF ALL PROTECTED TREES OR GROUP OF TREES. FENCES SHALL BE CONSTRUCTED PER THE DETAIL ON THIS SHEET.
- C.B. MAY BE REQUIRED TO COVER WITH MULCH TO A DEPTH OF AT LEAST SIX (6) INCHES OR WITH PLYWOOD OR SIMILAR MATERIAL IN THE AREAS ADJOINING THE CRITICAL ROOT ZONE OF A TREE IN ORDER TO PROTECT ROOTS FROM DAMAGE CAUSED BY HEAVY EQUIPMENT.
- C.C. SHALL PROHIBIT EXCAVATION OR COMPACTING OF EARTH OR OTHER POTENTIALLY DAMAGING ACTIVITIES WITHIN THE BARRIERS.
- C.D. MAY BE REQUIRED TO MINIMIZE ROOT DAMAGE BY EXCAVATING A TWO (2) FOOT DEEP TRENCH, AT EDGE OF CRITICAL ROOT ZONE, TO CLEANLY SEVER THE ROOTS OF TREES TO BE RETAINED. ROOTS ONE (1) INCH DIAMETER OR GREATER SHALL BE CLEANLY CUT WITH A SAW OR PRUNERS.
- C.E. MAY BE REQUIRED TO HAVE CORRECTIVE PRUNING PERFORMED ON PROTECTED TREES IN ORDER TO AVOID DAMAGE FROM MACHINERY OR BUILDING ACTIVITY. MAY BE REQUIRED TO MAINTAIN TREES THROUGHOUT THE CONSTRUCTION PERIOD BY WATERING AND FERTILIZING.
- C.F. SHALL MAINTAIN THE PROTECTIVE BARRIERS IN PLACE UNTIL THE PROJECT ARBORIST AUTHORIZES THEIR REMOVAL OR A FINAL CERTIFICATE OF OCCUPANCY IS ISSUED, WHICHEVER OCCURS FIRST.
- C.G. SHALL ENSURE THAT ANY LANDSCAPING DONE IN THE PROTECTED ZONE SUBSEQUENT TO THE REMOVAL OF THE BARRIERS SHALL BE ACCOMPLISHED WITH LIGHT MACHINERY OR HAND LABOR.

D. GRADE

- D.A. THE GRADE SHALL NOT BE ELEVATED OR REDUCED WITHIN THE CRITICAL ROOT ZONE OF TREES TO BE PRESERVED WITHOUT THE PROJECT ARBORISTS'S AUTHORIZATION. THE PROJECT ARBORIST MAY ALLOW COVERAGE OF UP TO ONE HALF OF THE AREA OF THE TREE'S CRITICAL 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.
- D.B. IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREES CRITICAL ROOT ZONE, IT SHALL BE PERMANENTLY STABILIZED TO PREVENT SUFFOCATION OF THE ROOTS.
- D.C. THE APPLICANT SHALL NOT INSTALL AN IMPERVIOUS SURFACE WITHIN THE CRITICAL ROOT ZONE OF ANY TREE TO BE RETAINED WITHOUT THE AUTHORIZATION OF THE PROJECT ARBORIST. THE PROJECT 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.
- D.D. TO THE GREATEST EXTENT PRACTICAL, UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE CRITICAL ROOT ZONE OF TREES TO BE RETAINED. THE PROJECT ARBORIST MAY REQUIRE THAT UTILITIES BE TUNNELED UNDER THE ROOTS OF TREES TO BE RETAINED IF THE PROJECT ARBORIST DETERMINES THAT TRENCHING WOULD SIGNIFICANTLY REDUCE THE CHANCES OF THE TREE'S SURVIVAL.
- D.E. TREE 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 TO EROSION FOR THE LEAST POSSIBLE TIME. TO CONTROL EROSION, SHRUBS, GROUND COVER, AND STUMPS SHALL BE MAINTAINED ON THE INDIVIDUAL LOTS, WHERE FEASIBLE. WHERE NOT FEASIBLE, APPROPRIATE EROSION CONTROL PRACTICES SHALL BE IMPLEMENTED PURSUANT TO CAMAS MUNICIPAL CODE CHAPTER 14.06.

E. DIRECTIONAL FELLING OF TREES SHALL BE USED TO AVOID DAMAGE TO TREES DESIGNATED FOR RETENTION.

F. ADDITIONAL REQUIREMENTS – THE PROJECT ARBORIST MAY REQUIRE ADDITIONAL TREE PROTECTION MEASURES WHICH ARE CONSISTENT WITH ACCEPTED URBAN FORESTRY PRACTICES.

G. ENCROACHMENT INTO THE ROOT PROTECTION ZONE IS ALLOWED WITH PROJECT ARBORIST APPROVAL AS DESCRIBED IN THE FOLLOWING NOTES:

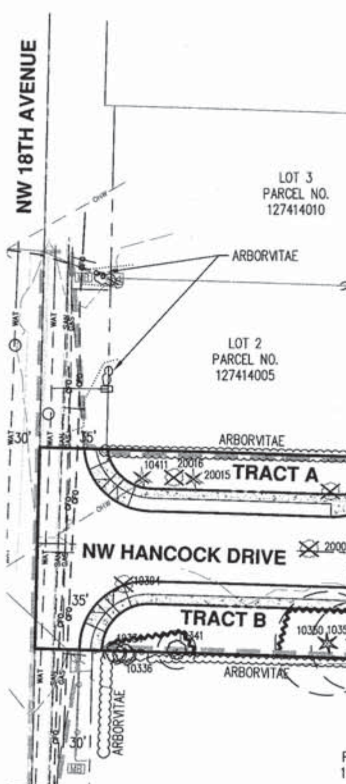
- G.A. EXCAVATION IN THE TOP 24 INCHES OF THE SOIL IN THE CRITICAL ROOT ZONE AREA SHOULD BEGIN AT THE EXCAVATION LINE THAT IS CLOSEST TO THE TREE.
- G.B. THE EXCAVATION SHOULD BE DONE BY HAND/SHOVEL OR WITH A BACKHOE AND A MAN WITH A SHOVEL, PRUNING SHEARS, AND A PRUNING SAW.
- G.C. IF DONE BY HAND, ALL ROOTS 1 INCH OR LARGER SHOULD BE PRUNED AT THE EXCAVATION LINE.
- G.D. IF DONE WITH BACKHOE (MOST LIKELY SCENARIO), THEN THE OPERATOR SHALL START THE CUT AT THE EXCAVATION LINE AND CAREFULLY "FEEL" FOR ROOT/RESISTANCE. WHEN THERE IS RESISTANCE, THE MAN WITH THE SHOVEL HAND DIGS AROUND THE ROOTS AND PRUNES THE ROOTS LARGER THAN 1 INCH DIAMETER.
- G.E. THE BACKHOE IS TO REMAIN OFF OF THE TREE ROOTS TO BE PRESERVED AT ALL TIMES.
- G.F. ALL ROOTS SHALL BE CUT CLEANLY WITH PRUNING SHEARS OR A PRUNING SAW.
- G.G. PROJECT ARBORIST MUST BE ONSITE DURING ANY WORK WITHIN THE TREE ROOT PROTECTION ZONE.
- G.H. THE CITY PLANNER MUST BE CONTACTED 24 HOURS PRIOR TO WORKING WITHIN THE TREE ROOT PROTECTION ZONE.

H. TREE PROTECTION ZONE IS DEFINED AS ALL AREAS BOUND AND PROTECTING THE OPTIMAL TREE PROTECTION ZONE.

I. TIMELINE FOR CLEARING, GRADING, AND INSTALLATION OF TREE PROTECTION MEASURES: WORK WILL BEGIN IMMEDIATELY FOLLOWING FINAL APPROVAL BY THE CITY. TREE PROTECTION MEASURES WILL BE DONE DURING CLEARING AND ANY GRADING WILL FOLLOW.

J. PRUNING/TREE REMOVAL NOTES: THE WORK TO BE COMPLETED UNDER THIS PROJECT SHALL CONSIST OF TREE REMOVAL AND TREE TRIMMING AS LISTED.

- J.A. THE CONTRACTOR SHALL PROVIDE ADEQUATE CREW OF MEN, 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 AND WHO SHALL BE RESPONSIBLE FOR THE CREW'S ACTIVITIES AND WHO SHALL RECEIVE INSTRUCTION FROM THE OWNER OR THE OWNER'S REPRESENTATIVE AND DIRECT THE CREW TO ACCOMPLISH SUCH WORK.
- J.B. WHENEVER A TREE, WHICH IS NOT SCHEDULED TO BE REMOVED, MUST BE TRIMMED OR PRUNED, THE CONTRACTOR SHALL INSURE THAT SUCH TRIMMING AND PRUNING IS CARRIED OUT UNDER THE DIRECT SUPERVISION OF A LICENSED ARBORIST. ALL PRUNING AND TRIMMING SHALL BE PERFORMED IN ACCORDANCE WITH THE PROVISIONS OF ANSI A 300 "STANDARD PRACTICES FOR TREE, SHRUB AND OTHER WOODY PLANT MAINTENANCE".
- J.C. THE CONTRACTOR SHALL BE REQUIRED TO CUT TREES TO A HEIGHT OF APPROXIMATELY 12". THE STUMPS AND ROOTS SHALL BE GROUND DOWN A MINIMUM OF TWELVE (12) INCHES BELOW NORMAL GROUND LEVEL.
- J.D. 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.
- J.E. 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 THEY SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING UTILITIES.
- J.F. ANY MATERIAL RESULTING FROM THE TRIMMING OR REMOVAL OF ANY TREES SHALL BECOME THE RESPONSIBILITY OF THE CONTRACTOR.
- J.G. HAZARDOUS TREES-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 OWNERS REPRESENTATIVE. SUCH TREES SHALL INCLUDE THOSE THAT ARE OVER MATURE, DISEASED, OR SHOWING SIGNS OF DECAY OR OTHER STRUCTURAL WEAKNESS.
- J.H. 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.
- J.I. ANY BRUSH CLEARING REQUIRED WITHIN THE TREE PROTECTION ZONE SHALL BE ACCOMPLISHED WITH HAND OPERATED EQUIPMENT.
- J.J. TREES TO BE REMOVED SHALL BE FELLED SO AS TO FALL AWAY FROM TREE ROOT PROTECTION ZONES AND TO AVOID PULLING AND BREAKING OF ROOTS TO REMAIN.
- J.K. ALL DOWNED BRUSH AND TREES SHALL BE REMOVED FROM THE TREE PROTECTION ZONE EITHER BY HAND OR WITH EQUIPMENT SITTING OUTSIDE THE TREE ROOT PROTECTION ZONE. EXTRACTION SHALL OCCUR BY LIFTING THE MATERIAL OUT, NOT BY SKIDDING IT ACROSS THE GROUND.
- J.L. IF TEMPORARY HAUL OR ACCESS ROADS MUST PASS OVER THE ROOT AREA OF TREES TO BE RETAINED A ROADBED OF 6 INCHES OF MULCH OR GRAVEL SHALL BE CREATED TO PROTECT THE SOIL. THE ROADBED MATERIAL SHALL BE REPLENISHED AS NECESSARY TO MAINTAIN A 6-INCH DEPTH.
- J.M. PRUNING. TREES SHALL BE PRUNED PRIOR TO THE START OF CONSTRUCTION. TREES SHALL BE CROWN CLEANED TO REMOVE THE DEADWOOD 2 INCHES IN DIAMETER AND OVER. TREES SHALL BE CROWN THINNED BY 10-20%. CROWNS MAY BE RAISED BY REMOVING BOTTOM BRANCHES AS NECESSARY UP TO 14 FEET HIGH TO GIVE CLEARANCE FOR ANY CONSTRUCTION TRAFFIC, ACTIVITIES, ETC. ALL WORK TO BE DONE IN ACCORDANCE WITH ANSI A300 PRUNING STANDARDS. REMOVE ANY LIMBS OF DOUBTFUL STRENGTH THAT COULD BE DANGEROUS TO PERSONS AND PROPERTY.



GENERAL NOTES

1. TREE PROTECTION FENCING SHALL BE INSTALLED PRIOR TO DEMOLITION AND SITE GRADING ACTIVITIES. SEE DETAIL SHEET P5.3. SILT FENCING MAY BE UTILIZED WHEN APPLICABLE.
2. ALL SHRUBS WITHIN SIGHT DISTANCE TRIANGLES SHALL BE MAINTAINED SO THAT THE FOLIAGE HEIGHT ABOVE THE PAVEMENT DOES NOT EXCEED 2.5 FEET. STREET TREES WITHIN SIGHT DISTANCE TRIANGLES SHALL BE LIMBED UP TO A HEIGHT OF 10 FEET CONSISTENT WITH ANSI A300 STANDARDS TO PROVIDE SIGHT DISTANCE VISIBILITY.
3. SEE SHEETS P5.1-P5.3 FOR TREE INVENTORY.
4. PRESERVED TREES WILL REQUIRE PRUNING TO IMPROVE CROWN STRUCTURE AND REMOVE DEAD BRANCHES, AND/OR REMOVAL OF SURROUNDING BLACKBERRY AND OTHER SPECIES TO INCREASE TREE HEALTH. RETAIN NATIVE VEGETATION WITHIN TREE PROTECTION AREAS. SEE TREE PROTECTION NOTES, THIS SHEET, FOR GENERAL PRUNING GUIDELINES.
5. FOLLOWING CLEARING AND GRADING ACTIVITIES, A CERTIFIED ARBORIST SHALL INSPECT RETAINED TREES FOR POTENTIALLY HAZARDOUS TREE CONDITIONS. COORDINATION WITH THE CITY SHALL OCCUR PRIOR TO ANY ADDITIONAL TREE REMOVALS FOR HAZARD ABATEMENT.
6. NOT ALL TREES WERE SURVEYED AND/OR INSPECTED WITHIN TRACT F, A CRITICAL AREA TRACT. ONLY TREES ADJACENT TO THE PROPOSED DEVELOPMENT ACTIVITIES WERE INSPECTED AND INCLUDED IN THE TREE SURVEY. THEREFORE, TRACT F IS EXCLUDED FROM THE SITE AREA FOR TREE DENSITY CALCULATIONS.
7. TREE PROTECTION AREAS MAY BE REVIEWED AGAIN PRIOR TO HOME CONSTRUCTION AND MODIFIED.

TREE PLAN

GROSS AREA:	10.03 AC
SITE AREA EXCLUDING ROW AND TRACT F:	5.63 AC
TOTAL TREE UNITS REQUIRED (5.63 X 20):	113
EXISTING TREES RETAINED/(TREE UNITS):	56/(190)
PROPOSED SITE TREES/(TREE UNITS):	52/(52)

NOTE: SEE LANDSCAPING PLAN (P9.0) FOR PROPOSED TREE PLANTING PLAN

KEYED NOTES

1. REMOVE THE FOLLOWING TREES: 11025, 11026, 11028, 11031, 11034, 11036, 11406, 20129, 20134, 20135, 20138, 20145, 20150, 20155, 20157, 20176, 20180, 20181, 20366, 20531, 21001, 21006. DO NOT PULL STUMPS WITHIN TREE PROTECTION FENCING. STUMP MAY BE GROUND AND COVERED WITH SOIL.
2. IMPACTS TO OFF-SITE ROW OF TREES EXCEEDS RECOMMENDED CRITICAL ROOT AREA IMPACTS. A CERTIFIED ARBORIST IS TO BE PRESENT DURING EXCAVATION ACTIVITIES IN THIS AREA. COORDINATION WITH ADJACENT PARCEL OWNER SHOULD BE COMPLETED PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES. ADDITIONAL ROOT EXPLORATION MAY BE NECESSARY TO DETERMINE ROOT IMPACTS FOR EACH TREE. IF IMPACTS ARE TOO SEVERE, TREE REMOVAL MAY BE NECESSARY WITH OWNER'S PERMISSION. IF TREE REMOVAL IS NECESSARY AND THE OWNER DOES NOT APPROVE, CONSTRUCTION OF NW CASCADE STREET SHALL OCCUR WITH DEVELOPMENT OF PARCEL 127400-000.

LEGEND

	DECIDUOUS / CONIFEROUS
EXISTING TREE TO REMAIN	
EXISTING TREE TO BE REMOVED	
TREE ROOT PROTECTION ZONE (1 FOOT RADIUS PER INCH DBH)	
TREE PROTECTION/CONSTRUCTION FENCE	

CERTIFIED ARBORIST ISA®
PRELIMINARY NOT FOR CONSTRUCTION
BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19
Bryce D Hanson

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HANCOCK SPRINGS SUBDIVISION
CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

TREE PRESERVATION AND REMOVAL PLAN

DESIGNED BY:	ELN
DRAWN BY:	ELN
MANAGED BY:	JMM
CHECKED BY:	BDH
DATE:	11-20-18

REVISIONS

JOB NUMBER 5638

SHEET P5.0

Detailed Tree Inventory for Hancock Springs

AKS JOB NO. 5638 Site Area = 5.63 acres

AKS Reference #	Total DBH (In)	Tree Species Common Name (Scientific name)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
10334	6	Norway Maple (Acer platanoides)	0	Off site, growing up against fence along property line, healthy	C		0
10336	6	Norway Maple (Acer platanoides)	0	Off site, growing up against fence along property line, healthy	C		0
10341	9,5	Paper Birch (Betula papyrifera)	2	Slight lean, crown clean recommended	C		2
10350	27	Noble Fir (Abies procera)	10	Stem forks into codominant stems at 30' & 45', dead branches in crown, crown clean recommended	C		10
10353	23	Douglas-fir (Pseudotsuga menziesii)	8	Stem forks into codominant stems at 40', dead branches in crown, crown clean recommended	C		8
10360	9	Western Redcedar (Thuja plicata)	0	Off site	C		0
10361	6	Western Redcedar (Thuja plicata)	0	Off site	C		0
10363	16	Douglas-fir (Pseudotsuga menziesii)	0	Off site	C		0
10394	32	Norway Maple (Acer platanoides)	12	Full crown, healthy	C	Located within proposed road grading	0
10411	8	Western Redcedar (Thuja plicata)	2	Growing against side of existing structure, surrounded by blackberry	C	Located within proposed road grading	0
10513	13	Red Alder (Alnus rubra)	3	Healthy	C	Located within proposed road grading	0
10514	11	Red Alder (Alnus rubra)	2	Moderate lean	B	Located within proposed road grading	0
10515	15	Red Alder (Alnus rubra)	4	Slight lean, topped	B	Located within proposed road grading	0
10516	9	Red Alder (Alnus rubra)	2	Slight lean, topped	B	Located within proposed road grading	0
10517	11	Red Alder (Alnus rubra)	2	Slight lean, stem forks at 15', topped	B	Located within proposed road grading	0
10518	8	Red Alder (Alnus rubra)	2	Stem forks at 10'	B	Located within proposed road grading	0
10519	9	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
10520	8	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10521	12	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
10522	9	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10523	9	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10524	8	Red Alder (Alnus rubra)	2	Healthy	C	Lot grading greatly impacts root zone	0
10525	9	Paper Birch (Betula papyrifera)	2	Healthy	C	Lot grading greatly impacts root zone	0
10526	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown, minor scarring on stem	C	Lot grading greatly impacts root zone	0
10529	12	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10530	14	Red Alder (Alnus rubra)	3	Moderate lean	B	Lot grading greatly impacts root zone	0
10531	10	Red Alder (Alnus rubra)	2	Topped, significant lean	B	Lot grading greatly impacts root zone	0
10532	72	Bigleaf Maple (Acer macrophyllum)	31	Three codominant stem begin above breast height, large dead branches in crown, large cavities in base	B	Located in center of proposed lot grading, poor tree health	0
10537	6	Red Alder (Alnus rubra)	2	Moderate lean	B	Located within proposed road grading	0
10539	8,4,5,3,2	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown with dead branches, slight lean, stem forks at 20', 2" & 3" stems are dead	B	Located within proposed road grading	0
10542	21	Bigleaf Maple (Acer macrophyllum)	7	Slight lean, dead branches in crown	C	Located within proposed road grading	0
10543	23	Bigleaf Maple (Acer macrophyllum)	8	Unbalanced crown with dead branches, slight lean, stem forks at 20'	B	Located within proposed road grading	0
10544	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown with dead branches	B	Located within proposed road grading	0
10545	37	Bigleaf Maple (Acer macrophyllum)	15	Has co-dominant stems, some dead branches, decay present	B	Located within proposed road grading	0
10546	9	Red Alder (Alnus rubra)	2	Slight lean, dead top, poor health	B	Located within proposed road grading	0
10547	6	Red Alder (Alnus rubra)	2	Moderate lean	B	Located within proposed road grading	0
10552	27	Bigleaf Maple (Acer macrophyllum)	0	Off site, unbalanced crown, codominant stems, decay in old branch collars, slight lean, scarring in stem	B		0
10553	25,6,6	Bigleaf Maple (Acer macrophyllum)	0	Off site, codominant stems, slight lean, scarring at 12'	B		0
10554	25	Bigleaf Maple (Acer macrophyllum)	0	Off site, codominant stems, included bark	C		0
10563	13	Bigleaf Maple (Acer macrophyllum)	3	Healthy	C	Lot grading greatly impacts root zone	0
10564	13	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 30', decay in cavity at base, slightly crooked	B	Lot grading greatly impacts root zone	0
10569	6	Red Alder (Alnus rubra)	2	Exhibits very poor health	B	Located within proposed road grading	0
10570	7	Red Alder (Alnus rubra)	2	Healthy	C	Located within proposed road grading	0
10572	7,7,4,4,4	Bigleaf Maple (Acer macrophyllum)	2	One 4" stem is dead, one 7" stem is topped	A	Located within proposed road grading	0
10578	6	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 15'	B	Located within proposed road grading	0
10579	9	Honey Locust (Gleditsia triacanthos)	2	Stem forks at 40', slightly crooked, slight lean	B	Located within proposed road grading	0
10580	9	Red Alder (Alnus rubra)	2	Signs of decay in stem, topped, declining health	B	Located within proposed road grading	0
10581	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean, topped	B	Located within proposed road grading	0
10584	23	Bigleaf Maple (Acer macrophyllum)	8	Unbalanced crown, some included bark, scarring in stem	B	Located within proposed road grading	0
10586	20	Bigleaf Maple (Acer macrophyllum)	6	Unbalanced crown, large dead branches in crown, crooked stem	B	Located within proposed road grading	0
10587	20	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10589	12	Bigleaf Maple (Acer macrophyllum)	2	Decay present at base, topped, slight lean, declining health	B	Lot grading greatly impacts root zone	0
10590	8	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean, crooked stem	B	Lot grading greatly impacts root zone	0
10591	12	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10592	17	Bigleaf Maple (Acer macrophyllum)	5	Codominant stems begin at 20', large dead branches in crown, scarring in stem	C	Lot grading greatly impacts root zone	0
10593	12	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10594	11	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 30', slight lean	B	Lot grading greatly impacts root zone	0
10595	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
10596	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 40', dead branches in crown	C	Lot grading greatly impacts root zone	0
10597	6	Bigleaf Maple (Acer macrophyllum)	2	Dead top	B	Lot grading greatly impacts root zone	0
10598	17	Bigleaf Maple (Acer macrophyllum)	5	Stem forks at 25' and 45', one stem is topped with large branch breakage near top	B	Lot grading greatly impacts root zone	0
10599	14	Bigleaf Maple (Acer macrophyllum)	3	Dead top	B	Lot grading greatly impacts root zone	0
10600	6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10601	8	Bigleaf Maple (Acer macrophyllum)	2	Slightly crooked, sweep in stem	B	Lot grading greatly impacts root zone	0
10602	15	Bigleaf Maple (Acer macrophyllum)	4	Dead top	B	Lot grading greatly impacts root zone	0
10603	16	Bigleaf Maple (Acer macrophyllum)	4	Crooked stem	C	Lot grading greatly impacts root zone	0
10604	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10605	13	Bigleaf Maple (Acer macrophyllum)	3	Dead top, slight lean	B	Lot grading greatly impacts root zone	0
10606	12,10	Bigleaf Maple (Acer macrophyllum)	4	Codominant stems above breast height, dead branches in crown	B	Lot grading greatly impacts root zone	0
10607	7,6,5,4	Bigleaf Maple (Acer macrophyllum)	2	Codominant stems above breast height, dead top, declining health	B	Lot grading greatly impacts root zone	0
10608	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
10610	7	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
10614	8	Red Alder (Alnus rubra)	2	Crooked stem, slight lean	B		2
10615	17,36	Bigleaf Maple (Acer macrophyllum)	16	Breakage and dead branches in crown, splits into three codominant stems above breast height, one stem topped	B		16
10619	12	Bigleaf Maple (Acer macrophyllum)	2	Decay in cavity at base	B	Lot grading greatly impacts root zone	0
10620	8	Red Alder (Alnus rubra)	2	Dead branches, top is dying	B	Lot grading greatly impacts root zone	0
10621	8	Bigleaf Maple (Acer macrophyllum)	2	Topped, decay in stem, moderate lean, crooked stem, declining health	A	Lot grading greatly impacts root zone	0
10622	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, dead top	B	Lot grading greatly impacts root zone	0
10623	9,9	Bigleaf Maple (Acer macrophyllum)	3	One stem forks near top, other stem is topped, decay present	B	Lot grading greatly impacts root zone	0
10624	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, crooked stem	B	Lot grading greatly impacts root zone	0
10625	17	Bigleaf Maple (Acer macrophyllum)	5	Unbalanced, codominant stems above breast height, one stem topped	B	Lot grading greatly impacts root zone	0
10626	10	Bigleaf Maple (Acer macrophyllum)	2	Large dead branches at top	C	Lot grading greatly impacts root zone	0
10627	15	Bigleaf Maple (Acer macrophyllum)	4	Stem forks at 45', decay in stem, crooked, scarring present, large dead branches in crown	B	Lot grading greatly impacts root zone	0
10628	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10629	12	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 40', one branch at fork dead	B	Lot grading greatly impacts root zone	0
10630	12	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
10631	6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10632	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10633	16	Bigleaf Maple (Acer macrophyllum)	4	Healthy	C	Lot grading greatly impacts root zone	0
10634	12	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, crooked	B	Lot grading greatly impacts root zone	0
10635	12,4	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
10637	8	Bigleaf Maple (Acer macrophyllum)	2	Topped, dead bark near break, declining health	B	Lot grading greatly impacts root zone	0
10638	14	Bigleaf Maple (Acer macrophyllum)	3	Slightly crooked	B	Lot grading greatly impacts root zone	0
10639	8,8	Bigleaf Maple (Acer macrophyllum)	2	Slightly crooked, one 8" stem dead	B	Lot grading greatly impacts root zone	0
10640	14	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10641	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10642	9	Bigleaf Maple (Acer macrophyllum)	2	Crooked stem, dead branches in crown	B	Lot grading greatly impacts root zone	0
10643	9	Bigleaf Maple (Acer macrophyllum)	2	Topped, no obvious dominant branches	B	Lot grading greatly impacts root zone	0
10644	13	Bigleaf Maple (Acer macrophyllum)	0	Dead, stem split in half	A	Tree is dead	0
10645	17	Bigleaf Maple (Acer macrophyllum)	5	Unbalanced crown, dead branches in crown, cavity in stem at eye height, decay present	B	Lot grading greatly impacts root zone	0
10646	9	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10647	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10648	7	Bigleaf Maple (Acer macrophyllum)	2	Topped, no obvious dominant branches	B	Lot grading greatly impacts root zone	0
10649	12	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, stem forks at 20', dead branches in crown	B	Lot grading greatly impacts root zone	0
10650	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, stem forks at 20'	B	Lot grading greatly impacts root zone	0
10651	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, stem forks at 20'	B	Lot grading greatly impacts root zone	0
10652	15	Bigleaf Maple (Acer macrophyllum)	4	Stem forks at 15'	B	Lot grading greatly impacts root zone	0
10653	13	Bigleaf Maple (Acer macrophyllum)	3	Dead branches in crown, one large branch contains almost all crown growth	B	Lot grading greatly impacts root zone	0
10654	17,15,13,14	Bigleaf Maple (Acer macrophyllum)	11	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10657	12,7	Bigleaf Maple (Acer macrophyllum)	3	Dead top, 7" stem shows declining health, unbalaced crown, 12" stem has sweep at base	B	Lot grading greatly impacts root zone	0
10660	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10661	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10662	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, dead top, stem forks near top	B	Located within proposed road grading	0
10663	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced, dead branches in crown, stem forks near top	B	Located within proposed road grading	0
10664	14	Bigleaf Maple (Acer macrophyllum)	3	Sparse crown, unbalanced	B	Located within proposed road grading	0
10665	12	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Located within proposed road grading	0
10666	8	Bigleaf Maple (Acer macrophyllum)	2	Topped, unbalanced crown, declining health	B	Located within proposed road grading	0
10667	9	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10668	25	Douglas-fir (Pseudotsuga menziesii)	9	Dead branches in crown	C	Located within proposed road grading	0
10669	14	Bigleaf Maple (Acer macrophyllum)	3	Large dead branches in crown, slight lean	B	Lot grading greatly impacts root zone	0
10670	7,7,7,6,4	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced, dead branches in crown, slight lean	B	Lot grading greatly impacts root zone	0
10674	9,7,7,6,4,4	Bigleaf Maple (Acer macrophyllum)	4	Unbalanced, dead branches in crown	B	Lot grading greatly impacts root zone	0
10675	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slightly crooked	B	Located within proposed road grading	0
10676	11,7	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10677	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 40', dead branches in crown	C	Located within proposed road grading	0
10678	11	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 35', unbalanced crown, dead top, slight lean, branches extend horizontally after fork	B	Located within proposed road grading	0
10679	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 40', unbalanced crown	B	Located within proposed road grading	0
10682	17	Bigleaf Maple (Acer macrophyllum)	5	Stem forks at 50', dead top, slight lean, slightly crooked	B	Located within proposed road grading	0
10683	12	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 45', slightly crooked	B	Located within proposed road grading	0
10684	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 20', topped	B	Located within proposed road grading	0
10691	20	Bigleaf Maple (Acer macrophyllum)	6	Codominant stems begin at 10', crooked stem	B	Lot grading greatly impacts root zone	0
10693	11	Bigleaf Maple (Acer macrophyllum)	2	Significant decay in stem, almost dead	A	Located within proposed road grading	0
10695	7	Bigleaf Maple (Acer macrophyllum)	2	Dead top, declining health	B	Located within proposed road grading	0
10696	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown	B	Located within proposed road grading	0
10697	7,4	Bigleaf Maple (Acer macrophyllum)	2	Dead top, slight lean	B	Located within proposed road grading	0
10698	6,7,8	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B	Located within proposed road grading	0
10702	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown, stem forks near top, dead branches in crown	B	Located within proposed road grading	0
10705	13,7	Bigleaf Maple (Acer macrophyllum)	4	7" stem unbalanced, slight lean, dead branches in crown	B	Located within proposed road grading	0
10707	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10708	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10709	13,14,6	Bigleaf Maple (Acer macrophyllum)	6	14" & 6" stems unbalanced, 14" stem has dead top, dead branches in crown	B	Lot grading greatly impacts root zone	0
10710	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, scarring in stem	B	Lot grading greatly impacts root zone	0
10711	7,7	Bigleaf Maple (Acer macrophyllum)	2	One stem broken, unbalanced, significant lean	A	Lot grading greatly impacts root zone	0
10712	11	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10713	17,19	Bigleaf Maple (Acer macrophyllum)	9	17" stem splits into codominant stems with one having a dead top, 19" stem unbalanced, decay in dead stem and branch sections	A	Lot grading greatly impacts root zone	0
10715	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10716	14	Bigleaf Maple (Acer macrophyllum)	3	Codominant stems begin above breast height, one stem dead	B	Located within proposed road grading	0
10717	14	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown, dead branches in crown	B	Located within proposed road grading	0
10718	14	Bigleaf Maple (Acer macrophyllum)	3	Slightly crooked	C	Located within proposed road grading	0
10719	13	Unknown Deciduous	3	Significant decay in stem, almost dead	A	Located within proposed road grading	0
10720	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10721	14	Bigleaf Maple (Acer macrophyllum)	3	Topped, large dead branch stubs	B	Located within proposed road grading	0
10723	20	Bigleaf Maple (Acer macrophyllum)	6	Large dead branches in crown, branches extend out far	C	Lot grading greatly impacts root zone	0
10724	22	Bigleaf Maple (Acer macrophyllum)	7	Large dead branches in crown, branches extend out far	C	Lot grading greatly impacts root zone	0
10725	6	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean	B	Located within proposed road grading	0

CERTIFIED ARBORIST
ISA
PRELIMINARY NOT FOR CONSTRUCTION
BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19
Bryce D. Hanson

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HANCOCK SPRINGS SUBDIVISION
CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY TREE INVENTORY

DESIGNED BY: ELN
DRAWN BY: ELN
MANAGED BY: CJS
CHECKED BY: BDH
DATE: 11-20-18

REVISIONS

JOB NUMBER 5638
SHEET P5.1

Detailed Tree Inventory for Hancock Springs

AKS JOB NO. 5638 Site Area = 5.63 acres

AKS Reference #	Total DBH (In)	Tree Species Common Name (Scientific name)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
10726	14	Bigleaf Maple (Acer macrophyllum)	3	Scarring in stem	C	Located within proposed road grading	0
10727	12	Bigleaf Maple (Acer macrophyllum)	2	Topped, no obvious dominant branches	B	Located within proposed road grading	0
10728	6,7	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10729	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, topped, branch extends horizontally at top	B	Located within proposed road grading	0
10730	7	Red Alder (Alnus rubra)	2	Severely unbalanced and leaning	B	Located within proposed road grading	0
10731	19	Bigleaf Maple (Acer macrophyllum)	6	Dead branches in crown	C	Located within proposed road grading	0
10732	13	Bigleaf Maple (Acer macrophyllum)	3	Fair health	C	Located within proposed road grading	0
10733	30	Bigleaf Maple (Acer macrophyllum)	11	Codominant stems begin above breast height, one stem crooked	C	Lot grading greatly impacts root zone	0
10734	18	Bigleaf Maple (Acer macrophyllum)	5	Very unbalanced crown, possible dead top	B	Lot grading greatly impacts root zone	0
10737	8	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 20'	B	Lot grading greatly impacts root zone	0
10738	9	Bigleaf Maple (Acer macrophyllum)	2	Scarring at base	C	Located within proposed road grading	0
10739	26	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10740	13	Bigleaf Maple (Acer macrophyllum)	3	Large dead branches in crown, declining health	B	Located within proposed road grading	0
10741	15	Bigleaf Maple (Acer macrophyllum)	4	Unbalanced crown, stems forks near top, one branch of fork dead	B	Lot grading greatly impacts root zone	0
10743	36	Bigleaf Maple (Acer macrophyllum)	14	Two codominant stems begin above breast height, dead third stem	B		14
10744	28	Bigleaf Maple (Acer macrophyllum)	10	Previous codominant stem broke off, significant decay in leftover wood, unbalanced crown, crooked stem, forks at 20', dead branches in crown	B	Poor tree health	0
11024	14	Douglas-fir (Pseudotsuga menziesii)	3	Large branch over existing access road	C	Located within proposed road grading	0
11025	11,11,10	Lodgepole Pine (Pinus contorta)	5	Codominant stems above breast height	B	Located within proposed road grading	0
11026	13	Western Redcedar (Thuja plicata)	3	Codominant stems above breast height, brown rot decay at base	B	Poor tree health	0
11027	7,6,6,3	Western Redcedar (Thuja plicata)	2	Codominant stems above breast height, crown clean recommended	B		2
11028	12	Lodgepole Pine (Pinus contorta)	2	Healthy	C	Located within proposed road grading	0
11029	11,12	Western Redcedar (Thuja plicata)	4	Codominant stems above breast height, crown clean recommended	B		4
11030	12	Western Redcedar (Thuja plicata)	2	Crown clean recommended, healthy	C		2
11031	10	Lodgepole Pine (Pinus contorta)	0	Dead	A	Tree is dead	0
11032	11	Western Redcedar (Thuja plicata)	2	Crown clean recommended, healthy	C		2
11033	16	Western Redcedar (Thuja plicata)	4	Crown clean recommended, healthy	C		4
11034	11	Lodgepole Pine (Pinus contorta)	2	Crooked stem	B	Located within proposed road grading	0
11035	24	Douglas-fir (Pseudotsuga menziesii)	8	Crown clean recommended, healthy	C		8
11036	14	Lodgepole Pine (Pinus contorta)	3	Unbalanced crown, large branch over driveway, scarring in stem, crooked	B	Located within proposed road grading	0
11037	8	Western Redcedar (Thuja plicata)	2	Growing in shade of adjacent Douglas-fir, exhibits slow growth in branches	B		2
11040	16	Douglas-fir (Pseudotsuga menziesii)	4	Healthy	C	Located within proposed road grading	0
11041	19	Douglas-fir (Pseudotsuga menziesii)	6	Healthy	C	Located within proposed road grading	0
11042	21	Douglas-fir (Pseudotsuga menziesii)	7	Healthy	C	Located within proposed road grading	0
11043	7	Honey Locust (Gleditsia triacanthos)	2	Unbalanced crown	B	Located within proposed road grading	0
11082	10	Honey Locust (Gleditsia triacanthos)	0	Off site	C		0
11085	10	Honey Locust (Gleditsia triacanthos)	0	Off site, dead branches in crown	C		0
11086	7	Honey Locust (Gleditsia triacanthos)	0	Off site, exhibits healthy growth in response to topping	C		0
11090	6,2,2	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11298	6 stems of 4"	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended, one stem extends outside of crown	C		0
11316	6 stems of 4"	Hawthorn (Crataegus spp.)	2	Healthy	C	Within stormwater facility grading	0
11323	4 stems of 4"	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended	C		0
11324	6,8	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended	C		0
11325	15,13	Port Orford Cedar (Chamaecyparis lawsoniana)	0	Dead	A	Tree is dead	0
11331	12,6,8	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11332	7	Honey Locust (Gleditsia triacanthos)	0	Off site, small 2" stem attached leaning over road requires pruning or removal	C		0
11333	6,6	Honey Locust (Gleditsia triacanthos)	0	Off site	C		0
11336	16	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11337	20	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11343	9	Honey Locust (Gleditsia triacanthos)	2	Codominant stems above breast height	B	Located within proposed road grading	0
11347	17,17,15,12,12, 12,10,6,6	Canyon Live Oak (Quercus chrysolepis)	15	Large stems branch off in all directions, one stem split in half, old scars with decay present in multiple stems, stems are crooked and unbalanced, moderate to severe leaning	A	Sidewalk to be constructed 7' from tree, poor tree health	0
11402	10 stems of 6"	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended	C		0
11403	7,7,6	Aspen (Populus spp.)	2	Less than 10' in height, yellow leaves, dead branches in crown, crown clean recommended	C		2
11405	12,14	Holly (Ilex spp.)	5	Heavy crown clean recommended, scars on stem	C		5
11406	33	Aspen (Populus spp.)	13	Surrounded by heavy blackberry, many dead branches in crown, severe lean, decay present in old branch collars	B	Trunk leans over proposed storm trenching	0
20000	6,4	Black Walnut (Juglans nigra)	2	Healthy	C	Located within proposed road grading	0
20015	8	Western Redcedar (Thuja plicata)	2	Growing against side of existing structure, surrounded by blackberry	C	Located within proposed road grading	0
20016	7	Red Alder (Alnus rubra)	2	Sweep at base, growing against side of existing structure, surrounded by blackberry	B	Located within proposed road grading	0
20023	53	Cherry (Prunus spp.)	22.5	Almost dead	B	Located within proposed road grading	0
20097	27,33	Bigleaf Maple (Acer macrophyllum)	0	Off site, decay in stem cavity, pitch seeps	B		0
20099	35	Bigleaf Maple (Acer macrophyllum)	0	Off site, topped, large branch containing all foliage extends 20' into site, scarring on branch, decay present	B		0
20100	7	Sycamore (Platanus spp.)	0	Off site, moderate lean	C		0
20103	14	Sycamore (Platanus spp.)	0	Off site	C		0
20105	18	Sycamore (Platanus spp.)	0	Off site, some branches extend over site	C		0
20106	9,7	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20107	10	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20108	6	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B		2
20109	8	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B		2
20110	7	Red Alder (Alnus rubra)	2	Surrounded by blackberry, slight lean	B		2
20111	6	Red Alder (Alnus rubra)	2	Surrounded by blackberry, slight lean, crooked stem	B		2
20112	10	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20114	6	Red Alder (Alnus rubra)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20115	7	Red Alder (Alnus rubra)	2	Healthy	C	Lot grading greatly impacts root zone	0
20116	8	Red Alder (Alnus rubra)	2	Healthy	C	Lot grading greatly impacts root zone	0
20117	6	Red Alder (Alnus rubra)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20118	6	Red Alder (Alnus rubra)	2	Topped, slight lean, declining health	B	Lot grading greatly impacts root zone	0
20129	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20130	9	Red Alder (Alnus rubra)	2	Slightly crooked stem, dead branches in crown	B		2
20131	10	Red Alder (Alnus rubra)	2	Slight lean	B		2
20132	9	Red Alder (Alnus rubra)	2	Healthy	B		2
20133	6	Red Alder (Alnus rubra)	2	Sweep at base	B		2
20134	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20135	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20138	8	Red Alder (Alnus rubra)	2	Dead top	B	Poor tree health	0
20141	6	Red Alder (Alnus rubra)	2	Slight lean	B		2
20144	9,10,14	Bigleaf Maple (Acer macrophyllum)	6	Large dead branches in crown	B		6
20145	7	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20146	12,6	Bigleaf Maple (Acer macrophyllum)	3	6" stem dead, large dead branches in crown	B		3
20147	11	Bigleaf Maple (Acer macrophyllum)	2	Moderate lean	B		2
20148	6,7,8,9,11,4	Bigleaf Maple (Acer macrophyllum)	6	Large dead branches in crown, moderate lean	B		6
20149	7,8,8,11,12,4,4	Bigleaf Maple (Acer macrophyllum)	7	Large dead branches in crown	C		7
20150	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20151	9,10,13,13	Unknown Deciduous	8	Large dead branches in crown, crown clean recommended	B		8
20153	6	Red Alder (Alnus rubra)	2	Healthy	C		2
20155	6	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B	High risk of falling after development	0
20156	8	Red Alder (Alnus rubra)	2	Healthy	C		2
20157	8	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20158	8	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20159	9	Red Alder (Alnus rubra)	2	Dead branches in crown, codominant stems above breast height	B		2
20160	6	Red Alder (Alnus rubra)	2	Healthy	C		2
20175	8	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C		2
20176	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20180	13	Bigleaf Maple (Acer macrophyllum)	3	Healthy	C	Lot grading greatly impacts root zone	0
20181	21	Bigleaf Maple (Acer macrophyllum)	7	Large dead branches in crown, scarring in stem	C	Lot grading greatly impacts root zone	0
20185	18	Bigleaf Maple (Acer macrophyllum)	5	Dead hanging branches in crown	C		5
20192	6	Red Alder (Alnus rubra)	2	Crooked stem, moderate lean	B		2
20193	9	Red Alder (Alnus rubra)	2	Significant lean	A		2
20194	10,7	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C		2
20195	7	Bigleaf Maple (Acer macrophyllum)	2	Scarring in stem	B		2
20196	8	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B		2
20199	6	Red Alder (Alnus rubra)	2	Crooked stem	B		2
20202	6,12	Red Alder (Alnus rubra)	3	Dead branches in crown, sweep at base	B	Lot grading greatly impacts root zone	0
20203	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20204	16	Red Alder (Alnus rubra)	4	Dead branches in crown	C		4
20205	13	Red Alder (Alnus rubra)	3	Topped, dead branches in crown, declining health	B	Poor tree health	0
20216	6	Red Alder (Alnus rubra)	2	Slight lean, crooked stem	B		2
20218	7	Red Alder (Alnus rubra)	2	Slight lean	B		2
20220	9	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B		2
20221	9	Red Alder (Alnus rubra)	2	Unbalanced crown, severe lean	B	High risk of falling after development	0
20222	7	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20223	14	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced, dead branches in crown	B	Lot grading greatly impacts root zone	0
20224	6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20226	7,4	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20228	6	Honey Locust (Gleditsia triacanthos)	2	Dead branches in crown, crooked stem	B	Lot grading greatly impacts root zone	0
20231	32	Bigleaf Maple (Acer macrophyllum)	12	Dead top, forks at 50', declining health	B	Lot grading greatly impacts root zone	0
20234	8	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
20235	10	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20236	10	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20237	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20238	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20240	11	Unknown Deciduous	2	Healthy	C	Lot grading greatly impacts root zone	0
20241	11	Unknown Deciduous	2	Unbalanced, decay present in stem	B	Lot grading greatly impacts root zone	0
20242	12	Unknown Deciduous	2	Unbalanced crown, sweep at base, severe lean	B	Lot grading greatly impacts root zone	0
20243	12	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20244	7	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20245	8	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20246	7	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20247	10	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20248	8	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20249	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20250	10	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20252	6,4	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20253	6,6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20254	37	Douglas-fir (Pseudotsuga menziesii)	15	Dead branches in crown	C	Located in center of proposed lot grading	0
20263	8	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
20265	9	Red Alder (Alnus rubra)	2	Few leaves on branches, declining health	B	Lot grading greatly impacts root zone	0
20267	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean, crooked stem	B	Lot grading greatly impacts root zone	0
20268	6	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, moderate lean, crooked stem	B	Lot grading greatly impacts root zone	0
20274	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	B	Lot grading greatly impacts root zone	0
20275	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	B	Lot grading greatly impacts root zone	0
20276	6	Bigleaf Maple (Acer macrophyllum)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20277	20	Bigleaf Maple (Acer macrophyllum)	6	Dead branches in crown, crooked stem	C	Lot grading greatly impacts root zone	0
20278	7,7	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown, crooked stem	B	Lot grading greatly impacts root zone	0
20283	7	Red Alder (Alnus rubra)	2	Crooked stem	B		2
20284	6,5	Red Alder (Alnus rubra)	2	Slight lean	B		2
20285	9	Red Alder (Alnus rubra)	2	Slight lean	B		2

CERTIFIED ARBORIST
ISA
BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY TREE INVENTORY

DESIGNED BY: ELN
DRAWN BY: ELN
MANAGED BY: CJS
CHECKED BY: BDH
DATE: 11-20-18

REVISIONS

JOB NUMBER 5638

SHEET P5.2

Detailed Tree Inventory for Hancock Springs

AKS JOB NO. 5638 Site Area = 5.63 acres

AKS Reference #	Total DBH (In)	Tree Species Common Name (Scientific name)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
20288	24,20,12	Bigleaf Maple (Acer macrophyllum)	0	Off site, dead branches in crown, decay in stem, large branches extend over site	B		0
20302	13,12	Bigleaf Maple (Acer macrophyllum)	0	12" stem extends off site & dead, decay in stem cavity at base, unbalanced, dead branches in crown	B	Poor tree health	0
20322	7	Paper Birch (Betula papyrifera)	2	Moderate lean	B		2
20323	7	Paper Birch (Betula papyrifera)	2	Unbalanced crown, slight lean, crooked stem	B		2
20324	11	Cottonwood (Populus spp.)	2	Healthy	C		2
20335	7	Unknown Deciduous	2	Decay in stem cavity	B	Lot grading greatly impacts root zone	0
20340	15	Unknown Deciduous	4	Decay in stem cavity, dead branches in crown, declining health	B	Lot grading greatly impacts root zone	0
20341	10	Unknown Deciduous	2	Dead top, cavity in stem, decay in cavity, declining health	B	Lot grading greatly impacts root zone	0
20343	21	Paper Birch (Betula papyrifera)	7	Large dead branches with breakage	C	Lot grading greatly impacts root zone	0
20345	8,8,6,6,4,4	Bigleaf Maple (Acer macrophyllum)	4	Both 4" stems are dead, dead branches in crown	B	Lot grading greatly impacts root zone	0
20366	6,6,7,7	Unknown Deciduous	3	Dead top, crown clean recommended	B	Final lot grading will greatly affect root zone	0
20404	15,10,6	Elderberry (Sambucus spp.)	6	Surrounded by heavy blackberry, significant decay in stem, scarring in stem	A	Lot grading greatly impacts root zone	0
20438	19	Norway Maple (Acer platanoides)	6	25' crown radius, stem splits into 7-8 large branches at 7'	B	Lot grading greatly impacts root zone	0
20443	31	Western Redcedar (Thuja plicata)	12	Surrounded by blackberry, healthy	C	Final lot grading will result in fills of over 4' in depth across entire root zone	0
20448	7,5	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B	Lot grading greatly impacts root zone	0
20449	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20450	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20451	7	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B	Lot grading greatly impacts root zone	0
20453	7	Bigleaf Maple (Acer macrophyllum)	2	Dead top	B	Lot grading greatly impacts root zone	0
20454	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
20496	9	Hawthorn (Crataegus spp.)	2	Many dead branches	C	Storm access road grading	0
20497	3,4,17,23	Hawthorn (Crataegus spp.)	11	Many dead branches	C	Storm access road grading	0
20531	11	Red Alder (Alnus rubra)	2	Moderate lean	B	Within stormwater facility grading	0
20549	26	Bigleaf Maple (Acer macrophyllum)	9	Scar at 15', dead branches in crown	C	Within stormwater facility grading	0
20551	12	Red Alder (Alnus rubra)	2	Sparse crown	B	Lot grading greatly impacts root zone	0
20552	6,10	Bigleaf Maple (Acer macrophyllum)	2	6" stem is topped and has decay, broken branches in crown	B	Within stormwater facility grading	0
20560	10	Red Alder (Alnus rubra)	2	Dead top	B	Within stormwater facility grading	0
20561	9	Red Alder (Alnus rubra)	2	Unbalanced crown, Dead top	B	Within stormwater facility grading	0
20562	6	Red Alder (Alnus rubra)	2	Many dead branches, slight lean, surrounded by blackberry, declining health	B	Within stormwater facility grading	0
20563	11	Red Alder (Alnus rubra)	2	Many dead branches, slight lean, surrounded by blackberry, declining health	B	Within stormwater facility grading	0
20564	7	Red Alder (Alnus rubra)	2	Significant decay in stem, moderate lean, stem forks at 10', surrounded by blackberry, almost dead	A	Within stormwater facility grading	0
20565	12	Red Alder (Alnus rubra)	2	Slight lean, stem forks near top	B	Within stormwater facility grading	0
20566	12	Red Alder (Alnus rubra)	2	Topped, scars from breakage at top and 20'	B	Within stormwater facility grading	0
20568	16	Red Alder (Alnus rubra)	4	Surrounded by blackberry, poor crown structure	B	Within stormwater facility grading	0
20571	9	Red Alder (Alnus rubra)	2	Moderate lean	B	Within stormwater facility grading	0
20572	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20573	36	Bigleaf Maple (Acer macrophyllum)	14	Codominant stems above breast height, decay in stem, many large dead branches	B	Within stormwater facility grading	0
20576	17	Bigleaf Maple (Acer macrophyllum)	0	Large dead branches, corrected sweep	C	Within stormwater facility grading	0
20577	8	Red Alder (Alnus rubra)	0	Dead	A	Retained within critical area	0
20578	7	Red Alder (Alnus rubra)	0	Off site, slight lean	B		0
20583	10	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20589	6	Bigleaf Maple (Acer macrophyllum)	0	Off site, slight lean	B		0
20590	12	Red Alder (Alnus rubra)	0	Dead	A	Retained within critical area	0
20591	6	Red Alder (Alnus rubra)	0	Off site, dead	A		0
20593	10	Red Alder (Alnus rubra)	0	Dead branches in crown	C	Within stormwater facility grading	0
20595	33	Bigleaf Maple (Acer macrophyllum)	0	3 codominant stems above breast height, large dead branches, unbalanced, slight lean	B	Within stormwater facility grading	0
20596	10	Bigleaf Maple (Acer macrophyllum)	0	2 codominant stems above breast height, one stem topped, dead branches in crown	B	Within stormwater facility grading	0
20597	23	Bigleaf Maple (Acer macrophyllum)	0	2 codominant stems above breast height, one stem dead, decay present in scar on stem	B	Within stormwater facility grading	0
20598	10	Bigleaf Maple (Acer macrophyllum)	0	Dead top, moderate lean, scarring on stem, crooked stem	B	Within stormwater facility grading	0
20604	14	Red Alder (Alnus rubra)	3	Dead top	B	Within stormwater facility grading	0
20608	14	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20611	15,15	Bigleaf Maple (Acer macrophyllum)	0	Slight lean, crooked stem	B		0
20612	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Retained within critical area	0
20613	10,6	Bigleaf Maple (Acer macrophyllum)	0	6" stem dead, sweep near base	B		0
20626	12	Red Alder (Alnus rubra)	2	Slight lean, one large dead branch	C	Within stormwater facility grading	0
20672	8	Vine Maple (Acer circinatum)	0	Dead	A	Tree is dead	0
20673	6,6,6,6	Vine Maple (Acer circinatum)	0	Dead	A	Tree is dead	0
20676	26	Red Alder (Alnus rubra)	0	Codominant stems begin at 8', decay in cavity at base, slight lean, scarring in stem, pitch leaking from scar, declining health, surrounded by heavy blackberry	B	Within stormwater facility grading	0
20677	15,12	Apple (Malus, spp.)	0	Many large dead branches, decay throughout tree, severe lean, very crooked, declining health	A	Within stormwater facility grading	0
20683	15,9	Red Alder (Alnus rubra)	0	Dead top, 9" stem spreads out horizontally 25', surrounded by heavy blackberry	B	Within stormwater facility grading	0
20684	22	Red Alder (Alnus rubra)	0	Dead branches in crown	C	Within stormwater facility grading	0
20687	10	Red Alder (Alnus rubra)	0	Dead branches in crown	C	Within stormwater facility grading	0
21000	35	Bigleaf Maple (Acer macrophyllum)	0	Off site	C		0
21001	10	Black Cottonwood (Populus trichocarpa)	2	Decay in stem cavity	B	Poor tree health	0
21002	6	Unknown Deciduous	2	Dead branches in crown, decay in stem, severe lean, declining health	B	Lot grading greatly impacts root zone	0
21003	13	Unknown Deciduous	3	Unbalanced crown, decay in stem	B	Lot grading greatly impacts root zone	0
21004	10	Unknown Deciduous	2	Unbalanced crown, significant decay in stem, severe lean	B	Lot grading greatly impacts root zone	0
21005	6	Black Cottonwood (Populus trichocarpa)	2	Healthy	C	Lot grading greatly impacts root zone	0
21006	4 stems of 4"	Hawthorn (Crataegus spp.)	2	Healthy	C	Lot grading greatly impacts root zone	0
21007	8	Red Alder (Alnus rubra)	0	Off site, dead	A		0
21008	16	Bigleaf Maple (Acer macrophyllum)	0	Slight lean, scarring on stem, crooked stem, dead branches in crown	B		0

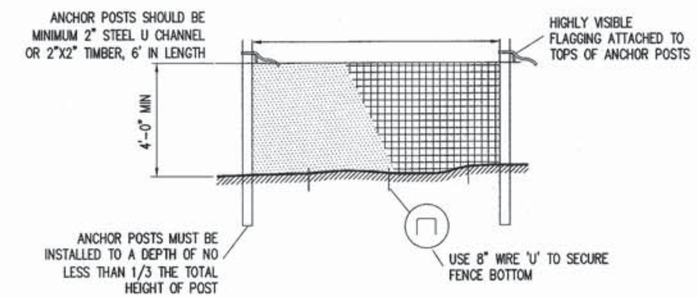
NOTE: Onsite trees existed during the site visits performed on 09/19/2018 - 09/21/2018.

Total # of On Site Existing Trees= 294
Total On Site Existing Tree Units = 1027.5
Total # of On Site Trees Retained= 56
Total # of Tree Units Retained= 190.0
Minimum Tree Units Required per City Code = 113
(5.63 acres * 20 trees/acre)
Minimum # Trees to replant= 0

Total # of Existing Trees Removed= 238
Total Existing Tree Units Removed= 837.5

Windthrow Rating:
A=Least windthrow resistant
B=Moderate windthrow resistant
C=Most windthrow resistant

Hazard assessment was not performed for each tree during the arborist site assessment. If hazards were identified, they are described within the table above. See arborist report for more information.



TREE PROTECTION NOTES:

1. BLAZE ORANGE OR BLUE PLASTIC MESH FENCE FOR TREE PROTECTION DEVICE, ONLY.
2. BOUNDARIES OF PROTECTION AREA WILL BE ESTABLISHED IN THE FIELD BY THE ARBORIST PRIOR TO CONSTRUCTION
3. BOUNDARIES OF PROTECTION AREA SHOULD BE STAKED AND FLAGGED BY THE ARBORIST, OR UNDER THE SUPERVISION OF THE ARBORIST, PRIOR TO INSTALLING DEVICES.
4. AVOID DAMAGE TO CRITICAL ROOT ZONE. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING POSTS.
5. TREE PROTECTION TO BE INSTALLED PRIOR TO CONSTRUCTION AND REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETED.

PLASTIC MESH TREE PROTECTION FENCE

NOT TO SCALE

ARBORIST DISCLOSURE STATEMENT

ARBORISTS ARE TREE SPECIALISTS WHO USE THEIR EDUCATION, KNOWLEDGE, TRAINING, AND EXPERIENCE TO EXAMINE TREES, RECOMMEND MEASURES TO ENHANCE THE HEALTH OF TREES, AND ATTEMPT TO REDUCE THE RISK OF LIVING NEAR TREES. THE CLIENT AND JURISDICTION MAY CHOOSE TO ACCEPT OR DISREGARD THE RECOMMENDATIONS OF THE ARBORIST, OR SEEK ADDITIONAL ADVICE.

ARBORISTS CANNOT DETECT EVERY CONDITION THAT COULD POSSIBLY LEAD TO THE STRUCTURAL FAILURE OF A TREE. TREES ARE LIVING ORGANISMS THAT FAIL IN WAYS WE DO NOT FULLY UNDERSTAND. CONDITIONS ARE OFTEN HIDDEN WITHIN TREES AND BELOW GROUND. ARBORISTS CANNOT GUARANTEE THAT A TREE WILL BE HEALTHY OR SAFE UNDER ALL CIRCUMSTANCES, OR FOR A SPECIFIED PERIOD OF TIME. LIKEWISE, REMEDIAL TREATMENTS, LIKE MEDICINE, CANNOT BE GUARANTEED.

TREES CAN BE MANAGED, BUT THEY CANNOT BE CONTROLLED. TO LIVE NEAR TREES IS TO ACCEPT SOME DEGREE OF RISK. THE ONLY WAY TO ELIMINATE ALL RISK ASSOCIATED WITH TREES IS TO ELIMINATE ALL TREES.

AT THE COMPLETION OF CONSTRUCTION, ALL TREES MUST ONCE AGAIN BE REVIEWED TO EVALUATE THEIR HAZARD RATING. LAND CLEARING AND REMOVAL OF ADJACENT TREES CAN EXPOSE PREVIOUSLY UNSEEN DEFECTS AND OTHERWISE HEALTHY TREES CAN BE DAMAGED DURING CONSTRUCTION.

TREE INFORMATION GATHERED UNDER THE SUPERVISION OF BRYCE HANSON, CERTIFIED ARBORIST, WITH AKS ENGINEERING AND FORESTRY, LLC.

TREES SHOWN TO BE SAVED WILL BE EVALUATED BY THE PROJECT ARBORIST PRIOR TO, DURING, AND AFTER CONSTRUCTION. TREES ADVERSELY AFFECTED BY CONSTRUCTION AND/OR DETERMINED TO BE A SAFETY HAZARD WILL BE REMOVED.

CERTIFIED ARBORIST
ISA
PRELIMINARY NOT FOR CONSTRUCTION
BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19
Bryce D. Hanson

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY TREE INVENTORY

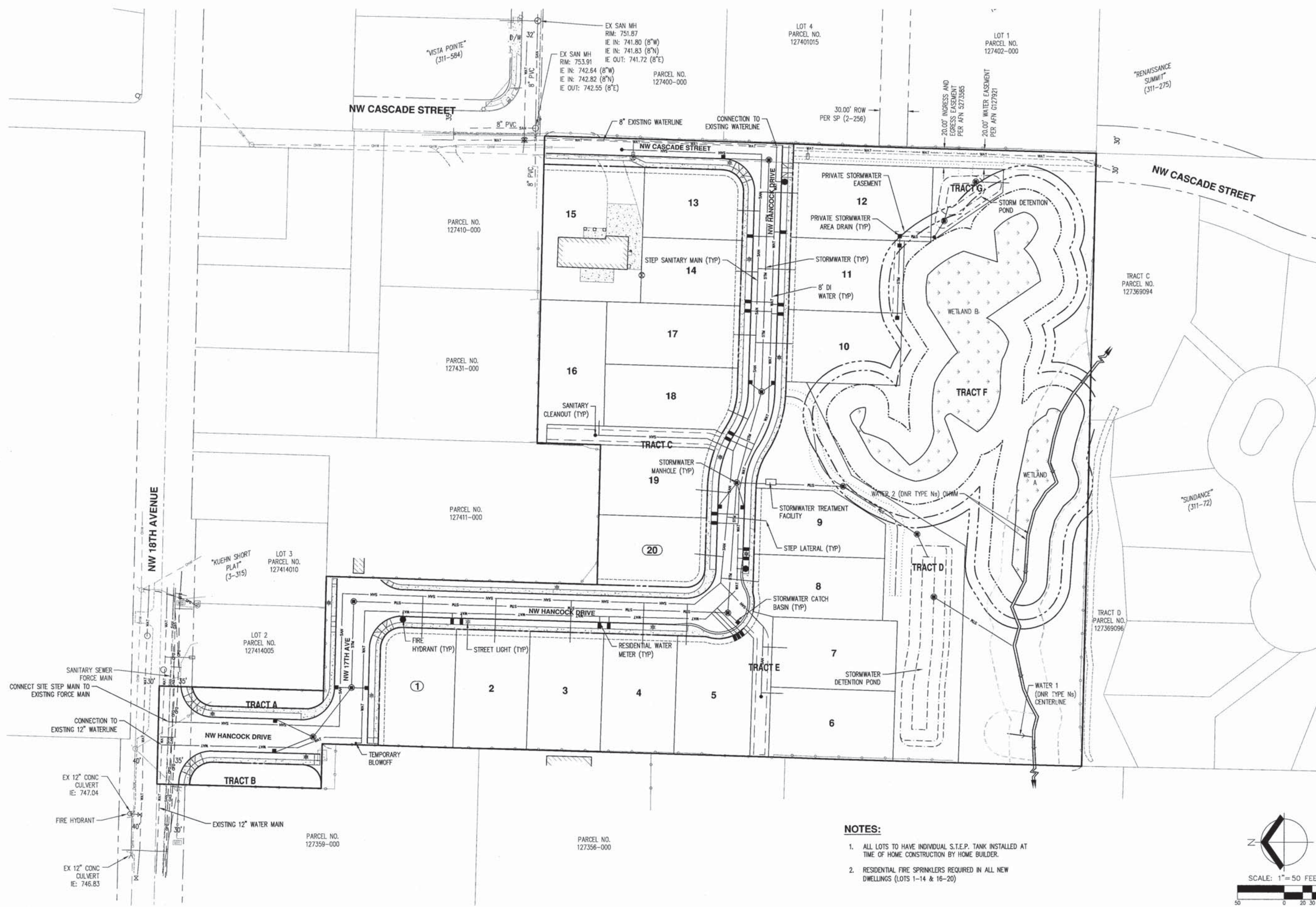
DESIGNED BY: ELN
DRAWN BY: ELN
MANAGED BY: JMM
CHECKED BY: BDH
DATE: 11.20.18

REVISIONS

JOB NUMBER 5638

SHEET P5.3

AKS DRAWING FILE: 5638 P5.0.DWG | LAYOUT: P5.3



NOTES:

1. ALL LOTS TO HAVE INDIVIDUAL S.T.E.P. TANK INSTALLED AT TIME OF HOME CONSTRUCTION BY HOME BUILDER.
2. RESIDENTIAL FIRE SPRINKLERS REQUIRED IN ALL NEW DWELLINGS (LOTS 1-14 & 16-20)

AKS

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

COMPOSITE UTILITY PLAN

DESIGNED BY: CJS
DRAWN BY: NAL
MANAGED BY: JMM
CHECKED BY: JMM
DATE: 11-20-18

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

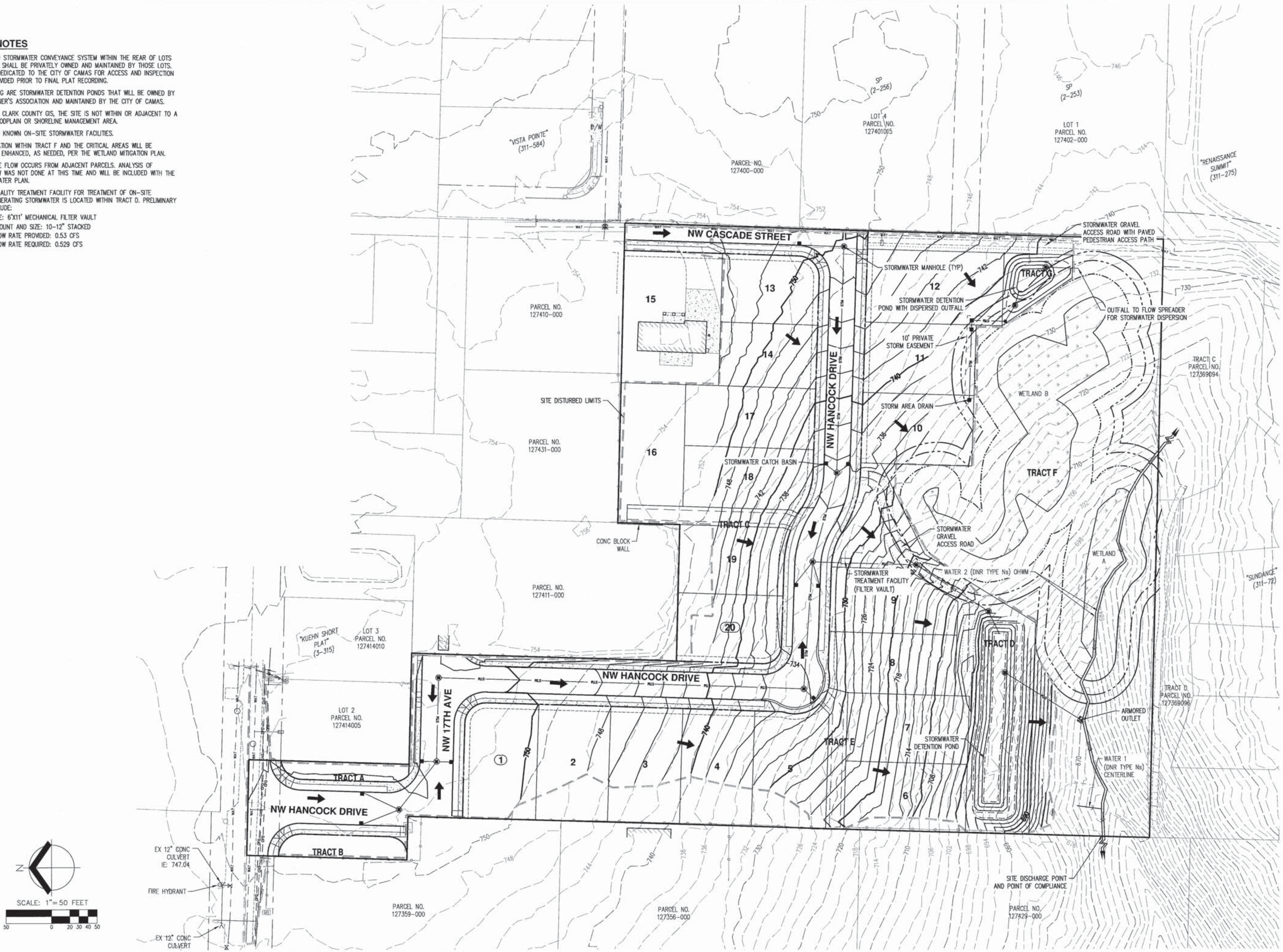
JOB NUMBER 5638

SHEET P6.0

AKS DRAWING FILE: 5638 P6.0.DWG | LAYOUT: P6.0

GENERAL NOTES

1. THE PROPOSED STORMWATER CONVEYANCE SYSTEM WITHIN THE REAR OF LOTS 10, 11 AND 12 SHALL BE PRIVATELY OWNED AND MAINTAINED BY THOSE LOTS. A COVENANT DEDICATED TO THE CITY OF CAMAS FOR ACCESS AND INSPECTION SHALL BE PROVIDED PRIOR TO FINAL PLAT RECORDING.
2. TRACT D AND G ARE STORMWATER DETENTION PONDS THAT WILL BE OWNED BY THE HOME OWNER'S ASSOCIATION AND MAINTAINED BY THE CITY OF CAMAS.
3. ACCORDING TO CLARK COUNTY GIS, THE SITE IS NOT WITHIN OR ADJACENT TO A 100-YEAR FLOODPLAIN OR SHORELINE MANAGEMENT AREA.
4. THERE ARE NO KNOWN ON-SITE STORMWATER FACILITIES.
5. NATIVE VEGETATION WITHIN TRACT F AND THE CRITICAL AREAS WILL BE RETAINED AND ENHANCED, AS NEEDED, PER THE WETLAND MITIGATION PLAN.
6. SOME OFF-SITE FLOW OCCURS FROM ADJACENT PARCELS. ANALYSIS OF OFF-SITE FLOW WAS NOT DONE AT THIS TIME AND WILL BE INCLUDED WITH THE FINAL STORMWATER PLAN.
7. THE WATER QUALITY TREATMENT FACILITY FOR TREATMENT OF ON-SITE POLLUTION GENERATING STORMWATER IS LOCATED WITHIN TRACT D. PRELIMINARY FEATURES INCLUDE:
   - FACILITY TYPE: 6'X11' MECHANICAL FILTER VAULT
   - CARTRIDGE COUNT AND SIZE: 10-12" STACKED
   - OFF-LINE FLOW RATE PROVIDED: 0.53 CFS
   - OFF-LINE FLOW RATE REQUIRED: 0.529 CFS



AKS ENGINEERING & FORESTRY, LLC
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aks-eng.com

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY STORMWATER PLAN

DESIGNED BY:	CJS
DRAWN BY:	NAL
MANAGED BY:	JMM
CHECKED BY:	JMM

DATE: 11-20-18

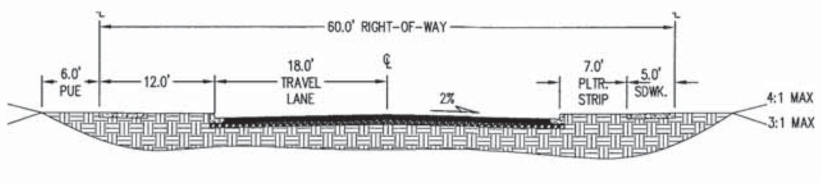
JOHN M. ME... STATE OF WASHINGTON 42614 REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

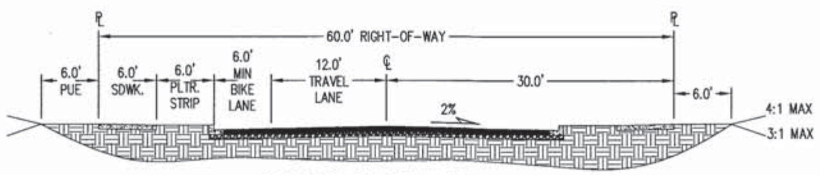
JOB NUMBER 5638

SHEET P7.0

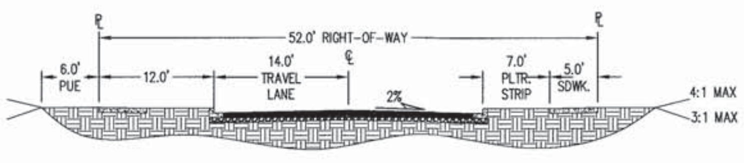
AKS DRAWING FILE: 5638 P7.0.DWG | LAYOUT: P7.0



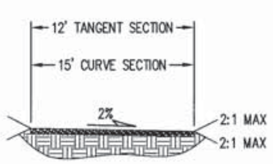
NW 17TH AVE, NW CASCADE ST, NW HANCOCK DRIVE(N) (ST2)



NW 18TH AVE (ST4)



NW HANCOCK DRIVE (ST3)



STORM ACCESS

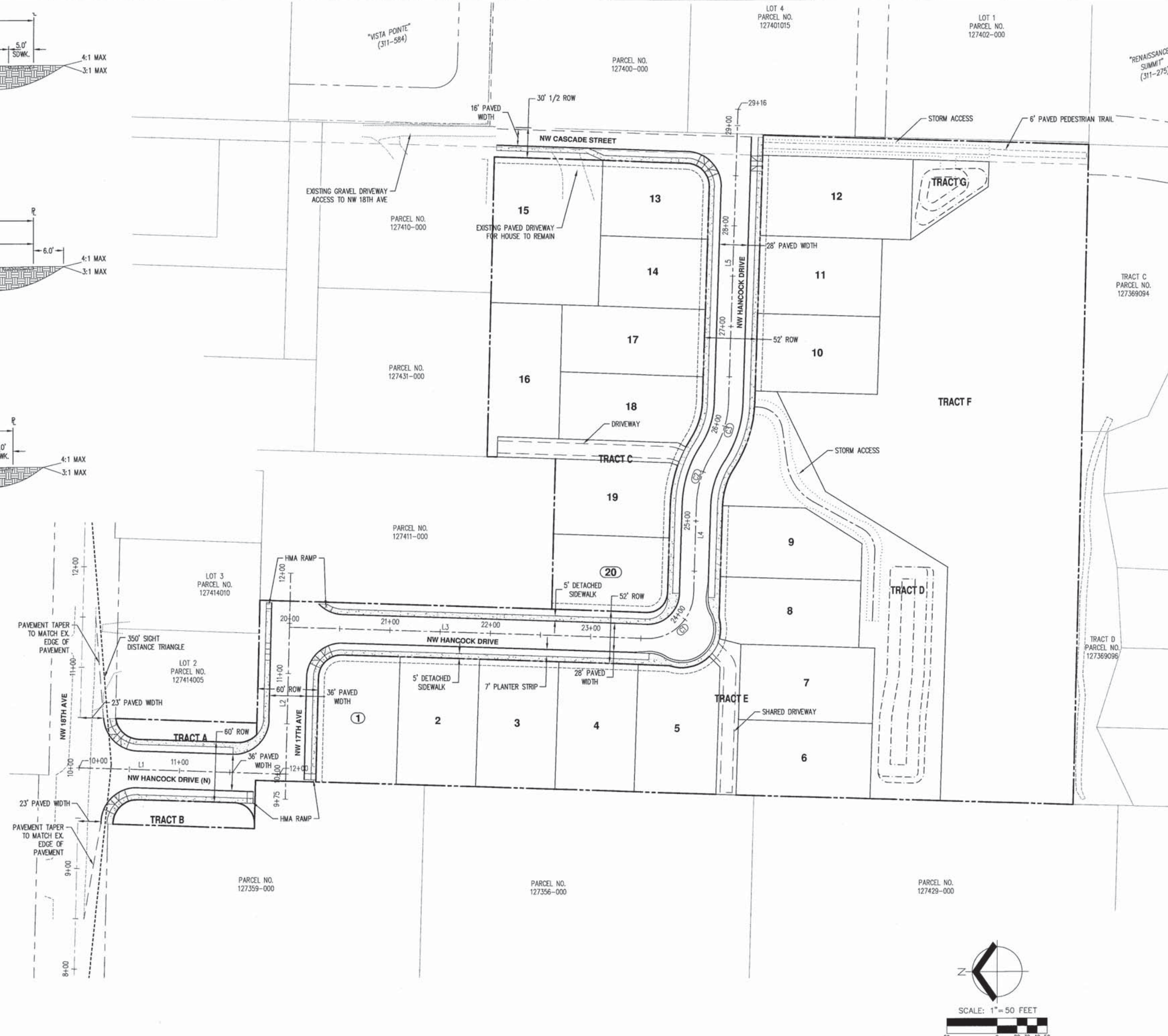
MAX SLOPE: 15%

CURVE TABLE: ALIGNMENTS

CURVE #	RADIUS	LENGTH
C1	46.00	72.26
C2	100.15	54.18
C3	100.15	54.18

LINE TABLE: ALIGNMENTS

LINE #	LENGTH	DIRECTION
L1	261.00	S1° 44' 40.47"W
L2	225.00	S88° 40' 03.92"E
L3	380.11	S1° 45' 46.42"W
L4	88.86	S88° 14' 13.58"E
L5	291.60	S88° 14' 13.58"E



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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY STREET PLAN

DESIGNED BY:	CJS
DRAWN BY:	NAL
MANAGED BY:	JMM
CHECKED BY:	JMM
DATE: 11-20-18	

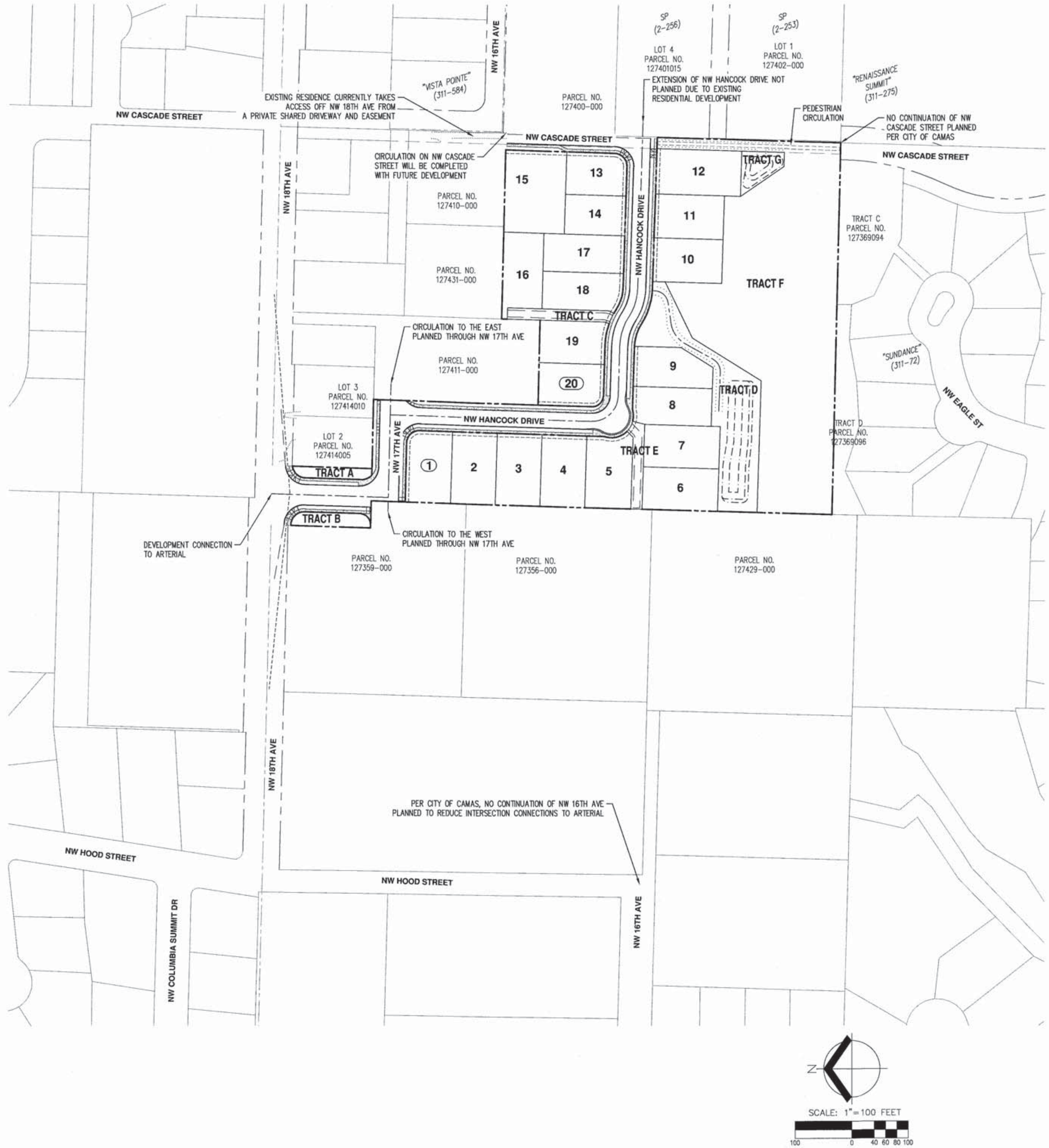
JOHN M. ... STATE OF WASHINGTON 42614 REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 5638

SHEET P8.0

AKS DRAWING FILE: 5638 P8.0.DWG | LAYOUT: P8.0



AKS

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CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY CIRCULATION PLAN

DESIGNED BY:	CJS
DRAWN BY:	NAL
MANAGED BY:	JMM
CHECKED BY:	JMM
DATE: 11-20-15	

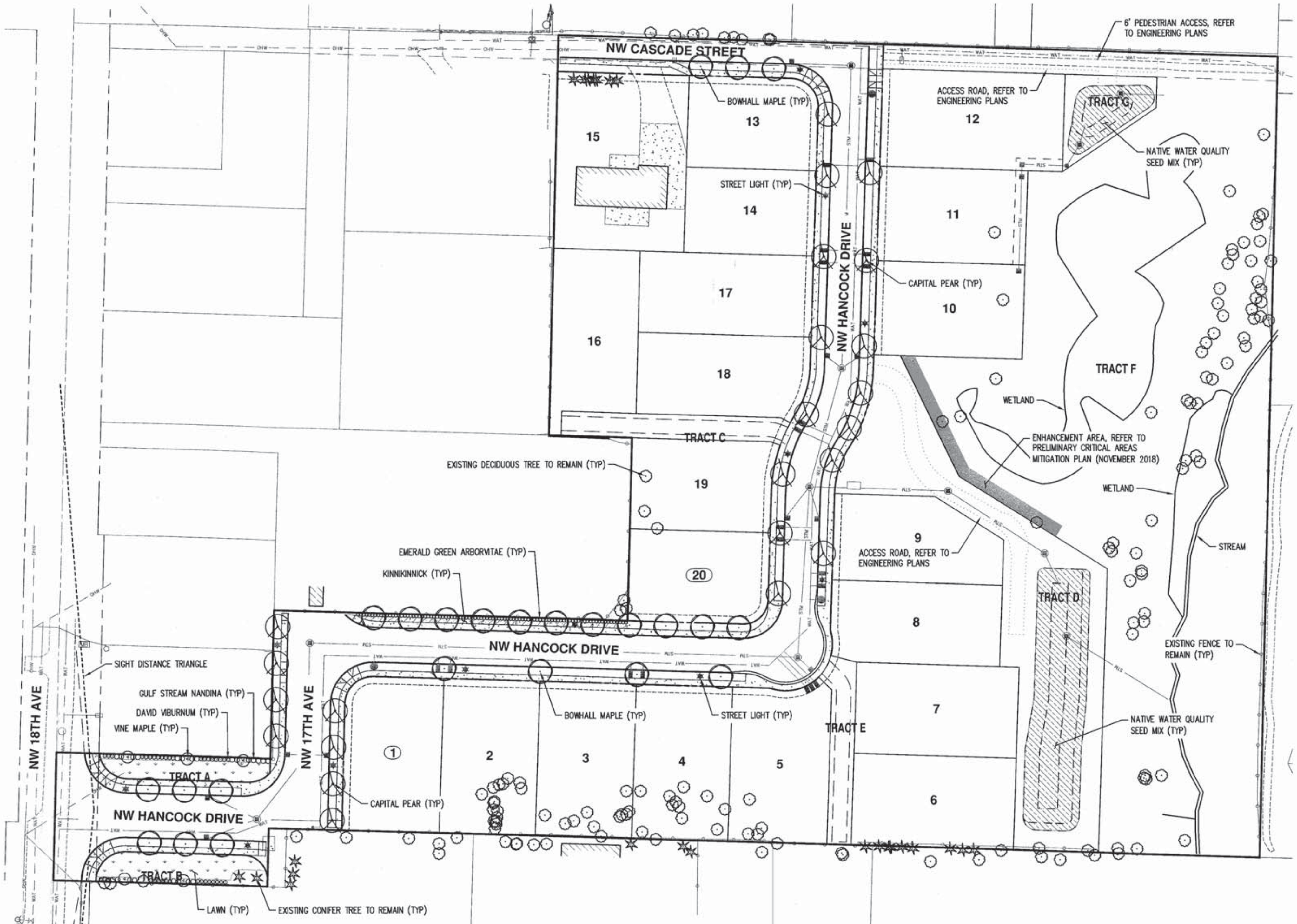
PRELIMINARY FOR CONSTRUCTION
STATE OF WASHINGTON
42614 REGISTERED PROFESSIONAL ENGINEER

REVISIONS

JOB NUMBER
5638

SHEET
P8.1

AKS DRAWING FILE: 5638 P8.0.DWG | LAYOUT: P8.1



SCALE: 1"=50 FEET

CONCEPTUAL PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE/CONTAINER	SPACING
	5	ACER CIRCINATUM	VINE MAPLE	5'-6' HT. B&B	AS SHOWN
	24	ACER RUBRUM 'BOWHALL'	BOWHALL MAPLE	2" CAL. B&B	AS SHOWN
	23	PYRUS CALLERYANA 'CAPITAL'	CAPITAL PEAR	2" CAL. B&B	AS SHOWN
SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE/CONTAINER**	**SPACING**
	23	NANDINA DOMESTICA 'GULF STREAM'	GULF STREAM NANDINA	3 GAL. CONT.	48" o.c.
	92	THUJA OCCIDENTALIS 'SMARAGD'	EMERALD GREEN ARBORVITAE	4-5' HT. CONT.	30" o.c.
	37	VIBURNUM DAVIDII	DAVID VIBURNUM	3 GAL CONT.	36" o.c.
GROUND COVERS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE/CONTAINER**	**SPACING**
	136	ARCTOSTAPHYLOS UVA-URSI	KINNIKINNICK	1 GAL CONT	30" o.c.

APPROX. 4,651 SF — LAWN - NORTHWEST SUPREME LAWN SEED MIX - SUNMARK SEEDS (OR APPROVED EQUAL)
- LOLIUM PERENNE VAR DASHER 3 (DASHER 3 PERENNIAL RYEGRASS) 35%
- LOLIUM PERENNE VAR CUTTER II (CUTTER II PERENNIAL RYEGRASS) 35%
- FESTUCA RUBRA VAR GARNET (GARNET CREEPING RED FESCUE) 15%
- FESTUCA RUBRA SPP FALLAX VAR WINDWARD (WINDWARDS CHEWINGS FESCUE) 15%

APPROX. 11,916 SF — NATIVE WATER QUALITY SEED MIX - SUNMARK SEEDS (OR APPROVED EQUAL)
- ELYMUS GLAUCUS (BLUE WILDRYE) 46%
- FESTUCA RUBRA RUBRA (NATIVE RED FESCUE) 38%
- DESCHAMPSIA CESPITOSA (TUFTED HAIRGRASS) 12%
- GLYCERIA OCCIDENTALIS (NORTHWESTERN MANNAGRASS) 2%
- BECKMANIA SYZIGACHNE (AMERICAN SLOUGHGRASS) 2%

APPLY AT A RATE OF 1 LB. PER 1,000 SF OR AS RECOMMENDED BY SUPPLIER.

GENERAL LANDSCAPE NOTES:

1. LANDSCAPE PLAN IS PRELIMINARY AND INTENDED TO SHOW DESIGN INTENT ONLY. REVISIONS OR SUBSTITUTIONS, INCLUDING CHANGES TO PLANT LOCATION, QUANTITIES, TYPES, AND SIZES MAY BE NECESSARY PRIOR TO FINAL APPROVAL BASED ON PLANT AVAILABILITY, SITE CONDITIONS, UTILITY CONFLICTS, ETC. ALL SUBSTITUTIONS SHALL CONFORM TO CITY OF CAMAS LANDSCAPE DESIGN STANDARDS.
2. ALL PLANTS AND PLANTINGS SHALL CONFORM TO CITY OF CAMAS DESIGN STANDARDS AND TO AMERICAN NURSERY STANDARDS ASN 1260.1. PLANT IN ACCORDANCE WITH ACCEPTED BEST-PRACTICE INDUSTRY STANDARDS SUCH AS THOSE ADOPTED BY THE WASHINGTON ASSOCIATION OF LANDSCAPE PROFESSIONALS (WALP).
3. CENTER TREES IN PLANTER STRIPS AND LANDSCAPE PLANTING BEDS WHERE POSSIBLE. KEEP OTHER TREE TRUNKS 3' O.C. MINIMUM FROM CURBS, SIDEWALKS, AND OTHER PAVING OR CENTERED IN PLANTING ISLAND. KEEP SHRUBS AND GROUNDCOVER A MINIMUM OF 24" O.C. FROM PAVING AND 3' O.C. FROM TREES. ADJUST PLANTINGS AS NECESSARY ON SITE TO AVOID CONFLICT WITH UTILITIES, HYDRANTS, LIGHT POLES, METERS, ETC..
4. HATCHED AREAS ARE MEANT TO CONVEY GENERAL PLANT LOCATION. PLANT COVERAGE, SPACING, AND LAYOUT SHALL BE CONSISTENT WITH THE SPACING LISTED IN THE PLANT LEGEND FOR FULL COVERAGE.
5. MULCH: APPLY 3" DEEP WELL-AGED MEDIUM GRIND OR SHREDDED DARK HEMLOCK BARK MULCH UNDER AND AROUND ALL TREES AND SHRUBS IN PLANTER STRIP AREAS NOT INCLUDED AS STORMWATER FACILITIES OR LAWN. WHERE TREES ARE IN LAWN AREAS, A MINIMUM 3' DIAMETER MULCH RING SHALL BE USED AROUND THE TREE TO PROTECT THE TRUNK FROM MOWER DAMAGE. CARE SHALL BE TAKEN TO AVOID COVERING FOLIAGE OR ROOT CROWNS OF PLANTS. PLANTS SHALL BE PLANTED AT A DEPTH TO ACCOMMODATE BARK MULCH APPLICATION.
6. IRRIGATION FOR HEALTHY PLANT ESTABLISHMENT AND SURVIVAL IS RECOMMENDED AND SHALL BE 'DESIGN-BUILD' BY LANDSCAPE CONTRACTOR.
7. REFER TO SHEET P5.0 FOR PRELIMINARY TREE PLAN.

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY LANDSCAPE AND LIGHTING PLAN

DESIGNED BY:	TEB
DRAWN BY:	TEB
MANAGED BY:	JMM
CHECKED BY:	KAH
DATE:	

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER
5638

SHEET
P9.0

AKS DRAWING FILE: 5638 P9.0.DWG | LAYOUT: P9.0

5. Critical Area Report

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

REPLY TO
ATTENTION OF

Regulatory Branch November 20, 2018

Northwest Classic Homes, LLC
Mr. Chris Wall
10100 Northeast 116th Circle
Vancouver, Washington 98662

Reference: NWS-2018-487
Northwest Classic
Homes, LLC

Dear Mr. Wall:

On July 9, 2018, Corps staff inspected property at 2926 Northeast 18th Avenue located in Camas, Clark County, Washington in response to your request for verification of wetland boundaries delineated on the property. The U.S. Army Corps of Engineers (Corps) has determined that boundaries for Wetland A and Wetland B and the ordinary high water line of the stream channel, as shown on the enclosed drawings dated May 3, 2018, accurately identify the extent of within the review area.

This determination applies only to onsite Wetlands A and B and the onsite portion of the unnamed tributary adjacent to Wetland A. Other waters and wetlands that may occur on this property outside the review area are not the subject of this determination and may be jurisdictional. This confirmation of wetland boundaries is valid for a period of five years from the date of this letter unless new information warrants revisions of the determination.

To document the extent of the Corps jurisdiction over the project and if you request, we can proceed with an approved jurisdictional determination (AJD), which is an official determination regarding the presence or absence of waters of the U.S. If one is requested, please be aware that I may require the submittal of additional information. Depending on our determination, we may have to coordinate with the U.S. Environmental Protection Agency on our findings before making an official determination. An AJD is appealable and is most often requested when a project proponent questions the Corps' jurisdiction or the extent (boundaries) of jurisdictional waters. I will <u>not</u> be able to process the permit request until the AJD determination is final.

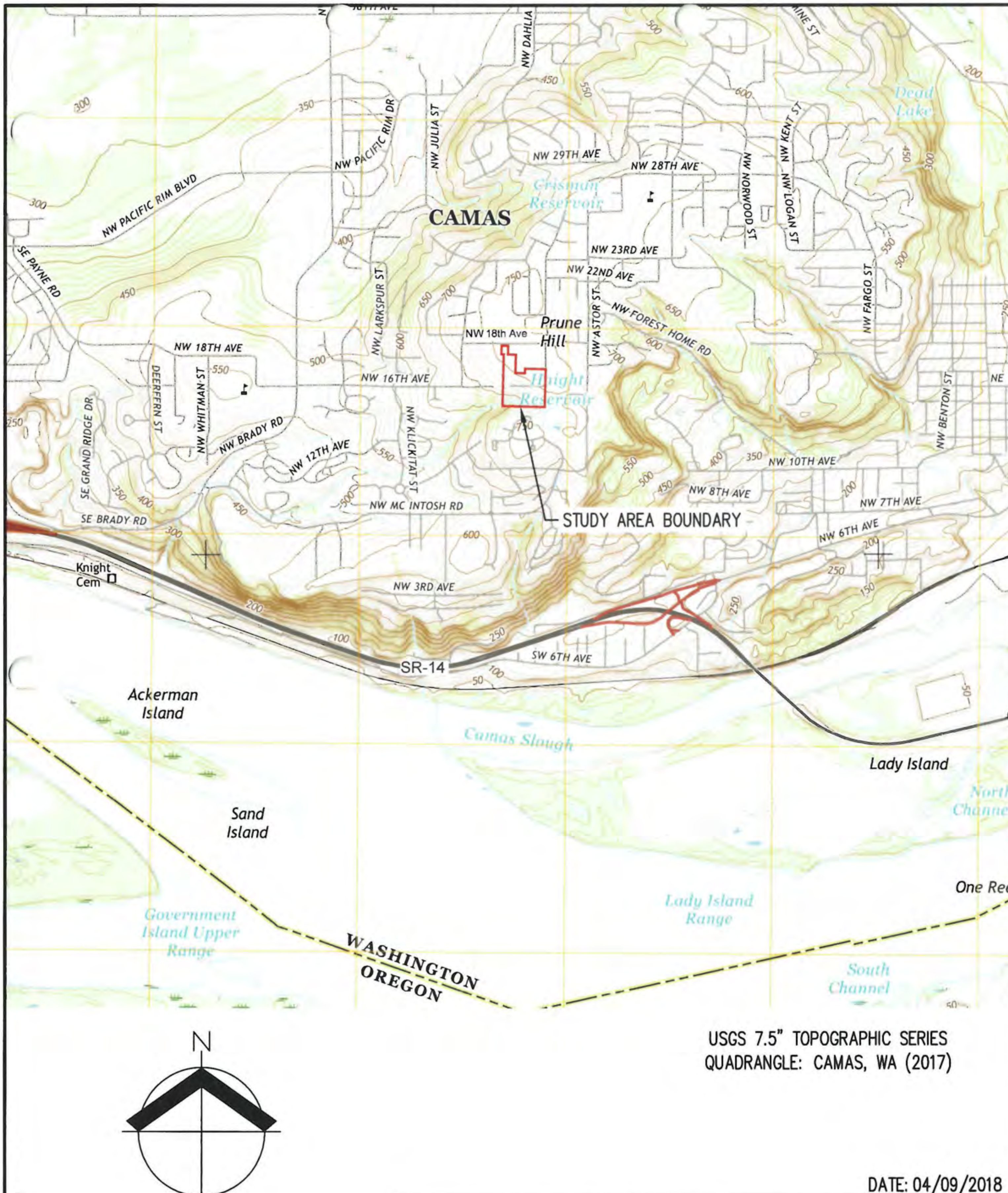
You can request a preliminary jurisdictional determination (PJD), which is a written indication that waters on the property may be waters of the United States. Such waters will be treated as jurisdictional waters of the U.S. for purposes of evaluating a permit request. While a preliminary JD is not appealable, the property owner can, at any time, request an approved JD for the site. The PJD is most often used in instances where a project proponent just wants to move ahead with the permit process without further delay.

A copy of this letter with drawings will be furnished to Ms. Taya MacLean of AKS Engineering & Forestry, 9600 Northeast 126th Avenue, Suite 2520, Vancouver, Washington 98682. If you propose to do any work in the areas identified to be wetlands, you should contact our office prior to commencing work to determine permit requirements. If you have any questions, please contact Jim Carsner at james.h.carsner@usace.army.mil or at (206) 316-3047.

Sincerely,

Randel Perry, Team Lead
Regulatory Branch

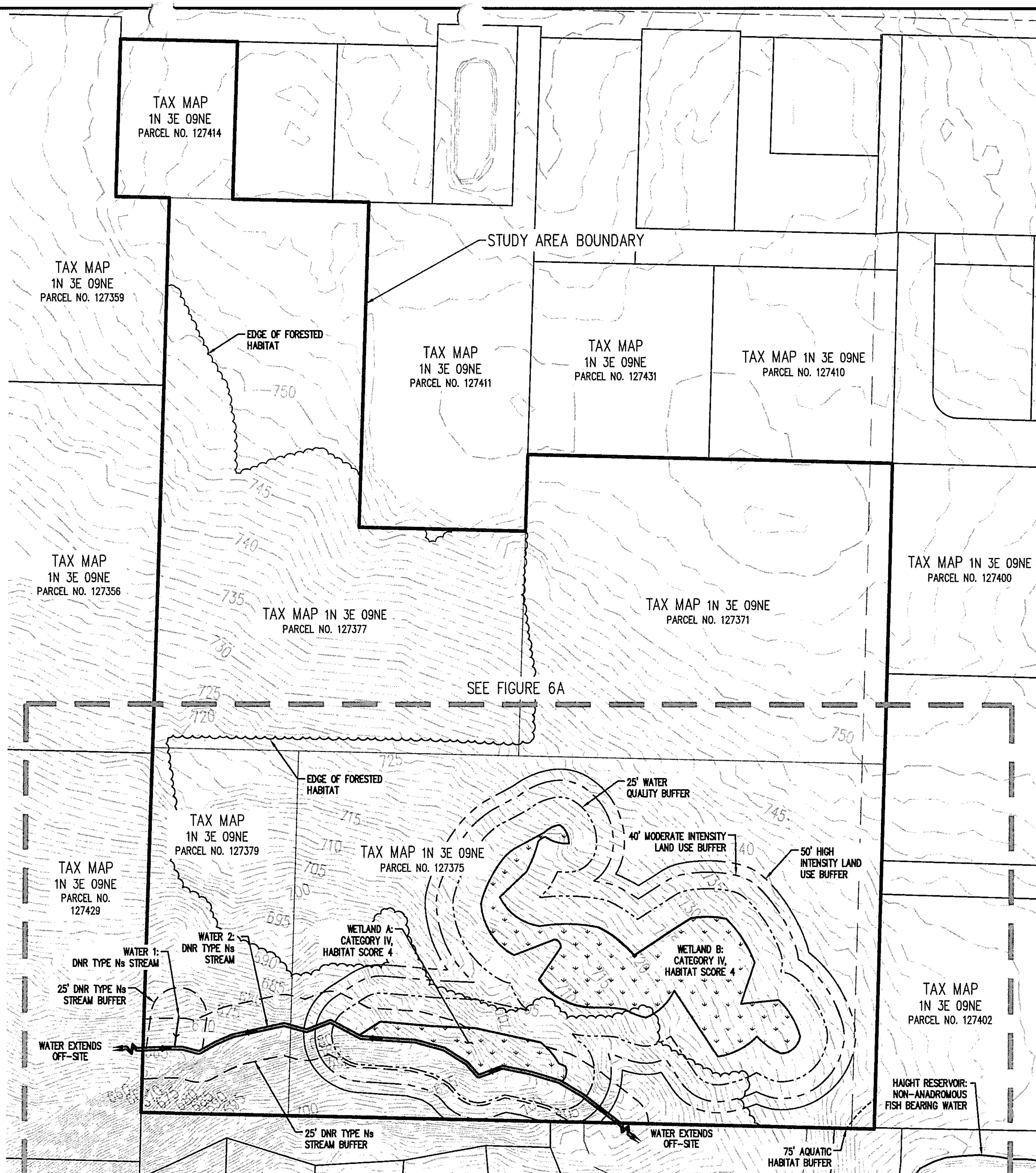
Enclosures



USGS 7.5" TOPOGRAPHIC SERIES
QUADRANGLE: CAMAS, WA (2017)

DATE: 04/09/2018

USGS VICINITY MAP **2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT**	FIGURE 1
AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com	DRWN: JRI CHKD: TKM AKS JOB: 5638



LEGEND:

ON-SITE WETLANDS TOTAL: 22,369 SF± (0.51 ACRES±)

WETLAND A: 3,964 SF± (0.09 ACRES±)
WETLAND B: 18,405 SF± (0.42 ACRES±)

ON-SITE WATERS TOTAL: 1,182 SF± (0.03 ACRES±)

WATER 1 (DNR TYPE Ns STREAM): 27 SF±/ 27 LINEAR FT±
WATER 2 (DNR TYPE Ns STREAM): 1,155 SF±/ 464 LINEAR FT± (0.03 ACRES±)

25' WATER QUALITY BUFFER

40' MODERATE INTENSITY LAND USE BUFFER

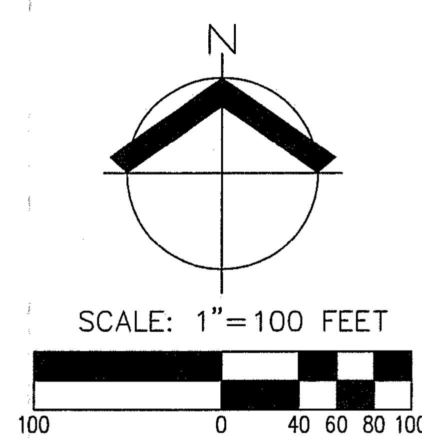
50' HIGH INTENSITY LAND USE BUFFER

25' DNR TYPE Ns BUFFER

75' AQUATIC HABITAT BUFFER

WETLAND AND WATER BOUNDARIES WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON MARCH 6, 2018 AND WERE PROFESSIONALLY LAND SURVEYED BY AKS ON MARCH 9, 2018.

1-FT GROUND CONTOURS DERIVED FROM CLARK COUNTY GIS DATA.



DATE: 05/03/2018

EXISTING CONDITIONS MAP	FIGURE 6
2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT	
AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com	DRWN: JRI CHKD: TKM AKS JOB: 5638

Hancock Springs Subdivision
City of Camas, Washington
Critical Areas Assessment

Date: May 4, 2018

Prepared for:
Chris Wall
NW Classic Homes, LLC
10100 NE 116th Circle
Vancouver, WA 98662

Prepared By:
AKS Engineering & Forestry, LLC
Taya K. MacLean, MS, PWS, Senior Biologist
Sonya Templeton, Natural Resource Specialist

Site Information:
Parcel No. 127414-000, 127377-000,
127371-000, 127375-000,
and 127379-000
Camas, Washington

AKS ENGINEERING & FORESTRY
9600 NE 126th Avenue, Suite 2520
Vancouver, WA 98682
(360) 882-0419

Table of Contents

Tables

Appendices

C. Photo Location Map and Site Photographs
D. Wetland Rating Forms
E. Historic Aerial Photographs
F. Precipitation Data

Introduction

AKS Engineering & Forestry, LLC (AKS) was contracted by NW Classic Homes LLC (Client) to conduct a wetland delineation and critical areas assessment of their property. The study area consists of Parcels 127414-000, 127377-000, 127371-000, 127375-000, and 127379-000, which is located at 2926 NE 18th Avenue in Camas, Washington (Figures 1 and 2 in Appendix A). A residential subdivision is proposed for the site. This report was prepared in accordance with the City of Camas' (City) Municipal Code (CMC) Critical Areas requirements for fish and wildlife habitat conservation areas (CMC 16.61.010) and wetlands (CMC 16.53.010). No other critical areas (critical aquifer recharge areas, frequently flooded areas, or geologically hazardous areas) are addressed in this report.

AKS visited the study area on March 6, 2018 to assess critical areas. The onsite boundaries of one palustrine forested wetland (PFO; Wetland A, 3,964 square feet), one palustrine emergent wetland (PEM; Wetland B, 18,405 square feet), two non-fishbearing streams (referred to as Waters 1 and 2) were delineated in the study area. Wetlands A and B are Category IV wetlands with a 50-foot high intensity protective buffer (CMC Table 16.53.040-1). The streams include Water 1 (a Type Ns water; 27 linear feet) which originates from a groundwater seep and drains directly into Water 2 (a Type Ns water; 464 linear feet onsite). Water 2 originates offsite from the Haight Reservoir located to the southeast and flows westerly through the southern portion of the study area. Water 2 appears to have a direct surface hydrologic connection to the Columbia River. The wetlands and waters delineated under this study and the offsite reservoir are protected by stream and aquatic system buffers per CMC 16.61.040.D. The waters and wetlands delineated on the site are potentially jurisdictional to the City and to the US Army Corps of Engineers (Corps) and their protective buffers are jurisdictional to the City.

Methods

Field work was conducted on March 6, 2018, by Taya K. MacLean, MS, PWS, Senior Biologist and Jessica Imbrie, Natural Resource Specialist. Soils, vegetation, and indicators of hydrology were recorded at 10 sample plot locations on standardized wetland determination data forms to document site conditions (Appendix B). The boundaries of onsite wetlands, waters, and sample plots were professionally land surveyed by AKS on March 9, 2018. Offsite features were assessed using visual observations where available and other sources of information including aerial photographs and topographic linework. A map of existing critical areas is included as Figure 6 in Appendix A. Representative ground level site photographs are included in Appendix C. References cited and literature used are listed at the end of this report.

Wetlands Delineation and Ratings

The methodology used to determine the presence of wetlands followed the Corps' *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 2016* (Lichvar, 2016) was used to assign wetland indicator status for plants for the appropriate region. The hydrogeomorphic (HGM) wetland classification system was used to classify wetlands based on their position in the landscape and the movement of water in the wetland. The US Fish and Wildlife Service (USFWS) classification system (Cowardin et al., 1979) was used to describe wetlands in terms of their vegetation communities (e.g., emergent, scrub-shrub, and forested community types).

The City requires wetlands to be rated using the methods described in the Washington State Department of Ecology's (ECY) *Wetland Rating System for Western Washington, 2014 Update* (CMC

16.53.020). Ratings are based on a wetland's sensitivity to disturbance, rarity within a region, and functions. The wetland rating system scores wetlands based on water quality, hydrologic, and habitat functions. These function scores provide a baseline measurement of wetland functions. Wetland rating forms and supporting documentation are provided in Appendix D.

Protective wetland buffer widths were assigned to each wetland based on the wetland category, wetland rating scores for habitat functions, and the proposed land use to determine buffer sizes, mitigation ratios, and permitted uses in wetlands (CMC 16.53.040).

Ordinary High Water Mark Delineation, Water Typing, and Buffer Determination

The ordinary high water mark (OHWM) of waters was delineated using methodology described in ECY's *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State*.

The City's fish and wildlife habitat conservation ordinance (CMC 16.61.010) is intended to protect streams and riparian priority habitat including areas extending outward on each side of a stream from the OHWM. Streams were classified per Washington Department of Natural Resources' (DNR) designated water types (WAC 222-16-030) and protective buffers extending from the OHWM to protect these features were assigned per CMC 16.61.040.D.

Other Critical Areas

The City's fish and wildlife habitat conservation ordinance is also intended to protect sensitive resources including locally important habitats and species, federal or state-listed threatened and/or endangered species, and Priority Habitats and Species (PHS) designated by Washington Department of Fish and Wildlife (WDFW). AKS accessed the WDFW PHS database and the County's online mapping tool to identify the potential for occurrence of endangered, threatened, sensitive, candidate, and other priority species and important habitats within the study area and vicinity. AKS also reviewed the Washington Natural Heritage Program (WHNP) database to determine whether there were any documented occurrences of rare plants or wetland habitats of high conservation value within the study area or vicinity of the study area.

During the AKS site visit, habitat features and the potential for sensitive species occurrences within the study area were documented in field notes. Information regarding wildlife habitat quality, reproduction, habitat use, activities, and special habitat features such as the presence of Oregon white oak (*Quercus garryana*; FACU), large/mature trees, snags [standing dead or partly dead trees at least 4 inches in diameter at breast height (DBH) and 6 feet tall], large down logs, and other PHS features was recorded in field notes. The boundaries of forested habitats and other unique habitat features were recorded in field notes and hand-mapped or flagged in the field.

Sources of Existing Information Used

AKS reviewed existing literature, maps, and other materials to identify wetlands, priority habitats, or site characteristics indicative of protected natural resources on the subject property. These sources can indicate the potential presence of protected natural resources; actual wetland determinations must be based upon data obtained from field investigations. AKS reviewed the following background information sources:

- Clark County MapsOnline (Clark County 2018)
- Natural Resource Conservation Service Web Soil Survey (NRCS 2018)
- USFWS National Wetland Inventory (NWI; USFWS, 2018)

- Washington Department of Fish and Wildlife Priority Habitats and Species Data (WDFW 2018)
- Washington National Heritage Program Rare Plants and High-Quality Wetlands Database
- (WNHP 2018)
- DNR Forest Practices Application Mapping Tool for Stream Typing (WDNR 2018)

The NRCS, NWI, and WDFW maps are provided as Figures 3, 4, and 5 in Appendix A.

Results and Discussion

Description of the Site

Land Use and Site Alterations

Historical aerial photographs dating from 1955 to 2016 were obtained from Clark County's online maps and a recent aerial photography (May 2017) was obtained from Google Earth (Appendix E). According to historical aerial imagery, the site has remained relatively unchanged from its current condition since the 1950s, including the presence of three residences. A water tower was built in the 1970s to the north. Residential development of vacant parcels surrounding the site began in the early 1970s and are now nearly completely developed. No signatures indicative of potential wetland features are apparent on the site since as early as 1955, including in the vicinity of wetlands delineated on the site. Vegetation along the riparian corridor of Waters 1 and 2 has remained relatively unchanged since 1955. The Haight Reservoir was constructed prior to 1955. The open fields have been used for hay production and as pasture in the past and are currently mowed regularly.

Topography

The terrain on the site is sloping to the southwest, towards Water 2 with steeper slopes in the southwestern portion of the site. Elevations range from 680 to 750 feet across the entire site with slopes ranging from relatively flat to 10 percent and 20-30 percent in the southwestern part of the site.

Plant communities

Plant communities identified within the study area include: mowed pasture dominated by non-native grasses, forbs, and Himalayan blackberry (*Rubs armeniacus*; FAC); upland forest dominated by Douglas-fir (*Pseudotsuga menziesii*; FACU) and big-leaf maple (*Acer macrophyllum*; FACU); forested riparian habitat dominated by red alder (*Alnus rubra*; FAC) Himalayan blackberry, Pacific ninebark (*Physocarpus capitatus*; FACW), salmon raspberry (*Rubus spectabilis*; FAC), piggyback plant (*Tolmiea menziesii*; FAC), red elderberry (*Sambucus racemosa*; FACU), sword fern (*Polystichum munitum*; FACU), western lady fern (*Athyrium cyclosorum*; FAC), and colonial bent grass (*Agrostis capillaris*; FAC).

Dominant vegetation plant communities were also documented on attached wetland data sheets (Appendix B).

Soils

The following soil units are mapped within the study area, according to the Natural Resources Conservation Service (NRCS) Clark County Area Soil Survey Map (Figure 3 in Appendix A):

- Powell silt loam (Unit PoB), 0 to 8 percent slopes – Non-hydric
- Powell silt loam (Unit PoD), 8 to 20 percent slopes – Non-hydric
- Powell silt loam (Unit PoE), 20 to 30 percent slopes – Non-hydric

Hydrology and Precipitation

The project area lies within the Salmon-Washougal Water Resource Inventory Area (WRIA #28), the Columbia Slope watershed, and the Camas sub-watershed. Hydrology onsite is received primarily from runoff from adjacent uplands, direct precipitation, and groundwater.

Observed precipitation data and the WETS (wetlands climate analysis) station data were obtained from the Vancouver, Washington weather station via the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) database.

The area typically receives an average of 41.51 inches of annual precipitation. According to the NOAA's NWS Vancouver station, no rainfall was received on the day of the March 6, 2018 site visit and 1.04 inches were received during the two weeks prior. Observed water year-to-date (starting October 1, 2017) for March 6, 2018 was 21.67 inches, which was 4.29 inches below normal. Table 1 shows antecedent rainfall according to the WETS Vancouver station for the three months prior to the March 6, 2018 site visit only. Raw precipitation data is provided in Appendix F.

Table 1. Precipitation Data Prior to March 6, 2018.

Prior Months	Observed Precipitation (Inches)	30% Chance Will Have		Condition Dry, Wet, Normal	Condition Value (1=dry, 2=normal, 3=wet)	Month Weight	Multiply Previous Two Columns
		Less Than	More Than				
March (1-6)	0.12 (so far)	3.27	4.87	Dry (so far)	-	-	-
February	1.77	3.41	5.76	Dry	1	3	3
January	5.59	3.72	7.00	Normal	2	2	4
December	3.14	4.44	7.54	Dry	1	1	1
						Sum	**8**
Rainfall of prior period was: **drier** than normal (sum is 6-9), **normal** (sum is 10-14), **wetter** than normal (sum is 15-18)							

When compared to WETS data, precipitation received in the three months prior to the March 6, 2018 site visit were drier than the normal range. Wetland hydrology indicators were observed in upland Plots 3 and 7 (which lacked hydric soils). However, even though below-average rainfall was received prior to the site visit, these plots were determined to be upland. This determination was made because these upland plots were dominated by facultative vegetation and displayed weaker hydrology (both lacked a high water table with saturation observed deeper than within the wetland) then paired wetland Plots 2 and 8.

Based on the WETS table, the growing season dates for the area are between March 30 and November 9. Soil temperature during the site visit on March 6 was 35 degrees Fahrenheit. However, biological activity in plants was observed including emergence of reed canary grasses (*Phalaris arundinacea*; FACW) and bud burst on Himalayan blackberry and salmon raspberry, indicating that the site visit was conducted during the growing season.

Existing Wetland Mapping

There are no permitted wetlands, high-quality wetlands or modeled wetlands mapped on the site by the County. AKS determined there are two wetlands in the southern portion of the site. Additionally, no rare plants or high-quality wetlands are mapped within or adjacent to the study area by the WHNP nor were these features observed by AKS.

Waters Mapping and Fish Habitat Mapping

The onsite western portion of Water 2 is mapped in DNR's water typing system as a Type N (non-fishbearing) water and its riparian area is mapped as riverine habitat per WDFW PHS mapping. The entire onsite portion of the stream was mapped by the USFWS NWI as a riverine feature. According to SalmonScape, the lower reach of Water 2 is mapped as a non-fishbearing perennial stream (DNR Type Np). AKS generally agrees with this mapping and determined Water 2 to be a non-fishbearing seasonal stream (DNR Type Ns) along the entire onsite reach and identified a short DNR Type Ns stream (Water 1) that directly discharges on-site into Water 2.

The Haight Reservoir is located off-site to the southeast and is mapped on the USFWS NWI as a pond surrounded by PEM wetland. The County has mapped a 200-foot protective buffer around the offsite reservoir, which extends onto the site. AKS verified the presence of this reservoir using recent aerial imagery.

Other Critical Areas Mapping

Based on a review of background mapping fish and wildlife habitat conservation areas mapped by the County and WDFW, an Oregon white oak woodland priority habitat area was mapped in forested habitat within the project area. Caves or cave-rich areas are also mapped onsite by WDFW. No caves or Oregon white oak trees were identified within the study area. Additionally, no rare plants or other priority habitats, priority species, ESA-listed species, or habitats of local importance are mapped within the project area, nor were these features observed on site by AKS.

Findings

Wetland Delineation, Rating, Categorization, and Buffers

Wetland A

Wetland A is a PFO wetland located in the south-central portion of the site. Water 2 flows along the southern boundary of the wetland, in a southwesterly direction. The wetland is 0.09 acres (3,964 square feet) in size with the main hydrology sources coming from groundwater and upland runoff. The wetland is on a slope with water flowing through the wetland in one direction without being impounded; therefore, Wetland A belongs in the Slope hydrogeomorphic (HGM) sub classification. Hydrology discharges from Wetland A directly into Water 2.

Wetland A conditions were documented at Plots 5 and 8. Dominant plants in Wetland A include red alder, salmon raspberry, Pacific ninebark, colonial bent, and piggyback plant. The wetland is located within mapped Powell silt loam soils which are not considered hydric by NRCS. Soils were of low chroma (chroma of 2 or less) displaying common, distinct and prominent redoximorphic features, meeting hydric soil indicator F6 Redox Dark Surface and had a hydrogen sulfide odor present, meeting hydric soil indicator A4 Hydrogen Sulfide. Primary indicators of hydrology were observed, including a high water table (A2) and saturation (A3) within 12 inches of the surface during the March 2018 site visit.

The wetland boundary is well defined based on changes in the vegetation community from hydrophytic-dominated vegetation in the wetland to a facultative to non-hydrophytic plant community dominated by Himalayan blackberry, red alder, red elder, western lady fern, and sword fern in the upland. The change in the vegetation coincides with a change in the local relief from concave in the wetland to a convex landform in the upland. The adjacent upland was documented at paired upland Plots 6 and 7, which also lacked hydric soil. Plot 7 did meet the primary indicator of hydrology for saturation (A3) but lacked hydric vegetation and soil and was therefore determined to be upland.

The wetland was rated as a Category IV wetland with a low habitat score of 4.

Wetland B

Wetland B is a palustrine emergent wetland (PEM) located in the southeastern portion of the site, immediately upslope of Wetland A. The wetland is 0.42 acres (18,405 square feet) in size. The main hydrology source for Wetland B is groundwater, upland runoff, and direct precipitation. Wetland B belongs to the Slope HGM sub classification.

Wetland B conditions were documented at Plots 2 and 10. Wetland B is dominated by common velvet grass (*Holcus lanatus*; FAC) and colonial bent. The wetland is in mapped Powell silt loam soils which are not considered hydric by NRCS. Soils were of low chroma (chroma of 2 or less) displaying common, distinct and prominent redoximorphic features, meeting hydric soil indicator F6 Redox Dark Surface, and also surface soils with a depleted matrix meeting hydric soil indicator Depleted Matrix (F3). Primary indicators of hydrology were observed, including a high water table (A2) and saturation (A3) within 12 inches of the surface during the March 2018 site visit.

The wetland boundary is well defined based on changes in the vegetation community from facultative-dominated vegetation in the wetland to a facultative to facultative wet plant community dominated by red alder, Himalayan blackberry, colonial bent, tall false rye grass (*Schedonorus arundinaceus*; FAC), and common velvet grass also present in the upland. The adjacent upland was documented at paired upland Plots 3 and 9. Plot 9 lacked indicators of hydric soils, vegetation, and hydrology. Plot 3 only met the primary indicator of hydrology for saturation (A3; at 10 inches) but was determined to be upland because it displayed weaker hydrology than its paired Plot 2, lacked hydric soil, and was dominated by facultative vegetation..

The wetland was rated as a Category IV wetland with a low habitat score of 4.

<u>Waters and Riparian Buffers</u>

Water 1

Water 1 is a seasonal, non-fishbearing stream that was delineated originating from a hillside seep in the southwestern portion of the site and draining directly into Water 2. The channel bed is approximately a half to one foot wide with an average of 2-inch tall banks. The OHWM was delineated at the top of channel bank based on change from unvegetated stream bed to the adjacent upland plant community. Bottom substrate was dominated by silty clay loam soils. Approximately 1/2- inch deep of continuous flow was present in the channel during the March 6, 2018 site visit. The channel bed is generally unvegetated.

Water 1 was determined to be a Type Ns stream and requires a 25-foot wide riparian habitat conservation buffer (CMC 16.61.040.3.D).

Our study determined approximately 27 linear feet (27 square feet) of Water 1 is present on the site.

Water 2

Water 2 is an unnamed non-fishbearing seasonal stream (Type Ns). Water 2 originates offsite to the southeast at the Haight Reservoir and flows in a southwesterly direction across the southern portion of the study area. Water 2 flows offsite to the southwest where it eventually discharges directly into the Columbia River. The channel bed is approximately two feet wide with an average of one-foot tall banks. The channel bed is generally unvegetated with a substrate dominated by silty clay loam soils, lacking gravels and cobbles. Approximately one inch deep of continuous flow was present in the channel during the March 6, 2018 site visit. The OHWM was delineated based on a change from an unvegetated stream channel to perennial forested vegetation adjacent to the OHWM.

Water 2 was determined to be a Type Ns stream and requires a 25-foot riparian habitat conservation buffer (CMC 16.61.040.D).

Our study determined approximately 464 linear feet (1,155 square feet) of Water 2 is present on the site.

Haight Reservoir (Offsite)
The Haight Reservoir is located offsite to the southeast of the study area, at the head of Water 2. AKS approximated its OHWM based on available recent aerial photography. The reservoir was likely constructed within the historic channel of Water 2 and therefore may be considered a water of US by the Corps and a surface water of the state by ECY (WAC 173-226-030). The reservoir is protected under the City's critical areas code (CMC 16.61.010.A) and is regulated as an aquatic system with an assigned a protective buffer akin to stream buffer widths (CMC 16.61.040.B.d). AKS was unable to verify the presence of non-anadromous fish in the reservoir and therefore assumes this feature would have a maximum buffer of 75-feet, extending slightly onto the site in the southeasternmost corner.

Other Critical Areas
No other wetlands, waters, or priority habitats and species protected by the City's critical areas ordinances were identified within the study area.

Jurisdiction

The Corps would likely take jurisdiction of Waters 1 and 2 and Wetland A because they have a direct hydrologic connection to the Columbia River, a traditional navigable water. The Corps would also likely take jurisdiction over Wetland B because of its adjacency to Wetland A and Water 2. Removal and/or fill within streams and wetlands would require a Joint Aquatic Resources Permit Application (JARPA) for authorization from the Corps.

The City will regulate Wetlands A and B and their protective buffers, Waters 1 and 2 and their protective buffers, and the portion of the Haight Reservoir buffer that extends on to the site. Direct and indirect impacts these resources and/or their protective buffers, including any non-exempt clearing or development activities, would require a wetland and/or habitat permit from the City.

Table 2 below provides a summary of the onsite sizes of the features, hydrologic connections to other nearby waters, the Cowardin and HGM classifications for the wetlands, DNR water types, and our prediction of whether each feature would likely be determined jurisdictional by the City or the Corps.

Table 2. Summary of Potentially Jurisdictional Wetland, Waters, and Critical Area Features.

Potentially Jurisdictional Feature	Size	Cowardin/HGM Class or DNR Water Type	Rating/Type and Buffers	Connection to Other Waters	Predicted Jurisdiction
Wetland A	0.09 acres (3,964 square feet)	PFO/Slope	Category IV, 50' High intensity land use buffer	Water 2	City, Corps
Wetland B	0.42 acres (18,405 square feet)	PEM/Slope	Category IV, 50' High intensity land use buffer	Adjacent Wetland A	City, Corps
Water 1	27 linear feet (27 square feet)	Ns	25'	Water 2	City, Corps
Water 2	464 linear feet (0.03 acres; 1,155 square feet)	Ns	25'	Columbia River	City, Corps
Haight Reservoir	n/a; offsite	F (non-anadromous fishbearing)	75'	Columbia River	City, Corps

Statement of Preparation

This wetland and habitat determination report was prepared in accordance with CMC Chapters 16.53 and 16.61, respectively. Natural resource fieldwork and reporting were conducted by wetland professionals qualified to conduct natural resource projects in Washington. Information contained in this document should be considered preliminary and used at your own risk until it has been reviewed and approved in writing by the appropriate local, state, or federal agency with jurisdiction over natural resources on the site.

Fieldwork and report preparation were conducted by the following individuals:

Taya K. MacLean

Taya K. MacLean, MS, PWS
Senior Biologist
Report Preparation, Fieldwork

Sonya Templeton

Sonya Templeton
Natural Resource Specialist
Report Preparation

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Appendix A: Maps

USGS 7.5" TOPOGRAPHIC SERIES
QUADRANGLE: CAMAS, WA (2017)

N

SCALE: 1"=2000 FEET

2000 0 800 1200 1600 2000

DATE: 04/09/2018

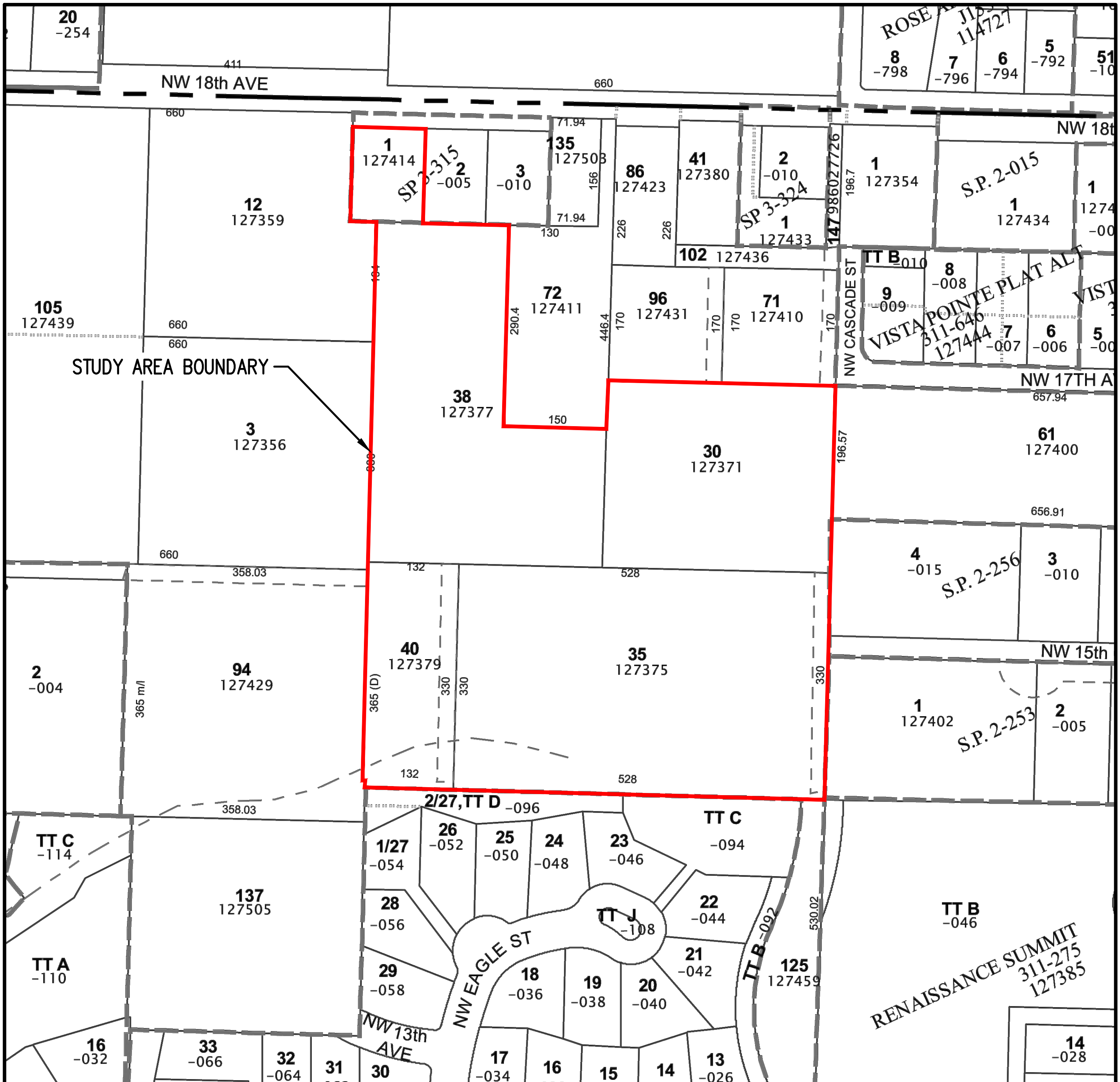
USGS VICINITY MAP
2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT

FIGURE 1

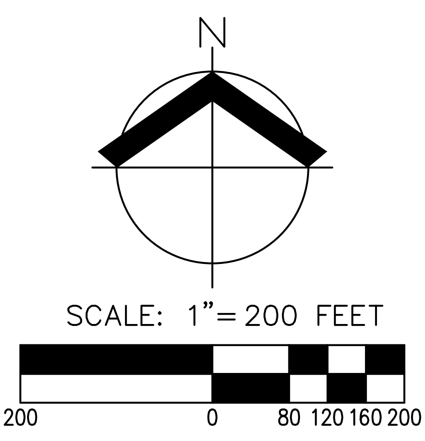
AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE, STE 2520
VANCOUVER, WA 98682
P: 360.882.0419 F: 360.882.0426 aks-eng.com

DRWN: JRI
CHKD: TKM
AKS JOB: 5638

DWG: 5638 CRITICAL AREAS FIGURES | FIGURE 1



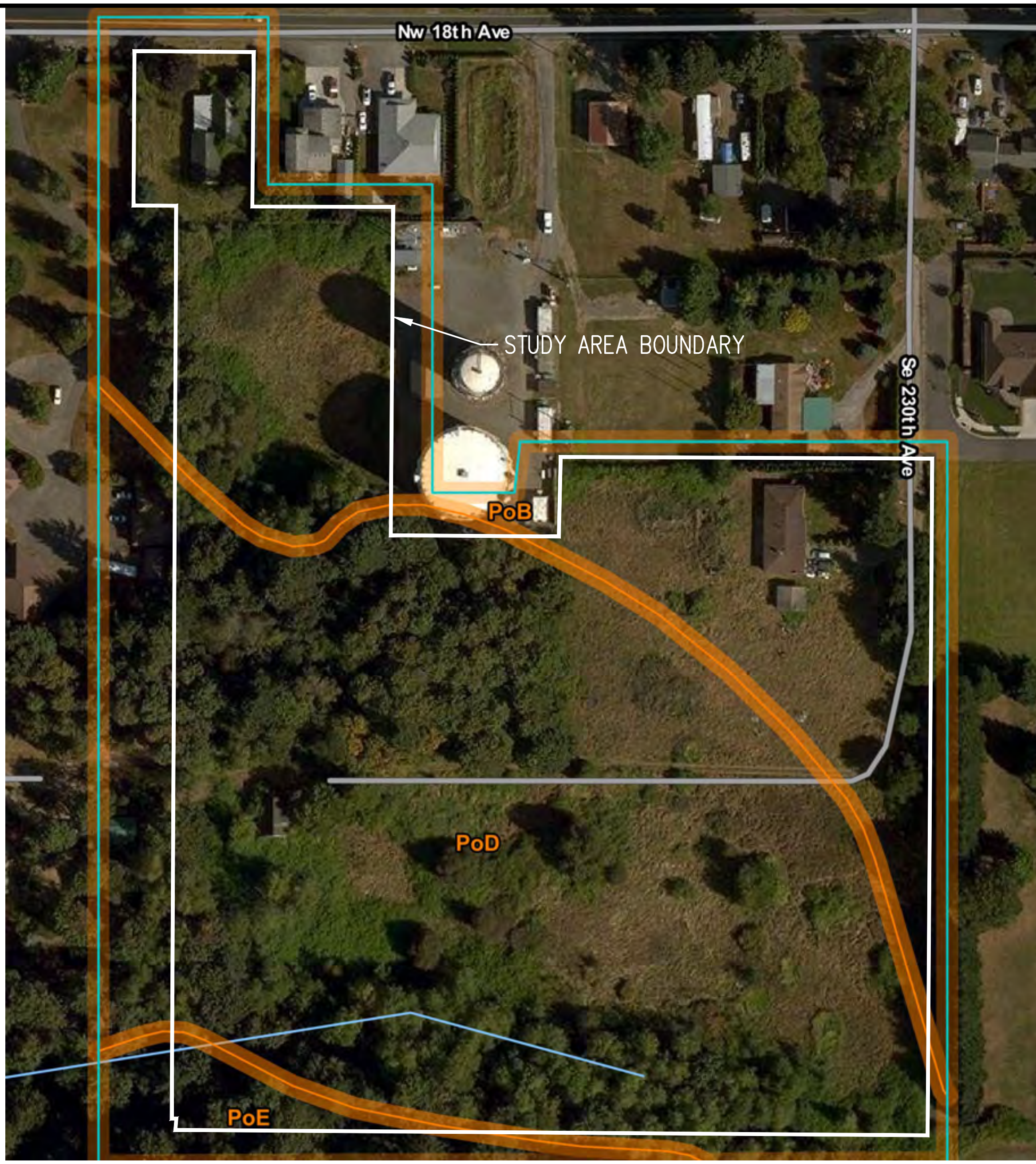
CLARK COUNTY
NE QTR OF SECT. 09., T. 1N., R. 3E., W. M.
PARCEL NO. 127371, 127375, 127377,
127379, AND 127414



DATE: 04/09/2018

PARCEL MAP **2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT**	FIGURE **2**
AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com	DRWN: JRI CHKD: TKM AKS JOB: 5638

DWG: 5638 CRITICAL AREAS FIGURES | FIGURE 2



MAP UNIT SYMBOL	MAP UNIT NAME
PoB	POWELL SILT LOAM, 0% TO 8% SLOPES; NON-HYDRIC
PoD	POWELL SILT LOAM, 8% TO 20% SLOPES; NON-HYDRIC
PoE	POWELL SILT LOAM, 20% TO 30% SLOPES; NON-HYDRIC

NRCS WEB SOIL SURVEY
FOR CLARK COUNTY

N

SCALE: 1"=150 FEET

150 0 60 90 120 150

DATE: 04/09/2018

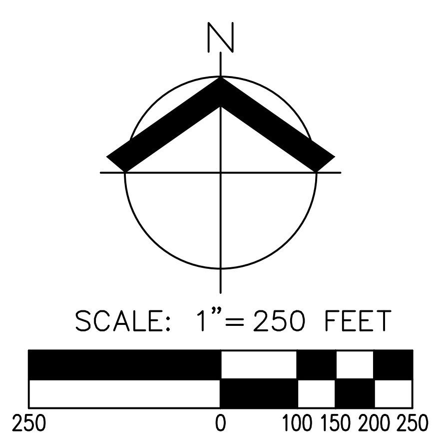
NRCS SOIL SURVEY MAP
2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT

FIGURE 3

AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE, STE 2520
VANCOUVER, WA 98682
P: 360.882.0419 F: 360.882.0426 aks-eng.com

DRWN: JRI
CHKD: TKM
AKS JOB: 5638

US FISH & WILDLIFE SERVICE
NATIONAL WETLAND INVENTORY (2017)



DATE: 04/09/2018

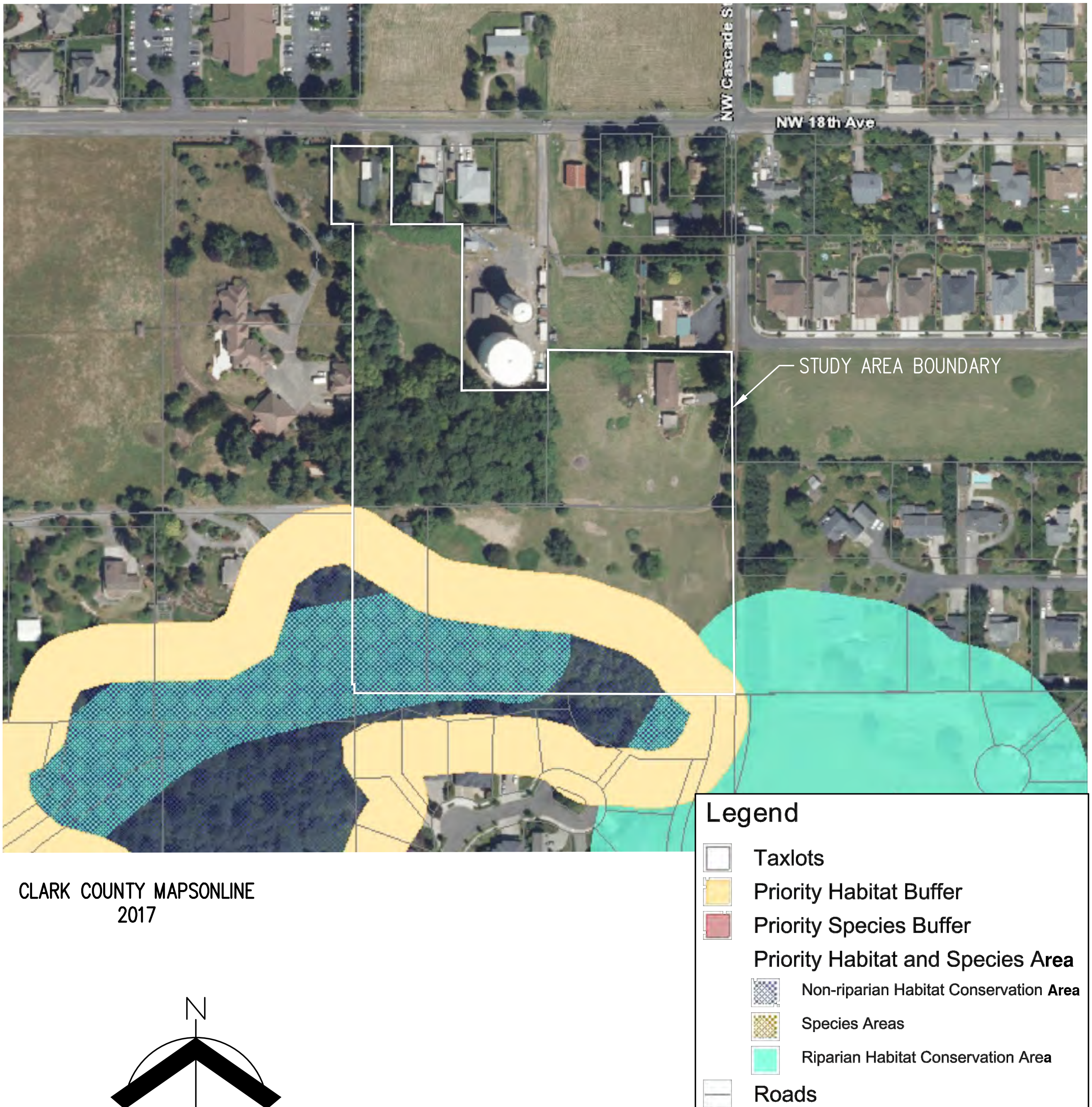
NATIONAL WETLAND INVENTORY MAP
2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT

FIGURE 4

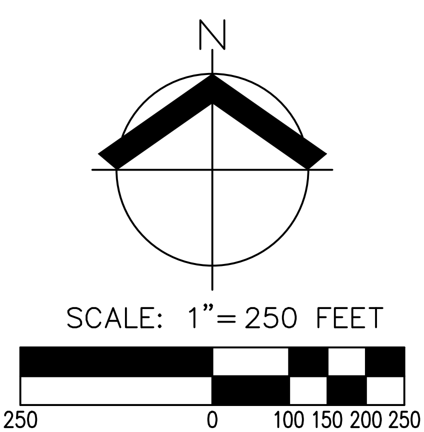
AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE, STE 2520
VANCOUVER, WA 98682
P: 360.882.0419 F: 360.882.0426 aks-eng.com

DRWN: JRI
CHKD: TKM
AKS JOB: 5638

DWG: 5638 CRITICAL AREAS FIGURES | FIGURE 4



CLARK COUNTY MAPSONLINE
2017



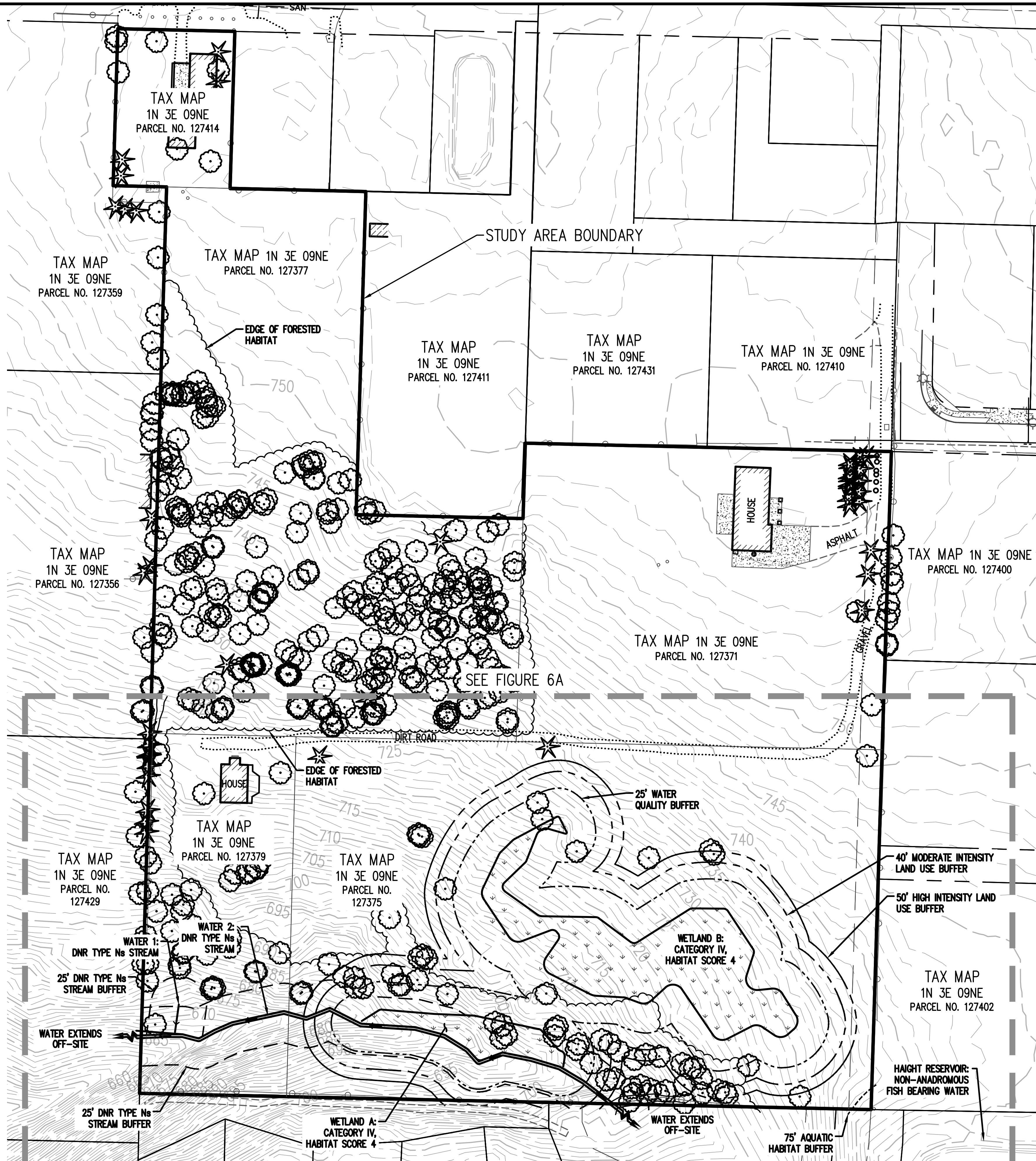
DATE: 04/09/2018

PRIORITY HABITAT AND SPECIES MAP
2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT

FIGURE 5

AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE, STE 2520
VANCOUVER, WA 98682
P: 360.882.0419 F: 360.882.0426 aks-eng.com

DRWN: JRI
CHKD: TKM
AKS JOB: 5638



LEGEND:

ON-SITE WETLANDS TOTAL: 22,369 SF± (0.51 ACRES±)

WETLAND A: 3,964 SF± (0.09 ACRES±)
WETLAND B: 18,405 SF± (0.42 ACRES±)

ON-SITE WATERS TOTAL: 1,182 SF± (0.03 ACRES±)

WATER 1 (DNR TYPE Ns STREAM): 27 SF±/ 27 LINEAR FT±
WATER 2 (DNR TYPE Ns STREAM): 1,155 SF±/ 464 LINEAR FT± (0.03 ACRES±)

25' WATER QUALITY BUFFER

40' MODERATE INTENSITY LAND USE BUFFER

50' HIGH INTENSITY LAND USE BUFFER

25' DNR TYPE Ns BUFFER

75' AQUATIC HABITAT BUFFER

WETLAND AND WATER BOUNDARIES WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON MARCH 6, 2018 AND WERE PROFESSIONALLY LAND SURVEYED BY AKS ON MARCH 9, 2018.

1-FT GROUND CONTOURS DERIVED FROM LAND SURVEY.

N

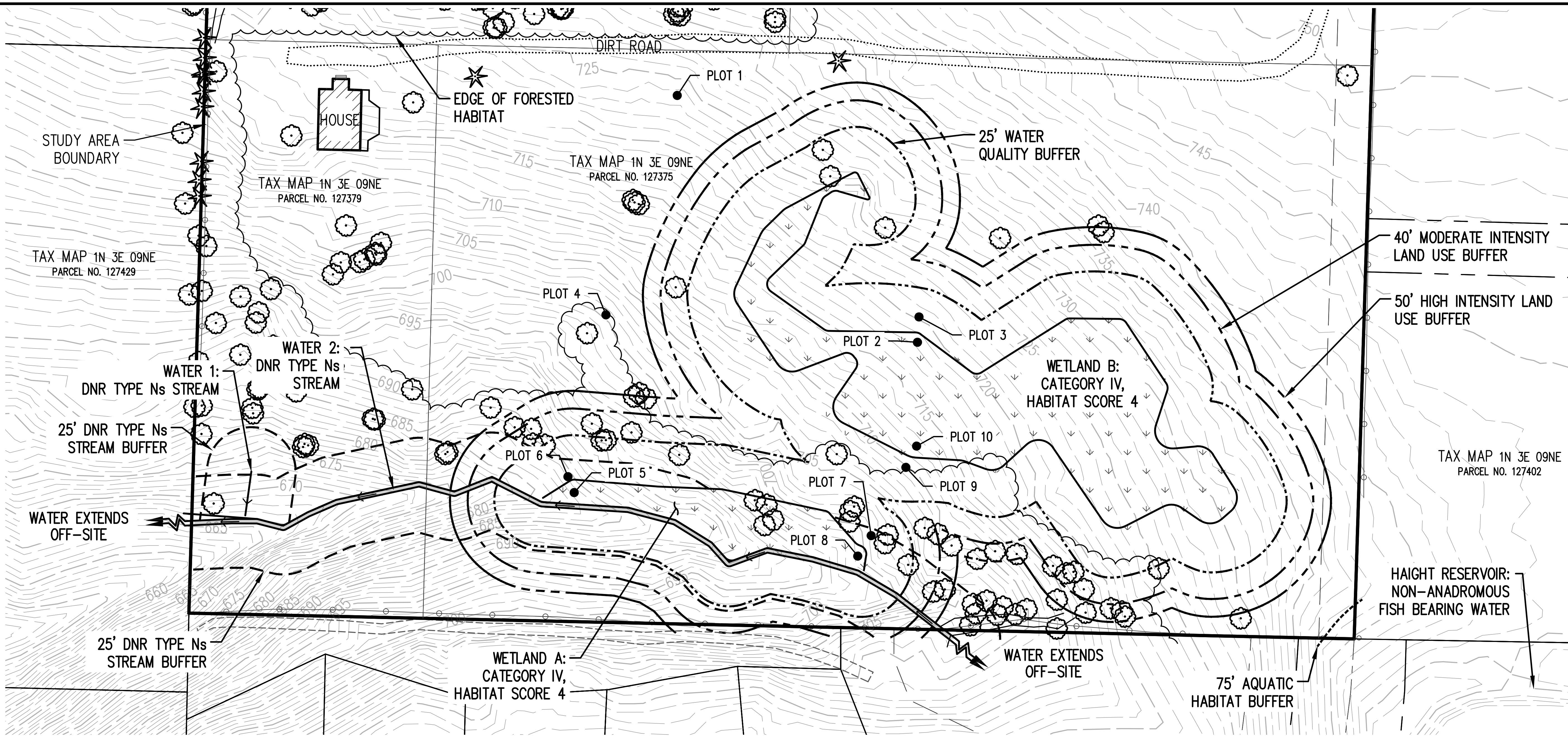
SCALE: 1"=100 FEET

100 0 40 60 80 100

DATE: 07/17/2018

EXISTING CONDITIONS MAP	FIGURE 6
2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT	
AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com	DRWN: JRI CHKD: TKM AKS JOB: 5638

DWG: 5638 EXCOND | FIGURE 6



LEGEND:

ON-SITE WETLANDS TOTAL: 22,369 SF± (0.51 ACRES±)

WETLAND A: 3,964 SF± (0.09 ACRES±)
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ON-SITE WATERS TOTAL: 1,182 SF± (0.03 ACRES±)

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WATER 2 (DNR TYPE Np STREAM): 1,155 SF±/ 464 LINEAR FT± (0.03 ACRES±)

25' WATER QUALITY BUFFER

40' MODERATE INTENSITY LAND USE BUFFER

50' HIGH INTENSITY LAND USE BUFFER

25' DNR TYPE Ns BUFFER

75' AQUATIC HABITAT BUFFER

WETLAND AND WATER BOUNDARIES WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON MARCH 6, 2018 AND WERE PROFESSIONALLY LAND SURVEYED BY AKS ON MARCH 9, 2018.

1-FT GROUND CONTOURS DERIVED FROM LAND SURVEY.

N

SCALE: 1"= 60 FEET

60 0 24 36 48 60

DATE: 07/17/2018

EXISTING CONDITIONS MAP	FIGURE **6A**
2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT	
AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com	DRWN: JRI CHKD: TKM AKS JOB: 5638

DWG: 5638 EXCOND | FIGURE 6A

Appendix B: Wetland Determination Data Forms

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

Project/Site: Hancock Springs Subdivision City/County: Camas/ Clark Sampling Date: 3/6/2018

Applicant/Owner: NW Classic Homes, LLC State: WA Sampling Point: **1**

Investigator(s): Taya MacLean and Jessica Imbrie Section, Township, Range: Sec. 09, T. 1N., R. 3E. W.M.

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): None Slope (%): 5%

Subregion (LRR): A, Northwest Forests and Coast Lat: ___ Long: ___ Datum: ___

Soil Map Unit Name: Unit PoD: Powell Silt Loam, 8% to 20% slopes 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.

	Yes	No
Hydrophytic Vegetation Present?	X	
Hydric Soil Present?		X
Wetland Hydrology Present?		X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Precipitation: According to the NWS Vancouver station, 0.00 inches of rainfall was received on the day of the site visit and 1.04 inches within the two weeks prior. Climatic conditions were drier than normal during the 3 months prior to the site visit.

Remarks:

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
= Total Cover	0%		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
= Total Cover	0%		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	60%	Yes	FACW
2. *Cardamine hirsuta*	10%	No	FACU
3. *Galium aparine*	5%	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	75%		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
= Total Cover	0%		

% Bare Ground in Herb Stratum 25%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	60	x 2 = 120
FAC species	0	x 3 = 0
FACU species	15	x 4 = 60
UPL species	0	x 5 = 0
Column Totals:	75 (A)	180 (B)

Prevalence Index = B/A = 2.40

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[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: Mowed pasture at Plot 1 was covered by moss and dead plant material.

SOIL

Sampling Point: **1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12.5	10YR 3/2	100					SiL	
12.5 - 14.5	10YR 3/4	100					SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ______ **No** **X**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

	Yes	No	Depth (inches):
Surface Water Present?		X	
Water Table Present?		X	>14"
Saturation Present? (includes capillary fringe)	X		14"

Wetland Hydrology Present? **Yes** ______ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: Hancock Springs Subdivision City/County: Camas/ Clark Sampling Date: 3/6/2018

Applicant/Owner: NW Classic Homes, LLC State: WA Sampling Point: **2**

Investigator(s): Taya MacLean and Jessica Imbrie Section, Township, Range: Sec. 09, T. 1N., R. 3E. W.M.

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 7%

Subregion (LRR): A, Northwest Forests and Coast Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Unit PoD: Powell Silt Loam, 8% to 20% slopes 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 **X**	No ______
Hydric Soil Present?	Yes **X**	No ______
Wetland Hydrology Present?	Yes **X**	No ______

Is the Sampled Area within a Wetland? **Yes X** **No** ______

Precipitation: According to the NWS Vancouver station, 0.00 inches of rainfall was received on the day of the site visit and 1.04 inches within the two weeks prior. Climatic conditions were drier than normal during the 3 months prior to the site visit.

Remarks:

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Holcus lanatus*	45%	Yes	FAC
2. *Schedonorus arundinaceus*	15%	No	FAC
3. *Agrostis capillaris*	15%	No	FAC
4. *Senecio vulgaris*	2%	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	77% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		
% Bare Ground in Herb Stratum 23%			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	75	x 3 = 225
FACU species	2	x 4 = 8
UPL species	0	x 5 = 0
Column Totals:	77 (A)	233 (B)

Prevalence Index = B/A = 3.03

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[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X** **No** ______

Remarks: Mowed pasture.

SOIL

Sampling Point: **2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 3/2	100					SiCL	
6 - 15	10YR 4/2	93	7.5YR 4/6	7	C	M	SIC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
_X_ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes _X_ No ___

Remarks: There were redoximorphic nodules present from 6 to 15 inches below the soil surface.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
_X_ High Water Table (A2)
_X_ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No _X_	Depth (inches):	___
Water Table Present?	Yes _X_	No ___	Depth (inches):	5"
Saturation Present? (includes capillary fringe)	Yes _X_	No ___	Depth (inches):	3"

Wetland Hydrology Present? Yes _X_ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: Hancock Springs Subdivision City/County: Camas/ Clark Sampling Date: 3/6/2018

Applicant/Owner: NW Classic Homes, LLC State: WA Sampling Point: **3**

Investigator(s): Taya MacLean and Jessica Imbrie Section, Township, Range: Sec. 09, T. 1N., R. 3E. W.M.

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 7%

Subregion (LRR): A, Northwest Forests and Coast Lat: ___ Long: ___ Datum: ___

Soil Map Unit Name: Unit PoD: Powell Silt Loam, 8% to 20% slopes 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 **X**	No
Hydric Soil Present?	Yes	No **X**
Wetland Hydrology Present?	Yes **X**	No

Is the Sampled Area within a Wetland? **Yes** ___ **No X**

Precipitation: According to the NWS Vancouver station, 0.00 inches of rainfall was received on the day of the site visit and 1.04 inches within the two weeks prior. Climatic conditions were drier than normal during the 3 months prior to the site visit.

Remarks: The plot was determined to be upland because vegetation was dominated by facultative species and the hydrology was not as strong as in the paired wetland Plot 2.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover	0%		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
= Total Cover	0%		
Herb Stratum (Plot size: 5' r)			
1. *Agrostis capillaris*	25%	Yes	FAC
2. *Schedonorus arundinaceus*	20%	Yes	FAC
3. *Holcus lanatus*	20%	Yes	FAC
4. *Cardamine hirsuta*	5%	No	FACU
5. *Taraxacum officinale*	5%	No	FACU
6.			
7.			
8.			
9.			
10.			
11.			
= Total Cover	75%		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
= Total Cover	0%		
% Bare Ground in Herb Stratum	25%		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	65	x 3 =	195
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	75 (A)		235 (B)

Prevalence Index = B/A = 3.13

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[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes X No** ___

Remarks: Mowed pasture dominated by facultative vegetation.

SOIL

Sampling Point: **3**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 9	10YR 2/2	100					SiCL	
9 - 15	10YR 3/2	99	5YR 3/4	1	C	M	SiCL	
15 - 18	10YR 3/2	90	5YR 3/4	10	C	M	SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	
Water Table Present?	Yes X	No ___	Depth (inches):	13"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	10"

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: Hancock Springs Subdivision City/County: Camas/ Clark Sampling Date: 3/6/2018

Applicant/Owner: NW Classic Homes, LLC State: WA Sampling Point: **4**

Investigator(s): Taya MacLean and Jessica Imbrie Section, Township, Range: Sec. 09, T. 1N., R. 3E. W.M.

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): SL. Concave Slope (%): 10%

Subregion (LRR): A, Northwest Forests and Coast Lat: Long: Datum:

Soil Map Unit Name: Unit PoD: Powell Silt Loam, 8% to 20% slopes 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 X	No ____	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Wetland Hydrology Present?	Yes ____	No X	

Precipitation: According to the NWS Vancouver station, 0.00 inches of rainfall was received on the day of the site visit and 1.04 inches within the two weeks prior. Climatic conditions were drier than normal during the 3 months prior to the site visit.

Remarks:

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Crataegus monogyna*	30%	Yes	FAC
2.			
3.			
4.			
	30% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Rubus armeniacus*	20%	Yes	FAC
2.			
3.			
4.			
5.			
	20% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Schedonorus arundinaceus*	20%	Yes	FAC
2. *Agrostis capillaris*	15%	Yes	FAC
3. *Taraxacum officinale*	5%	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		
% Bare Ground in Herb Stratum 60%			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	85	x 3 = 255
FACU species	5	x 4 = 20
UPL species	0	x 5 = 0
Column Totals:	90 (A)	275 (B)

Prevalence Index = B/A = 3.06

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[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks: The majority of bare ground at Plot 4 was covered in a thick layer of moss.

SOIL

Sampling Point: **4**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 13	10YR 2/2	100					SiL	
13 - 16	10YR 3/3	100					SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): >16"
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >16"

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: Hancock Springs Subdivision City/County: Camas/ Clark Sampling Date: 3/6/2018

Applicant/Owner: NW Classic Homes, LLC State: WA Sampling Point: **5**

Investigator(s): Taya MacLean and Jessica Imbrie Section, Township, Range: Sec. 09, T. 1N., R. 3E. W.M.

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): <3%

Subregion (LRR): A, Northwest Forests and Coast Lat: ___ Long: ___ Datum: ___

Soil Map Unit Name: Unit PoD: Powell Silt Loam, 8% to 20% slopes 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 X	No	**Is the Sampled Area within a Wetland?** **Yes** X **No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Precipitation: According to the NWS Vancouver station, 0.00 inches of rainfall was received on the day of the site visit and 1.04 inches within the two weeks prior. Climatic conditions were drier than normal during the 3 months prior to the site visit.

Remarks: Plot located 3' from OHWM.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	40%	Yes	FAC
2.			
3.			
4.			
	40% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Agrostis capillaris*	25%	Yes	FAC
2. *Tolmiea menziesii*	20%	Yes	FAC
3. *Veronica anagallis-aquatica*	10%	No	OBL
4. *Cardamine hirsuta*	2%	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	57% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		
% Bare Ground in Herb Stratum 43%			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	85	x 3 =	255
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	97 (A)		273 (B)

Prevalence Index = B/A = 2.81

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[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 6	10YR 2/2	100					SiCL	
6 - 15	10Y 2.5/1	100					SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
X Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 3"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): surface

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: Hancock Springs Subdivision City/County: Camas/ Clark Sampling Date: 3/6/2018

Applicant/Owner: NW Classic Homes, LLC State: WA Sampling Point: **6**

Investigator(s): Taya MacLean and Jessica Imbrie Section, Township, Range: Sec. 09, T. 1N., R. 3E. W.M.

Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Convex Slope (%): 3%

Subregion (LRR): A, Northwest Forests and Coast Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Unit PoD: Powell Silt Loam, 8% to 20% slopes 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 **X**	No ______
Hydric Soil Present?	Yes ______	No **X**
Wetland Hydrology Present?	Yes ______	No **X**

Is the Sampled Area within a Wetland? **Yes** ______ **No** **X**

Precipitation: According to the NWS Vancouver station, 0.00 inches of rainfall was received on the day of the site visit and 1.04 inches within the two weeks prior. Climatic conditions were drier than normal during the 3 months prior to the site visit.

Remarks:

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Rubus armeniacus*	75%	Yes	FAC
2.			
3.			
4.			
5.			
	75% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Athyrium cyclosorum*	15%	Yes	FAC
2. *Polystichum munitum*	5%	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 80%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	95 (A)		290 (B)

Prevalence Index = B/A = 3.05

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[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** **X** **No** ______

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 15	10YR 3/2	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

	Yes	No	Depth (inches):
Surface Water Present?		X	
Water Table Present?		X	>15"
Saturation Present? (includes capillary fringe)		X	>15"

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: Hancock Springs Subdivision City/County: Camas/ Clark Sampling Date: 3/6/2018

Applicant/Owner: NW Classic Homes, LLC State: WA Sampling Point: **7**

Investigator(s): Taya MacLean and Jessica Imbrie Section, Township, Range: Sec. 09, T. 1N., R. 3E. W.M.

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 7%

Subregion (LRR): A, Northwest Forests and Coast Lat: ____ Long: ____ Datum: ____

Soil Map Unit Name: Unit PoD: Powell Silt Loam, 8% to 20% slopes 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.

	Yes	No
Hydrophytic Vegetation Present?		X
Hydric Soil Present?		X
Wetland Hydrology Present?	X	
Is the Sampled Area within a Wetland?		X

Precipitation: According to the NWS Vancouver station, 0.00 inches of rainfall was received on the day of the site visit and 1.04 inches within the two weeks prior. Climatic conditions were drier than normal during the 3 months prior to the site visit.

Remarks: Plot 7 is approximately 2.5' higher in elevation than Plot 8. Hydrology was not as strong as in the paired wetland Plot 8.

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1. *Alnus rubra*	25%	Yes	FAC
2.			
3.			
4.			
	25% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Rubus armeniacus*	15%	Yes	FAC
2. *Sambucus racemosa*	15%	Yes	FACU
3.			
4.			
5.			
	30% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Polystichum munitum*	10%	Yes	FACU
2. *Epilobium ciliatum*	1%	No	FACW
3. *Geum macrophyllum*	1%	No	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1. *Rubus ursinus*	25%	Yes	FACU
2.			
	25% = Total Cover		

% Bare Ground in Herb Stratum 80%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	1	x 2 = 2
FAC species	41	x 3 = 123
FACU species	50	x 4 = 200
UPL species	0	x 5 = 0
Column Totals:	92 (A)	325 (B)

Prevalence Index = B/A = 3.53

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[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 14	10YR 2/2	100					SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

	Yes	No	Depth (inches):
Surface Water Present?		X	
Water Table Present?	X		14"
Saturation Present? (includes capillary fringe)	X		11"

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Soils were very moist throughout.

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

Project/Site: Hancock Springs Subdivision City/County: Camas/ Clark Sampling Date: 3/6/2018

Applicant/Owner: NW Classic Homes, LLC State: WA Sampling Point: **8**

Investigator(s): Taya MacLean and Jessica Imbrie Section, Township, Range: Sec. 09, T. 1N., R. 3E. W.M.

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): <3%

Subregion (LRR): A, Northwest Forests and Coast Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Unit PoD: Powell Silt Loam, 8% to 20% slopes 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 X No ______		
Hydric Soil Present?	Yes X No ______	**Is the Sampled Area**	
Wetland Hydrology Present?	Yes X No ______	**within a Wetland?**	**Yes** X **No** ______

Precipitation: According to the NWS Vancouver station, 0.00 inches of rainfall was received on the day of the site visit and 1.04 inches within the two weeks prior. Climatic conditions were drier than normal during the 3 months prior to the site visit.

Remarks: Plot 8 was approximately 2' from the OHWM of the stream.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	30%	Yes	FAC
2.			
3.			
4.			
	30% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Physocarpus capitatus*	25%	Yes	FACW
2. *Rubus spectabilis*	15%	Yes	FAC
3.			
4.			
5.			
	40% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Tolmiea menziesii*	15%	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1. *Rubus ursinus*	15%	Yes	FACU
2.			
	15% = Total Cover		
% Bare Ground in Herb Stratum 85%			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	25	x 2 =	50
FAC species	60	x 3 =	180
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	100 (A)		290 (B)

Prevalence Index = B/A = 2.90

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[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X **No** ______

Remarks:

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 5	10YR 2/2	100					SiCL	
5 - 15	10YR 2/2	92	5YR 3/4	8	C	M	SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
X Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches):	___
Water Table Present?	Yes X	No ___	Depth (inches):	10"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches):	8"

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: Hancock Springs Subdivision City/County: Camas/ Clark Sampling Date: 3/6/2018

Applicant/Owner: NW Classic Homes, LLC State: WA Sampling Point: **9**

Investigator(s): Taya MacLean and Jessica Imbrie Section, Township, Range: Sec. 09, T. 1N., R. 3E. W.M.

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 7%

Subregion (LRR): A, Northwest Forests and Coast Lat: ______ Long: ______ Datum: ______

Soil Map Unit Name: Unit PoD: Powell Silt Loam, 8% to 20% slopes 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.

	Yes	No
Hydrophytic Vegetation Present?	X	
Hydric Soil Present?		X
Wetland Hydrology Present?		X

Is the Sampled Area within a Wetland? **Yes** ______ **No** X

Precipitation: According to the NWS Vancouver station, 0.00 inches of rainfall was received on the day of the site visit and 1.04 inches within the two weeks prior. Climatic conditions were drier than normal during the 3 months prior to the site visit.

Remarks: Plot 9 was located in an upland area approximately 3' lower in elevation than Plot 10.

VEGETATION

Tree Stratum (Plot size: 30' r)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus rubra*	20%	Yes	FAC
2.			
3.			
4.			
	20% = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' r)			
1. *Rubus armeniacus*	35%	Yes	FAC
2.			
3.			
4.			
5.			
	35% = Total Cover		
Herb Stratum (Plot size: 5' r)			
1. *Agrostis capillaris*	30%	Yes	FAC
2. *Polystichum munitum*	5%	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	35% = Total Cover		
Woody Vine Stratum (Plot size: 10' r)			
1. *Rubus ursinus*	5%	Yes	FACU
2.			
	5% = Total Cover		

% Bare Ground in Herb Stratum 65%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	85	x 3 = 255
FACU species	10	x 4 = 40
UPL species	0	x 5 = 0
Column Totals:	95 (A)	295 (B)

Prevalence Index = B/A = 3.11

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[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? **Yes** X **No** ______

Remarks:

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 14	10YR 3/2	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? **Yes** ___ **No** X

Remarks: The soil temperature was 35 degrees Fahrenheit.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): >14"
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >14"

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Project/Site: Hancock Springs Subdivision City/County: Camas/ Clark Sampling Date: 3/6/2018

Applicant/Owner: NW Classic Homes, LLC State: WA Sampling Point: **10**

Investigator(s): Taya MacLean and Jessica Imbrie Section, Township, Range: Sec. 09, T. 1N., R. 3E. W.M.

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 5%

Subregion (LRR): A, Northwest Forests and Coast Lat: ___ Long: ___ Datum: ___

Soil Map Unit Name: Unit PoD: Powell Silt Loam, 8% to 20% slopes 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 X	No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Precipitation: According to the NWS Vancouver station, 0.00 inches of rainfall was received on the day of the site visit and 1.04 inches within the two weeks prior. Climatic conditions were drier than normal during the 3 months prior to the site visit.

Remarks: Plot 10 was located at the southern end of a mowed pasture.

VEGETATION

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
	0%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10' r)			
1.			
2.			
3.			
4.			
5.			
	0%	= Total Cover	
Herb Stratum (Plot size: 5' r)			
1. *Agrostis capillaris*	35%	Yes	FAC
2. *Holcus lanatus*	30%	Yes	FAC
3. *Rumex crispus*	5%	No	FAC
4. *Geranium molle*	2%	No	NOL
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	72%	= Total Cover	
Woody Vine Stratum (Plot size: 10' r)			
1.			
2.			
	0%	= Total Cover	
% Bare Ground in Herb Stratum 28%			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	0	x 4 =	0
UPL species	2	x 5 =	10
Column Totals:	72	(A)	220 (B)

Prevalence Index = B/A = 3.06

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[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes X No

Remarks: Mowed pasture. The majority of the bare ground at Plot 10 was covered by moss.

SOIL

Sampling Point: **10**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 8	10YR 2/2	95	7.5YR 3/4	5	C	M / PL	SiCL	
8 - 14	10YR 4/2	93	7.5YR 4/6	7	C	M	SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
X Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: The soil temperature at Plot 10 was 35 degrees Fahrenheit.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**)
___ Frost-Heave Hummocks (D7)

Field Observations:

	Yes		No		Depth (inches):	
Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes	X	No		Depth (inches):	6"
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	surface

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: The pit was left open for approximately 5 minutes, with water still seeping in.

Appendix C: Photo Location Map and Site Photographs

Photo A. Northwest view of Plot 1 with upland forest in background.

Photo B. View east towards Plot 2, Plot 3, and Wetland B.

Photo C. View of ponded area in Wetland B.

Photo D. View of Plots 9 and 10 along Wetland B boundary facing east.

Photos taken March 6, 2018 by Taya K. MacLean

Photo E. View of Plot 4 facing East.

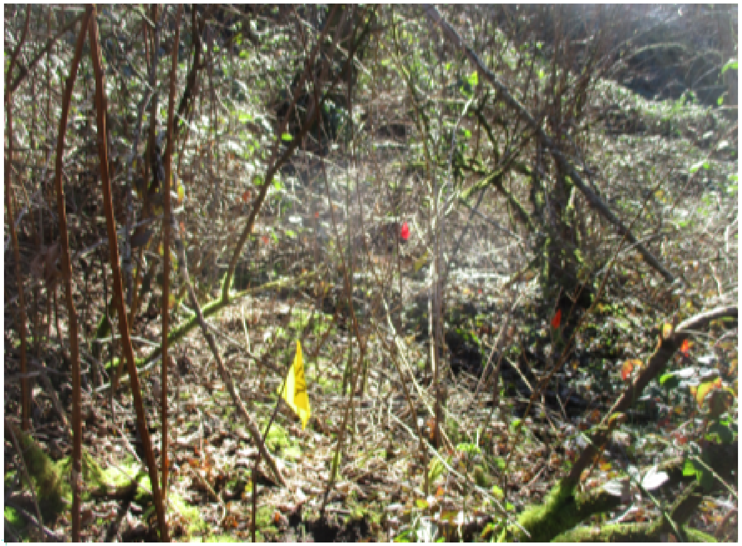


Photo F. View facing south of Plot 7, Plot 8, Wetland A, and Water 2.

Photo G. View south towards Plot 5, Plot 6, Wetland A, and Water 2.

Photo H. South view of Plot 2, Plot 3, Wetland B, and forested riparian habitat in background.

Photos taken March 6, 2018 by Taya K. MacLean

Photo I. View facing west downstream along Water 2.

Photo J. View facing south at Water 1 seep and channel.

Photos taken March 6, 2018 by Taya K. MacLean

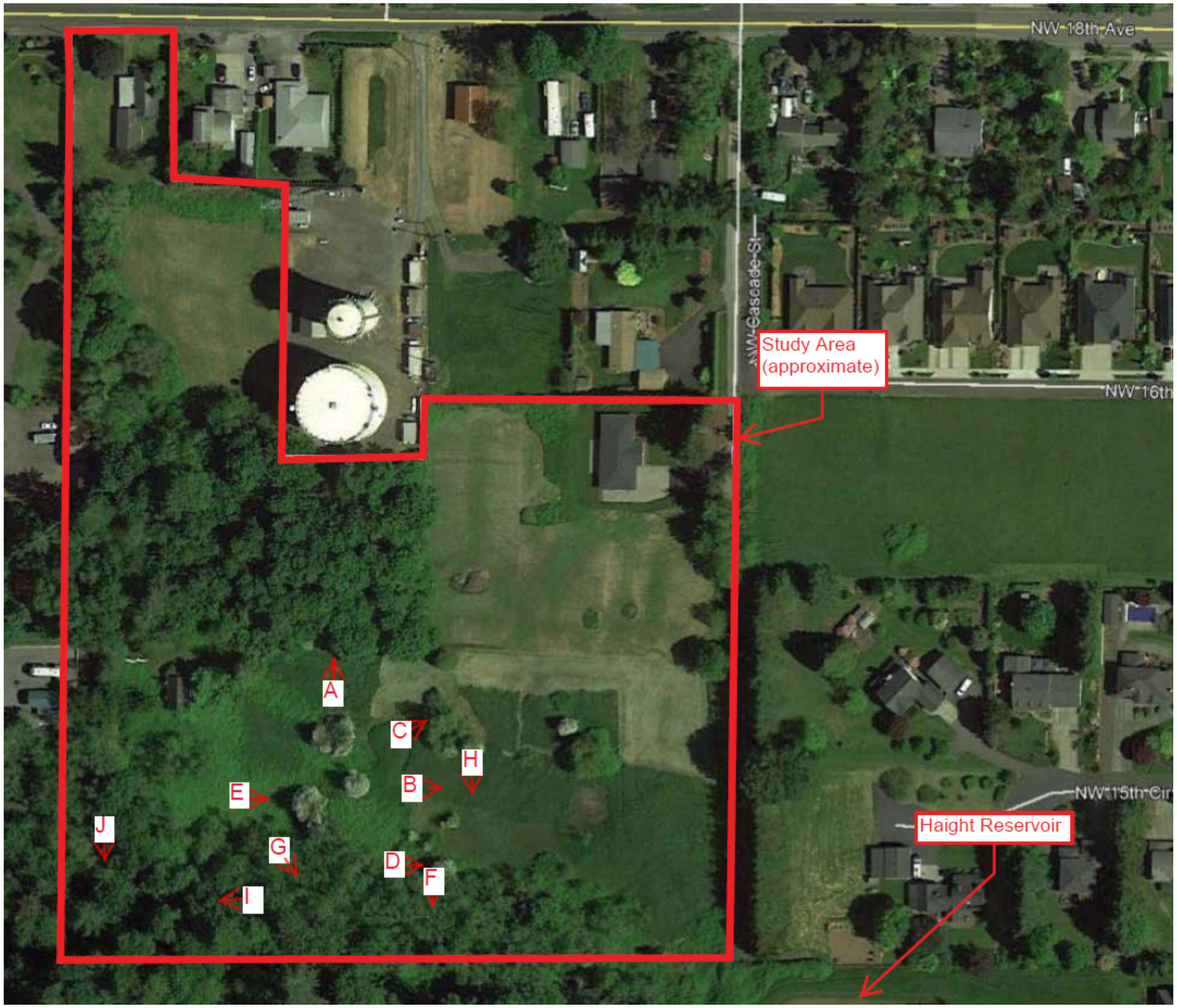


Photo K. Photo location map (Photos A-J; Google Earth May 2017 aerial image).

Photos taken March 6, 2018 by Taya K. MacLean

Appendix D: Wetland Rating Forms

Wetland name or number A   AKS Job: Hancock Springs
adjacent to creek

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A   Date of site visit: 3/6/2018
Rated by Taya K. MacLean   Trained by Ecology? ✓ Yes ___No Date of training 6/2014

HGM Class used for rating Slope   Wetland has multiple HGM classes?___Y ✓ N

NOTE: Form is not complete without the figures requested *(figures can be combined)*.
Source of base aerial photo/map ____________

OVERALL WETLAND CATEGORY IV (based on functions ✓ or special characteristics___)

1. Category of wetland based on FUNCTIONS

_______**Category I** – Total score = 23 - 27
_______**Category II** – Total score = 20 - 22
_______**Category III** – Total score = 16 - 19
✓ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
			Circle the appropriate ratings	
Site Potential	H M L	H M L	H M L	
Landscape Potential	H M L	H M L	H M L	
Value	H M L	H M L	H M L	**TOTAL**
Score Based on Ratings	4	4	4	12

Score for each function based on three ratings
(order of ratings is not important)

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	

Wetland name or number _____

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet *(can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes PFO	H 1.1, H 1.4	1
Hydroperiods saturated only	H 1.2	1
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	1
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	1
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	1
✓ 1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	3

Wetland name or number _____

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   If your wetland can be classified as a Freshwater Tidal Fringe use the forms for ***Riverine*** *wetlands. If it is Saltwater Tidal Fringe it is an* ***Estuarine*** *wetland and is not scored. This method* ***cannot*** *be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**
   If your wetland can be classified as a Flats wetland, use the form for ***Depressional*** *wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   __The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   __At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ✓ The wetland is on a slope (*slope can be very gradual*),
   ✓ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   ✓ The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES** – The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   __The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   __The overbank flooding occurs at least once every 2 years.

Wetland name or number _____

NO – go to 6 **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

   NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number _____

SLOPE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance)* Slope is 1% or less points = 3 Slope is > 1%-2% points = 2 Slope is > 2%-5% 8% points = 1 Slope is greater than 5% points = 0	0
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 Dense, uncut, herbaceous plants > ½ of area points = 3 Dense, woody, plants > ½ of area ✓ points = 2 Dense, uncut, herbaceous plants > ¼ of area points = 1 Does not meet any of the criteria above for plants points = 0	2
Total for S 1 Add the points in the boxes above	2

Rating of Site Potential If score is:___**12 = H** ___**6-11 = M** ✓**0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Mowed pasture Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _______________ Not grazed, houses Yes = 1 No = 0	1
Total for S 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is:✓**1-2 = M** ___**0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? >1 mi, to Columbia Yes = 1 No = 0	0
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list.* No Yes = 1 No = 0	0
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the basin in which unit is found.* No. Yes = 2 No = 0	0
Total for S 3 Add the points in the boxes above	0

Rating of Value If score is:___**2-4 = H** ___**1 = M** ✓**0 = L** *Record the rating on the first page*

Wetland name or number _____

SLOPE WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and stream erosion	
S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.* Dense, uncut, **rigid** plants cover > 90% of the area of the wetland <90% stem cover points = 1 All other conditions points = 0	0

Rating of Site Potential If score is:___1 = M ✓0 = L *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? mowed pasture, yards Yes = 1 No = 0	1

Rating of Landscape Potential If score is: ✓1 = M ___0 = L *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	0
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6 Add the points in the boxes above	0

Rating of Value If score is:___2-4 = H ___1 = M ✓0 = L *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number _____

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

____Aquatic bed — 4 structures or more: points = 4
____Emergent — 3 structures: points = 2
✓ Scrub-shrub (areas where shrubs have > 30% cover) 2 structures: points = 1
✓ Forested (areas where trees have > 30% cover) 1 structure: points = 0
If the unit has a Forested class, check if:
____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

1

H 1.2. Hydroperiods
Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

____Permanently flooded or inundated 4 or more types present: points = 3
____Seasonally flooded or inundated 3 types present: points = 2
____Occasionally flooded or inundated 2 types present: points = 1
✓ Saturated only 1 type present: points = 0
____Permanently flowing stream or river in, or adjacent to, the wetland
✓ Seasonally flowing stream in, or adjacent to, the wetland non-fishbearing
____**Lake Fringe wetland** **2 points**
____**Freshwater tidal wetland** hillslope = saturated **2 points**

1

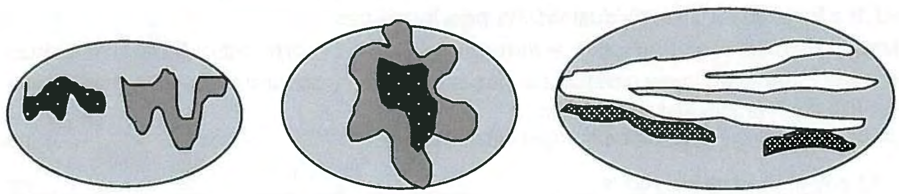
H 1.3. Richness of plant species
Count the number of plant species in the wetland that cover at least 10 ft^2.
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***
If you counted: > 19 species points = 2
5 - 19 species points = 1
< 5 species points = 0

1

H 1.4. Interspersion of habitats
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*

None = 0 points **Low** = 1 point **Moderate** = 2 points

All three diagrams in this row are **HIGH** = 3points



1

Wetland name or number _____

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* _✓_Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). _✓_Standing snags (dbh > 4 in) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* No ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* _✓_Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*) Rub Arm = 25+% cover	1
Total for H 1 Add the points in the boxes above	5

Rating of Site Potential If score is:____**15-18 = H** ____**7-14 = M** _✓_**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat___ + [(% moderate and low intensity land uses)/2]___ = _8.5_% 5 7/2 3.5 If total accessible habitat is: > $^{1}/_{3}$ (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat___ + [(% moderate and low intensity land uses)/2]___ = _37_% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches 30 14/2 7 points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use 57% points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is:____**4-6 = H** ____**1-3 = M** _✓_**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m – Riparian, Instream. points = 1 – PHS mapped oak woodland along Riparian corridor Site does not meet any of the criteria above points = 0	1

Rating of Value If score is:____**2 = H** _✓_**1 = M** ____**0 = L** *Record the rating on the first page*

but no Oaks present on site or adjacent.

Wetland name or number _____

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

Mapped by WDFW, but none present

✓ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

✓ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

non-fishbearing

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

No

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	Category
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 2.2** No – Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes – **Contact WNHP/WDNR and go to SC 2.4** No = **Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = **Category I** No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below. **If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No = **Is not a bog**	**Cat. I**

SC 4.0. Forested Wetlands Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

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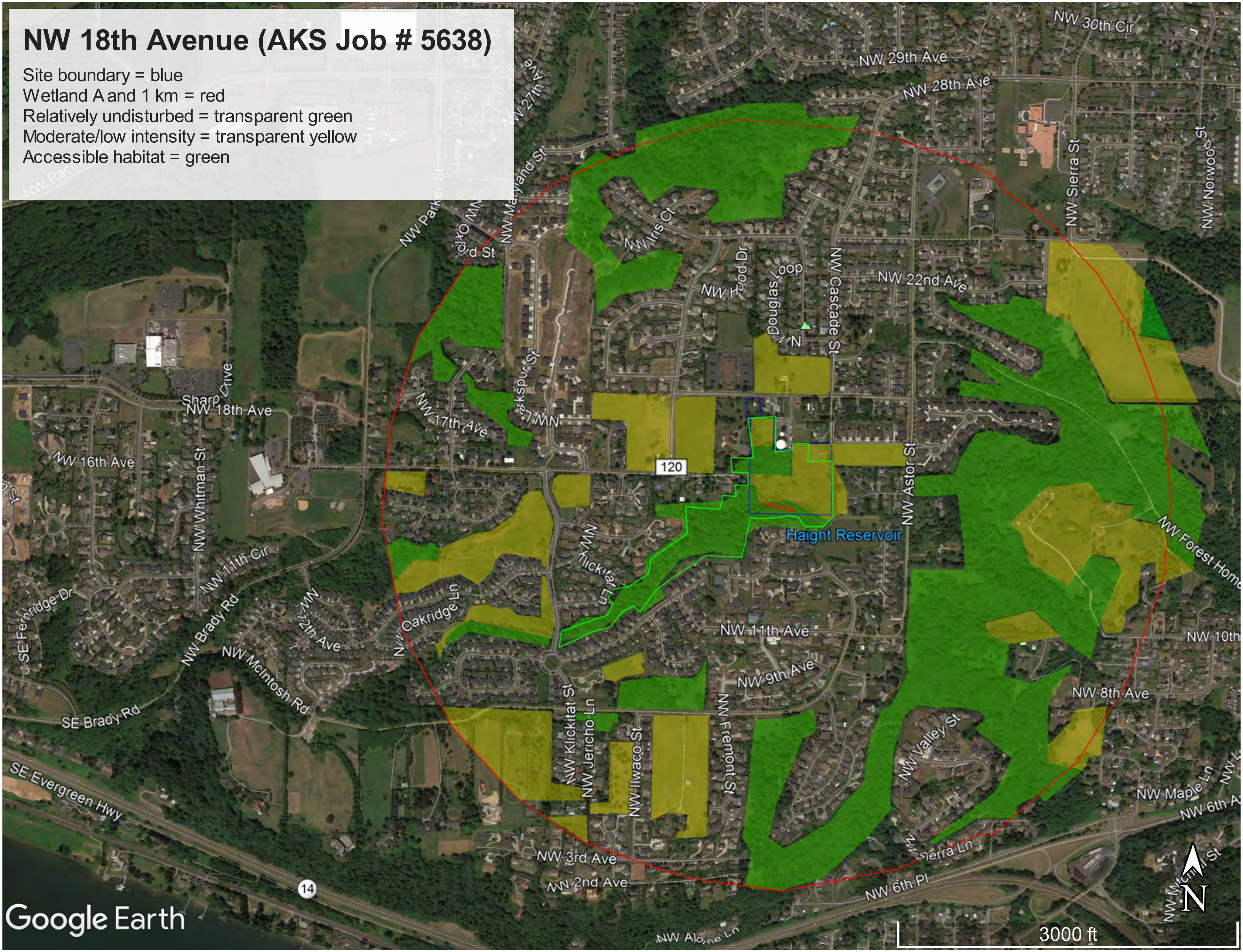
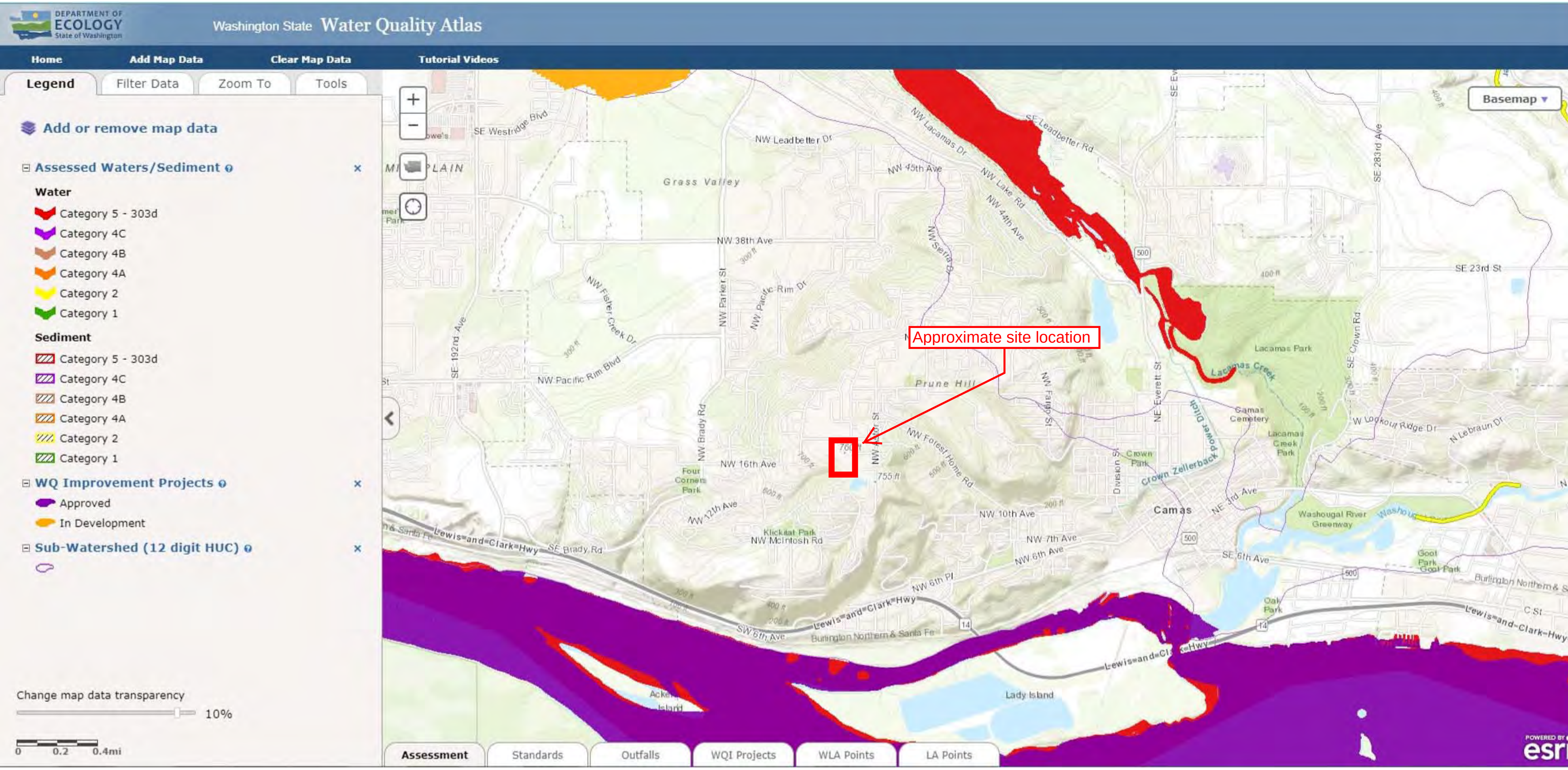
2926 NW 18th (AKS Job #5638)
Red- Wetland A= PFO, saturated only, dense, rigid trees, shrubs, and herbaceous plants.
150' buffer
Legend
150' Buffer
Wetland A
Wetland A
150' buffer
Google Earth
N
100 ft

NW 18th Avenue (AKS Job # 5638)

Site boundary = blue
Wetland A and 1 km = red
Relatively undisturbed = transparent green
Moderate/low intensity = transparent yellow
Accessible habitat = green





Washington State Water Quality Atlas
Home
Add Map Data
Clear Map Data
Tutorial Videos
Legend
Filter Data
Zoom To
Tools
Add or remove map data
Assessed Waters/Sediment
Water
Category 5 - 303d
Category 4C
Category 4B
Category 4A
Category 2
Category 1
Sediment
Category 5 - 303d
Category 4C
Category 4B
Category 4A
Category 2
Category 1
WQ Improvement Projects
Approved
In Development
Sub-Watershed (12 digit HUC)
Change map data transparency
10%
0 0.2 0.4mi
Basemap
Approximate site location
Grass Valley
Prune Hill
Camas
Lacamas Park
Lacamas Creek
Lady Island
NW 38th Ave
NW 16th Ave
NW 10th Ave
Lewis and Clark Hwy
Assessment
Standards
Outfalls
WQI Projects
WLA Points
LA Points
esri

Wetland name or number B on hillslope AKS Job: Hancock Springs

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland B Date of site visit: ____

Rated by Taya MacLean Trained by Ecology? ✓ Yes ___No Date of training 6/2014

HGM Class used for rating Slope Wetland has multiple HGM classes? ___Y ✓ N

NOTE: Form is not complete without the figures requested *(figures can be combined).*
Source of base aerial photo/map ____

OVERALL WETLAND CATEGORY IV (based on functions ✓ or special characteristics ___)

1. Category of wetland based on FUNCTIONS

____ **Category I** – Total score = 23 - 27
____ **Category II** – Total score = 20 - 22
____ **Category III** – Total score = 16 - 19
✓ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
			Circle the appropriate ratings	
Site Potential	H M L	H M L	H M L	
Landscape Potential	H M L	H M L	H M L	
Value	H M L	H M L	H M L	**TOTAL**
Score Based on Ratings	4	4	4	12

Score for each function based on three ratings
(order of ratings is not important)

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	

Wetland name or number _____

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet *(can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes all PEM	H 1.1, H 1.4	1
Hydroperiods	H 1.2	1
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	1
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)* NA	S 4.1	NA
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	1
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	3

Wetland name or number _____

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**

   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   NO – go to 3 **YES** – The wetland class is **Flats**

   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   ✓The wetland is on a slope (*slope can be very gradual*),
   ✓The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   ✓The water leaves the wetland **without being impounded**.

   NO – go to 5 **YES** – The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

NO – go to 6 **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number _____

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance)* Slope is 1% or less points = 3 Slope is > 1%-2% points = 2 Slope is > 2%-5% <5% points = 1 Slope is greater than 5% points = 0	1
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 Dense, uncut, herbaceous plants > ½ of area points = 3 Dense, woody, plants > ½ of area points = 2 Dense, uncut, herbaceous plants > ¼ of area points = 1 Does not meet any of the criteria above for plants Mowed points = 0	0
Total for S 1 Add the points in the boxes above	1

Rating of Site Potential If score is:___**12 = H** ___**6-11 = M** ✓**0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Mowed pasture Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources Not grazed, Road Yes = 1 No = 0	1
Total for S 2 Add the points in the boxes above	2

Rating of Landscape Potential If score is:✓**1-2 = M** ___**0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	0
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list.* Yes = 1 No = 0	0
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the basin in which unit is found.* Yes = 2 No = 0	0
Total for S 3 Add the points in the boxes above	0

Rating of Value If score is:___**2-4 = H** ___**1 = M** ✓**0 = L** *Record the rating on the first page*

Wetland name or number _____

SLOPE WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and stream erosion	
S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > $^1/_8$ in), or dense enough, to remain erect during surface flows.* Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions mowed field points = 0	0

Rating of Site Potential If score is: ___1 = M ✓0 = L *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Mowed Yes = 1 No = 0	1

Rating of Landscape Potential If score is: ✓1 = M ___0 = L *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	0
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6 Add the points in the boxes above	0

Rating of Value If score is: ___2-4 = H ___1 = M ✓0 = L *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number _____

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

- ____Aquatic bed
- ✓ Emergent
- ____Scrub-shrub (areas where shrubs have > 30% cover)
- ____Forested (areas where trees have > 30% cover)

If the unit has a Forested class, check if:

- ____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

4 structures or more: points = 4
3 structures: points = 2
2 structures: points = 1
1 structure: points = 0

Score: 0

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*).

- ____Permanently flooded or inundated
- ____Seasonally flooded or inundated
- ____Occasionally flooded or inundated
- ✓ Saturated only
- ____Permanently flowing stream or river in, or adjacent to, the wetland
- ____Seasonally flowing stream in, or adjacent to, the wetland
- ____**Lake Fringe wetland** — **2 points**
- ____**Freshwater tidal wetland** — **2 points**

Ponded area <1/4 ac or 10% of WL

4 or more types present: points = 3
3 types present: points = 2
2 types present: points = 1
1 type present: points = 0

Score: 1

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.

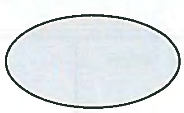
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

If you counted: > 19 species — points = 2
5 - 19 species — points = 1
< 5 species — points = 0   Pasture grasses, plots 2/10

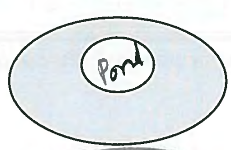
Score: 0

H 1.4. Interspersion of habitats

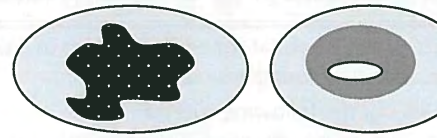
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



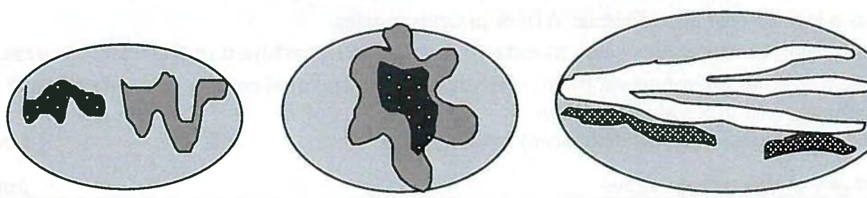
None = 0 points



Low = 1 point



Moderate = 2 points



All three diagrams in this row are **HIGH** = 3points

Score: 1

Wetland name or number _____

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ____Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ____Standing snags (dbh > 4 in) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* _1_Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	1
Total for H 1 Add the points in the boxes above	3

Rating of Site Potential If score is:____**15-18 = H** ____**7-14 = M** _✓_**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat___ + [(% moderate and low intensity land uses)/2]___ = 8.5 % 5 7/2 3.5 If total accessible habitat is: > $^1/_3$ (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat___ + [(% moderate and low intensity land uses)/2]___ = 35.75 % 28.6 + (14.3/2) 7.15 Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = 2 Undisturbed habitat 10-50% and > 3 patches ✓ points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use 57% points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is:____**4-6 = H** ____**1-3 = M** _✓_**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	1

Rating of Value If score is:____**2 = H** _✓_**1 = M** ____**0 = L** *Record the rating on the first page*

Wetland name or number _____

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

✓ — **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

✓ — **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

Wetland name or number _____

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** No= **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 2.2** No – Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes – **Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = **Category I** No = **Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** No – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No = **Is not a bog**	**Cat. I**

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** No = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^1/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	

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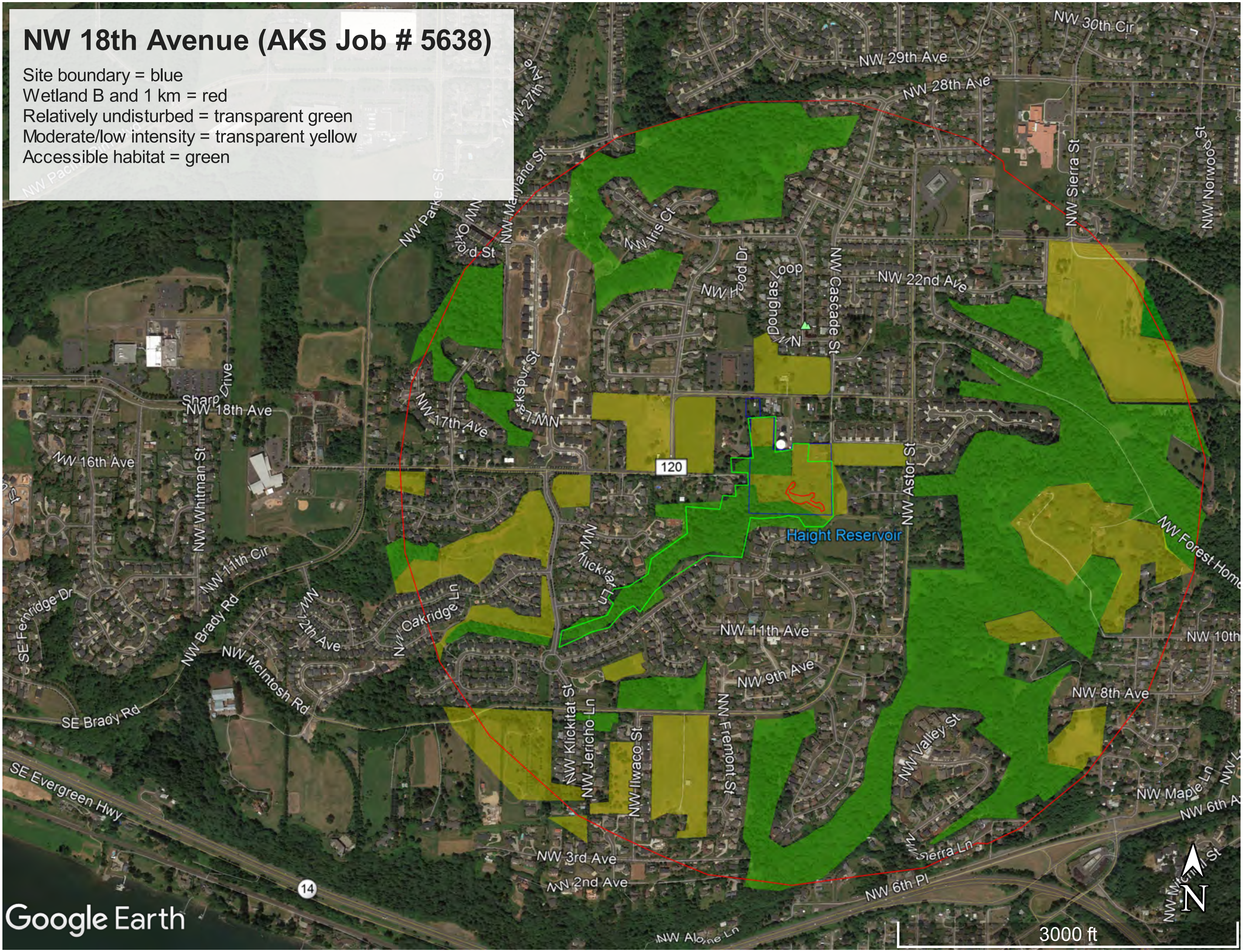
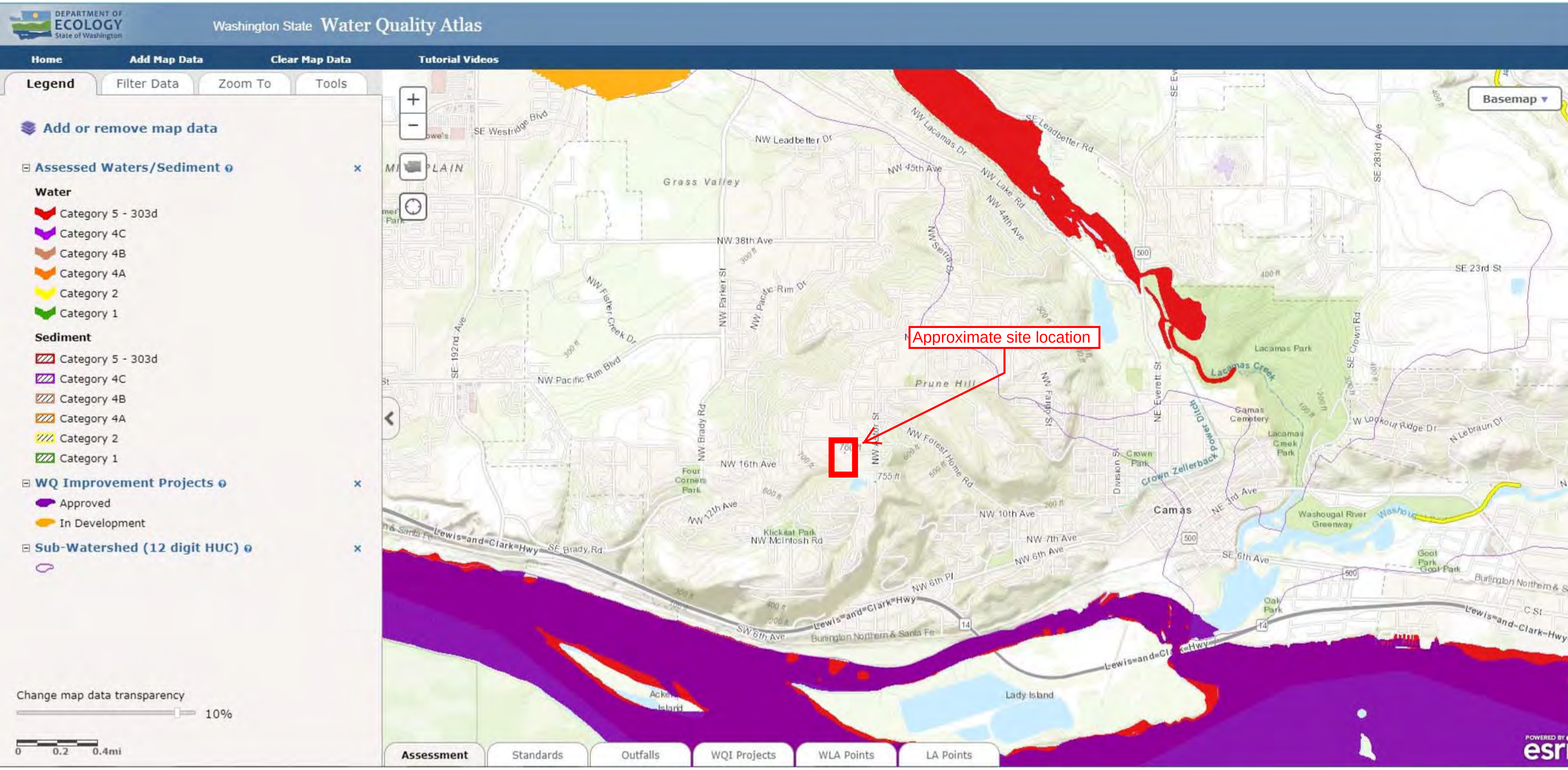
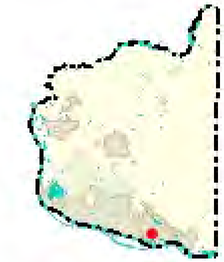
2926 NW 18th (AKS Job #5638)
Red- Wetland B= PEM, saturated only, dense herbaceous cover
150' buffer
Legend
150' buffer
Wetland B
150' buffer
Wetland B
Google Earth
N
100 ft


NW 18th Avenue (AKS Job # 5638)
Site boundary = blue
Wetland B and 1 km = red
Relatively undisturbed = transparent green
Moderate/low intensity = transparent yellow
Accessible habitat = green
NW 30th Cir
NW 29th Ave
NW 28th Ave
NW 27th Ave
NW Parker St
NW Maryland St
NW Iris Ct
NW Hood Dr
Douglas Loop
NW Cascade St
NW 22nd Ave
NW Sierra St
NW Norwood St
Sharp Drive
NW 18th Ave
NW 17th Ave
NW Larkspur St
NW 16th Ave
NW Whitman St
120
Haight Reservoir
NW Astor St
NW Forest Home
NW 11th Cir
NW Brady Rd
NW 12th Ave
NW Oakridge Ln
NW Klickitat Ln
NW 11th Ave
NW 10th
NW McIntosh Rd
NW 9th Ave
NW 8th Ave
SE Brady Rd
SE Fernridge Dr
NW Klickitat St
NW Jericho Ln
NW Ilwaco St
NW Fremont St
NW Valley St
NW Maple Ln
NW 6th Ave
SE Evergreen Hwy
NW 3rd Ave
NW 2nd Ave
NW Sierra Ln
NW 6th Pl
14
NW Alpine Ln
Google Earth
N
3000 ft


DEPARTMENT OF ECOLOGY State of Washington
Washington State Water Quality Atlas
Home
Add Map Data
Clear Map Data
Tutorial Videos
Legend
Filter Data
Zoom To
Tools
Add or remove map data
Assessed Waters/Sediment
Water
Category 5 - 303d
Category 4C
Category 4B
Category 4A
Category 2
Category 1
Sediment
Category 5 - 303d
Category 4C
Category 4B
Category 4A
Category 2
Category 1
WQ Improvement Projects
Approved
In Development
Sub-Watershed (12 digit HUC)
Change map data transparency
10%
0 0.2 0.4mi
Basemap
Approximate site location
Grass Valley
Prune Hill
Camas
Lacamas Park
Lacamas Creek
Camas Cemetery
Crown Park
Four Corners Park
Klickitat Park
Washougal River Greenway
Lady Island
NW Leadbetter Dr
NW 38th Ave
NW 16th Ave
NW 10th Ave
NW 7th Ave
NW 6th Ave
NW Pacific Rim Blvd
Lewis and Clark Hwy
Burlington Northern & Santa Fe
SE 23rd St
Assessment
Standards
Outfalls
WQI Projects
WLA Points
LA Points
POWERED BY esri

Appendix E: Historic Aerial Photographs

August 1955



Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

451.9 0 225.95 451.9 Feet

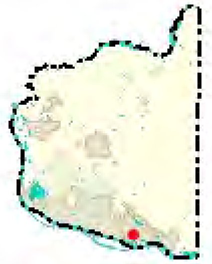
WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information.

Notes:

Job #5638

July 1968



Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

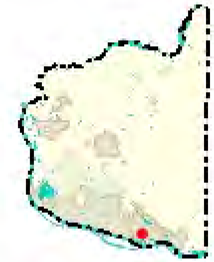
Notes:

Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

May 1974



Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

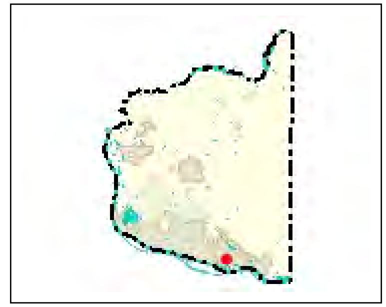
Notes:

Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

July 1984



Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

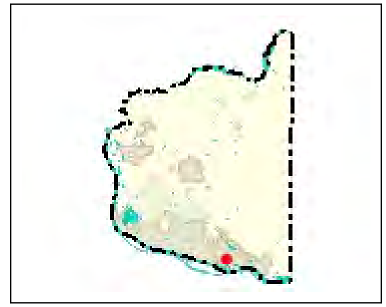
Notes:

Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

1990



Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

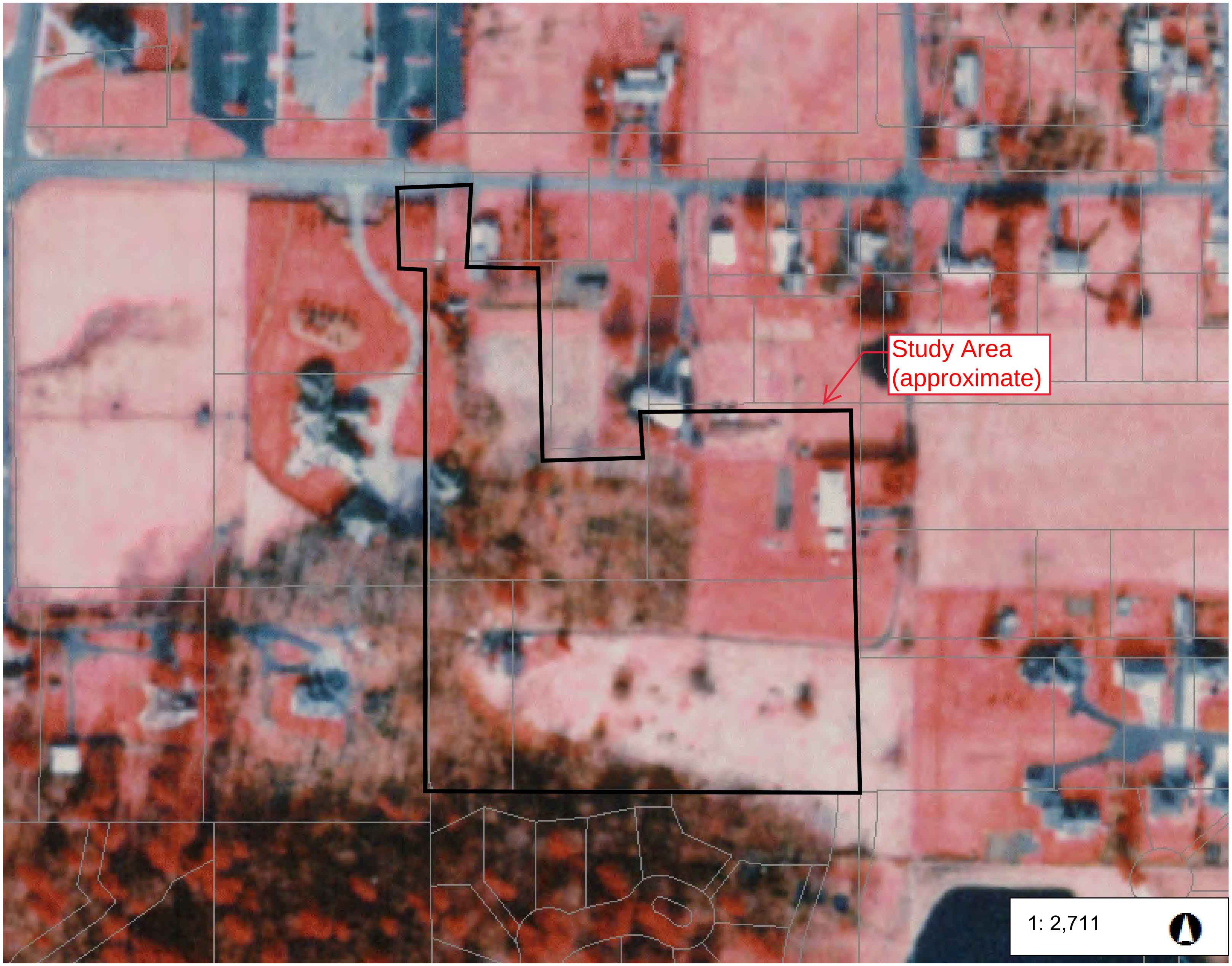
Notes:

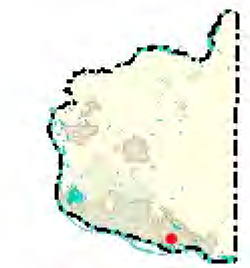
Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

1996 Infrared





Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

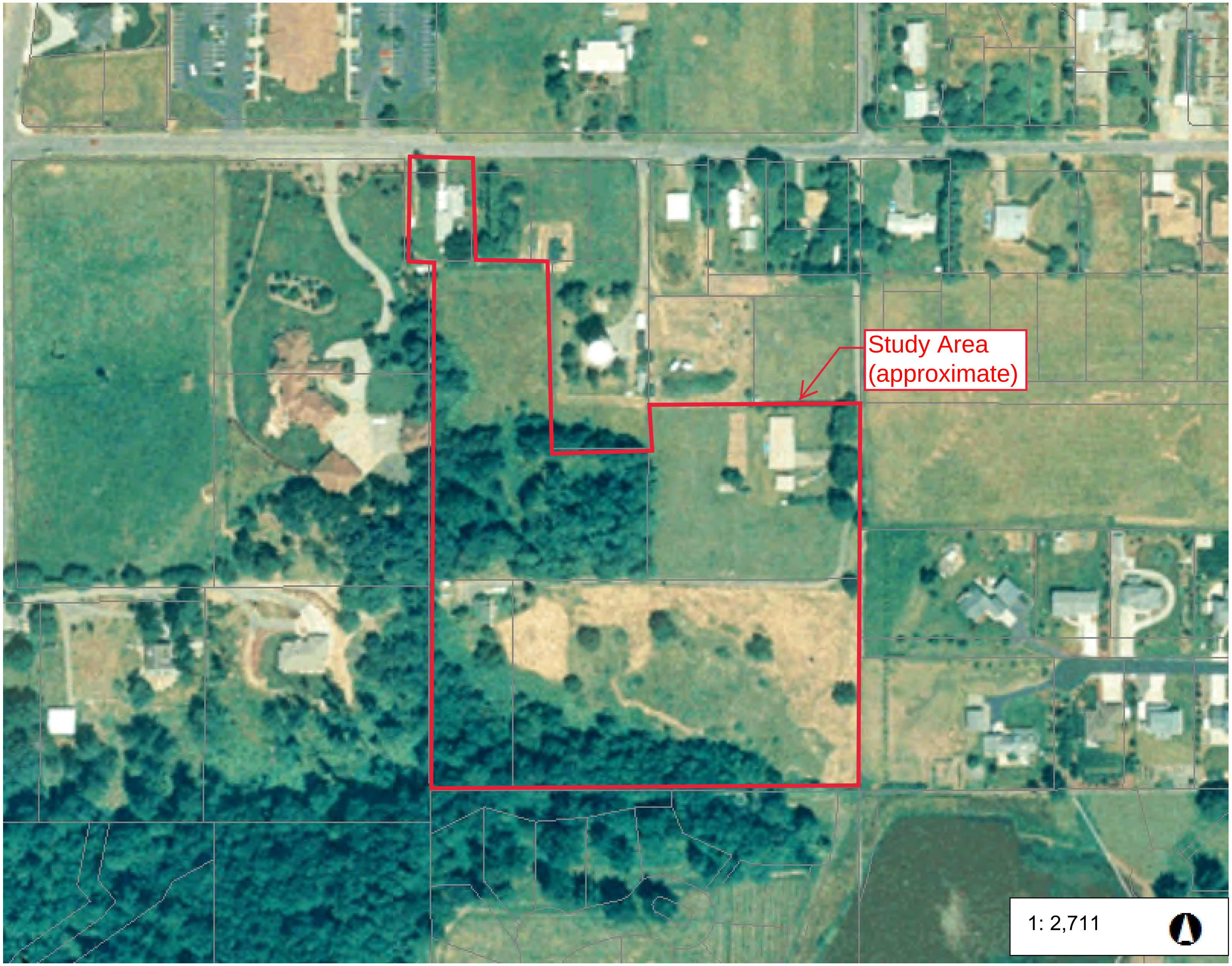
Notes:

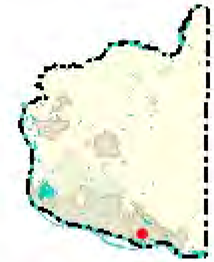
Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

1996





Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

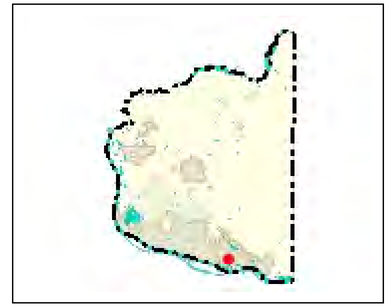
Notes:

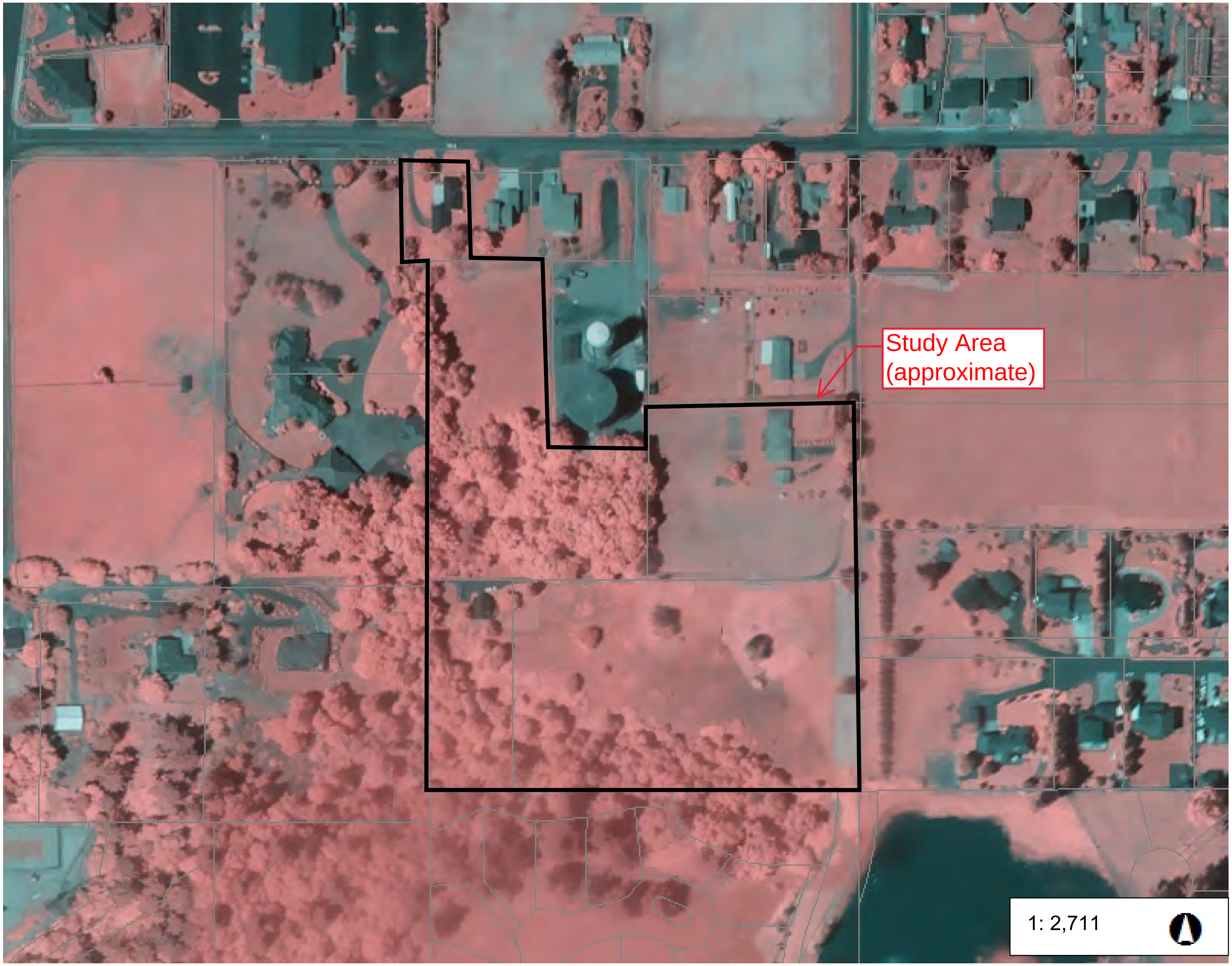
Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

June 2002 Infrared





Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

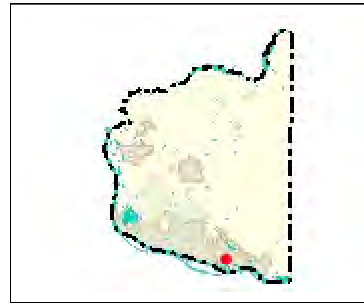
Notes:

Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

April/May 2002



Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

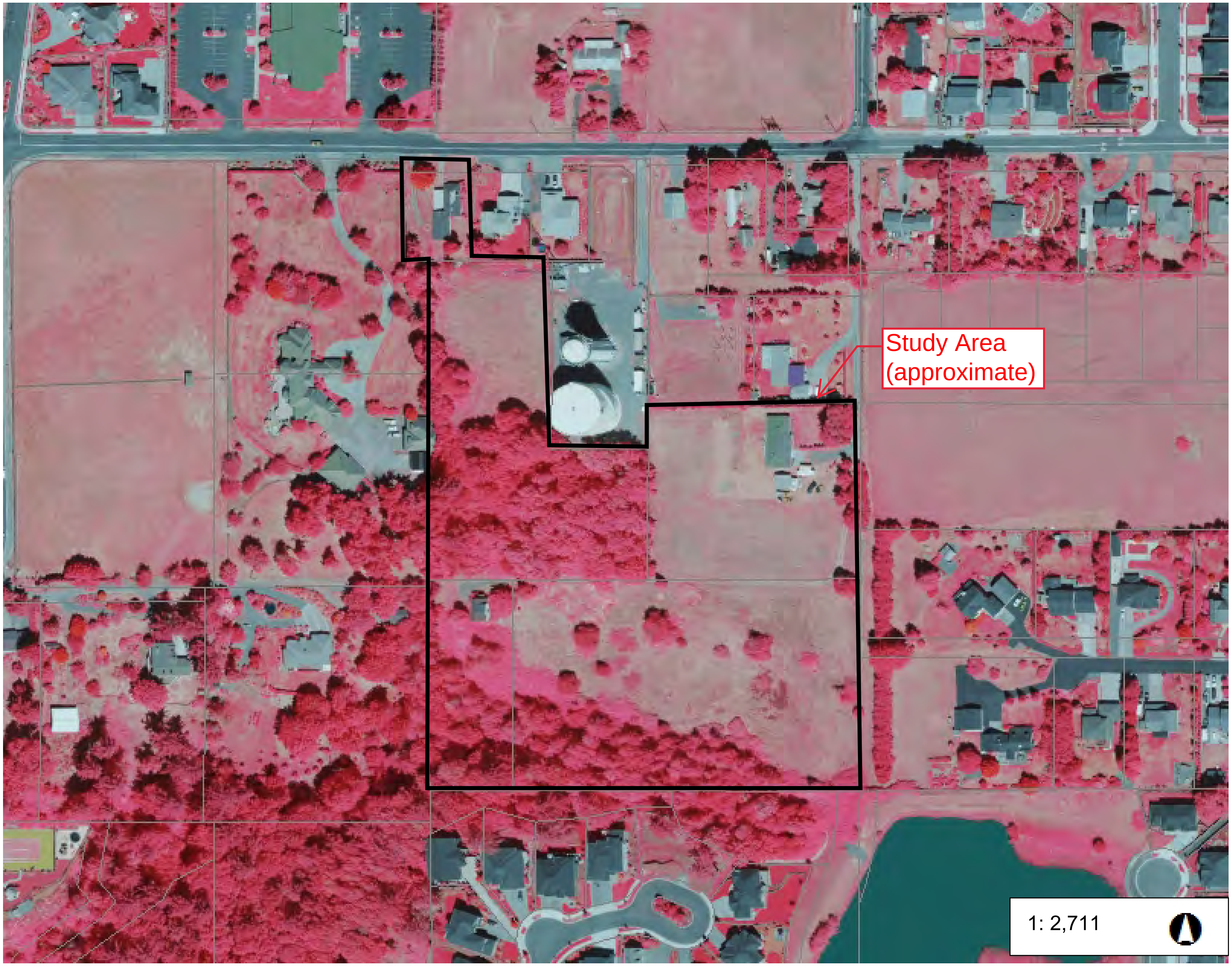
Notes:

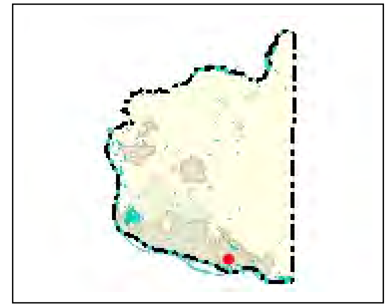
Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

July/August 2007 Infrared





Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

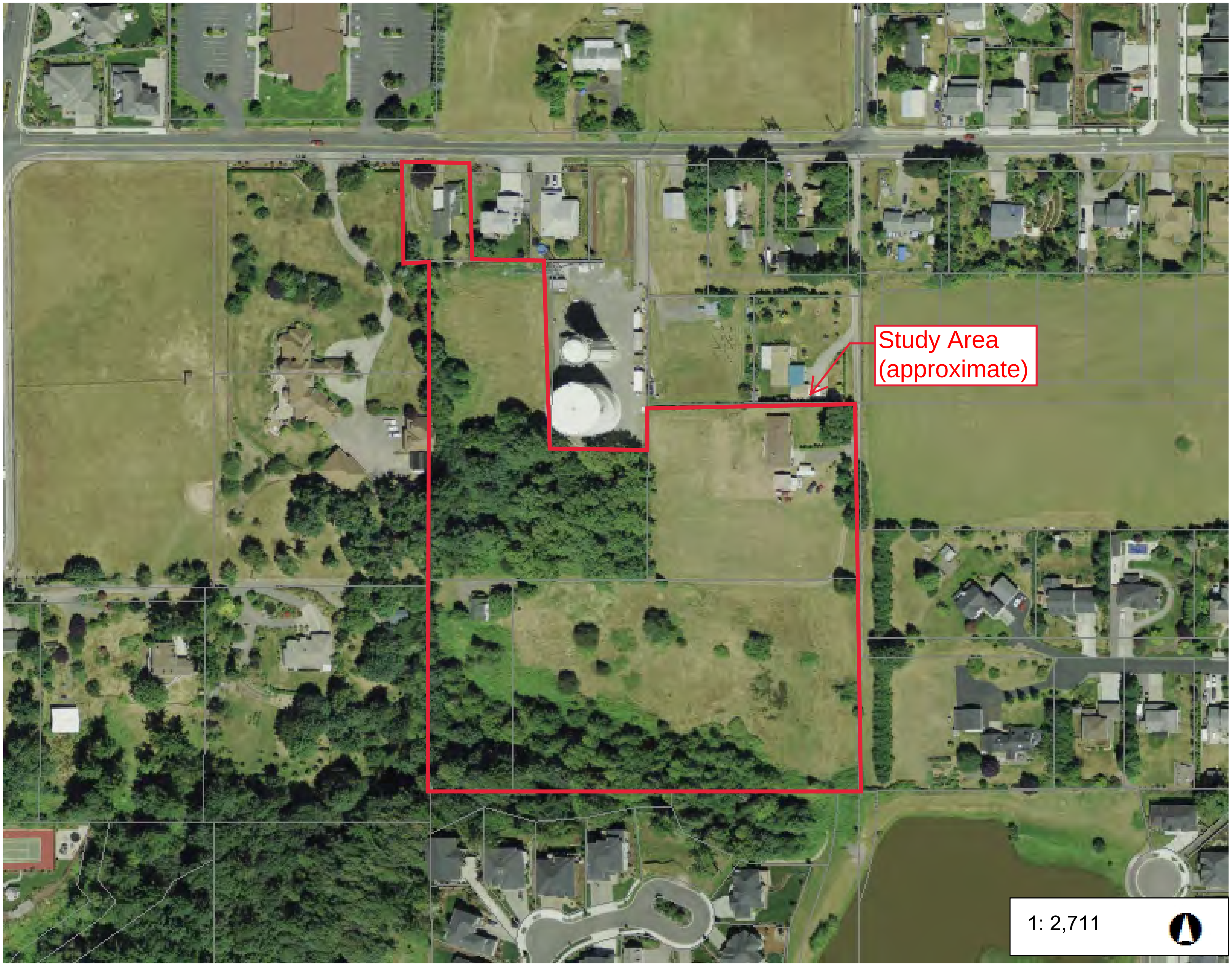
Notes:

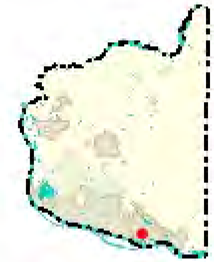
1: 2,711

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

July/August 2007





Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

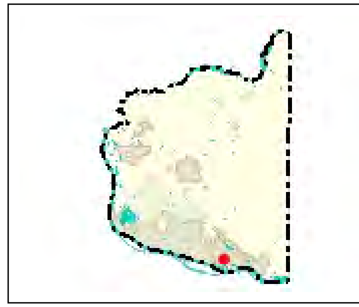
Notes:

Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

April 2012



Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

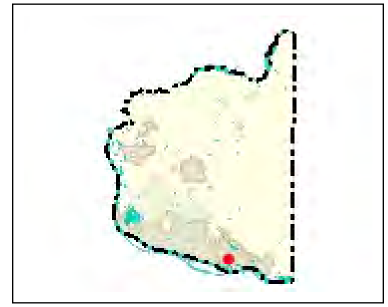
Notes:

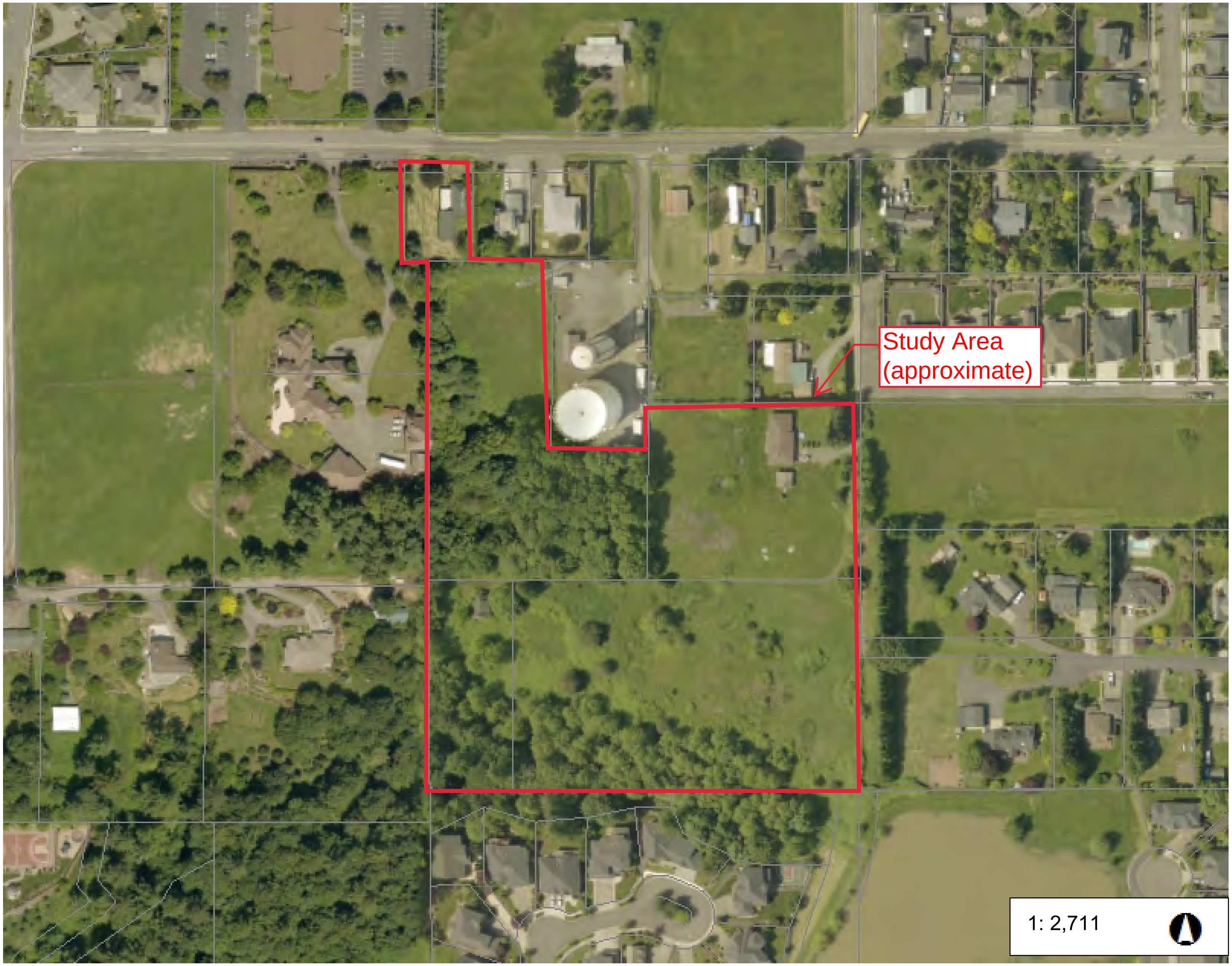
Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

May 2014





Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

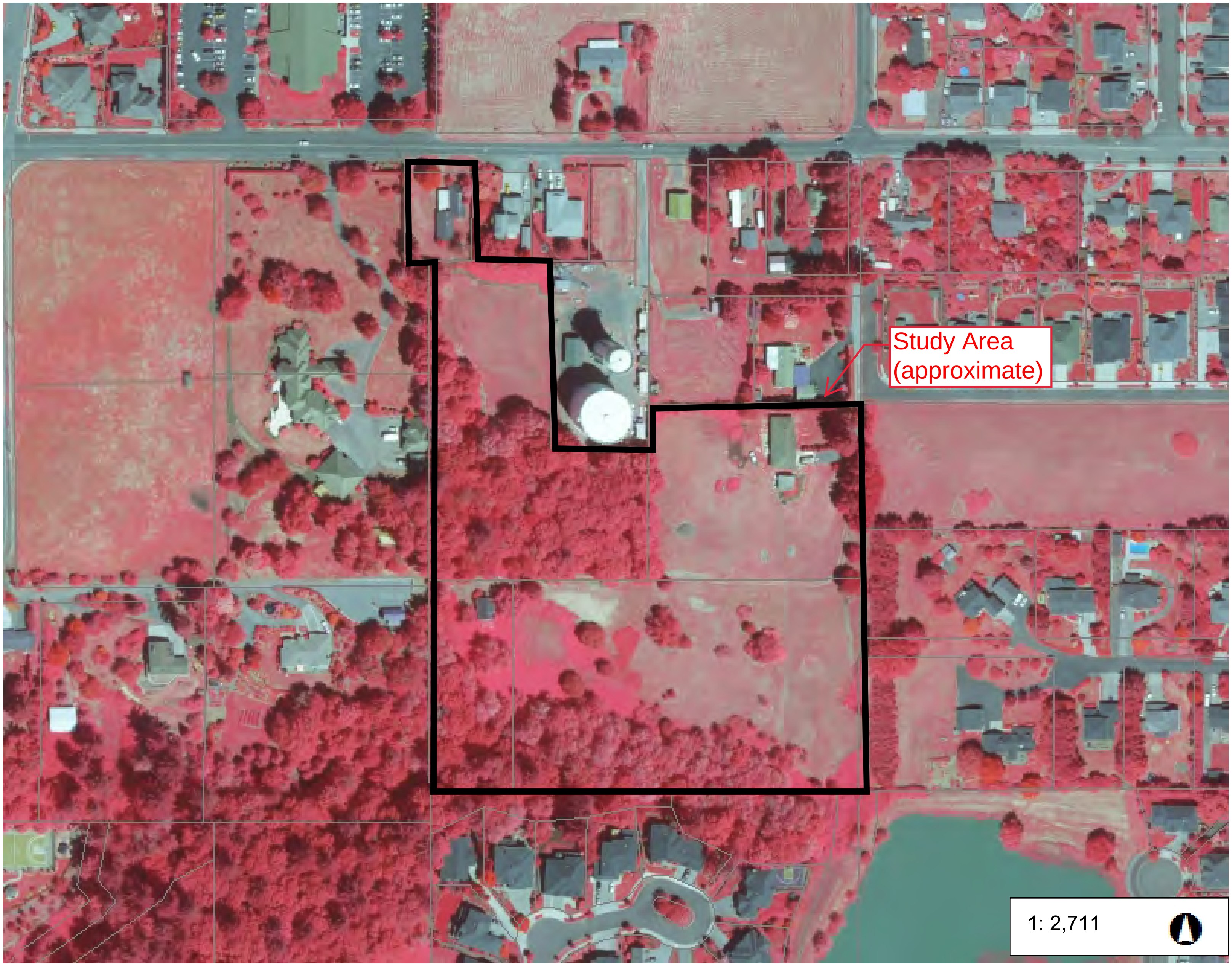
Notes:

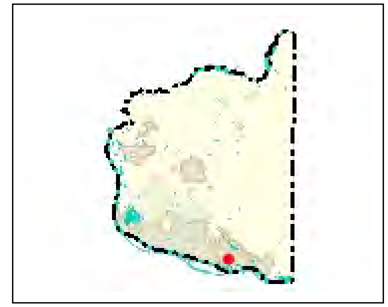
Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

July 2016 (Infrared)





Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

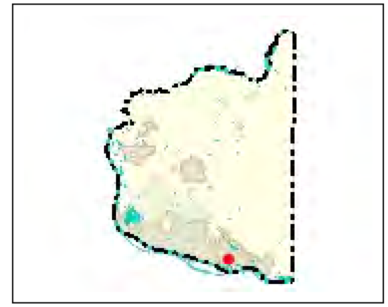
Notes:

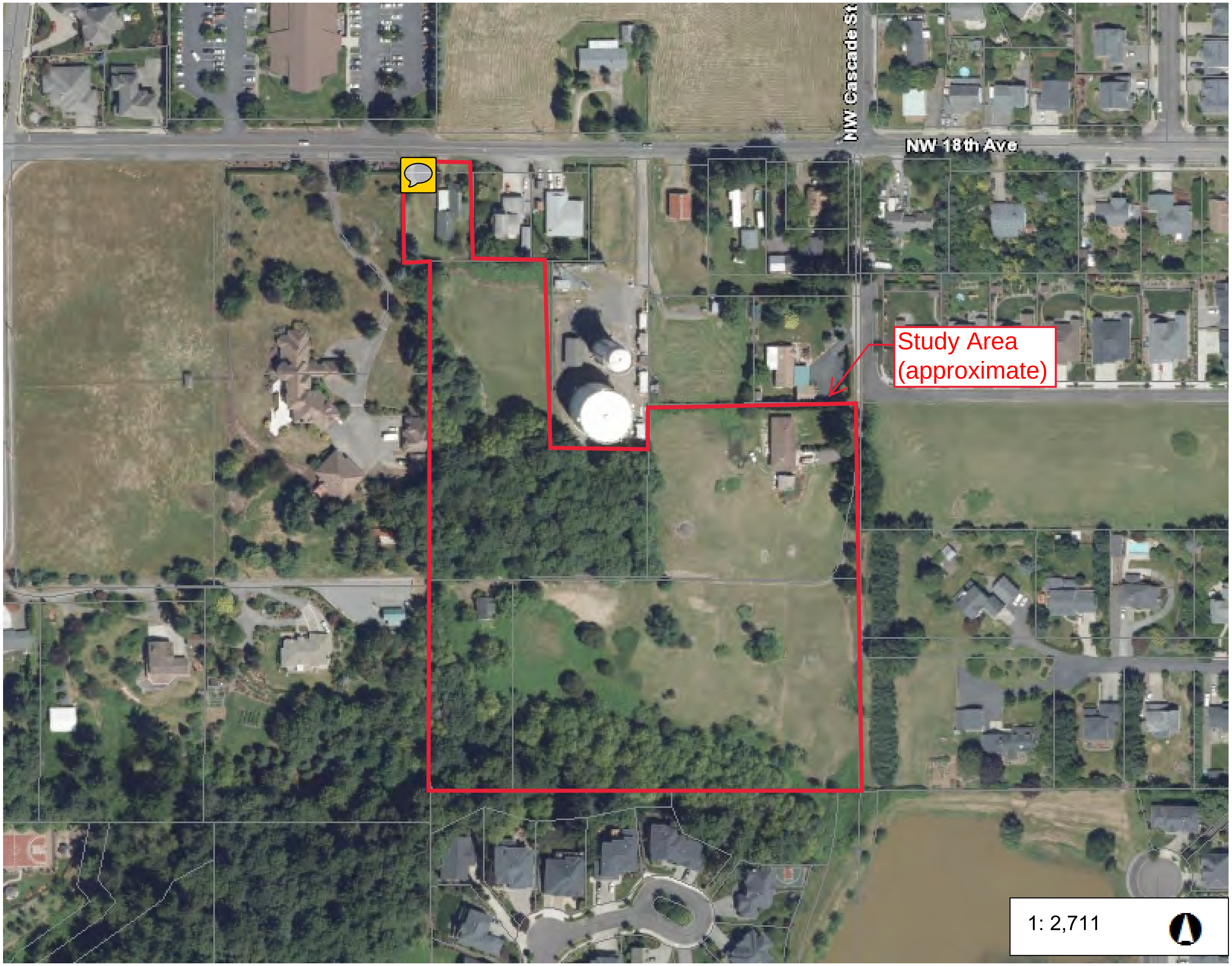
Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

July 2016





Legend

- Taxlots
- Roads
- MajorRoads
  - Interstate
  - Interstate Ramps
  - State Route
  - State Route Ramps
  - Primary Arterial
  - Arterial
  - Forest Arterial
- ImageOrtho
  - Red: Red
  - Green: Green
  - Blue: Blue
- Cities Boundaries
- Urban Growth Boundaries

Notes:

Job #5638

451.9 0 225.95 451.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov


May 2017
Hancock Springs
Job #5638
NW 18th Ave
NW Hood St
120
NW Cascade St
Study Area
(approximate)
NW 16th Ave
NW 15th Cir
Haight Reservoir
Google Earth
©2018 Google
N
400 ft

Appendix F: Precipitation Data

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

```
245
CXUS56 KPQR 071200
CF6VUO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                          STATION:   VANCOUVER WA
                                          MONTH:     MARCH
                                          YEAR:      2018
                                          LATITUDE:   45 37 N
                                          LONGITUDE: 122 39 W

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
================================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                     12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
================================================================================

 1  49  39  44  -1  21   0 0.06    M    0  5.1 14 190   M    M  10 1      19 180
 2  50  37  44  -2  21   0    T    M    0  5.3 14 210   M    M   8        24 210
 3  51  32  42  -4  23   0 0.00  0.0    0  2.1  9 260   M    M   3        12 270
 4  51  31  41  -5  24   0    T    M    0  3.0 12 160   M    M   9        16 190
 5  51  32  42  -4  23   0 0.06    M    0  1.5  8 110   M    M   8 1      11 130
 6  59  28  44  -2  21   0 0.00  0.0    0  2.0 10 300   M    M   1 1      17 290
================================================================================
SM  311  199       133   0  0.12     0.0  19.0          M       39
================================================================================
AV 51.8 33.2                               3.2 FASTST   M    M   7    MAX(MPH)
                                 MISC ---->  # 14 190              # 24  210
================================================================================
NOTES:
# LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

                                          STATION:  VANCOUVER WA
                                          MONTH:    MARCH
                                          YEAR:     2018
                                          LATITUDE:   45 37 N
                                          LONGITUDE: 122 39 W

[TEMPERATURE DATA]      [PRECIPITATION DATA]       SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 42.5   TOTAL FOR MONTH:   0.12    1 = FOG OR MIST
DPTR FM NORMAL:  -3.3   DPTR FM NORMAL:   -0.56    2 = FOG REDUCING VISIBILITY
HIGHEST:     59 ON  6   GRTST 24HR  0.06 ON  5- 5      TO 1/4 MILE OR LESS
LOWEST:      28 ON  6                              3 = THUNDER
                        SNOW, ICE PELLETS, HAIL    4 = ICE PELLETS
                        TOTAL MONTH:   0.0 INCH    5 = HAIL
                        GRTST 24HR     0.0         6 = FREEZING RAIN OR DRIZZLE
                        GRTST DEPTH:   0           7 = DUSTSTORM OR SANDSTORM:
```

```
                                                         VSBY 1/2 MILE OR LESS
                                                     8 = SMOKE OR HAZE
[NO. OF DAYS WITH]       [WEATHER - DAYS WITH]       9 = BLOWING SNOW
                                                     X = TORNADO
MAX 32 OR BELOW:   0    0.01 INCH OR MORE:   2
MAX 90 OR ABOVE:   0    0.10 INCH OR MORE:   0
MIN 32 OR BELOW:   4    0.50 INCH OR MORE:   0
MIN  0 OR BELOW:   0    1.00 INCH OR MORE:   0

[HDD (BASE 65) ]
TOTAL THIS MO.   133    CLEAR  (SCALE 0-3)   2
DPTR FM NORMAL    18    PTCLDY (SCALE 4-7)   1
TOTAL FM JUL 1  3166    CLOUDY (SCALE 8-10)  3
DPTR FM NORMAL   -63

[CDD (BASE 65) ]
TOTAL THIS MO.     0
DPTR FM NORMAL     0    [PRESSURE DATA]
TOTAL FM JAN 1     0    HIGHEST SLP M ON M
DPTR FM NORMAL     0    LOWEST  SLP 29.45 ON  1

[REMARKS]
```

Explanation of the Preliminary Monthly Climate Data (F6) Product

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

754
CXUS56 KPQR 011200
CF6VUO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: VANCOUVER WA
MONTH: FEBRUARY
YEAR: 2018
LATITUDE: 45 37 N
LONGITUDE: 122 39 W

TEMPERATURE IN F: :PCPN: SNOW: WIND :SUNSHINE: SKY :PK WND

1 DY	2 MAX	3 MIN	4 AVG	5 DEP	6A HDD	6B CDD	7 WTR	8 SNW	9 12Z DPTH	10 AVG SPD	11 MX SPD	12 2MIN DIR	13 MIN	14 PSBL	15 S-S	16 WX	17 SPD	18 DR
1	51	41	46	3	19	0	0.12	M	0	2.7	12	120	M	M	10	1	14	120
2	60	43	52	9	13	0	T	M	0	2.8	10	210	M	M	7	12	15	210
3	57	45	51	8	14	0	0.02	M	0	0.6	7	280	M	M	9	1	10	190
4	60	45	53	10	12	0	0.00	0.0	0	2.3	9	260	M	M	9		13	260
5	58	38	48	5	17	0	0.00	0.0	0	0.7	6	210	M	M	3	1	7	200
6	52	35	44	1	21	0	0.00	0.0	0	1.4	7	120	M	M	8	1	9	120
7	59	36	48	5	17	0	0.00	0.0	0	0.1	5	210	M	M	1	1	5	220
8	55	37	46	3	19	0	0.00	0.0	0	1.9	9	320	M	M	7	128	13	310
9	51	37	44	1	21	0	T	0.0	0	2.9	9	300	M	M	7		13	330
10	50	32	41	-2	24	0	0.00	0.0	0	3.1	10	290	M	M	3		13	290
11	49	34	42	-1	23	0	T	0.0	0	3.1	12	290	M	M	5		14	300
12	49	28	39	-4	26	0	0.00	0.0	0	4.6	17	80	M	M	1		25	60
13	51	23	37	-6	28	0	T	0.0	0	1.2	7	120	M	M	1		9	210
14	47	33	40	-3	25	0	0.32	M	0	2.7	14	270	M	M	8	1	17	270
15	49	38	44	1	21	0	0.07	M	0	2.1	9	270	M	M	8	1	11	250
16	50	42	46	3	19	0	0.07	M	0	5.8	12	190	M	M	10	1	17	180
17	56	42	49	5	16	0	0.07	M	0	8.6	24	260	M	M	10	1	34	240
18	43	32	38	-6	27	0	0.17	M	0	7.1	15	190	M	M	7	1	21	190
19	40	28	34	-10	31	0	0.01	M	M	2.8	13	300	M	M	7		17	270
20	34	31	33	-11	32	0	0.25	M	M	6.7	14	110	M	M	9	1	17	120
21	36	20	28	-16	37	0	0.03	M	M	2.5	12	110	M	M	4	12	14	120
22	39	29	34	-10	31	0	0.04	M	M	3.4	13	290	M	M	9	1	16	290
23	39	22	31	-13	34	0	T	M	0	6.1	16	200	M	M	6		24	220
24	49	37	43	-1	22	0	0.04	M	0	6.7	18	280	M	M	8		25	280
25	46	33	40	-5	25	0	0.18	M	0	7.1	18	300	M	M	10	1	26	260
26	44	31	38	-7	27	0	0.00	0.0	0	2.3	8	120	M	M	8	1	10	130
27	46	35	41	-4	24	0	0.06	M	0	4.6	13	200	M	M	10	1	20	210
28	46	41	44	-1	21	0	0.32	M	0	7.8	15	110	M	M	10	1	22	190
SM	1366	968			646	0	1.77		0.0	103.7			M		195			
AV	48.8	34.6								3.7	FASTST		M	M	7	MAX(MPH)		
								MISC	---->		# 24	260				#	34	240

NOTES:

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# LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

                                          STATION:  VANCOUVER WA
                                          MONTH:    FEBRUARY
                                          YEAR:     2018
                                          LATITUDE:   45 37 N
                                          LONGITUDE: 122 39 W

[TEMPERATURE DATA]      [PRECIPITATION DATA]       SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 41.7   TOTAL FOR MONTH:   1.77    1 = FOG OR MIST
DPTR FM NORMAL:  -1.8   DPTR FM NORMAL:   -2.26    2 = FOG REDUCING VISIBILITY
HIGHEST:    60 ON  4, 2 GRTST 24HR  0.32 ON 28-28      TO 1/4 MILE OR LESS
LOWEST:     20 ON 21                               3 = THUNDER
                        SNOW, ICE PELLETS, HAIL    4 = ICE PELLETS
                        TOTAL MONTH:   0.0 INCH    5 = HAIL
                        GRTST 24HR     0.0         6 = FREEZING RAIN OR DRIZZLE
                        GRTST DEPTH:   0           7 = DUSTSTORM OR SANDSTORM:
                                                       VSBY 1/2 MILE OR LESS
                                                   8 = SMOKE OR HAZE
[NO. OF DAYS WITH]      [WEATHER - DAYS WITH]      9 = BLOWING SNOW
                                                   X = TORNADO
MAX 32 OR BELOW:   0    0.01 INCH OR MORE:  15
MAX 90 OR ABOVE:   0    0.10 INCH OR MORE:   6
MIN 32 OR BELOW:  10    0.50 INCH OR MORE:   0
MIN  0 OR BELOW:   0    1.00 INCH OR MORE:   0

[HDD (BASE 65) ]
TOTAL THIS MO.   646    CLEAR  (SCALE 0-3)   5
DPTR FM NORMAL    44    PTCLDY (SCALE 4-7)  11
TOTAL FM JUL 1  3033    CLOUDY (SCALE 8-10) 12
DPTR FM NORMAL   -81

[CDD (BASE 65) ]
TOTAL THIS MO.     0
DPTR FM NORMAL     0    [PRESSURE DATA]
TOTAL FM JAN 1     0    HIGHEST SLP 30.53 ON 23
DPTR FM NORMAL     0    LOWEST  SLP 29.56 ON 28

[REMARKS]
#FINAL-02-18#
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[Explanation of the Preliminary Monthly Climate Data (F6) Product](#)

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

573
CXUS56 KPQR 112241
CF6VUO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: VANCOUVER WA
MONTH: JANUARY
YEAR: 2018
LATITUDE: 45 37 N
LONGITUDE: 122 39 W

TEMPERATURE IN F:							:PCPN:	SNOW:		WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	44	28	36	-4	29	0	0.00	0.0	0	1.7	9	260	M	M	1	12	10	260
2	44	27	36	-4	29	0	0.00	0.0	0	3.5	13	120	M	M	0		16	120
3	47	31	39	-1	26	0	0.00	0.0	0	2.2	14	120	M	M	0		19	120
4	46	34	40	-1	25	0	0.04	M	0	3.2	15	120	M	M	7		21	110
5	52	39	46	5	19	0	0.28	M	0	6.9	16	180	M	M	8	1	27	180
6	50	35	43	2	22	0	0.02	0.0	0	1.3	13	220	M	M	6	1	19	240
7	45	39	42	1	23	0	0.16	M	0	3.7	9	110	M	M	9		12	110
8	45	35	40	-1	25	0	0.08	M	0	0.4	7	240	M	M	7	1	8	220
9	49	40	45	4	20	0	0.46	M	0	2.2	9	300	M	M	9	1	13	300
10	47	42	45	4	20	0	0.05	M	0	4.0	9	110	M	M	10	1	12	120
11	58	46	52	11	13	0	0.71	M	0	8.2	18	220	M	M	10	1	28	220
12	53	48	51	10	14	0	0.14	M	M	5.6	14	190	M	M	8	1	20	220
13	58	38	48	7	17	0	0.00	M	M	1.7	7	270	M	M	4	12	8	120
14	57	34	46	4	19	0	0.00	M	M	4.1	15	120	M	M	3	12	19	120
15	57	35	46	4	19	0	0.08	M	M	5.9	22	110	M	M	2	1	29	120
16	56	40	48	6	17	0	0.05	M	0	6.0	14	120	M	M	4	1	19	120
17	52	40	46	4	19	0	0.51	M	0	8.1	17	120	M	M	6	1	23	120
18	52	42	47	5	18	0	0.16	M	0	6.4	13	120	M	M	8	1	20	150
19	48	41	45	3	20	0	0.04	M	0	7.7	15	200	M	M	9		25	210
20	49	43	46	4	19	0	T	M	0	7.1	14	180	M	M	10		21	170
21	51	43	47	5	18	0	0.17	M	0	7.8	17	170	M	M	7	1	28	180
22	49	42	46	4	19	0	0.19	M	0	4.1	10	110	M	M	8	1	14	210
23	48	41	45	3	20	0	0.70	M	0	9.2	15	110	M	M	9	1	20	110
24	52	42	47	5	18	0	0.63	M	0	6.9	16	200	M	M	10	1	26	220
25	47	39	43	1	22	0	0.28	M	0	7.4	15	190	M	M	7	1	23	220
26	48	41	45	3	20	0	0.21	M	0	8.1	15	210	M	M	8	1	23	230
27	53	42	48	6	17	0	0.22	M	0	7.1	15	110	M	M	10	1	22	210
28	56	48	52	10	13	0	T	M	0	6.8	13	120	M	M	7	1	16	120
29	54	46	50	8	15	0	0.40	M	0	7.7	18	200	M	M	5	1	27	220
30	50	35	43	1	22	0	0.01	M	0	2.5	12	260	M	M	7		14	270
31	48	38	43	1	22	0	T	0.0	0	1.2	7	110	M	M	9	1	8	130
SM	1565	1214			619	0	5.59	0.0		158.7			M		208			
AV	50.5	39.2								5.1	FASTST		M	M	7		MAX(MPH)	

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                                         MISC ---->  # 22 110              # 29  120
================================================================================
NOTES:
# LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

                                          STATION:  VANCOUVER WA
                                          MONTH:    JANUARY
                                          YEAR:     2018
                                          LATITUDE:   45 37 N
                                          LONGITUDE: 122 39 W

[TEMPERATURE DATA]      [PRECIPITATION DATA]       SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 44.8   TOTAL FOR MONTH:   5.59    1 = FOG OR MIST
DPTR FM NORMAL:   3.2   DPTR FM NORMAL:    0.09    2 = FOG REDUCING VISIBILITY
HIGHEST:    58 ON 13,11 GRTST 24HR  0.71 ON 11-11      TO 1/4 MILE OR LESS
LOWEST:     27 ON  2                               3 = THUNDER
                        SNOW, ICE PELLETS, HAIL    4 = ICE PELLETS
                        TOTAL MONTH:   0.0 INCH    5 = HAIL
                        GRTST 24HR     0.0         6 = FREEZING RAIN OR DRIZZLE
                        GRTST DEPTH:   0           7 = DUSTSTORM OR SANDSTORM:
                                                       VSBY 1/2 MILE OR LESS
                                                   8 = SMOKE OR HAZE
[NO. OF DAYS WITH]      [WEATHER - DAYS WITH]      9 = BLOWING SNOW
                                                   X = TORNADO
MAX 32 OR BELOW:   0    0.01 INCH OR MORE:  23
MAX 90 OR ABOVE:   0    0.10 INCH OR MORE:  15
MIN 32 OR BELOW:   3    0.50 INCH OR MORE:   4
MIN  0 OR BELOW:   0    1.00 INCH OR MORE:   0

[HDD (BASE 65) ]
TOTAL THIS MO.   619    CLEAR  (SCALE 0-3)   5
DPTR FM NORMAL  -108    PTCLDY (SCALE 4-7)  13
TOTAL FM JUL 1  2387    CLOUDY (SCALE 8-10) 13
DPTR FM NORMAL  -125

[CDD (BASE 65) ]
TOTAL THIS MO.     0
DPTR FM NORMAL     0    [PRESSURE DATA]
TOTAL FM JAN 1     0    HIGHEST SLP 30.43 ON 13
DPTR FM NORMAL     0    LOWEST  SLP 29.60 ON  9

[REMARKS]
#FINAL-01-18#
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Explanation of the Pr eliminary Monthly Climate Data (F6) Pr oduct

These data ar e pr eliminary and have not undergone final quality contr ol by the National Climatic Data Center (NCDC). Ther efore, these data ar e subject to r evision. Final and certified climate data can be accessed at the NCDC - http://www .ncdc.noaa.gov .

WFO Monthly/Daily Climate Data

360
CXUS56 KPQR 011200
CF6VUO
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: VANCOUVER WA
MONTH: DECEMBER
YEAR: 2017
LATITUDE: 45 37 N
LONGITUDE: 122 39 W

TEMPERATURE IN F:							:PCPN:	SNOW:		WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	50	45	48	5	17	0	0.02	M	0	4.0	10	210	M	M	10		17	220
2	49	44	47	5	18	0	0.29	M	0	5.1	10	180	M	M	10	1	16	170
3	47	35	41	-1	24	0	0.07	M	0	1.5	8	270	M	M	9	1	9	210
4	45	35	40	-2	25	0	T	M	0	1.8	8	270	M	M	7		10	340
5	50	31	41	-1	24	0	0.00	0.0	0	2.1	9	100	M	M	2	2	13	100
6	55	31	43	1	22	0	0.00	0.0	0	9.9	23	100	M	M	0		37	120
7	52	28	40	-1	25	0	0.00	0.0	0	6.2	16	120	M	M	0		22	120
8	45	27	36	-5	29	0	0.00	0.0	0	3.1	13	130	M	M	0		17	120
9	46	24	35	-6	30	0	0.00	0.0	0	3.3	15	120	M	M	0		20	130
10	46	23	35	-6	30	0	0.00	0.0	0	2.6	14	120	M	M	0		19	140
11	45	23	34	-7	31	0	0.00	0.0	0	3.4	15	120	M	M	0		20	130
12	45	22	34	-7	31	0	T	M	0	1.3	8	130	M	M	2		10	120
13	45	26	36	-4	29	0	0.00	0.0	0	2.6	13	110	M	M	0		16	110
14	44	26	35	-5	30	0	0.00	0.0	0	4.4	13	120	M	M	0		16	120
15	40	28	34	-6	31	0	0.01	M	0	1.0	13	120	M	M	7	18	16	120
16	45	34	40	0	25	0	0.02	M	0	1.6	6	110	M	M	10	1	8	120
17	49	42	46	6	19	0	0.00	0.0	0	5.2	9	110	M	M	9	1	13	110
18	53	47	50	10	15	0	0.01	M	0	4.0	12	200	M	M	10	1	16	190
19	53	40	47	7	18	0	0.66	M	0	8.4	20	180	M	M	10	1	32	150
20	46	27	37	-3	28	0	0.03	M	0	3.8	12	290	M	M	4	1	19	230
21	36	24	30	-10	35	0	0.00	0.0	0	1.2	7	110	M	M	7	12	9	110
22	40	34	37	-3	28	0	0.38	M	0	2.9	8	130	M	M	10	1	10	140
23	41	30	36	-4	29	0	0.17	M	0	4.7	13	100	M	M	7	1	20	110
24	34	29	32	-8	33	0	0.21	M	0	6.3	14	110	M	M	7	16	19	120
25	33	29	31	-9	34	0	0.08	M	0	3.9	12	130	M	M	10	16	16	120
26	35	25	30	-10	35	0	0.02	M	0	1.9	13	110	M	M	7	1	16	120
27	37	32	35	-5	30	0	0.01	M	0	3.1	9	110	M	M	10	16	12	110
28	53	37	45	5	20	0	0.64	M	0	6.8	14	120	M	M	10	1	17	120
29	56	48	52	12	13	0	0.52	M	0	8.5	20	180	M	M	9	1	32	200
30	52	32	42	2	23	0	0.00	0.0	0	1.5	7	240	M	M	5	12	11	240
31	50	28	39	-1	26	0	0.00	0.0	0	2.7	12	110	M	M	2	12	15	120
SM	1417	986			807	0	3.14	0.0		118.8			M		174			
AV	45.7	31.8								3.8	FASTST		M	M	6		MAX(MPH)	

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                                        MISC ---->  # 23 100              # 37  120
================================================================================
NOTES:
# LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

                                          STATION:  VANCOUVER WA
                                          MONTH:    DECEMBER
                                          YEAR:     2017
                                          LATITUDE:   45 37 N
                                          LONGITUDE: 122 39 W

[TEMPERATURE DATA]      [PRECIPITATION DATA]       SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 38.8   TOTAL FOR MONTH:   3.14    1 = FOG OR MIST
DPTR FM NORMAL:  -1.8   DPTR FM NORMAL:   -3.63    2 = FOG REDUCING VISIBILITY
HIGHEST:    56 ON 29    GRTST 24HR  0.66 ON 19-19      TO 1/4 MILE OR LESS
LOWEST:     22 ON 12                               3 = THUNDER
                        SNOW, ICE PELLETS, HAIL    4 = ICE PELLETS
                        TOTAL MONTH:   0.0 INCH    5 = HAIL
                        GRTST 24HR     0.0         6 = FREEZING RAIN OR DRIZZLE
                        GRTST DEPTH:   0           7 = DUSTSTORM OR SANDSTORM:
                                                       VSBY 1/2 MILE OR LESS
                                                   8 = SMOKE OR HAZE
[NO. OF DAYS WITH]      [WEATHER - DAYS WITH]      9 = BLOWING SNOW
                                                   X = TORNADO
MAX 32 OR BELOW:   0    0.01 INCH OR MORE:  16
MAX 90 OR ABOVE:   0    0.10 INCH OR MORE:   7
MIN 32 OR BELOW:  20    0.50 INCH OR MORE:   3
MIN  0 OR BELOW:   0    1.00 INCH OR MORE:   0

[HDD (BASE 65) ]
TOTAL THIS MO.   807    CLEAR  (SCALE 0-3)  11
DPTR FM NORMAL    51    PTCLDY (SCALE 4-7)   8
TOTAL FM JUL 1  1768    CLOUDY (SCALE 8-10) 12
DPTR FM NORMAL   -17

[CDD (BASE 65) ]
TOTAL THIS MO.     0
DPTR FM NORMAL     0    [PRESSURE DATA]
TOTAL FM JAN 1   639    HIGHEST SLP 30.59 ON  6
DPTR FM NORMAL   265    LOWEST  SLP 29.62 ON 19

[REMARKS]
#FINAL-12-17#
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WETS Table

WETS Station: VANCOUVER 4 NNE, WA								
Requested years: 1971 - 2000								
Month	Avg Max Temp	Avg Min Temp	Avg Mean Temp	Avg Precip	30% chance precip less than	30% chance precip more than	Avg number days precip 0.10 or more	Avg Snowfall
Jan	45.7	31.5	38.6	5.69	3.74	6.83	12	2.3
Feb	49.9	33.2	41.6	4.83	3.44	5.72	12	1.1
Mar	55.0	36.3	45.6	4.21	3.32	4.85	12	0.2
Apr	59.8	39.2	49.5	3.07	2.23	3.62	10	0.0
May	66.0	44.5	55.2	2.64	1.69	3.18	7	0.0
Jun	71.3	49.1	60.2	1.76	1.16	2.11	5	0.0
Jul	77.3	52.6	64.9	0.80	0.34	0.93	2	0.0
Aug	78.1	51.9	65.0	1.06	0.41	1.25	3	0.0
Sep	73.8	46.9	60.3	1.76	0.79	2.06	4	0.0
Oct	63.3	40.4	51.8	3.18	1.87	3.87	8	0.0
Nov	51.8	36.6	44.2	6.18	4.15	7.39	14	0.2
Dec	45.5	32.3	38.9	6.35	4.44	7.54	13	0.9
Annual:					36.41	43.38		
Average	61.5	41.2	51.3	-	-	-	-	-
Total	-	-	-	41.51			103	4.7

GROWING SEASON DATES			
Years with missing data:	24 deg = 3	28 deg = 2	32 deg = 2
Years with no occurrence:	24 deg = 0	28 deg = 0	32 deg = 0
Data years used:	24 deg = 27	28 deg = 28	32 deg = 28
Probability	24 F or higher	28 F or higher	32 F or higher
50 percent *	2/11 to 11/30: 292 days	3/30 to 11/9: 224 days	4/19 to 10/15: 179 days
70 percent *	2/3 to 12/9: 309 days	3/23 to 11/16: 238 days	4/14 to 10/21: 190 days
* Percent chance of the growing season occurring between the Beginning and Ending dates.			

STATS TABLE - total precipitation (inches)													
Yr	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annl
1856	5.00	3.07	1.01	4.01	4.08	M3.36	2.89	0.08	2.37	4.81	6.62	15.37	52.67
1857													
1858													
1859													
1860													
1861													
1862													
1863													
1864													
1865													
1866													
1867													
1868													

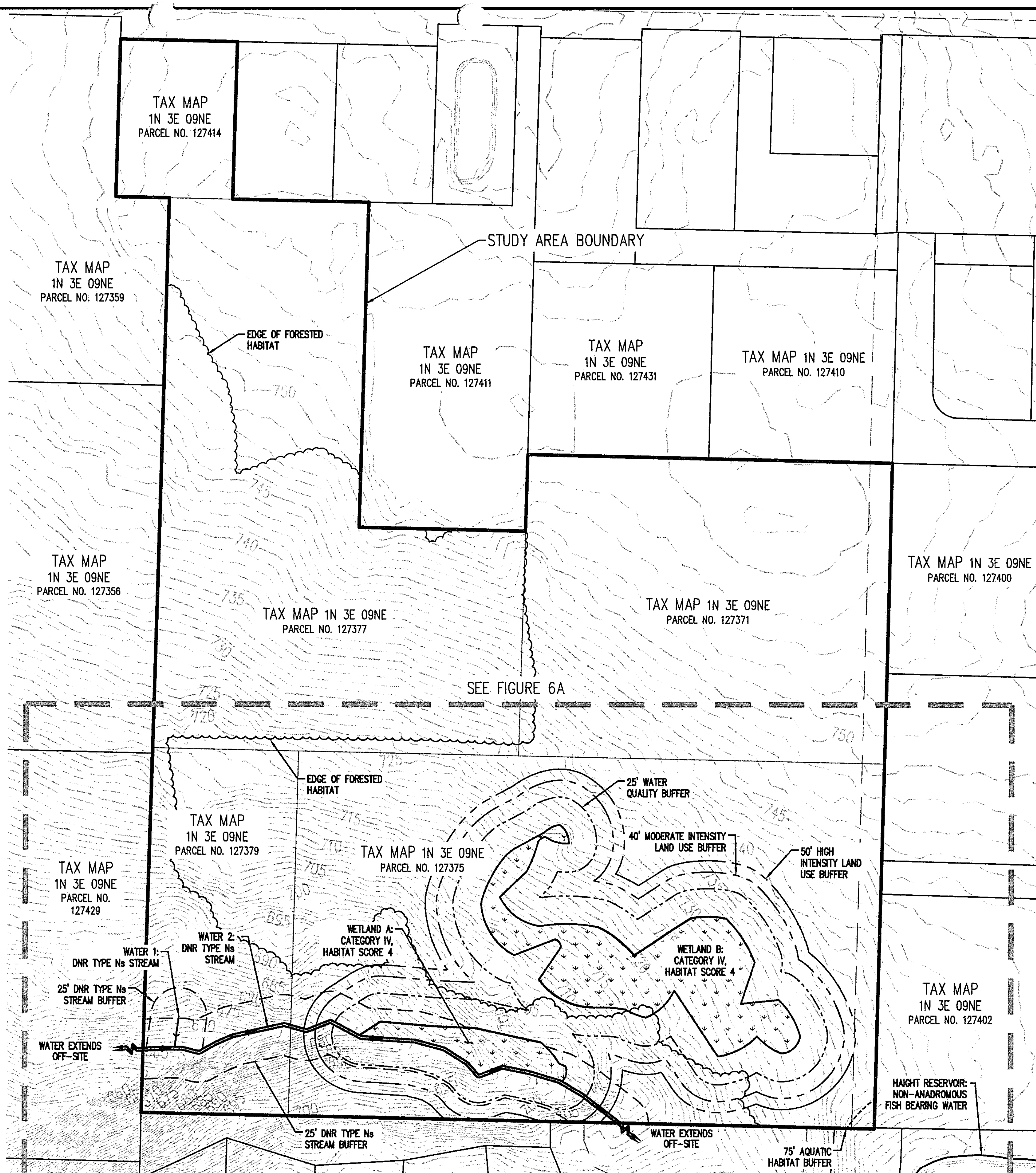
1869													
1870													
1871													
1872													
1873													
1874													
1875													
1876													
1877													
1878													
1879													
1880													
1881													
1882													
1883													
1884													
1885													
1886													
1887													
1888													
1889													
1890													
1891								1.30	M3.40	M4.52	M6.50	M9.33	25.05
1892	M4.22	M2.35	2.49										9.06
1893													
1894													
1895													
1896													
1897													
1898					2.42	2.01	0.85	0.18	2.89	1.84	5.48	4.49	20.16
1899	6.46	4.39	2.46	3.75	4.00	1.20	0.10	3.03	1.83	5.05	9.07	5.86	47.20
1900	4.00	3.90	4.55	2.13	4.40	2.66	0.82	0.32	1.96	4.25	4.34	7.10	40.43
1901	6.66	6.70	4.71	3.36	2.29	1.89	0.18	0.18	3.07	1.10	6.74	3.68	40.56
1902	3.86	9.14	4.76	3.14	2.28	0.75	1.94	0.31	1.92	1.74	10.00	11.13	50.97
1903	5.29	1.84	4.07	2.40	1.71	2.06	0.37	0.56	1.58	2.26	9.34	2.77	34.25
1904	4.49	9.13	7.69	2.44	1.16	0.39	0.51	0.15	0.21	2.23	7.21	6.82	42.43
1905	4.46	1.95	4.05	1.54	3.36	2.40	0.24	0.18	2.53	4.15	2.97	5.47	33.30
1906	4.90	5.90	2.47	1.63	2.41	3.34	T	0.05	2.09	3.25	9.42	6.92	42.38
1907	6.55	4.67	2.67	2.81	1.56	1.80	0.99	1.38	2.17	0.68	5.77	8.81	39.86
1908	4.20	2.80	3.85	3.05	4.31	0.80	0.08	1.68	0.16	4.40	3.26	4.18	32.77
1909	9.33	6.26	2.10	0.87	1.91	0.14	2.41	0.07	1.41	2.43	12.79	4.52	44.24
1910	6.47	5.74	2.17	3.41	2.11	1.20	0.02	0.29	1.34	3.42	8.78	3.59	38.54
1911	7.50	2.90	0.70	1.68	4.08	1.07	0.11	0.76	4.88	1.07	2.28	3.82	30.85
1912	7.98	4.20	0.72	1.85	1.55	3.13	0.88	3.57	1.40	2.76	5.35	6.10	39.49
1913	5.36	1.06	3.30	2.51	1.79	3.49	0.27	0.29	2.41	3.29	5.91	3.68	33.36
1914	11.22	3.68	2.07	3.22	1.31	1.99	0.02	0.00	2.	3.	3.32	2.41	35.

									81	10			15
1915	4.54	4.09	2.85	2.56	2.70	1.05	1.74	0.03	0.55	1.99	9.71	8.85	40.66
1916	4.02	8.34	8.38	2.43	2.02	1.86	3.15	0.19	1.12	0.99	5.38	3.34	41.22
1917	1.69	2.43	3.89	4.81	1.99	1.30	T	T	2.33	0.10	3.88	11.92	34.34
1918	4.86	6.43	3.32	0.76	1.34	0.12	0.74	0.91	0.44	4.95	5.70	3.19	32.76
1919	8.13	6.63	3.09	3.78	2.12	0.89	0.13	0.03	3.79	1.35	6.71	5.13	41.78
1920	4.09	0.17	3.28	5.03	0.82	2.43	1.36	1.20	3.94	3.70	5.36	6.70	38.08
1921	6.64	6.53	4.51	1.56	0.64	1.41	0.03	0.35	3.07	3.01	9.06	2.90	39.71
1922	2.42	3.62	4.56	2.37	1.23	0.12	0.00	3.64	1.89	4.91	2.33	M6.95	34.04
1923	M7.03	1.85	1.63	1.18	1.74	1.33	2.05	0.30	0.47	1.55	3.73	5.46	28.32
1924	3.95	5.00	1.60	0.78	0.38	0.59	0.09	0.82	2.14	5.06	5.84	4.40	30.65
1925	5.85	5.35	1.74	2.67	1.00	0.84	T	0.69	4.46	0.05	5.37	5.45	33.47
1926	3.63	8.15	0.74	1.07	3.87	0.34	0.00	2.98	1.87	4.63	9.25	5.25	41.78
1927	7.40	5.71	1.74	1.45	1.53	1.80	0.07	0.17	4.35	2.87	7.45	2.09	36.63
1928	5.48	0.92	6.01	3.97	0.75	0.87	0.37	T	0.75	1.93	4.99	6.11	32.15
1929	2.68	0.93	2.50	3.61	1.28	2.40	0.07	0.25	0.51	0.87	0.73	8.05	23.88
1930	3.09	4.93	1.38	2.90	2.14	0.97	T	0.01	1.52	1.79	2.64	3.07	24.44
1931	4.73	2.24	6.53	2.02	1.04	3.29	T	0.01	1.75	3.92	5.28	7.16	37.97
1932	4.93	1.99	5.20	2.63	1.58	0.07	0.43	0.72	0.03	3.51	7.47	6.47	35.03
1933	6.22	2.99	7.70	1.37	3.56	2.41	T	1.41	2.68	3.80	2.30	15.04	49.48
1934	6.04	1.36	3.17	2.53	1.44	0.91	0.22	0.20	1.73	4.92	9.57	8.21	40.30
1935	3.92	2.77	4.94	2.94	0.28	0.74	0.30	0.22	1.08	2.23	2.58	4.99	26.99
1936	7.72	4.24	2.46	0.65	3.14	2.41	1.10	0.13	1.06	0.40	0.58	8.91	32.80
1937	3.43	6.41	3.37	6.37	1.02	3.80	0.09	1.88	1.74	2.20	8.88	12.83	52.02
1938	4.43	5.86	5.40	2.21	0.39	0.80	0.18	0.29	0.98	2.46	3.86	4.12	30.98
1939	4.89	4.66	2.23	0.39	1.39	1.69	0.77	1.38	0.44	2.42	1.77	8.61	30.64
1940	2.88	10.52	4.26	3.43	1.95	0.00	0.74	0.08	3.54	4.59	4.12	4.59	40.70
1941	5.60	1.90	1.80	1.57	4.32	1.20	0.05	1.58	2.53	2.36	5.48	10.19	38.58
1942	3.45	4.10	1.44	1.98	2.60	2.35	1.26	0.72	0.05	2.64	12.92	8.00	41.51
1943	5.56	4.06	5.92	1.62	1.71	3.52	0.37	1.28	0.15	5.48	2.18	2.71	34.56
1944	2.85	3.59	2.12	3.07	1.16	1.38	0.21	0.03	2.64	1.23	5.58	1.88	25.74
1945	4.44	5.06	5.49	2.67	4.49	0.20	0.42	0.48	4.01	2.39	9.40	5.97	45.02
1946	5.19	5.21	3.95	1.05	1.30	2.69	0.93	0.18	1.90	5.18	7.81	6.26	41.65
1947	3.97	2.97	4.39	2.32	0.16	3.03	1.30	0.23	1.03	7.00	4.77	4.52	35.69
1948	6.17	4.76	3.10	3.67	4.03	1.88	0.59	2.23	3.	2.	6.63	7.89	46.

									37	35			67
1949	1.23	8.84	3.03	0.68	2.09	0.82	0.63	0.16	0.87	2.24	5.04	4.52	30.15
1950	9.07	6.41	4.83	3.10	0.71	2.07	1.02	0.66	1.30	6.89	8.89	7.70	52.65
1951	8.04	5.30	3.86	1.81	1.96	0.05	0.65	0.03	3.08	6.56	6.67	5.33	43.34
1952	4.71	3.66	4.19	1.20	1.09	2.57	T	0.16	0.41	0.72	1.05	7.41	27.17
1953	12.81	3.63	3.49	2.05	2.78	2.65	0.08	2.05	0.98	3.74	6.89	8.22	49.37
1954	9.19	4.97	2.29	2.52	2.04	3.44	0.57	1.70	1.47	3.17	6.28	4.48	42.12
1955	2.27	2.86	2.97	4.19	1.37	1.64	0.99	0.01	2.77	7.25	8.08	10.13	44.53
1956	11.41	3.06	M4.17	0.91	1.67	2.16	0.00	2.40	1.81	4.98	1.98	3.78	38.33
1957	2.51	4.81	7.83	1.82	2.72	1.28	0.09	0.63	0.69	4.28	2.93	7.44	37.03
1958	7.50	5.62	1.92	3.94	1.30	3.46	M0.00	0.02	1.07	1.57	7.47	5.32	39.19
1959	9.14	4.99	3.57	0.64	3.66	3.09	0.92	0.12	2.63	3.77	3.71	3.62	39.86
1960	4.71	4.04	4.17	3.87	3.71	0.70	T	1.24	1.45	3.03	9.10	3.40	39.42
1961	4.90	9.25	6.09	4.62	3.35	0.59	0.41	0.74	0.79	3.44	4.79	6.87	45.84
1962	1.70	3.82	4.30	3.11	3.33	0.89	0.08	1.61	1.65	3.87	10.35	3.19	37.90
1963	1.18	5.35	5.11	4.40	2.77	2.34	1.48	1.27	1.59	3.11	6.09	5.41	40.10
1964	10.06	0.81	2.71	1.68	1.36	2.11	0.90	1.17	1.75	1.03	9.70	11.50	44.78
1965	8.47	2.39	0.87	2.77	1.35	0.77	0.50	1.17	T	1.84	5.43	6.31	31.87
1966	7.54	2.10	5.57	0.94	1.12	0.72	1.74	0.28	2.17	3.25	5.29	7.63	38.35
1967	7.46	2.04	4.61	2.10	0.56	0.96	0.00	T	1.00	6.10	2.11	M4.27	31.21
1968	5.64	6.79	2.90	2.14	3.29	2.85	0.27	5.11	3.53	6.38	6.54	11.15	56.59
1969	9.91	3.42	1.13	2.78	1.56	2.96	0.26	0.02	4.82	4.12	3.24	8.93	43.15
1970	12.84	5.38	2.50	2.75	1.74	0.32	0.19	0.02	1.99	2.97	6.75	8.06	45.51
1971	7.48	3.90	5.74	2.87	1.06	2.02	0.22	0.86	3.78	2.97	6.45	9.94	47.29
1972	6.04	4.61	6.75	3.75	2.37	0.91	0.64	0.74	2.30	0.78	5.02	9.45	43.36
1973	4.51	2.21	2.84	1.28	2.31	1.90	0.11	0.72	3.28	3.39	12.92	10.44	45.91
1974	9.02	5.18	5.84	3.06	2.40	0.88	2.91	0.18	0.22	2.25	7.24	6.94	46.12
1975	8.55	5.74	4.04	2.13	1.64	1.13	0.54	2.68	0.00	6.35	3.97	7.37	44.14
1976	5.50	5.08	3.06	2.58	2.78	0.98	1.12	3.66	1.02	1.87	1.13	1.64	30.42
1977	1.35	2.33	3.57	0.97	4.16	1.45	0.40	3.05	3.80	2.45	5.64	8.87	38.04
1978	5.15	4.68	1.83	4.16	3.94	1.22	1.35	2.90		1.09	3.54	3.60	33.46
1979	2.92	7.19	2.73	3.78	2.15	0.71	0.41	1.62	2.34	5.79	3.80	6.75	40.19
1980	8.85	5.04	3.38	3.55	1.74	1.91	0.26	0.48	1.70	1.64	6.78	10.83	46.16
1981	1.93	4.58	2.91	2.66	3.90	3.45	0.49	0.09	2.33	4.06	4.40	8.91	39.71
1982	M7.53	6.82	3.12	3.58	0.44	1.24	1.08	1.42	4.	4.	4.16		38.

									33	98			70
1983	7.13	8.71	6.20	2.81	1.86	3.65	3.75	M2.38	1.06	2.29	10.58	M5.86	56.28
1984	3.05		4.81	3.76	4.28	4.02	0.00	0.13	1.81	4.63	11.74	3.12	41.35
1985	M0.29	M2.92	3.81	1.40	1.89	2.88	0.31	0.76	3.21	3.25	4.77	M2.39	27.88
1986	6.66	6.46	3.33	2.34	3.23	0.69	1.28	0.10	4.38	2.04	7.44	4.76	42.71
1987	6.84	5.00	6.99	2.22	1.97	0.46	1.72	0.60	0.52	0.45	2.40	8.76	37.93
1988	5.73	2.11	4.47	3.75	3.24	2.88	0.44	0.20	1.41	0.25	9.50	3.00	36.98
1989	M4.01	2.88	7.16	2.32	2.18	0.75	1.11	1.71	0.92	2.60	3.64	3.23	32.51
1990	9.27	M3.92	2.96	2.41	2.47	1.65	0.69	0.91	0.26	5.71	4.31	3.58	38.14
1991	3.23	3.95	4.70	4.59	3.38	2.15	0.12	1.18	0.04	1.91	6.91	5.18	37.34
1992	4.71	4.40	2.05	4.24	0.17	0.64	M0.05	0.71	1.50	2.15	6.04	6.12	32.78
1993	3.94	0.81	4.59	7.72	4.41	1.78	1.53	0.29	0.00	1.49	1.34	6.16	34.06
1994	4.65	5.01	2.52	2.32	1.05	2.45	T	0.10	1.07	5.72	7.97	7.58	40.44
1995	7.69	3.41	4.25	4.19	1.98	2.05	1.32		1.98	4.62	10.68	6.63	48.80
1996	7.44	10.58	2.85	5.40	4.65	0.94	0.70	0.23	2.79	M6.17	M9.95	M14.14	65.84
1997	M8.06	2.35	6.88	3.62	2.00	3.07	0.65	1.77	3.00	7.37	5.11	4.72	48.60
1998	M7.46	5.72	4.69	1.01	6.18	1.37	0.40	0.00	1.27	3.92	11.15	7.06	50.23
1999	7.74	8.91	4.67	1.79	2.22	2.44	0.15	0.79	0.14	2.50	7.51	4.93	43.79
2000	6.38	5.62	3.53	1.79	3.07	1.01	0.21	0.35	M0.54	3.76	2.99	M2.17	31.42
2001	2.07	1.62	3.21	2.55	1.34	2.72	0.76	0.90	1.54	3.50	7.72	7.75	35.68
2002	7.20	3.65	4.15	2.46	2.39	1.36	0.44	0.21	1.23	M0.68	M2.45	10.41	36.63
2003	8.36	3.35	5.90	6.64	1.77	0.03	T	0.10	1.24	2.77	4.37	M8.57	43.10
2004	M4.59	4.61	2.22	2.21	M1.68	1.21	0.02	2.58	1.41	4.07	2.61	4.03	31.24
2005	2.90	1.26	5.09	4.28	4.97	2.74	0.84	0.15		5.64	6.31	7.63	41.81
2006	11.66	3.11	4.42	2.50		1.31	0.39	0.10	1.42	2.01	M12.47	8.03	47.42
2007	M3.57	4.42	3.43	2.01	1.29	1.92	0.66	0.49	1.62	3.38	4.86	10.51	38.16
2008	5.96	2.75	4.38	2.69	1.19	M0.67	0.50	1.81	0.27	1.79	5.19	5.38	32.58
2009	6.34	1.23	3.24	3.05	3.36	1.03	0.18	0.89	1.33	3.47	6.90	4.35	35.37
2010	7.21	4.15	3.85	3.74	5.29	4.34	0.36	0.00	3.20	4.43	7.05	9.42	53.04
2011	5.01	4.24	7.58	4.65	2.79	M0.63	1.17	0.06	0.78	2.73	7.16	2.74	39.54
2012	6.85	2.98	8.02	3.76	3.49	3.24	M0.16	0.00	0.06	3.58	7.07	6.99	46.20
2013	3.83	1.27	1.33	1.99	4.59	2.08	0.00	0.88	5.66	1.12	2.75	2.01	27.51
2014	2.79	5.56	6.21	3.60	2.33	2.31	0.65	0.26	1.06	6.37	3.73	5.72	40.59
2015	3.07	3.94	4.50	1.74	1.00	0.86	0.61	1.38	0.96	1.78	6.24	15.32	41.40
2016	7.52	3.84	5.61	2.04	2.01	1.26	0.63	0.38	1.	8.	11.	8.86	54.

									38	93	95		41
2017	9.22	10.00	7.90	4.04	4.62	3.51	T	0.18	2.28	4.91	6.76	3.77	57.19
2018	9.02												9.02
Notes: Data missing in any month have an "M" flag. A "T" indicates a trace of precipitation.													
Data missing for all days in a month or year is blank.													
Creation date: 2016-07-22													



LEGEND:

ON-SITE WETLANDS TOTAL: 22,369 SF± (0.51 ACRES±)

WETLAND A: 3,964 SF± (0.09 ACRES±)
WETLAND B: 18,405 SF± (0.42 ACRES±)

ON-SITE WATERS TOTAL: 1,182 SF± (0.03 ACRES±)

WATER 1 (DNR TYPE Ns STREAM): 27 SF±/ 27 LINEAR FT±
WATER 2 (DNR TYPE Ns STREAM): 1,155 SF±/ 464 LINEAR FT± (0.03 ACRES±)

25' WATER QUALITY BUFFER

40' MODERATE INTENSITY LAND USE BUFFER

50' HIGH INTENSITY LAND USE BUFFER

25' DNR TYPE Ns BUFFER

75' AQUATIC HABITAT BUFFER

WETLAND AND WATER BOUNDARIES WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON MARCH 6, 2018 AND WERE PROFESSIONALLY LAND SURVEYED BY AKS ON MARCH 9, 2018.

1-FT GROUND CONTOURS DERIVED FROM CLARK COUNTY GIS DATA.

N

SCALE: 1"=100 FEET

100 0 40 60 80 100

DATE: 05/03/2018

EXISTING CONDITIONS MAP	FIGURE 6
2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT	
AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com	DRWN: JRI CHKD: TKM AKS JOB: 5638

Hancock Springs Subdivision Preliminary Critical Areas Mitigation Plan

Date: November 6, 2018

Prepared for:
Craig Moody
Northwest Classic Homes, LLC
10100 NE 116th Circle
Vancouver, WA 98662

Prepared By:
AKS Engineering & Forestry, LLC
Taya K. MacLean, MS, PWS, Senior Biologist

Site Information:
Parcel No. 127414-000, 127377-000, 127371-000, 127375-000, and 127379-000
Camas, Washington

AKS ENGINEERING & FORESTRY
9600 NE 126th Avenue, Suite 2520
Vancouver, WA 98682
(360) 882-0419

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Appendices

Introduction

AKS Engineering & Forestry, LLC (AKS) was contracted by Northwest Classic Homes, LLC (Applicant) to provide critical areas services for the Hancock Springs Subdivision (project) located at 2926 NE 18th Avenue in Camas, Washington (Parcels 127371-000, 127375-000, 127377-000, 127379-000, and 127414-000; Figure 1 of Appendix A). A critical areas report was previously prepared by AKS for the project (May 2018). This preliminary critical areas mitigation plan details wetland buffer and stream buffer modifications, impacts, and enhancement measures developed to ensure no net loss of wetland and stream buffer functions result from the project. This report was prepared in accordance with mitigation plan report requirements set forth in the City of Camas' (City) municipal code (CMC) requirements for fish and wildlife habitat conservation areas (CMC Section 16.61) and wetlands (CMC Section 16.53). No other critical areas (critical aquifer recharge areas, frequently flooded areas, or geologically hazardous areas) are addressed in this report.

A site visit to verify wetland and waters boundaries was conducted with AKS and Jim Carsner, USACE, on July 9, 2018. Mr. Carsner has indicated that the USACE concurs with the boundaries presented in the critical areas report. Their letter of verification will be provided to the City by AKS once received. Two Category IV wetlands (referred to as Wetlands A and B), Type NS waters (referred to as Waters 1 and 2), and associated buffers were delineated on the project site.

No impacts to Water 1, Water 2, Wetland A, or Wetland B are planned. Buffer modifications associated with Wetland B will include buffer reductions and averaging (CMC 16.53.050.C.3). Impact to the modified Wetland B buffer will be necessary to accommodate stormwater tracts and residential lot layout. The stormwater outfall to Water 2 from Tract D will result in stream buffer impacts, including temporary impacts during installation of the outfall pipe and permanent impacts from the outfall and rock placement for the energy dissipator. On-site buffer enhancement of the wetland buffer and restoration of temporarily impacted stream buffer surrounding stormwater Tract D is planned to offset loss of wetland and stream functions resulting from these impacts.

Specifically, enhancement of the wetland buffer will account for minor encroachment beyond allowable 75% modified wetland buffer width reduction and permanent impacts within the Water 2 stream buffer. Enhancement measures will consist of (1) planting of native trees and shrubs and (2) control of Himalayan blackberry (*Rubus armeniacus*) and other invasive plants to ensure no net loss of functions of Wetland B and Water 2. Temporarily impacted areas will be restored to pre-construction contours and will be reseeded with a native grass seed mix. A conservation covenant, financial assurances, fencing and signage, and a 5-year maintenance and monitoring plan will also be implemented.

Existing conditions are depicted on Figures 2 and 2A and a preliminary mitigation plan is included as Figures 3 and 3A of Appendix A.

Project Description

The project includes the 20-lot subdivision with the main access from NW 18th Avenue and future secondary access from NW Cascade Street as neighboring properties develop, two open space tracts at the main access, a critical area tract to protect the existing wetlands and stream corridor on site, two stormwater tracts, and an easement for construction of a public path to connect to a future extension of the trail system identified in the City's park, recreation, and open space comprehensive plan (2014).

All stormwater runoff from the site will be collected via catch basins or will be dispersed and routed to the stormwater facilities located in Tracts D and G. To meet water quality and quantity treatment requirements, stormwater from the site will be treated by a mechanical filter vault located at the north end of Tract D, and then be conveyed to a detention pond also within Tract D. Non-pollution generating stormwater from lots nearest to Tract G (lots 10, 11 and 12) will be collected from rear yards and roofs and then conveyed to a detention pond located within Tract G where it will outflow into the Wetland B buffer through a dispersion trench located entirely within the tract. A preliminary drainage plan is provided as Figure 4 of Appendix A.

Baseline Information

AKS visited the project area on March 6, 2018 to assess critical areas. The critical areas report prepared the site includes all applicable baseline information for fish and wildlife habitat conservation areas (CMC 16.61.010) and wetlands (CMC 16.53.050.E.2.a). The onsite boundaries of one palustrine forested wetland (PFO; Wetland A, 3,964 square feet), one palustrine emergent wetland (PEM; Wetland B, 18,405 square feet), and two non-fishbearing seasonal streams referred to as Waters 1 (a Washington State Department of Natural Resources (DNR) Type Ns water; 27 linear feet) and Water 2 (a Type Ns water; 464 linear feet onsite) were delineated in the project area. Wetlands A and B are Category IV wetlands with a 50-foot high intensity use protective buffer (CMC Table 16.53.040-1). Waters 1 and 2 are protected by 25-foot wide base buffers (CMC 16.61.040.D).

The off-site Haight Reservoir was likely constructed within the historic headwater of Water 2. Initially, AKS was unable to verify the presence of fish in the reservoir and therefore assumed it was fishbearing and protected under the City's critical areas code (CMC 16.61.010.A; AKS 2018). However, additional review indicates that this reservoir is a non-fishbearing, perennial (DNR Type Np) water which does not provide fish habitat because of poor water quality and the lack of a natural channel providing fish access to the reservoir. Therefore, the reservoir has a 50 foot wide base buffer which does not extend onto the project area and it is not discussed further herein.

Waters and wetlands delineated on the site are jurisdictional to the City, the USACE, and Washington Department of Ecology (ECY). Their protective buffers are jurisdictional to the City. A summary of critical areas is provided in Table 1.

Table 1. Summary of On-Site Critical Areas.

Critical Area ID	Size	Cowardin/HGM Class or DNR Water Type/Flow Duration	Base Buffer, Rating, Habitat Score	Connection to Other Waters	Jurisdiction
Wetland A	0.09 acres (3,964 square feet)	PFO/Slope	50' buffer, Category IV, Habitat score: 4	Water 2	City, USACE
Wetland B	0.42 acres (18,405 square feet)	PEM/Slope	50' buffer, Category IV, Habitat score: 4	Wetland A (adjacent)	City, USACE
Water 1	27 linear feet (27 square feet)	Ns/Intermittent	25' buffer	Water 2	City, USACE
Water 2	464 linear feet (1,155 square feet)	Ns/Intermittent	25' buffer	Columbia River	City, USACE

Site Directions

From Vancouver, take Washington State Route 14 (SR-14) east towards to SE 192nd Avenue (exit 10). Turn left on to SE 192nd Avenue and take the first right onto SE Brady Road. Turn right onto NW 16th Avenue. Turn left onto NW Hood Street. Turn right onto NW 18th Avenue to arrive at the site.

Buffer Modification Plan

The project avoids impacts to wetlands and waters delineated on the site and only requires minor encroachment into the buffer associated with Wetland B and Water 2.

Wetland Buffer Modification

Buffer Reductions

The Wetland B buffer will be reduced from a high intensity land use 50-foot buffer to a moderate intensity land use 40-foot buffer by implementation of the following measures (CMC 16.53.050.C.1.a):

- Stormwater treatment and detention.
- Direction of noise and light away from the wetland.
- Retention of native vegetation and soils within unimpacted wetlands and wetland buffers.
- Fencing and critical areas signage along the outer edge of the buffer.
- A relatively undisturbed, vegetated corridor exceeding one hundred feet wide will be protected along Water 1 and 2 which are riverine priority habitats identified by Washington State Department of Fish and Wildlife (WDFW).

Buffer Averaging

The reduced 40-foot wide moderate land use intensity buffer of Wetland B will be further modified by buffer averaging in select locations to accommodate residential lots and stormwater tracts. Buffer averaging will be achieved through the following modes (CMC 16.53.050.C.2):

- The total area contained in the buffer after averaging is equal to the area contained within the buffer prior to averaging
- All areas to be averaged out and averaged back in will occur in existing highly disturbed (regularly mowed pasture or Himalayan blackberry) habitat to avoid loss of functions due to sensitivity of the higher functioning forested buffers to adjacent land uses.
- The averaged buffer width will not be less than 75% of the required buffer width (i.e., not less than 30 feet) at its narrowest point.

Implementation of wetland buffer averaging as described above is not expected to result in a net loss of wetland functions and no additional mitigation associated with buffer averaging is required.

Stream Buffer Modification

Stormwater conveyance facilities are allowed in stream buffers so long as mitigation is provided (CMC 16.61.040.E.10). Since allowable impacts from the stormwater outfall within the Water 2 stream buffer are minor and will be mitigated for on-site via enhancement and restoration, no stream buffer averaging or reductions are planned.

Mitigation Sequencing

The Applicant has significantly revised the site layout over what was originally proposed to the City during the pre-application land use process (File PA18-30). The planned project design avoids all direct impacts to Wetlands A and B, the Wetland A buffer, Waters 1 and 2, and the Water 1 buffer.

Minor encroachment into the modified Wetland B buffer is necessary to accommodate stormwater management and well-laid out residential lots. The Applicant has minimized the degree of encroachment into the Wetland B buffer to the greatest extent practicable by application of careful site design and the implementation of allowable buffer reduction and averaging measures. Encroachment into the Wetland B buffer does not extend any closer to the wetland than 25 feet (the low intensity land use buffer required to protect water quality wetland functions). A portion of the Wetland B buffer will be enhanced by installing native shrubs and trees at a 2:1 ratio and invasive plant control will be conducted within all on-site critical areas and buffers to compensate for this minor impact.

Stormwater facilities have been designed to avoid impact to wetland and stream buffers to the greatest extent practicable. Temporary impacts within the Water 2 stream buffer from installation of the stormwater conveyance pipe will be restored immediately following construction, including restoring original contours and planting with a native grass seed mix. The stormwater outfall design avoids impacts below the ordinary high water mark (OHWM) of Water 2. Minor permanent encroachment into the Water 1 stream buffer from rock placement at the energy dissipator at the outfall location will be offset by additional enhancement at a 2:1 ratio within the Wetland B buffer enhancement planting area.

A conservation covenant, performance and mitigation bonding, and a 5-year maintenance and monitoring program will be implemented to ensure impacts are appropriately mitigated.

Impact and Mitigation Plan

A total of 990 square feet of permanent impact and 211 square feet of temporary impact into wetland and stream buffers is necessary to accommodate stormwater and residential lots. These impacts will be mitigated for via onsite enhancement of the critical areas and restoration of temporarily impacted area. A summary of impacts and mitigation measures is provided in Table 2 below. Buffer impacts and mitigation areas are depicted on Figure 3 in Appendix A.

Table 2. Impact and Mitigation Summary

Critical Areas (Impact Type)	Impact Area (square feet)	Mitigation Ratio (Mitigation Type)	Mitigation Area (square feet)
Wetland B Buffer (permanent)	960	2:1 (enhancement)	1,920 (enhancement)
Water 2 Buffer (permanent)	30	2:1 (enhancement)	60 (enhancement)
Water 2 Buffer (temporary)	211	1:1 (restoration)	211 (restoration)
Total Buffer Impact	**1,201**	**Total Buffer Enhancement**	**1,980**
		Total Buffer Restoration	**211**

An overall increase of native plant cover and diversity and decrease in cover of Himalayan blackberry is expected from enhancement measures will result in a net benefit to critical area functions. Enhancement proposed is in-kind and is located on-site, contiguous with other critical areas, thereby substantially maintaining the level of critical area functions and values.

Environmental Goals and Objectives

Mitigation Plan Goal 1: Compensate for permanent impacts to wetland and stream functions by enhancement of on-site critical areas and buffers.
Objective 1a. Install and maintain (for a period of five years) a diverse mix of native shrubs and trees within the Wetland B buffer.
Objective 1b: Control invasive plants, including Himalayan blackberry, throughout on-site critical areas and buffers.

Mitigation Plan Goal 2: Compensate for temporary stream buffer impacts by restoration of the temporarily impacted stream buffer area.
Objective 2a. Re-establish original contours over the area temporarily disturbed by pipe installation within the Water 2 buffer.
Objective 2a. Establish herbaceous native plant cover over the area temporarily disturbed by pipe installation within the Water 2 buffer.

Likelihood of Success

The success of mitigation projects can be judged on whether a project meets its administrative and ecological performance measures. The Applicant is committed to ensuring that administrative requirements (i.e., financial assurances, conservation covenant, maintenance and monitoring, and annual reporting) will be completed. Currently, the impacted portions of the Wetland B and Water 2 buffers are highly disturbed, consisting primarily of Himalayan blackberry and regularly mowed nonnative pasture grasses. Control of Himalayan blackberry and installation and maintenance of native shrubs and trees has been proven to be successful at many mitigation locations throughout the City and southwest Washington. Critical areas will also be protected in a separate conservation tract and will be fenced and signed to discourage disturbance from people and dogs. The mitigation plan has been designed to ensure that appropriate measures are taken to promote establishment of native plant cover across the enhancement planting area and to control invasive plants, thereby offsetting critical area functions impacted by the project. Based on AKS' previous experience with similar buffer enhancement projects, the enhancement project is expected to have a very high likelihood of success.

Enhancement Specifications

Enhancement Planting

Installation of native shrubs and trees within the buffer enhancement planting area will provide increased habitat structure and diversity over the existing disturbed habitat. Native plant species selected for the enhancement activities are well-adapted to on-site conditions and are common in natural areas throughout the County in similar habitats. Temporarily impacted areas will be restored to pre-construction contours and reseeded using a native grass seed mix.

Plants will be installed directly into existing degraded habitat. Prior to planting, all Himalayan blackberry should be removed and temporary irrigation should be installed within the enhancement planting areas. Immediately following installation, shrubs and trees should be mulched a minimum of three inches in depth and 18 inches in diameter to retain moisture and discourage weed growth around newly installed plant material. Plants should be installed in the quantities and spacing layout described in Table 2 below. Appropriate native plant substitutions may be acceptable.

Table 3. Mitigation Planting Table

Common Name	Scientific Name	Quantity	Spacing	Size
WETLAND B BUFFER ENHANCEMENT PLANTING AREA (1,980 square feet)				
Trees				
Douglas fir	*Pseudotsuga menzeisii*	3	15' on center	Bareroot or 1-gallon
western redcedar	*Thuja plicata*	3	15' on center	Bareroot or 1-gallon
bigleaf maple	*Acer macrophyllum*	3	15' on center	Bareroot or 1-gallon
Shrubs				
vine maple	*Acer circinatum*	12	6' on center	Bareroot or 1-gallon
tall Oregon grape	*Mahonia aquifolium*	12	6' on center	Bareroot or 1-gallon
common snowberry	*Symphoricarpos albus*	11	6' on center	Bareroot or 1-gallon
baldhip rose	*Rosa gymnocarpa*	11	6' on center	Bareroot or 1-gallon
WATER 2 BUFFER RESTORATION AREA (211 square feet)				
Seed Mix				
Native riparian seed mix consisting of: • blue wildrye (*Elymus glaucus*) • meadow barley (*Hordeum brachyantherum*)		Seeding Rate: • 1 pound of seed per 1000 square feet		

• California brome (*Bromus carinatum*)	• Apply to all areas temporarily disturbed by construction within wetland and stream buffers Available at: http://www.sunmarkseeds.com

All plantings will be irrigated via an installed overhead irrigation or drip system. Irrigation typically should be applied once every two weeks during extended dry periods for the first two seasons following planting or as needed until vegetation is fully established. Deep, infrequent watering during this period will encourage root growth and plant survival during the critical establishment period. All irrigation system components will be removed by the third season or following successful establishment of installed plants. Installation and maintenance of additional plants to replace any dead plants should be conducted during the monitoring period.

Invasive Plant Control

Removal of Himalayan blackberry and other invasive species will be conducted prior to the installation of enhancement plantings and will be controlled annually thereafter as needed throughout the 5-year monitoring and maintenance period. Removal of invasive plants will be conducted with herbicide applications, hand labor, or with light power equipment.

Wetland Hydrology

The project area lies within the Salmon-Washougal Water Resource Inventory Area (WRIA #28), the Columbia Slope watershed, and the Camas sub-watershed. Hydrology to on-site wetlands is received primarily from groundwater and upland runoff and to waters is received primarily from upstream flow in Water 2, runoff from adjacent uplands, direct precipitation, and groundwater. Stormwater will be dispersed into the Wetland B buffer from the storm pond in Tract G and directly to Water 2 from the storm pond in Tract D. The hydroperiod of on-site wetlands and waters is not expected to be adversely impacted by the project.

As-Built Report

An as-built report will be due to the City following removal of invasive vegetation and installation of plants, irrigation, fencing, and signage. The as-built report will consist of a brief memorandum of activities conducted, a list of vegetation installed, any deviations from the mitigation plan, an as-built map, and representative photographs.

Performance Standards

Performance standards will include:

- Within the buffer enhancement planting area, woody plantings shall maintain a 100% survival rate in Years 1 and 2 and an 80% survival rate in years three through five.
- Himalayan blackberry and other noxious or invasive plant species (excluding existing pasture grasses) acknowledged by the City will not exceed 10% aerial cover in critical areas during all monitoring years.

Monitoring Program

The purpose of monitoring this project is to evaluate the success of the enhancement plantings and invasive plant control. Annual monitoring will be conducted on an alternating schedule in Years 1, 3, and 5. General site inspections may be conducted annually or as needed to identify maintenance needs, but monitoring will not be required for Year 2 and 4.

Monitoring will consist of establishing four vegetation monitoring plot locations across the enhancement planting area. At each plot, performance standards will be addressed by assessing the survivorship and cover of installed plants and cover of invasive plants. General site observations, such as invasive plant cover, wildlife use, maintenance considerations, or other relative issues will be documented. Representative site photographs will be taken annually from established locations to track change within the enhancement area over the monitoring period. Vegetation monitoring plot and photograph locations will be determined during Year 1 monitoring efforts.

The annual monitoring report will summarize overall success towards meeting performance standards and will include current site photos documenting overall enhancement area conditions. The report will also include milestones, successes, and recommendations for corrective measures, maintenance actions, and maintenance recommendations. Success will be achieved when monitoring results indicate that performance standards are being met at the end of five years. Monitoring reports will be submitted to the City by December 31st of each monitoring year.

Maintenance and Contingency Planning

Site maintenance activities will be guided by results of annual monitoring and corrective measures or adaptive management recommendations. Maintenance and management of the site may include installation of replacement of enhancement plantings, invasive plant management, irrigation, signage upkeep, and garbage removal.

The Applicant or other designated responsible official will be responsible for implementation of management activities during the five year monitoring period. If deficiencies towards meeting performance standards are identified, adaptive management actions or contingency planning will be recommended as necessary to ensure success of the mitigation project.

Buffer Marking

Fencing to demarcate the boundaries of critical areas will be installed and maintained both during and after construction (CMC 16.53.040.C.1-2). Prior to commencement of construction activities, the outer perimeter of the construction area will be marked in the field with high-visibility flagging in addition to silt fencing installed for erosion control. This temporary marking will be maintained throughout construction and will not be removed until permanent fencing and signage are in place. Rear parcel boundaries of residential lots and stormwater tracts backing to the wetland buffer will be permanently fenced and thereafter maintained. In addition, small signs will be posted at an interval of one per lot or every 100-feet and perpetually maintained. Signage will be worded as follows:

Wetland and Buffer—Please Retain in a Natural State

Financial Assurances and Conservation Covenant

To ensure that the mitigation plan is fully implemented, the Applicant will provide financial guarantee to the City to ensure fulfillment of the mitigation project for the performance period (installation) and for the maintenance and monitoring period (Years 1 through 5). Bonds in the amount of 150% of the estimated cost or other mechanisms (surety bond, performance bond, assignment of savings account, or an irrevocable letter of credit) in the amount of 110% of the estimated cost guaranteed by an acceptable financial institution with terms and conditions acceptable to the City Attorney will be required. Upon approval of this mitigation plan, the Applicant will provide a cost estimate for performance and mitigation assurances to the City for review prior to posting required assurances.

Release of the performance assurance will occur upon request to the City once the as-built report has been approved and the maintenance assurance has been recorded. Release of maintenance assurance will occur upon request to the City following approval of the final monitoring report demonstrating that the goals and objectives of this mitigation plan have been met.

A conservation covenant will be recorded with the City prior to construction (CMC 16.53.040.C.3).

Project Schedule

The following project schedule outlines the proposed timeline for project development and implementation of the mitigation plan. Construction of the project, including mitigation activities, is projected to begin in summer of 2019.

Table 4. Mitigation and Monitoring Schedule

Activity	Timeframe
Year 0 (2019)	
Recorded protection instrument conservation covenant (prior to final plat approval)	Summer
Performance financial assurance (prior to construction)	Summer
Construction, including silt and high visibility fencing along wetland buffers	Summer (begin)
Enhancement planting, irrigation, signage, and invasive species control	Fall
As-built report	Late Fall
Release of performance assurance and establish maintenance assurance	Early Winter
Year 1 (2020)	
Year 1 monitoring site visit	Summer
Invasive species control (initial and ongoing)	Early spring, early fall
Supplemental planting (if needed)	Fall
Irrigation (as needed during dry season)	May 1-October 1
Year 1 monitoring report	December 31
Year 2 (2021)	
Invasive species control and general site maintenance	Early spring, early fall
Supplemental planting (if needed)	Early spring or fall
Irrigation (as needed during dry season)	May 1-October 1
Year 3 (2022)	
Year 3 monitoring site visit	Summer
Invasive species control	Early spring, early fall
Supplemental planting (if needed)	Fall
Irrigation (as needed during dry season)	May 1-October 1
Year 1 monitoring report	December 31
Removal of irrigation system (if plants are established)	December 31
Year 4 (2023)	
Invasive species control and general site management	Early spring, early fall
Year 5 (2024)	
Final monitoring site visit	Summer
Invasive species control and general site management	Early spring, early fall
Final Year 5 monitoring report	December 31
Release of maintenance assurance	December 31

Statement of Preparation

This critical areas report was prepared in accordance with CMC 16.53.040. Natural resource fieldwork and reporting were conducted by professionals qualified to conduct wetlands and fish and wildlife critical areas projects in Camas, Washington. Information contained in this document should be considered preliminary and used at your own risk until it has been reviewed and approved in writing by the City.

Qualifications of Preparers

Taya K. MacLean, MS, PWS, regularly conducts wetlands and fish and wildlife habitat areas critical area assessments and mitigation plans. She has been performing site evaluations, analyzing critical area functions and values, analyzing critical area impacts, and recommending critical area mitigation and restoration in Washington for over a decade and has worked in natural resource management since 1998. She specializes in natural resource management with expertise in wetlands, waters, wildlife, botany, and habitat. Ms. MacLean has a Master of Science degree in biology, an undergraduate degree in forestry and natural resources management, and is a certified professional wetland scientist (PWS; Certification #2702).

Taya K. MacLean

Taya K. MacLean, MS, PWS
Senior Biologist
Report Preparation

Literature Cited and Referenced

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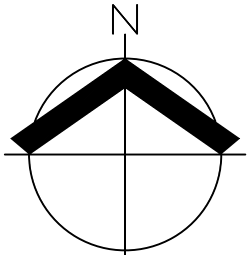
Appendix A: Figures

USGS 7.5" TOPOGRAPHIC SERIES
QUADRANGLE: CAMAS, WA (2017)

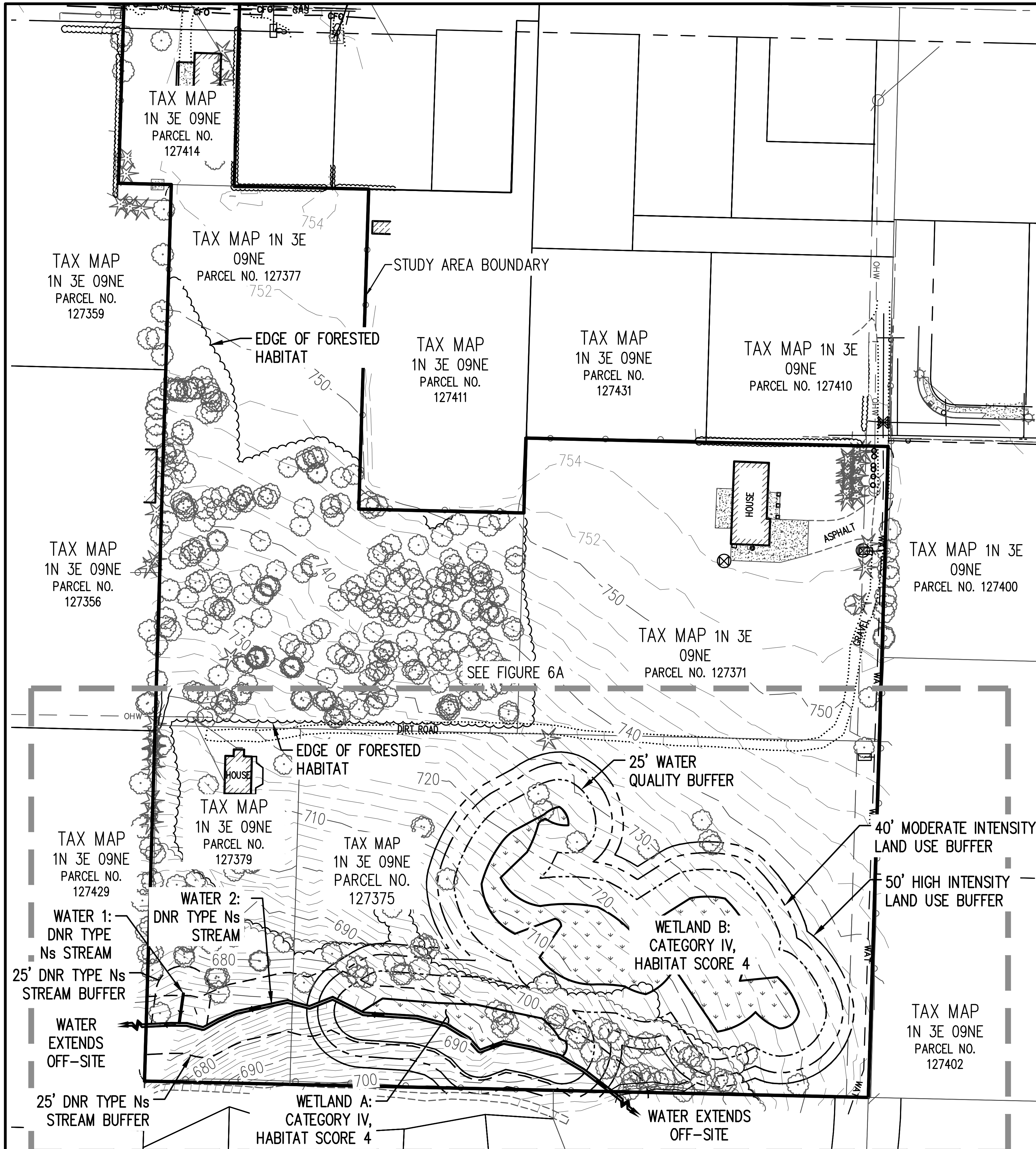


SCALE: 1"= 2000 FEET

2000 0 800 1200 1600 2000

DATE: 04/09/2018

USGS VICINITY MAP HANCOCK SPRINGS PRELIMINARY CRITICAL AREAS MITIGATION PLAN	FIGURE 1
AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com	DRWN: JRI CHKD: TKM AKS JOB: 5638



LEGEND:

ON-SITE WETLANDS TOTAL: 22,369 SF± (0.51 ACRES±)
WETLAND A: 3,964 SF± (0.09 ACRES±)
WETLAND B: 18,405 SF± (0.42 ACRES±)

ON-SITE WATERS TOTAL: 1,182 SF± (0.03 ACRES±)
WATER 1 (DNR TYPE Ns STREAM): 27 SF±/ 27 LINEAR FT±
WATER 2 (DNR TYPE Ns STREAM): 1,155 SF±/ 464 LINEAR FT± (0.03 ACRES±)

25' WATER QUALITY BUFFER

40' MODERATE INTENSITY LAND USE BUFFER

50' HIGH INTENSITY LAND USE BUFFER

25' DNR TYPE Ns BUFFER

WETLAND AND WATER BOUNDARIES WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON MARCH 6, 2018 AND WERE PROFESSIONALLY LAND SURVEYED BY AKS ON MARCH 9, 2018.

2-FT GROUND CONTOURS DERIVED FROM LAND SURVEY.

EXISTING GROUND CONTOUR (2 FT)

350 EXISTING GROUND CONTOUR (10 FT)

EXISTING TREE

N

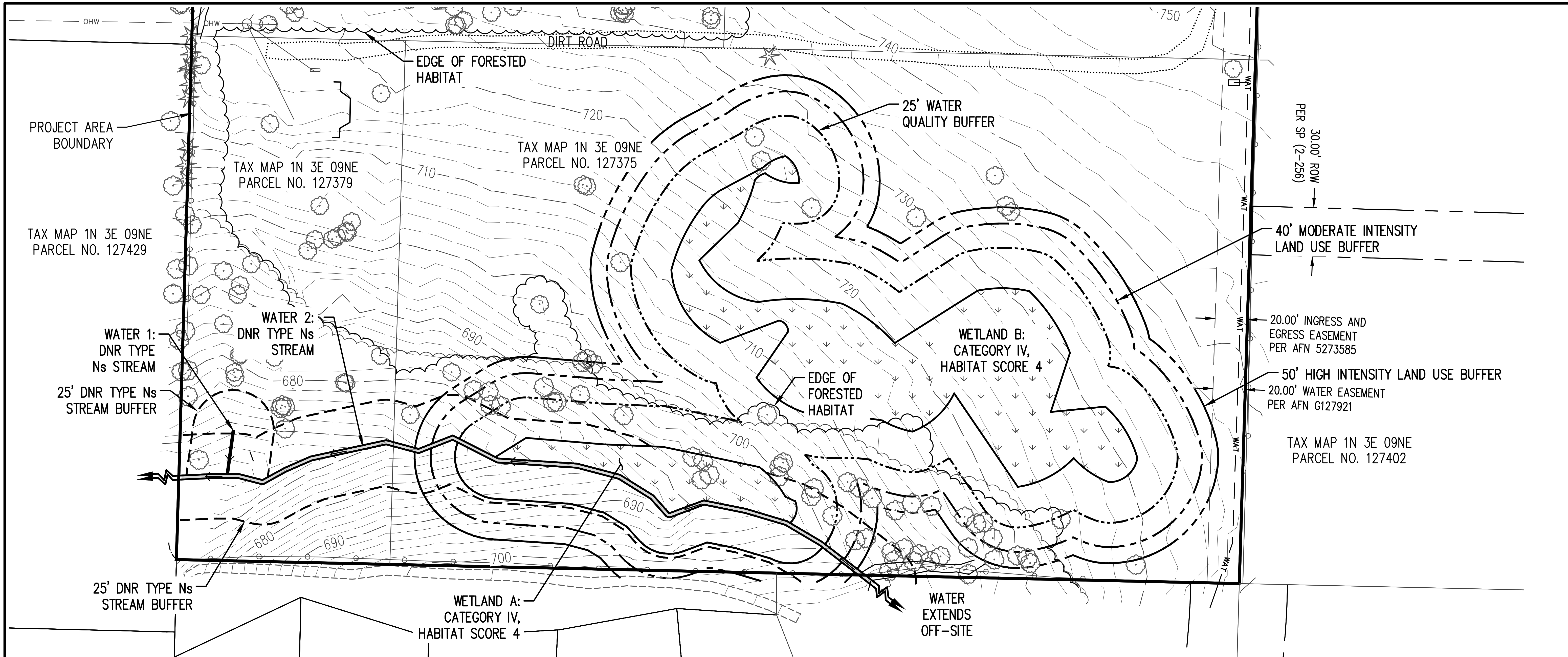
SCALE: 1"=100 FEET

100 0 40 60 80 100

DATE: 11/06/2018

EXISTING CONDITIONS MAP	FIGURE 2
2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT	
AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com	DRWN: JRI CHKD: TKM AKS JOB: 5638

DWG: 5638 EXCOND | FIGURE 3



LEGEND:

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WETLAND A: 3,964 SF± (0.09 ACRES±)
WETLAND B: 18,405 SF± (0.42 ACRES±)

ON-SITE WATERS TOTAL: 1,182 SF± (0.03 ACRES±)
WATER 1 (DNR TYPE Ns STREAM): 27 SF±/ 27 LINEAR FT±
WATER 2 (DNR TYPE Np STREAM): 1,155 SF±/ 464 LINEAR FT± (0.03 ACRES±)

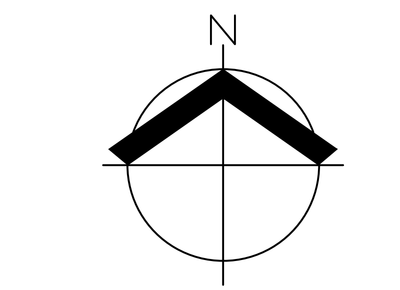
EXISTING GROUND CONTOUR (2 FT)

350 EXISTING GROUND CONTOUR (10 FT)

EXISTING TREE

WETLAND AND WATER BOUNDARIES WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON MARCH 6, 2018 AND WERE PROFESSIONALLY LAND SURVEYED BY AKS ON MARCH 9, 2018.

2-FT GROUND CONTOURS DERIVED FROM LAND SURVEY.



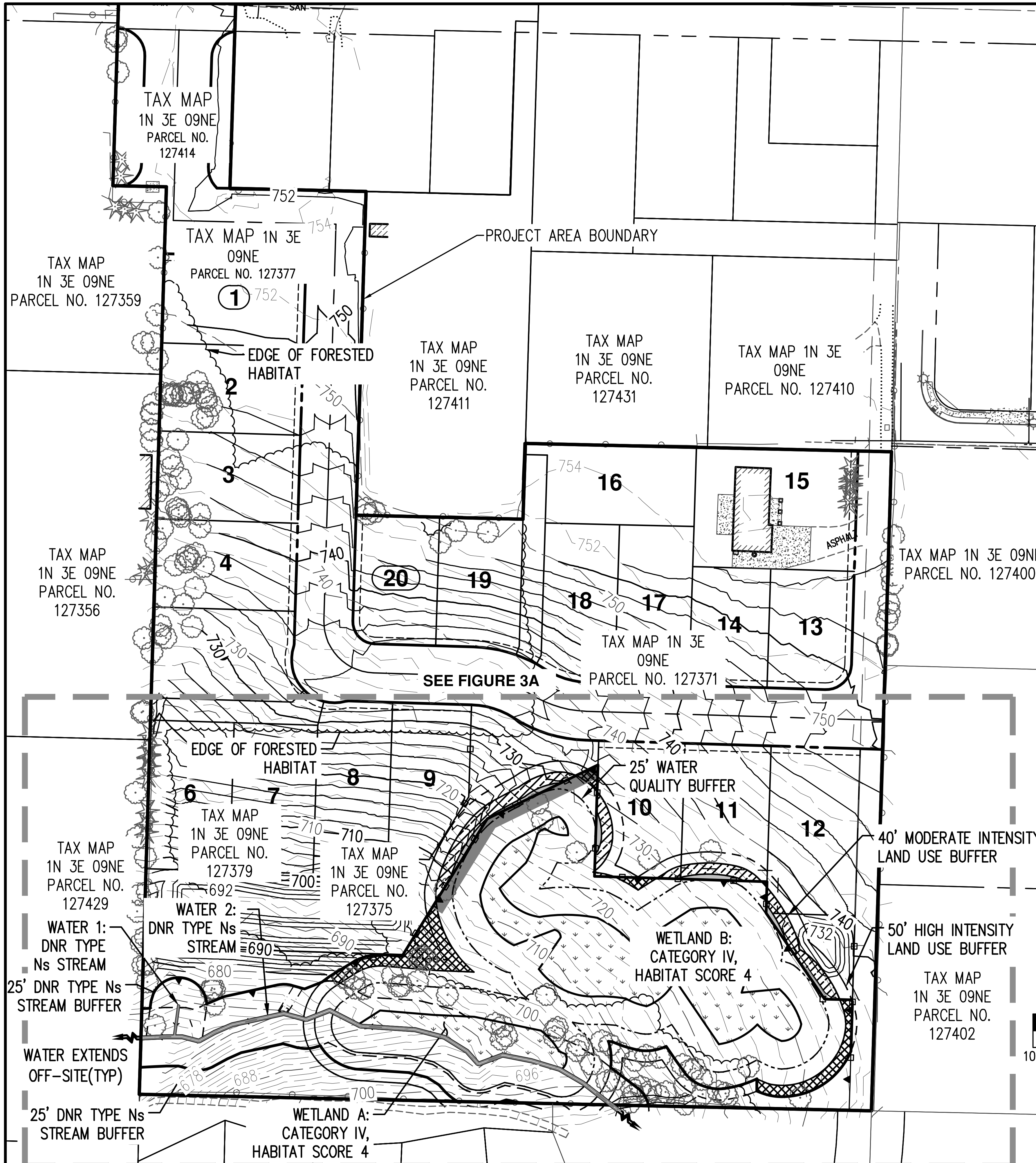
SCALE: 1"=60 FEET

60 0 24 36 48 60

DATE: 11/06/2018

EXISTING CONDITIONS	FIGURE 2A
2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT	
AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com	DRWN: JRI CHKD: TKM AKS JOB: 5638

DWG: 5638 EXCOND | FIGURE 2A



LEGEND:

ON-SITE WETLANDS TOTAL: 22,369 SF± (0.51 ACRES±)
WETLAND A: 3,964 SF± (0.09 ACRES±)
WETLAND B: 18,405 SF± (0.42 ACRES±)

ON-SITE WATERS TOTAL: 1,182 SF± (0.03 ACRES±)
WATER 1 (DNR TYPE Ns STREAM): 27 SF±/ 27 LINEAR FT±
WATER 2 (DNR TYPE Ns STREAM): 1,155 SF±/ 464 LINEAR FT± (0.03 ACRES±)

25' WATER QUALITY BUFFER

40' MODERATE INTENSITY LAND USE BUFFER

50' HIGH INTENSITY LAND USE BUFFER

25' DNR TYPE Ns BUFFER

TEMPORARY STREAM BUFFER IMPACT AND RESTORATION (211 SF)

PERMANENT STREAM BUFFER IMPACT (30 SF)

WETLAND AND WATER BOUNDARIES WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON MARCH 6, 2018 AND WERE PROFESSIONALLY LAND SURVEYED BY AKS ON MARCH 9, 2018.

2-FT GROUND CONTOURS DERIVED FROM LAND SURVEY.

EXISTING GROUND CONTOUR (2 FT)

350 EXISTING GROUND CONTOUR (10 FT)

FINISHED GRADE CONTOUR (2 FT)

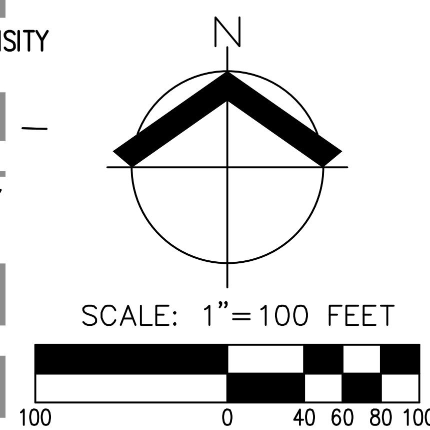
345 FINISHED GRADE CONTOUR (10 FT)

EXISTING TREE TO REMAIN

EXISTING TREE TO BE REMOVED

PROPOSED FENCE LINE

PROPOSED SIGNAGE



DATE: 11/05/2018

PRELIMINARY CRITICAL AREAS MITIGATION PLAN

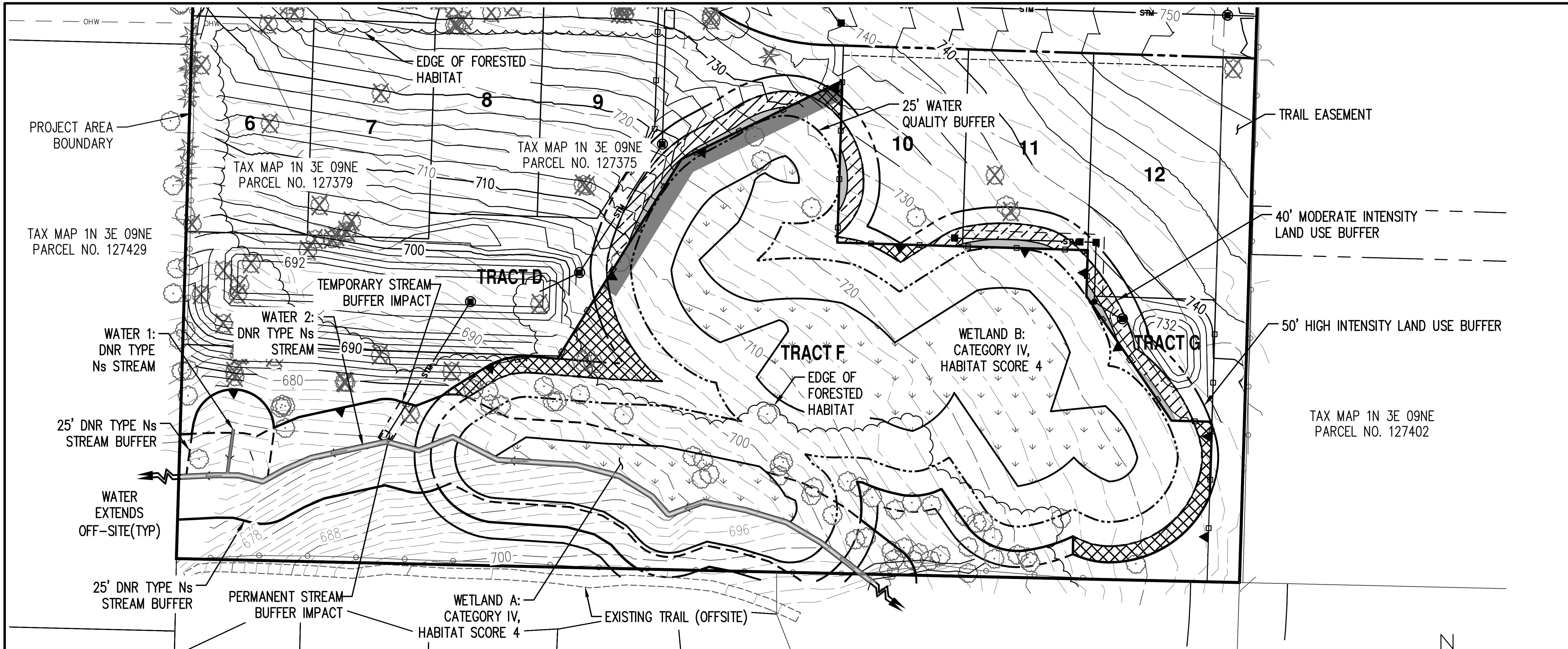
FIGURE 3

2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT

AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE, STE 2520
VANCOUVER, WA 98682
P: 360.882.0419 F: 360.882.0426 aks-eng.com

DRWN: JRI
CHKD: TKM
AKS JOB: 5638

DWG: 5638 FIG3 | FIGURE 3



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2-FT GROUND CONTOURS DERIVED FROM LAND SURVEY.

BUFFER AVERAGING

WETLAND BUFFER AVERAGE OUT 4,205 SF (0.097 AC)

WETLAND BUFFER AVERAGE IN 4,206 SF (0.097 AC)

BUFFER IMPACTS

PERMANENT WETLAND BUFFER IMPACT 960 SF

TEMPORARY STREAM BUFFER IMPACT AND RESTORATION 211 SF

PERMANENT STREAM BUFFER IMPACT 30 SF

ENHANCMENT & FINAL BUFFER

ENHANCEMENT AREA FOR PERMANENT IMPACTS (2:1) 1,980 SF

FINAL WETLAND BUFFER

EXISTING GROUND CONTOUR (2 FT)

350 EXISTING GROUND CONTOUR (10 FT)

FINISHED GRADE CONTOUR (2 FT)

345 FINISHED GRADE CONTOUR (10 FT)

EXISTING TREE TO REMAIN

EXISTING TREE TO BE REMOVED

PROPOSED FENCE LINE

PROPOSED SIGNAGE

N

SCALE: 1"=60 FEET

60 0 24 36 48 60

DATE: 11/05/2018

PRELIMINARY CRITICAL AREAS MITIGATION PLAN

FIGURE 3A

2926 NW 18TH AVE SUBDIVISION CRITICAL AREAS ASSESSMENT

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DRWN: JRI
CHKD: TKM
AKS JOB: 5638

DWG: 5638 FIG3 | FIGURE 3A

Exhibit 6
SUB18-05

6. Tree Report

Hancock Springs Subdivision Preliminary Tree Report

Date: November 2018

Prepared For:
Craig Moody
Northwest Classic Homes, LLC
10100 NE 116th Circle
Vancouver, Washington 98662

Prepared By: Bryce Hanson, Certified Arborist

Site Information:
2926 NW 18th Avenue
Camas, WA 98607
Parcel #'s 127414-000, 127377-000, 127371-000, 127379-000, 137375-000

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Tree Report

HANCOCK SPRINGS SUBDIVISION
CAMAS, WASHINGTON

Location

The project site is located at 2926 NW 18th Avenue, (Parcel Serial No. 127414-000, 127377-000, 127371-000, 127379-000, 127375-000) in the City of Camas, Clark County, Washington.

General Site Notes

This Tree Plan consists of a written report with tree density calculations, Site Plan, Tree Protection Plan, and Landscape Plan.

This report is for the net developable area (5.63 net acres) of the proposed residential subdivision. The existing site consists of five parcels containing three existing single-family residences, driveways, a large wetland area, numerous trees, and landscaping. The proposed development will result in 20 single-family residential lots with tracts set aside for wetland preservation and stormwater facilities. Tree protection will be established at the beginning of development and maintained through the entire length of the development. See Appendix A for additional information regarding the described trees in the detailed tree inventory table. The site consists of 294 trees over 6 inches in diameter. Only the trees existing near where the proposed development activities will occur have been inspected for this report, as the remainder are found in or immediately adjacent to the wetland area. Due to the planned site development and high potential for extensive root impacts, 238 on-site trees are proposed for removal. Fifty-six on-site trees outside of the critical areas are planned for retention.

On-Site Tree Condition

Based on the Detailed Tree Inventory Table (Appendix A), most on-site trees are recommended for removal. Preserved trees will require some pruning to remove dead branches and improve crown structure, and removal of competing vegetation to promote tree health. Site trees are primarily Bigleaf Maple and Red Alder, growing within the same forested area inside Parcel 127377-000. Many trees contain multiple stems and compete directly with adjacent trees for resources. Various other species exist and are scattered throughout the site. The health and structure of on-site trees range from poor to good based on conditions observed during the site visits on September 19-21, 2018. Tree removal was recommended mainly on location and root impact from development activities, as well as to enhance the health of trees selected for retention due to the high density of trees in the same location.

Off-Site Trees

There are several off-site trees that are directly adjacent to the site. Most off-site trees should be minimally impacted based on the location of where development will happen. They appear in the rear and sides of the proposed lots. A row of Honey Locust is also growing adjacent to the eastern site property line where the proposed NW Cascade Street will be constructed and will be greatly affected by construction activities. The construction of NW Cascade street will therefore require coordination with the adjacent parcel owner, and a certified arborist will need to be present during construction to monitor the impacts to the trees. If impacts are too severe, tree removal may be necessary with the owner's permission. All other off-site trees will be protected with tree protection measures as further described in this report and on the Tree Preservation Plan (Appendix B).

Tree Density Calculations

The total site area is 10.03 acres, which includes 2.75 acres to be set aside as critical area, and 1.65 acres to be dedicated to the City as right-of-way. The net site area of 5.63 acres is required to meet minimum tree density. Per Chapter 18.13.051 of the City of Camas municipal code, the City requires 20 tree units per acre, or a total of 113 tree units (20*5.63 ac) for this site. Table 1 summarizes the tree units required, removed, retained, and proposed for the entire site. All trees, both retained and removed, are detailed on the Tree Preservation and Removal Plans found in Appendix B and in the Detailed Tree Inventory found in Appendix A. The proposed trees are detailed within the Tree Planting Plan in Appendix C.

	Net Site Area (Acres)	Tree Units Required	Tree Units Existing	Tree Units Removed	Tree Units Retained	Proposed Tree Units	Total Tree Units
Overall	5.63	113	1027.5	837.5	190	52	242

Table 1: Summary of Tree Units

Designing for Tree Preservation

Designing for tree preservation means that trees are considered an important project feature. The goal of tree preservation is to have trees remain safe assets to the site for years to come. Trees that are preserved must be carefully selected to make sure that they will survive the construction impacts, adapt to the new environment, and perform well in the new landscape. An assessment of suitability for preservation evaluates tree health, structure, age, and species factors. The consultant gathers information on the individual trees and makes recommendations as to which trees are suitable for preservation, and how much undisturbed space they will require. The consultant also provides specific guidelines regarding grading, drainage, trenching, protected areas, root pruning, etc.

Tree Characteristics and Their Suitability for Preservation:

Trees vary in their suitability for preservation both based on their inherent characteristics and their future response to construction impacts. Trees that are structurally unstable, in poor health, or are unlikely to survive construction impacts could be a dangerous liability to future neighborhoods. A good tree preservation plan will call for the pre-construction removal of trees likely to die or to become a tree with a higher than acceptable risk of failure after construction. The factors to be evaluated are:

Tree Health-Healthy, vigorous trees are more adaptable than non-vigorous trees to tolerate construction related stresses such as root removal, changes in grade, changes in soil moisture, and soil compaction. These healthy trees are also better able to adapt to the changed site conditions that occur after development.

Tree Structure-Trees with defects such as decayed wood, poor crown structure from past manual "topping" or natural broken tops, and co-dominant trunks with poor attachments are not suitable for preservation in areas where people or property could be injured or damaged. Such defects cannot be treated and may lead to failure.

Species-Although trees require protection to avoid injury, species vary widely in their ability to withstand damage and changes in their environment.

Tree Age-As a tree ages, its capacity to overcome injury, adapt to changes in its site environment, and to resist pests declines. For these reasons, mature and over-mature trees are less adaptable to tolerate construction impacts and remain assets than are young and semi-mature trees. Young vigorous trees are able to generate new tissue and adapt to a new environment better than old trees.

Tree Size/Height-Larger, taller trees are capable of hitting targets a greater distance away from the tree and cause greater damage. Taller trees also provide a larger wind "sail", catching more wind and being more prone to blowing down in a large storm. Coupling this "sail" effect with the structural weakening of root removal/disturbance can lead to a higher than acceptable windthrow risk.

Tree Location-The best candidates for preservation are single trees that developed as individual specimens, as they typically have uniform canopies and well tapered trunks. Trees that grow in groups do not function well as individuals. They often have tall, poorly shaped trunks, irregularly shaped crowns, and are prone to failure and decline when their neighbors are removed.

The arboricultural consultant weighs each of the above factors and makes recommendations as to which trees are likely to thrive and be a long-term asset to the new development, as well as recommendations to remove those trees that will likely have an unacceptable risk of failure and become a liability in the new development.

Guidelines for the Area Required to Preserve a Tree:
In order to preserve a tree, an area around that tree must be protected to ensure that the tree is not physically damaged and that the roots are protected. A method to calculate this area, utilizes the diameter at breast height (DBH), species, and age. The DBH is multiplied by a factor (the factor is based on the tree age and the species tolerance for disturbance) from 0.5 feet radius to 1.5 feet radius (from the trunk-often 1 foot radius per inch DBH is used for an average), and this area is called the "Optimal Tree Protection Zone". The general guidelines for preservation are that you do not want to disturb more than 1/3 of this area, but that with healthy vigorous trees, up to 50% of the area could be disturbed. In addition to these percentages, excavation should not take place within 10 feet of the base of a tree to avoid the loss of structural roots.

How to Preserve Trees During Construction:
The portion of the "Optimal Tree Protection Zone" that is being protected must be fenced off (with a "substantial" fence). Within this area, no soil disturbance, including stripping is permitted. The natural grade is to be maintained, and no storage or dumping of materials, parking, etc. will be allowed within this zone without the approval of the arboricultural consultant. This tree protection fence should remain in place through the construction of the dwellings.

Excavation Within the "Optimal Tree Protection Zone":
Where there is excavation proposed within an "Optimal Tree Protection Zone" (outside of the protected zone fenced off above), it will be important for the contractor to prune the roots along the excavation lines. These roots should be pruned in the following manner:

- Excavation in the top 24" of the soil in the critical root zone area should begin at the excavation line that is <u>closest</u> to the tree.
- The excavation should be done by hand/shovel or with a backhoe and a man with a shovel, pruning shears and a pruning saw.
- If done by hand all roots 1" or larger should be pruned at the excavation line.
- If done with a backhoe (most likely scenario) then the operator needs to start the cut at the excavation line and carefully "feel" for roots/resistance. When there is resistance, the man with the shovel hand digs around the roots and prunes the roots larger than 1" diameter.
- The backhoe is to remain off of the tree roots to be saved at all times.
- The work will be done under the supervision of the Project Consulting Arborist.

The above system works well and can be done quickly. The key is to avoid pulling on the roots larger than 1” diameter, potentially resulting in damage to roots between the excavation line and the tree.

How Trees Die:
Natural tree death is frequently a slow and complex process generally with a gradual decline involving a number of factors. Most trees die from one of three causes: (1) structural failure, (2) environmental degradation, or (3) pest infestation. Generally, trees die from a combination of factors. Trees weakened by changes in their environment (such as construction impacts) become more susceptible to infestation by disease and insects. Most individual trees survive for only a fraction of the potential lifespan of the species. Soil compaction, changes in grade, mechanical injury, changes in the environment around the tree, and changes in drainage may not kill the tree themselves, but they may weaken the tree to a point that death occurs by another cause. Prevention of stress and the maintenance of health are the key elements of tree longevity.

What is “Tree Topping” and How Does It Damage a Tree?
Tree Topping is a pruning technique to reduce the height by cutting the central leader. This method of pruning is very detrimental to trees and not considered a good practice. Trees are generally topped by unknowledgeable pruners in order to lower the height of the tree and minimize the chance of windthrow by reducing the tree’s wind profile. The large stub of a topped tree has a difficult time forming callus over the wound. The terminal location of these cuts, as well as their large diameter, prevents the tree’s chemically based natural defense system from doing its job. The stubs are highly vulnerable to both insect invasion and the spores of decay fungi. If decay is already present, topping will speed the spread of the disease. The tree reacts to the topping cut by producing multiple shoots below the cut. These shoots develop from buds near the surface of the topping cut. Unlike normal branches that develop in a socket of overlapping wood tissues, these new shoots are anchored only in the outermost layers of the bole. These new shoots grow quickly, and are prone to breaking, especially during windy conditions. For all of these reasons, trees that have been topped pose a danger to life and safety and are recommended for removal.

Development Impacts Affecting Preserved Trees:
Construction of the site improvements generally consists of cut and fills (grading), construction of retaining walls, trenching for the wet and dry utilities, coring of roads and placement of aggregate and pavement. During this work, adjacent soil areas outside of the grading can be compacted by heavy equipment driving over it. The grading and placement of utility trenches (and subsequent pipe bedding), and retaining walls can also affect the local water table.

Construction of the buildings and landscaping requires foundation placement, pruning of trees near the buildings under construction, and the installation of lawn irrigation systems. During this work, adjacent soil areas outside of the work area can be compacted by equipment driving over it.

Future Condition of Trees on the Site:
The characteristics of the individual tree are a guide to how well that tree will respond to site disturbance. Larger trees have correspondingly larger root zones. Older trees are less resilient to disturbance. Unhealthy trees are less resilient to disturbance than healthy trees.

Development of this site will result in a large area of disturbance. The disturbance to the on-site trees will occur during the site grading. The trees planned for retention are relatively healthy, but proper protection methods should be followed per this document to provide the greatest opportunity for survival following development.

Windthrow Potential

The trees on-site have been evaluated for windthrow based on factors including, but not limited to: soil conditions, tree health, tree structure, prevailing wind direction, and past evidence of wind damage. Windthrow is defined as full tree failure in the form of trunk breakage or root ball overturning. It should be understood that proposed retained trees are still susceptible to partial tree failure from wind exposure. Refer to the tree inventory table in Appendix A for specific tree conditions at risk of single part failure and recommendations for risk reduction as well as a windthrow rating. A windthrow rating of A, B or C was assigned to each tree that was evaluated; with A being the least windthrow resistant, B being more windthrow resistant than A, and C being the most windthrow resistant. Since the edge of the stand has been changed to allow for development, trees along the new stand edge do not contain the same structural integrity and wind resistance as the existing trees did. This was considered when selecting trees for retention. The trees planned for retention have been selected because of their good taper, overall structure, health, and location to site impacts. Retained trees will continue to protect the majority of off-site trees to the west due to the location of the retained trees being clumped along the western property boundary. The windthrow potential of the site should remain similar to the existing site conditions.

Soils

Soils on-site are comprised of Powell silt loam with slopes ranging from 0 to 30 percent. These soils are described as moderately well-drained per the USDA Natural Resources Conservation Service's Web Soil Survey. However, a geotechnical study performed on August 15, 2018, found that on-site soils have very poor infiltration rates and are not considered moderately well-drained. Trees growing in poorly drained soils generally exhibit shallow root growth and are more susceptible to windthrow as a result.

Tree Protection Plan

See the plans found in Appendix B.

Planting Plan

No trees are required for planting on the site since the minimum 20 tree units per acre threshold has been satisfied. Fifty-two street trees are proposed to be planted to meet landscape requirements. Per Section 18.13.050 of Chapter 18 of the City of Camas Municipal Code, replacement trees shall optimize tree diversity by including a minimum of 60% native species and at least 50% evergreen. For this site the required deciduous tree needs to be 2" or greater while a conifer tree needs to be a minimum of 5' tall. See Appendix C for the Tree Planting Plan.

Hazard Assessment

Hazard assessment of on-site trees was not performed for each tree during the initial arborist site assessment. General hazards may have been identified and reported in the Tree Inventory Table (Appendix A) as they were encountered during the site visit. Once development activities are complete, a hazard assessment may be done on retained trees to review previously unseen defects or damages done to retained trees during land clearing and development activities.

Conclusion

The development of the 10.03-acre site proposes to remove 238 on-site trees. Of the existing trees, 56 will be retained. Fifty-two street trees will be planted to meet the required city code for street tree placement. This tree report is only for the overall site development activities and tree protection measures outlined on the Tree Preservation Plan and for the protection of the existing trees from the overall proposed development. This does not include the construction of building foundations for each lot that may interfere with the proposed retained trees.

Arborist Disclosure Statement

Arborists are tree specialists who use their education, knowledge, training, and experience to examine trees, recommend measures to enhance the health of trees, and attempt to reduce the risk of living near trees. The Client and Jurisdiction may choose to accept or disregard the recommendations of the arborist, or seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like medicine, cannot be guaranteed.

Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

11.20.18

CERTIFIED ARBORIST

ISA®

BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19

Bryce D Hanson

Appendix 'A'

(Detailed Tree Inventory Table)

Detailed Tree Inventory for Hancock Springs

AKS JOB NO. 5638 **Site Area = 5.63 acres**

AKS Reference #	Total DBH (In)	Tree Species Common Name (*Scientific name*)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
10334	6	Norway Maple (*Acer platanoides*)	0	Off site, growing up against fence along property line, healthy	C		0
10336	6	Norway Maple (*Acer platanoides*)	0	Off site, growing up against fence along property line, healthy	C		0
10341	9,5	Paper Birch (*Betula papyrifera*)	2	Slight lean, crown clean recommended	C		2
10350	27	Noble Fir (*Abies procera*)	10	Stem forks into codominant stems at 30' & 45', dead branches in crown, crown clean recommended	C		10
10353	23	Douglas-fir (*Pseudotsuga menziesii*)	8	Stem forks into codominant stems at 40', dead branches in crown, crown clean recommended	C		8
10360	9	Western Redcedar (*Thuja plicata*)	0	Off site	C		0
10361	6	Western Redcedar (*Thuja plicata*)	0	Off site	C		0
10363	16	Douglas-fir (*Pseudotsuga menziesii*)	0	Off site	C		0
10394	32	Norway Maple (*Acer platanoides*)	12	Full crown, healthy	C	Located within proposed road grading	0
10411	8	Western Redcedar (*Thuja plicata*)	2	Growing against side of existing structure, surrounded by blackberry	C	Located within proposed road grading	0
10513	13	Red Alder (*Alnus rubra*)	3	Healthy	C	Located within proposed road grading	0
10514	11	Red Alder (*Alnus rubra*)	2	Moderate lean	B	Located within proposed road grading	0
10515	15	Red Alder (*Alnus rubra*)	4	Slight lean, topped	B	Located within proposed road grading	0
10516	9	Red Alder (*Alnus rubra*)	2	Slight lean, topped	B	Located within proposed road grading	0
10517	11	Red Alder (*Alnus rubra*)	2	Slight lean, stem forks at 15', topped	B	Located within proposed road grading	0
10518	8	Red Alder (*Alnus rubra*)	2	Stem forks at 10'	B	Located within proposed road grading	0
10519	9	Red Alder (*Alnus rubra*)	0	Dead	A	Tree is dead	0
10520	8	Red Alder (*Alnus rubra*)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10521	12	Red Alder (*Alnus rubra*)	0	Dead	A	Tree is dead	0
10522	9	Red Alder (*Alnus rubra*)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10523	9	Red Alder (*Alnus rubra*)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10524	8	Red Alder (*Alnus rubra*)	2	Healthy	C	Lot grading greatly impacts root zone	0
10525	9	Paper Birch (*Betula papyrifera*)	2	Healthy	C	Lot grading greatly impacts root zone	0
10526	9	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown, minor scarring on stem	C	Lot grading greatly impacts root zone	0
10529	12	Red Alder (*Alnus rubra*)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10530	14	Red Alder (*Alnus rubra*)	3	Moderate lean	B	Lot grading greatly impacts root zone	0
10531	10	Red Alder (*Alnus rubra*)	2	Topped, significant lean	B	Lot grading greatly impacts root zone	0
10532	72	Bigleaf Maple (*Acer macrophyllum*)	31	Three codominant stem begin above breast height, large dead branches in crown, large cavities in base	B	Located in center of proposed lot grading, poor tree health	0
10537	6	Red Alder (*Alnus rubra*)	2	Moderate lean	B	Located within proposed road grading	0
10539	8,4,5,3,2	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown with dead branches, slight lean, stem forks at 20', 2" & 3" stems are dead	B	Located within proposed road grading	0
10542	21	Bigleaf Maple (*Acer macrophyllum*)	7	Slight lean, dead branches in crown	C	Located within proposed road grading	0
10543	23	Bigleaf Maple (*Acer macrophyllum*)	8	Unbalanced crown with dead branches, slight lean, stem forks at 20	B	Located within proposed road grading	0
10544	13	Bigleaf Maple (*Acer macrophyllum*)	3	Unbalanced crown with dead branches	B	Located within proposed road grading	0
10545	37	Bigleaf Maple (*Acer macrophyllum*)	15	Has co-dominant stems, some dead branches, decay present	B	Located within proposed road grading	0
10546	9	Red Alder (*Alnus rubra*)	2	Slight lean, dead top, poor health	B	Located within proposed road grading	0
10547	6	Red Alder (*Alnus rubra*)	2	Moderate lean	B	Located within proposed road grading	0
10552	27	Bigleaf Maple (*Acer macrophyllum*)	0	Off site, unbalanced crown, codominant stems, decay in old branch collars, slight lean, scarring in stem	B		0
10553	25,6,6	Bigleaf Maple (*Acer macrophyllum*)	0	Off site, codominant stems, slight lean, scarring at 12	B		0
10554	25	Bigleaf Maple (*Acer macrophyllum*)	0	Off site, codominant stems, included bark	C		0
10563	13	Bigleaf Maple (*Acer macrophyllum*)	3	Healthy	C	Lot grading greatly impacts root zone	0
10564	13	Bigleaf Maple (*Acer macrophyllum*)	3	Stem forks at 30', decay in cavity at base, slightly crooked	B	Lot grading greatly impacts root zone	0
10569	6	Red Alder (*Alnus rubra*)	2	Exhibits very poor health	B	Located within proposed road grading	0
10570	7	Red Alder (*Alnus rubra*)	2	Healthy	C	Located within proposed road grading	0
10572	7,7,4,4,4	Bigleaf Maple (*Acer macrophyllum*)	2	One 4" stem is dead, one 7" stem is topped	A	Located within proposed road grading	0
10578	6	Bigleaf Maple (*Acer macrophyllum*)	2	Stem forks at 15'	B	Located within proposed road grading	0
10579	9	Honey Locust (*Gleditsia triacanthos*)	2	Stem forks at 40', slightly crooked, slight lean	B	Located within proposed road grading	0
10580	9	Red Alder (*Alnus rubra*)	2	Signs of decay in stem, topped, declining health	B	Located within proposed road grading	0
10581	7	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, slight lean, topped	B	Located within proposed road grading	0
10584	23	Bigleaf Maple (*Acer macrophyllum*)	8	Unbalanced crown, some included bark, scarring in stem	B	Located within proposed road grading	0
10586	20	Bigleaf Maple (*Acer macrophyllum*)	6	Unbalanced crown, large dead branches in crown, crooked stem	B	Located within proposed road grading	0
10587	20	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10589	12	Bigleaf Maple (*Acer macrophyllum*)	2	Decay present at base, topped, slight lean, declining health	B	Lot grading greatly impacts root zone	0
10590	8	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, slight lean, crooked stem	B	Lot grading greatly impacts root zone	0
10591	12	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10592	17	Bigleaf Maple (*Acer macrophyllum*)	5	Codominant stems begin at 20', large dead branches in crown, scarring in stem	C	Lot grading greatly impacts root zone	0
10593	12	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10594	11	Bigleaf Maple (*Acer macrophyllum*)	2	Stem forks at 30', slight lean	B	Lot grading greatly impacts root zone	0
10595	8	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Lot grading greatly impacts root zone	0
10596	14	Bigleaf Maple (*Acer macrophyllum*)	3	Stem forks at 40', dead branches in crown	C	Lot grading greatly impacts root zone	0
10597	6	Bigleaf Maple (*Acer macrophyllum*)	2	Dead top	B	Lot grading greatly impacts root zone	0
10598	17	Bigleaf Maple (*Acer macrophyllum*)	5	Stem forks at 25' and 45', one stem is topped with large branch breakage near top	B	Lot grading greatly impacts root zone	0
10599	14	Bigleaf Maple (*Acer macrophyllum*)	3	Dead top	B	Lot grading greatly impacts root zone	0
10600	6	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10601	8	Bigleaf Maple (*Acer macrophyllum*)	2	Slightly crooked, sweep in stem	B	Lot grading greatly impacts root zone	0
10602	15	Bigleaf Maple (*Acer macrophyllum*)	4	Dead top	B	Lot grading greatly impacts root zone	0
10603	16	Bigleaf Maple (*Acer macrophyllum*)	4	Crooked stem	C	Lot grading greatly impacts root zone	0
10604	10	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10605	13	Bigleaf Maple (*Acer macrophyllum*)	3	Dead top, slight lean	B	Lot grading greatly impacts root zone	0
10606	12,10	Bigleaf Maple (*Acer macrophyllum*)	4	Codominant stems above breast height, dead branches in crown	B	Lot grading greatly impacts root zone	0
10607	7,6,5,4	Bigleaf Maple (*Acer macrophyllum*)	2	Codominant stems above breast height, dead top, declining health	B	Lot grading greatly impacts root zone	0
10608	6	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Lot grading greatly impacts root zone	0
10610	7	Red Alder (*Alnus rubra*)	0	Dead	A	Tree is dead	0
10614	8	Red Alder (*Alnus rubra*)	2	Crooked stem, slight lean	B		2
10615	17,36	Bigleaf Maple (*Acer macrophyllum*)	16	Breakage and dead branches in crown, splits into three codominant stems above breast height, one stem topped	B		16
10619	12	Bigleaf Maple (*Acer macrophyllum*)	2	Decay in cavity at base	B	Lot grading greatly impacts root zone	0
10620	8	Red Alder (*Alnus rubra*)	2	Dead branches, top is dying	B	Lot grading greatly impacts root zone	0
10621	8	Bigleaf Maple (*Acer macrophyllum*)	2	Topped, decay in stem, moderate lean, crooked stem, declining health	A	Lot grading greatly impacts root zone	0
10622	7	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced, dead top	B	Lot grading greatly impacts root zone	0
10623	9,9	Bigleaf Maple (*Acer macrophyllum*)	3	One stem forks near top, other stem is topped, decay present	B	Lot grading greatly impacts root zone	0
10624	9	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced, crooked stem	B	Lot grading greatly impacts root zone	0
10625	17	Bigleaf Maple (*Acer macrophyllum*)	5	Unbalanced, codominant stems above breast height, one stem topped	B	Lot grading greatly impacts root zone	0
10626	10	Bigleaf Maple (*Acer macrophyllum*)	2	Large dead branches at top	C	Lot grading greatly impacts root zone	0
10627	15	Bigleaf Maple (*Acer macrophyllum*)	4	Stem forks at 45', decay in stem, crooked, scarring present, large dead branches in crown	B	Lot grading greatly impacts root zone	0
10628	9	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10629	12	Bigleaf Maple (*Acer macrophyllum*)	2	Stem forks at 40', one branch at fork dead	B	Lot grading greatly impacts root zone	0
10630	12	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
10631	6	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10632	10	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10633	16	Bigleaf Maple (*Acer macrophyllum*)	4	Healthy	C	Lot grading greatly impacts root zone	0
10634	12	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, crooked	B	Lot grading greatly impacts root zone	0
10635	12,4	Bigleaf Maple (*Acer macrophyllum*)	3	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
10637	8	Bigleaf Maple (*Acer macrophyllum*)	2	Topped, dead bark near break, declining health	B	Lot grading greatly impacts root zone	0
10638	14	Bigleaf Maple (*Acer macrophyllum*)	3	Slightly crooked	B	Lot grading greatly impacts root zone	0
10639	8,8	Bigleaf Maple (*Acer macrophyllum*)	2	Slightly crooked, one 8" stem dead	B	Lot grading greatly impacts root zone	0
10640	14	Bigleaf Maple (*Acer macrophyllum*)	3	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10641	8	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10642	9	Bigleaf Maple (*Acer macrophyllum*)	2	Crooked stem, dead branches in crown	B	Lot grading greatly impacts root zone	0

AKS Reference #	Total DBH (In)	Tree Species Common Name (*Scientific name*)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
10643	9	Bigleaf Maple (*Acer macrophyllum*)	2	Topped, no obvious dominant branches	B	Lot grading greatly impacts root zone	0
10644	13	Bigleaf Maple (*Acer macrophyllum*)	0	Dead, stem split in half	A	Tree is dead	0
10645	17	Bigleaf Maple (*Acer macrophyllum*)	5	Unbalanced crown, dead branches in crown, cavity in stem at eye height, decay present	B	Lot grading greatly impacts root zone	0
10646	9	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10647	10	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10648	7	Bigleaf Maple (*Acer macrophyllum*)	2	Topped, no obvious dominant branches	B	Lot grading greatly impacts root zone	0
10649	12	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, stem forks at 20', dead branches in crown	B	Lot grading greatly impacts root zone	0
10650	9	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, stem forks at 20	B	Lot grading greatly impacts root zone	0
10651	9	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, stem forks at 20	B	Lot grading greatly impacts root zone	0
10652	15	Bigleaf Maple (*Acer macrophyllum*)	4	Stem forks at 15'	B	Lot grading greatly impacts root zone	0
10653	13	Bigleaf Maple (*Acer macrophyllum*)	3	Dead branches in crown, one large branch contains almost all crown growth	B	Lot grading greatly impacts root zone	0
10654	17,15,13,14	Bigleaf Maple (*Acer macrophyllum*)	11	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10657	12,7	Bigleaf Maple (*Acer macrophyllum*)	3	Dead top, 7" stem shows declining health, unbalaced crown, 12" stem has sweep at base	B	Lot grading greatly impacts root zone	0
10660	10	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10661	8	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10662	10	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced, dead top, stem forks near top	B	Located within proposed road grading	0
10663	13	Bigleaf Maple (*Acer macrophyllum*)	3	Unbalanced, dead branches in crown, stem forks near top	B	Located within proposed road grading	0
10664	14	Bigleaf Maple (*Acer macrophyllum*)	3	Sparse crown, unbalanced	B	Located within proposed road grading	0
10665	12	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Located within proposed road grading	0
10666	8	Bigleaf Maple (*Acer macrophyllum*)	2	Topped, unbalanced crown, declining health	B	Located within proposed road grading	0
10667	9	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10668	25	Douglas-fir (*Pseudotsuga menziesii*)	9	Dead branches in crown	C	Located within proposed road grading	0
10669	14	Bigleaf Maple (*Acer macrophyllum*)	3	Large dead branches in crown, slight lean	B	Lot grading greatly impacts root zone	0
10670	7,7,7,6,4	Bigleaf Maple (*Acer macrophyllum*)	3	Unbalanced, dead branches in crown, slight lean	B	Lot grading greatly impacts root zone	0
10674	9,7,7,6,4,4	Bigleaf Maple (*Acer macrophyllum*)	4	Unbalanced, dead branches in crown	B	Lot grading greatly impacts root zone	0
10675	10	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, slightly crooked	B	Located within proposed road grading	0
10676	11,7	Bigleaf Maple (*Acer macrophyllum*)	3	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10677	14	Bigleaf Maple (*Acer macrophyllum*)	3	Stem forks at 40', dead branches in crown	C	Located within proposed road grading	0
10678	11	Bigleaf Maple (*Acer macrophyllum*)	2	Stem forks at 35', unbalanced crown, dead top, slight lean, branches extend horizontally after fork	B	Located within proposed road grading	0
10679	14	Bigleaf Maple (*Acer macrophyllum*)	3	Stem forks at 40', unbalanced crown	B	Located within proposed road grading	0
10682	17	Bigleaf Maple (*Acer macrophyllum*)	5	Stem forks at 50', dead top, slight lean, slightly crooked	B	Located within proposed road grading	0
10683	12	Bigleaf Maple (*Acer macrophyllum*)	2	Stem forks at 45', slightly crooked	B	Located within proposed road grading	0
10684	14	Bigleaf Maple (*Acer macrophyllum*)	3	Stem forks at 20', topped	B	Located within proposed road grading	0
10691	20	Bigleaf Maple (*Acer macrophyllum*)	6	Codominant stems begin at 10', crooked stem	B	Lot grading greatly impacts root zone	0
10693	11	Bigleaf Maple (*Acer macrophyllum*)	2	Significant decay in stem, almost dead	A	Located within proposed road grading	0
10695	7	Bigleaf Maple (*Acer macrophyllum*)	2	Dead top, declining health	B	Located within proposed road grading	0
10696	13	Bigleaf Maple (*Acer macrophyllum*)	3	Unbalanced crown	B	Located within proposed road grading	0
10697	7,4	Bigleaf Maple (*Acer macrophyllum*)	2	Dead top, slight lean	B	Located within proposed road grading	0
10698	6,7,8	Bigleaf Maple (*Acer macrophyllum*)	2	Slight lean	B	Located within proposed road grading	0
10702	13	Bigleaf Maple (*Acer macrophyllum*)	3	Unbalanced crown, stem forks near top, dead branches in crown	B	Located within proposed road grading	0
10705	13,7	Bigleaf Maple (*Acer macrophyllum*)	4	7" stem unbalanced, slight lean, dead branches in crown	B	Located within proposed road grading	0
10707	9	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10708	9	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10709	13,14,6	Bigleaf Maple (*Acer macrophyllum*)	6	14" & 6" stems unbalanced, 14" stem has dead top, dead branches in crown	B	Lot grading greatly impacts root zone	0
10710	10	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced, scarring in stem	B	Lot grading greatly impacts root zone	0
10711	7,7	Bigleaf Maple (*Acer macrophyllum*)	2	One stem broken, unbalanced, significant lean	A	Lot grading greatly impacts root zone	0
10712	11	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10713	17,19	Bigleaf Maple (*Acer macrophyllum*)	9	17" stem splits into codominant stems with one having a dead top, 19" stem unbalanced, decay in dead stem and branch sections	A	Lot grading greatly impacts root zone	0
10715	8	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10716	14	Bigleaf Maple (*Acer macrophyllum*)	3	Codominant stems begin above breast height, one stem dead	B	Located within proposed road grading	0
10717	14	Bigleaf Maple (*Acer macrophyllum*)	3	Unbalanced crown, dead branches in crown	B	Located within proposed road grading	0
10718	14	Bigleaf Maple (*Acer macrophyllum*)	3	Slightly crooked	C	Located within proposed road grading	0
10719	13	Unknown Deciduous	3	Significant decay in stem, almost dead	A	Located within proposed road grading	0
10720	10	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10721	14	Bigleaf Maple (*Acer macrophyllum*)	3	Topped, large dead branch stubs	B	Located within proposed road grading	0
10723	20	Bigleaf Maple (*Acer macrophyllum*)	6	Large dead branches in crown, branches extend out far	C	Lot grading greatly impacts root zone	0
10724	22	Bigleaf Maple (*Acer macrophyllum*)	7	Large dead branches in crown, branches extend out far	C	Lot grading greatly impacts root zone	0
10725	6	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, slight lean	B	Located within proposed road grading	0
10726	14	Bigleaf Maple (*Acer macrophyllum*)	3	Scarring in stem	C	Located within proposed road grading	0
10727	12	Bigleaf Maple (*Acer macrophyllum*)	2	Topped, no obvious dominant branches	B	Located within proposed road grading	0
10728	6,7	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10729	10	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, topped, branch extends horizontally at top	B	Located within proposed road grading	0
10730	7	Red Alder (*Alnus rubra*)	2	Severely unbalanced and leaning	B	Located within proposed road grading	0
10731	19	Bigleaf Maple (*Acer macrophyllum*)	6	Dead branches in crown	C	Located within proposed road grading	0
10732	13	Bigleaf Maple (*Acer macrophyllum*)	3	Fair health	C	Located within proposed road grading	0
10733	30	Bigleaf Maple (*Acer macrophyllum*)	11	Codominant stems begin above breast height, one stem crooked	C	Lot grading greatly impacts root zone	0
10734	18	Bigleaf Maple (*Acer macrophyllum*)	5	Very unbalanced crown, possible dead top	B	Lot grading greatly impacts root zone	0
10737	8	Bigleaf Maple (*Acer macrophyllum*)	2	Stem forks at 20'	B	Lot grading greatly impacts root zone	0
10738	9	Bigleaf Maple (*Acer macrophyllum*)	2	Scarring at base	C	Located within proposed road grading	0
10739	26	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
10740	13	Bigleaf Maple (*Acer macrophyllum*)	3	Large dead branches in crown, declining health	B	Located within proposed road grading	0
10741	15	Bigleaf Maple (*Acer macrophyllum*)	4	Unbalanced crown, stems forks near top, one branch of fork dead	B	Lot grading greatly impacts root zone	0
10743	36	Bigleaf Maple (*Acer macrophyllum*)	14	Two codominant stems begin above breast height, dead third stem	B		14
10744	28	Bigleaf Maple (*Acer macrophyllum*)	10	Previous codominant stem broke off, significant decay in leftover wood, unbalanced crown, crooked stem, forks at 20', dead branches in crown	B	Poor tree health	0
11024	14	Douglas-fir (*Pseudotsuga menziesii*)	3	Large branch over existing access road	C	Located within proposed road grading	0
11025	11,11,10	Lodgepole Pine (*Pinus contorta*)	5	Codominant stems above breast height	B	Located within proposed road grading	0
11026	13	Western Redcedar (*Thuja plicata*)	3	Codominant stems above breast height, brown rot decay at base	B	Poor tree health	0
11027	7,6,6,3	Western Redcedar (*Thuja plicata*)	2	Codominant stems above breast height, crown clean recommended	B		2
11028	12	Lodgepole Pine (*Pinus contorta*)	2	Healthy	C	Located within proposed road grading	0
11029	11,12	Western Redcedar (*Thuja plicata*)	4	Codominant stems above breast height, crown clean recommended	B		4
11030	12	Western Redcedar (*Thuja plicata*)	2	Crown clean recommended, healthy	C		2
11031	10	Lodgepole Pine (*Pinus contorta*)	0	Dead	A	Tree is dead	0
11032	11	Western Redcedar (*Thuja plicata*)	2	Crown clean recommended, healthy	C		2
11033	16	Western Redcedar (*Thuja plicata*)	4	Crown clean recommended, healthy	C		4
11034	11	Lodgepole Pine (*Pinus contorta*)	2	Crooked stem	B	Located within proposed road grading	0
11035	24	Douglas-fir (*Pseudotsuga menziesii*)	8	Crown clean recommended, healthy	C		8
11036	14	Lodgepole Pine (*Pinus contorta*)	3	Unbalanced crown, large branch over driveway, scarring in stem, crooked	B	Located within proposed road grading	0
11037	8	Western Redcedar (*Thuja plicata*)	2	Growing in shade of adjacent Douglas-fir, exhibits slow growth in branches	B		2
11040	16	Douglas-fir (*Pseudotsuga menziesii*)	4	Healthy	C	Located within proposed road grading	0
11041	19	Douglas-fir (*Pseudotsuga menziesii*)	6	Healthy	C	Located within proposed road grading	0
11042	21	Douglas-fir (*Pseudotsuga menziesii*)	7	Healthy	C	Located within proposed road grading	0
11043	7	Honey Locust (*Gleditsia triacanthos*)	2	Unbalanced crown	B	Located within proposed road grading	0
11082	10	Honey Locust (*Gleditsia triacanthos*)	0	Off site	C		0
11085	10	Honey Locust (*Gleditsia triacanthos*)	0	Off site, dead branches in crown	C		0
11086	7	Honey Locust (*Gleditsia triacanthos*)	0	Off site, exhibits healthy growth in response to topping	C		0
11090	6,2,2	Honey Locust (*Gleditsia triacanthos*)	0	Off site, healthy	C		0
11298	6 stems of 4"	Hawthorn (*Crataegus spp.*)	0	Heavy crown clean recommended, one stem extends outside of crow	C		0
11316	6 stems of 4"	Hawthorn (*Crataegus spp.*)	2	Healthy	C	Within stormwater facility grading	0
11323	4 stems of 4"	Hawthorn (*Crataegus spp.*)	0	Heavy crown clean recommended	C		0
11324	6,8	Hawthorn (*Crataegus spp.*)	0	Heavy crown clean recommended	C		0
11325	15,13	Port Orford Cedar (*Chamaecyparis lawsoniana*)	0	Dead	A	Tree is dead	0
11331	12,6,8	Honey Locust (*Gleditsia triacanthos*)	0	Off site, healthy	C		0
11332	7	Honey Locust (*Gleditsia triacanthos*)	0	Off site, small 2" stem attached leaning over road requries pruning or removal	C		0

AKS Reference #	Total DBH (In)	Tree Species Common Name (*Scientific name*)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
11333	6,6	Honey Locust (*Gleditsia triacanthos*)	0	Off site	C		0
11336	16	Honey Locust (*Gleditsia triacanthos*)	0	Off site, healthy	C		0
11337	20	Honey Locust (*Gleditsia triacanthos*)	0	Off site, healthy	C		0
11343	9	Honey Locust (*Gleditsia triacanthos*)	2	Codominant stems above breast height	B	Located within proposed road grading	0
11347	17,17,15,12,12,12,10,6,6	Canyon Live Oak (*Quercus chrysolepis*)	15	Large stems branch off in all directions, one stem split in half, old scars with decay present in multiple stems, stems are crooked and unbalanced, moderate to severe leaning	A	Sidewalk to be constructed 7' from tree, poor tree health	0
11402	10 stems of 6"	Hawthorn (*Crataegus spp.*)	0	Heavy crown clean recommended	C		0
11403	7,7,6	Aspen (*Populus spp.*)	2	Less than 10' in height, yellow leaves, dead branches in crown, crown clean recommended	C		2
11405	12,14	Holly (*Ilex spp.*)	5	Heavy crown clean recommended, scars on stem	C		5
11406	33	Aspen (*Populus spp.*)	13	Surrounded by heavy blackberry, many dead branches in crown, severe lean, decay present in old branch collars	B	Trunk leans over proposed storm trenching	0
20000	6,4	Black Walnut (*Juglans nigra*)	2	Healthy	C	Located within proposed road grading	0
20015	8	Western Redcedar (*Thuja plicata*)	2	Growing against side of existing structure, surrounded by blackberry	C	Located within proposed road grading	0
20016	7	Red Alder (*Alnus rubra*)	2	Sweep at base, growing against side of existing structure, surrounded by blackberry	B	Located within proposed road grading	0
20023	53	Cherry (*Prunus spp.*)	22.5	Almost dead	B	Located within proposed road grading	0
20097	27,33	Bigleaf Maple (*Acer macrophyllum*)	0	Off site, decay in stem cavity, pitch seeps	B		0
20099	35	Bigleaf Maple (*Acer macrophyllum*)	0	Off site, topped, large branch containing all foliage extends 20' into site, scarring on branch, decay present	B		0
20100	7	Sycamore (*Platanus spp.*)	0	Off site, moderate lean	C		0
20103	14	Sycamore (*Platanus spp.*)	0	Off site	C		0
20105	18	Sycamore (*Platanus spp.*)	0	Off site, some branches extend over site	C		0
20106	9,7	Red Alder (*Alnus rubra*)	2	Dead branches in crown	B		2
20107	10	Red Alder (*Alnus rubra*)	2	Dead branches in crown	B		2
20108	6	Red Alder (*Alnus rubra*)	2	Dead branches in crown, crooked stem	B		2
20109	8	Red Alder (*Alnus rubra*)	2	Dead branches in crown, crooked stem	B		2
20110	7	Red Alder (*Alnus rubra*)	2	Surrounded by blackberry, slight lean	B		2
20111	6	Red Alder (*Alnus rubra*)	2	Surrounded by blackberry, slight lean, crooked stem	B		2
20112	10	Red Alder (*Alnus rubra*)	2	Dead branches in crown	B		2
20114	6	Red Alder (*Alnus rubra*)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20115	7	Red Alder (*Alnus rubra*)	2	Healthy	C	Lot grading greatly impacts root zone	0
20116	8	Red Alder (*Alnus rubra*)	2	Healthy	C	Lot grading greatly impacts root zone	0
20117	6	Red Alder (*Alnus rubra*)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20118	6	Red Alder (*Alnus rubra*)	2	Topped, slight lean, declining health	B	Lot grading greatly impacts root zone	0
20129	6	Red Alder (*Alnus rubra*)	0	Dead	A	Tree is dead	0
20130	9	Red Alder (*Alnus rubra*)	2	Slightly crooked stem, dead branches in crown	B		2
20131	10	Red Alder (*Alnus rubra*)	2	Slight lean	B		2
20132	9	Red Alder (*Alnus rubra*)	2	Healthy	B		2
20133	6	Red Alder (*Alnus rubra*)	2	Sweep at base	B		2
20134	6	Red Alder (*Alnus rubra*)	0	Dead	A	Tree is dead	0
20135	6	Red Alder (*Alnus rubra*)	0	Dead	A	Tree is dead	0
20138	8	Red Alder (*Alnus rubra*)	2	Dead top	B	Poor tree health	0
20141	6	Red Alder (*Alnus rubra*)	2	Slight lean	B		2
20144	9,10,14	Bigleaf Maple (*Acer macrophyllum*)	6	Large dead branches in crown	B		6
20145	7	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
20146	12,6	Bigleaf Maple (*Acer macrophyllum*)	3	6" stem dead, large dead branches in crown	B		3
20147	11	Bigleaf Maple (*Acer macrophyllum*)	2	Moderate lean	B		2
20148	6,7,8,9,11,4	Bigleaf Maple (*Acer macrophyllum*)	6	Large dead branches in crown, moderate lean	B		6
20149	7,8,8,11,12,4,4	Bigleaf Maple (*Acer macrophyllum*)	7	Large dead branches in crown	C		7
20150	6	Red Alder (*Alnus rubra*)	0	Dead	A	Tree is dead	0
20151	9,10,13,13	Unknown Deciduous	8	Large dead branches in crown, crown clean recommended	B		8
20153	6	Red Alder (*Alnus rubra*)	2	Healthy	C		2
20155	6	Red Alder (*Alnus rubra*)	2	Dead branches in crown, crooked stem	B	High risk of falling after development	0
20156	8	Red Alder (*Alnus rubra*)	2	Healthy	C		2
20157	8	Red Alder (*Alnus rubra*)	0	Dead	A	Tree is dead	0
20158	8	Red Alder (*Alnus rubra*)	2	Dead branches in crown	B		2
20159	9	Red Alder (*Alnus rubra*)	2	Dead branches in crown, codominant stems above breast height	B		2
20160	6	Red Alder (*Alnus rubra*)	2	Healthy	C		2
20175	8	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown	C		2
20176	8	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Lot grading greatly impacts root zone	0
20180	13	Bigleaf Maple (*Acer macrophyllum*)	3	Healthy	C	Lot grading greatly impacts root zone	0
20181	21	Bigleaf Maple (*Acer macrophyllum*)	7	Large dead branches in crown, scarring in stem	C	Lot grading greatly impacts root zone	0
20185	18	Bigleaf Maple (*Acer macrophyllum*)	5	Dead hanging branches in crown	C		5
20192	6	Red Alder (*Alnus rubra*)	2	Crooked stem, moderate lean	B		2
20193	9	Red Alder (*Alnus rubra*)	2	Significant lean	A		2
20194	10,7	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C		2
20195	7	Bigleaf Maple (*Acer macrophyllum*)	2	Scarring in stem	B		2
20196	8	Bigleaf Maple (*Acer macrophyllum*)	2	Slight lean	B		2
20199	6	Red Alder (*Alnus rubra*)	2	Crooked stem	B		2
20202	6,12	Red Alder (*Alnus rubra*)	3	Dead branches in crown, sweep at base	B	Lot grading greatly impacts root zone	0
20203	9	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20204	16	Red Alder (*Alnus rubra*)	4	Dead branches in crown	C		4
20205	13	Red Alder (*Alnus rubra*)	3	Topped, dead branches in crown, declining health	B	Poor tree health	0
20216	6	Red Alder (*Alnus rubra*)	2	Slight lean, crooked stem	B		2
20218	7	Red Alder (*Alnus rubra*)	2	Slight lean	B		2
20220	9	Red Alder (*Alnus rubra*)	2	Dead branches in crown, crooked stem	B		2
20221	9	Red Alder (*Alnus rubra*)	2	Unbalanced crown, severe lean	B	High risk of falling after development	0
20222	7	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Lot grading greatly impacts root zone	0
20223	14	Bigleaf Maple (*Acer macrophyllum*)	3	Unbalanced, dead branches in crown	B	Lot grading greatly impacts root zone	0
20224	6	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
20226	7,4	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Lot grading greatly impacts root zone	0
20228	6	Honey Locust (*Gleditsia triacanthos*)	2	Dead branches in crown, crooked stem	B	Lot grading greatly impacts root zone	0
20231	32	Bigleaf Maple (*Acer macrophyllum*)	12	Dead top, forks at 50', declining health	B	Lot grading greatly impacts root zone	0
20234	8	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
20235	10	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Lot grading greatly impacts root zone	0
20236	10	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Lot grading greatly impacts root zone	0
20237	8	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Lot grading greatly impacts root zone	0
20238	8	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
20240	11	Unknown Deciduous	2	Healthy	C	Lot grading greatly impacts root zone	0
20241	11	Unknown Deciduous	2	Unbalanced, decay present in stem	B	Lot grading greatly impacts root zone	0
20242	12	Unknown Deciduous	2	Unbalanced crown, sweep at base, severe lean	B	Lot grading greatly impacts root zone	0
20243	12	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
20244	7	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20245	8	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20246	7	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20247	10	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20248	8	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20249	9	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20250	10	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20252	6,4	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Lot grading greatly impacts root zone	0
20253	6,6	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Tree is dead	0
20254	37	Douglas-fir (*Pseudotsuga menziesii*)	15	Dead branches in crown	C	Located in center of proposed lot grading	0
20263	8	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
20265	9	Red Alder (*Alnus rubra*)	2	Few leaves on branches, declining health	B	Lot grading greatly impacts root zone	0
20267	7	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, slight lean, crooked stem	B	Lot grading greatly impacts root zone	0

AKS Reference #	Total DBH (In)	Tree Species Common Name (*Scientific name*)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
20268	6	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, moderate lean, crooked stem	B	Lot grading greatly impacts root zone	0
20274	6	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	B	Lot grading greatly impacts root zone	0
20275	6	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	B	Lot grading greatly impacts root zone	0
20276	6	Bigleaf Maple (*Acer macrophyllum*)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20277	20	Bigleaf Maple (*Acer macrophyllum*)	6	Dead branches in crown, crooked stem	C	Lot grading greatly impacts root zone	0
20278	7,7	Bigleaf Maple (*Acer macrophyllum*)	2	Dead branches in crown, crooked stem	B	Lot grading greatly impacts root zone	0
20283	7	Red Alder (*Alnus rubra*)	2	Crooked stem	B		2
20284	6,5	Red Alder (*Alnus rubra*)	2	Slight lean	B		2
20285	9	Red Alder (*Alnus rubra*)	2	Slight lean	B		2
20288	24,20,12	Bigleaf Maple (*Acer macrophyllum*)	0	Off site, dead branches in crown, decay in stem, large branches extend over sit	B		0
20302	13,12	Bigleaf Maple (*Acer macrophyllum*)	0	12" stem extends off site & dead, decay in stem cavity at base, unbalanced, dead branches in crown	B	Poor tree health	0
20322	7	Paper Birch (*Betula papyrifera*)	2	Moderate lean	B		2
20323	7	Paper Birch (*Betula papyrifera*)	2	Unbalanced crown, slight lean, crooked stem	B		2
20324	11	Cottonwood (*Populus spp.*)	2	Healthy	C		2
20335	7	Unknown Deciduous	2	Decay in stem cavity	B	Lot grading greatly impacts root zone	0
20340	15	Unknown Deciduous	4	Decay in stem cavity, dead branches in crown, declining health	B	Lot grading greatly impacts root zone	0
20341	10	Unknown Deciduous	2	Dead top, cavity in stem, decay in cavity, declining health	B	Lot grading greatly impacts root zone	0
20343	21	Paper Birch (*Betula papyrifera*)	7	Large dead branches with breakage	C	Lot grading greatly impacts root zone	0
20345	8,8,6,6,4,4	Bigleaf Maple (*Acer macrophyllum*)	4	Both 4" stems are dead, dead branches in crown	B	Lot grading greatly impacts root zone	0
20366	6,6,7,7	Unknown Deciduous	3	Dead top, crown clean recommended	B	Final lot grading will greatly affect root zone	0
20404	15,10,6	Elderberry (*Sambucus spp.*)	6	Surrounded by heavy blackberry, significant decay in stem, scarring in ster	A	Lot grading greatly impacts root zone	0
20438	19	Norway Maple (*Acer platanoides*)	6	25' crown radius, stem splits into 7-8 large branches at 7	B	Lot grading greatly impacts root zone	0
20443	31	Western Redcedar (*Thuja plicata*)	12	Surrounded by blackberry, healthy	C	Final lot grading will result in fills of over 4' in depth across entire root zone	0
20448	7,5	Bigleaf Maple (*Acer macrophyllum*)	2	Slight lean	B	Lot grading greatly impacts root zone	0
20449	6	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Lot grading greatly impacts root zone	0
20450	8	Bigleaf Maple (*Acer macrophyllum*)	2	Healthy	C	Lot grading greatly impacts root zone	0
20451	7	Bigleaf Maple (*Acer macrophyllum*)	2	Slight lean	B	Lot grading greatly impacts root zone	0
20453	7	Bigleaf Maple (*Acer macrophyllum*)	2	Dead top	B	Lot grading greatly impacts root zone	0
20454	7	Bigleaf Maple (*Acer macrophyllum*)	2	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
20496	9	Hawthorn (*Crataegus spp.*)	2	Many dead branches	C	Storm access road grading	0
20497	3,4,17,23	Hawthorn (*Crataegus spp.*)	11	Many dead branches	C	Storm access road grading	0
20531	11	Red Alder (*Alnus rubra*)	2	Moderate lean	B	Within stormwater facility grading	0
20549	26	Bigleaf Maple (*Acer macrophyllum*)	9	Scar at 15', dead branches in crown	C	Within stormwater facility grading	0
20551	12	Red Alder (*Alnus rubra*)	2	Sparse crown	B	Lot grading greatly impacts root zone	0
20552	6,10	Bigleaf Maple (*Acer macrophyllum*)	2	6" stem is topped and has decay, broken branches in crown	B	Within stormwater facility grading	0
20560	10	Red Alder (*Alnus rubra*)	2	Dead top	B	Within stormwater facility grading	0
20561	9	Red Alder (*Alnus rubra*)	2	Unbalanced crown, Dead top	B	Within stormwater facility grading	0
20562	6	Red Alder (*Alnus rubra*)	2	Many dead branches, slight lean, surrounded by blackberry, declining health	B	Within stormwater facility grading	0
20563	11	Red Alder (*Alnus rubra*)	2	Many dead branches, slight lean, surrounded by blackberry, declining health	B	Within stormwater facility grading	0
20564	7	Red Alder (*Alnus rubra*)	2	Significant decay in stem, moderate lean, stem forks at 10', surrounded by blackberry, almost dead	A	Within stormwater facility grading	0
20565	12	Red Alder (*Alnus rubra*)	2	Slight lean, stem forks near top	B	Within stormwater facility grading	0
20566	12	Red Alder (*Alnus rubra*)	2	Topped, scars from breakage at top and 20	B	Within stormwater facility grading	0
20568	16	Red Alder (*Alnus rubra*)	4	Surrounded by blackberry, poor crown structure	B	Within stormwater facility grading	0
20571	9	Red Alder (*Alnus rubra*)	2	Moderate lean	B	Within stormwater facility grading	0
20572	6	Red Alder (*Alnus rubra*)	0	Dead	A	Tree is dead	0
20573	36	Bigleaf Maple (*Acer macrophyllum*)	14	Codominant stems above breast height, decay in stem, many large dead branche	B	Within stormwater facility grading	0
20576	17	Bigleaf Maple (*Acer macrophyllum*)	0	Large dead branches, corrected sweep	C	Within stormwater facility grading	0
20577	8	Red Alder (*Alnus rubra*)	0	Dead	A	Retained within critical area	0
20578	7	Red Alder (*Alnus rubra*)	0	Off site, slight lean	B		0
20583	10	Red Alder (*Alnus rubra*)	0	Dead	A	Tree is dead	0
20589	6	Bigleaf Maple (*Acer macrophyllum*)	0	Off site, slight lean	B		0
20590	12	Red Alder (*Alnus rubra*)	0	Dead	A	Retained within critical area	0
20591	6	Red Alder (*Alnus rubra*)	0	Off site, dead	A		0
20593	10	Red Alder (*Alnus rubra*)	0	Dead branches in crown	C	Within stormwater facility grading	0
20595	33	Bigleaf Maple (*Acer macrophyllum*)	0	3 codominant stems above breast height, large dead branches, unbalanced, slight lear	B	Within stormwater facility grading	0
20596	10	Bigleaf Maple (*Acer macrophyllum*)	0	2 codominant stems above breast height, one stem topped, dead branches in crown	B	Within stormwater facility grading	0
20597	23	Bigleaf Maple (*Acer macrophyllum*)	0	2 codominant stems above breast height, one stem dead, decay present in scar on stem	B	Within stormwater facility grading	0
20598	10	Bigleaf Maple (*Acer macrophyllum*)	0	Dead top, moderate lean, scarring on stem, crooked stem	B	Within stormwater facility grading	0
20604	14	Red Alder (*Alnus rubra*)	3	Dead top	B	Within stormwater facility grading	0
20608	14	Red Alder (*Alnus rubra*)	0	Dead	A	Tree is dead	0
20611	15,15	Bigleaf Maple (*Acer macrophyllum*)	0	Slight lean, crooked stem	B		0
20612	10	Bigleaf Maple (*Acer macrophyllum*)	0	Dead	A	Retained within critical area	0
20613	10,6	Bigleaf Maple (*Acer macrophyllum*)	0	6" stem dead, sweep near base	B		0
20626	12	Red Alder (*Alnus rubra*)	2	Slight lean, one large dead branch	C	Within stormwater facility grading	0
20672	8	Vine Maple (*Acer circimatum*)	0	Dead	A	Tree is dead	0
20673	6,6,6,6	Vine Maple (*Acer circimatum*)	0	Dead	A	Tree is dead	0
20676	26	Red Alder (*Alnus rubra*)	0	Codominant stems begin at 8', decay in cavity at base, slight lean, scarring in stem, pitch leaking from scar, declining health, surrounded by heavy blackberry	B	Within stormwater facility grading	0
20677	15,12	Apple (*Malus, spp.*)	0	Many large dead branches, decay throughout tree, severe lean, very crooked, declining health	A	Within stormwater facility grading	0
20683	15,9	Red Alder (*Alnus rubra*)	0	Dead top, 9" stem spreads out horizontally 25', surrounded by heavy blackberry	B	Within stormwater facility grading	0
20684	22	Red Alder (*Alnus rubra*)	0	Dead branches in crown	C	Within stormwater facility grading	0
20687	10	Red Alder (*Alnus rubra*)	0	Dead branches in crown	C	Within stormwater facility grading	0
21000	35	Bigleaf Maple (*Acer macrophyllum*)	0	Off site	C		0
21001	10	Black Cottonwood (*Populus trichocarpa*)	2	Decay in stem cavity	B	Poor tree health	0
21002	6	Unknown Deciduous	2	Dead branches in crown, decay in stem, severe lean, declining health	B	Lot grading greatly impacts root zone	0
21003	13	Unknown Deciduous	3	Unbalanced crown, decay in stem	B	Lot grading greatly impacts root zone	0
21004	10	Unknown Deciduous	2	Unbalanced crown, significant decay in stem, severe lean	B	Lot grading greatly impacts root zone	0
21005	6	Black Cottonwood (*Populus trichocarpa*)	2	Healthy	C	Lot grading greatly impacts root zone	0
21006	4 stems of 4"	Hawthorn (*Crataegus spp.*)	2	Healthy	C	Lot grading greatly impacts root zone	0
21007	8	Red Alder (*Alnus rubra*)	0	Off site, dead	A		0
21008	16	Bigleaf Maple (*Acer macrophyllum*)	0	Slight lean, scarring on stem, crooked stem, dead branches in crown	B		0

NOTE: Onsite trees existed during the site visits performed on 09/19/2018 - 09/21/2018.

Total # of On Site Existing Trees= 294
Total On Site Existing Tree Units = 1027.5
Total # of On Site Trees Retained= 56
Total # of Tree Units Retained= 190.0
Minimum Tree Units Required per City Code = 113
(5.63 acres * 20 trees/acre)
Minimum # Trees to replant= 0

Total # of Existing Trees Removed= 238
Total Existing Tree Units Removed= 837.5

Windthrow Rating:
A=Least windthrow resistant
B=Moderate windthrow resistant
C=Most windthrow resistant

Tree Root Protection Zone: The tree root protection zone for each tree is a circle with a radius equal to 1 foot per 1 inch DBH.

Arborist Disclosure Statement:
Arborists are tree specialists who use their education, knowledge, training, and experience to examine trees, recommend measures to enhance the health of trees, and attempt to reduce the risk of living near trees. The Client and Jurisdiction may choose to accept or disregard the recommendations of the arborist, or seek additional advice.
Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like medicine, cannot be guaranteed. Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.
At the completion of construction, all trees must once again be reviewed to evaluate their hazard rating. Land clearing and removal of adjacent trees can expose previously unseen defects and otherwise healthy trees can be damaged during construction.

Appendix 'B'

(Tree Preservation and Removal Plan)

TREE PROTECTION NOTES

A. PLACING MATERIALS NEAR TREES – NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE PROTECTED AREA OF ANY TREE DESIGNATED TO REMAIN, INCLUDING, BUT NOT LIMITED TO, PARKING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIALS AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT, ETC.

B. ATTACHMENTS TO TREES – DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY OBJECT TO ANY TREE DESIGNATED FOR PROTECTION.

C. PROTECTIVE BARRIER – BEFORE DEVELOPMENT, LAND CLEARING, FILLING OR ANY LAND ALTERATION FOR WHICH A TREE REMOVAL PERMIT IS REQUIRED, THE CONTRACTOR:

- C.A. SHALL ERECT AND MAINTAIN READILY VISIBLE PROTECTIVE TREE FENCING ALONG THE OUTER EDGE AND COMPLETELY SURROUNDING THE PROTECTED AREA OF ALL PROTECTED TREES OR GROUP OF TREES. FENCES SHALL BE CONSTRUCTED PER THE DETAIL ON THIS SHEET.
- C.B. MAY BE REQUIRED TO COVER WITH MULCH TO A DEPTH OF AT LEAST SIX (6) INCHES OR WITH PLYWOOD OR SIMILAR MATERIAL IN THE AREAS ADJOINING THE CRITICAL ROOT ZONE OF A TREE IN ORDER TO PROTECT ROOTS FROM DAMAGE CAUSED BY HEAVY EQUIPMENT.
- C.C. SHALL PROHIBIT EXCAVATION OR COMPACTING OF EARTH OR OTHER POTENTIALLY DAMAGING ACTIVITIES WITHIN THE BARRIERS.
- C.D. MAY BE REQUIRED TO MINIMIZE ROOT DAMAGE BY EXCAVATING A TWO (2) FOOT DEEP TRENCH, AT EDGE OF CRITICAL ROOT ZONE, TO CLEANLY SEVER THE ROOTS OF TREES TO BE RETAINED. ROOTS ONE (1) INCH DIAMETER OR GREATER SHALL BE CLEANLY CUT WITH A SAW OR PRUNERS.
- C.E. MAY BE REQUIRED TO HAVE CORRECTIVE PRUNING PERFORMED ON PROTECTED TREES IN ORDER TO AVOID DAMAGE FROM MACHINERY OR BUILDING ACTIVITY. MAY BE REQUIRED TO MAINTAIN TREES THROUGHOUT THE CONSTRUCTION PERIOD BY WATERING AND FERTILIZING.
- C.F. SHALL MAINTAIN THE PROTECTIVE BARRIERS IN PLACE UNTIL THE PROJECT ARBORIST AUTHORIZES THEIR REMOVAL OR A FINAL CERTIFICATE OF OCCUPANCY IS ISSUED, WHICHEVER OCCURS FIRST.
- C.G. SHALL ENSURE THAT ANY LANDSCAPING DONE IN THE PROTECTED ZONE SUBSEQUENT TO THE REMOVAL OF THE BARRIERS SHALL BE ACCOMPLISHED WITH LIGHT MACHINERY OR HAND LABOR.

D. GRADE

- D.A. THE GRADE SHALL NOT BE ELEVATED OR REDUCED WITHIN THE CRITICAL ROOT ZONE OF TREES TO BE PRESERVED WITHOUT THE PROJECT ARBORISTS'S AUTHORIZATION. THE PROJECT ARBORIST MAY ALLOW COVERAGE OF UP TO ONE HALF OF THE AREA OF THE TREE'S CRITICAL 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.
- D.B. IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREES CRITICAL ROOT ZONE, IT SHALL BE PERMANENTLY STABILIZED TO PREVENT SUFFOCATION OF THE ROOTS.
- D.C. THE APPLICANT SHALL NOT INSTALL AN IMPERVIOUS SURFACE WITHIN THE CRITICAL ROOT ZONE OF ANY TREE TO BE RETAINED WITHOUT THE AUTHORIZATION OF THE PROJECT ARBORIST. THE PROJECT 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.
- D.D. TO THE GREATEST EXTENT PRACTICAL, UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE CRITICAL ROOT ZONE OF TREES TO BE RETAINED. THE PROJECT ARBORIST MAY REQUIRE THAT UTILITIES BE TUNNELED UNDER THE ROOTS OF TREES TO BE RETAINED IF THE PROJECT ARBORIST DETERMINES THAT TRENCHING WOULD SIGNIFICANTLY REDUCE THE CHANCES OF THE TREE'S SURVIVAL.
- D.E. TREE 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 TO EROSION FOR THE LEAST POSSIBLE TIME. TO CONTROL EROSION, SHRUBS, GROUND COVER, AND STUMPS SHALL BE MAINTAINED ON THE INDIVIDUAL LOTS, WHERE FEASIBLE. WHERE NOT FEASIBLE, APPROPRIATE EROSION CONTROL PRACTICES SHALL BE IMPLEMENTED PURSUANT TO CAMAS MUNICIPAL CODE CHAPTER 14.06.

E. DIRECTIONAL FELLING OF TREES SHALL BE USED TO AVOID DAMAGE TO TREES DESIGNATED FOR RETENTION.

F. ADDITIONAL REQUIREMENTS – THE PROJECT ARBORIST MAY REQUIRE ADDITIONAL TREE PROTECTION MEASURES WHICH ARE CONSISTENT WITH ACCEPTED URBAN FORESTRY PRACTICES.

G. ENCROACHMENT INTO THE ROOT PROTECTION ZONE IS ALLOWED WITH PROJECT ARBORIST APPROVAL AS DESCRIBED IN THE FOLLOWING NOTES:

- G.A. EXCAVATION IN THE TOP 24 INCHES OF THE SOIL IN THE CRITICAL ROOT ZONE AREA SHOULD BEGIN AT THE EXCAVATION LINE THAT IS CLOSEST TO THE TREE.
- G.B. THE EXCAVATION SHOULD BE DONE BY HAND/SHOVEL OR WITH A BACKHOE AND A MAN WITH A SHOVEL, PRUNING SHEARS, AND A PRUNING SAW.
- G.C. IF DONE BY HAND, ALL ROOTS 1 INCH OR LARGER SHOULD BE PRUNED AT THE EXCAVATION LINE.
- G.D. IF DONE WITH BACKHOE (MOST LIKELY SCENARIO), THEN THE OPERATOR SHALL START THE CUT AT THE EXCAVATION LINE AND CAREFULLY "FEEL" FOR ROOT/RESISTANCE. WHEN THERE IS RESISTANCE, THE MAN WITH THE SHOVEL HAND DIGS AROUND THE ROOTS AND PRUNES THE ROOTS LARGER THAN 1 INCH DIAMETER.
- G.E. THE BACKHOE IS TO REMAIN OFF OF THE TREE ROOTS TO BE PRESERVED AT ALL TIMES.
- G.F. ALL ROOTS SHALL BE CUT CLEANLY WITH PRUNING SHEARS OR A PRUNING SAW.
- G.G. PROJECT ARBORIST MUST BE ONSITE DURING ANY WORK WITHIN THE TREE ROOT PROTECTION ZONE.
- G.H. THE CITY PLANNER MUST BE CONTACTED 24 HOURS PRIOR TO WORKING WITHIN THE TREE ROOT PROTECTION ZONE.

H. TREE PROTECTION ZONE IS DEFINED AS ALL AREAS BOUND AND PROTECTING THE OPTIMAL TREE PROTECTION ZONE.

I. TIMELINE FOR CLEARING, GRADING, AND INSTALLATION OF TREE PROTECTION MEASURES: WORK WILL BEGIN IMMEDIATELY FOLLOWING FINAL APPROVAL BY THE CITY. TREE PROTECTION MEASURES WILL BE DONE DURING CLEARING AND ANY GRADING WILL FOLLOW.

J. PRUNING/TREE REMOVAL NOTES: THE WORK TO BE COMPLETED UNDER THIS PROJECT SHALL CONSIST OF TREE REMOVAL AND TREE TRIMMING AS LISTED.

- J.A. THE CONTRACTOR SHALL PROVIDE ADEQUATE CREW OF MEN, 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 AND WHO SHALL BE RESPONSIBLE FOR THE CREW'S ACTIVITIES AND WHO SHALL RECEIVE INSTRUCTION FROM THE OWNER OR THE OWNER'S REPRESENTATIVE AND DIRECT THE CREW TO ACCOMPLISH SUCH WORK.
- J.B. WHENEVER A TREE, WHICH IS NOT SCHEDULED TO BE REMOVED, MUST BE TRIMMED OR PRUNED, THE CONTRACTOR SHALL INSURE THAT SUCH TRIMMING AND PRUNING IS CARRIED OUT UNDER THE DIRECT SUPERVISION OF A LICENSED ARBORIST. ALL PRUNING AND TRIMMING SHALL BE PERFORMED IN ACCORDANCE WITH THE PROVISIONS OF ANSI A 300 "STANDARD PRACTICES FOR TREE, SHRUB AND OTHER WOODY PLANT MAINTENANCE".
- J.C. THE CONTRACTOR SHALL BE REQUIRED TO CUT TREES TO A HEIGHT OF APPROXIMATELY 12". THE STUMPS AND ROOTS SHALL BE GROUND DOWN A MINIMUM OF TWELVE (12) INCHES BELOW NORMAL GROUND LEVEL.
- J.D. 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.
- J.E. 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 THEY SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING UTILITIES.
- J.F. ANY MATERIAL RESULTING FROM THE TRIMMING OR REMOVAL OF ANY TREES SHALL BECOME THE RESPONSIBILITY OF THE CONTRACTOR.
- J.G. HAZARDOUS TREES-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 OWNERS REPRESENTATIVE. SUCH TREES SHALL INCLUDE THOSE THAT ARE OVER MATURE, DISEASED, OR SHOWING SIGNS OF DECAY OR OTHER STRUCTURAL WEAKNESS.
- J.H. 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.
- J.I. ANY BRUSH CLEARING REQUIRED WITHIN THE TREE PROTECTION ZONE SHALL BE ACCOMPLISHED WITH HAND OPERATED EQUIPMENT.
- J.J. TREES TO BE REMOVED SHALL BE FELLED SO AS TO FALL AWAY FROM TREE ROOT PROTECTION ZONES AND TO AVOID PULLING AND BREAKING OF ROOTS TO REMAIN.
- J.K. ALL DOWNED BRUSH AND TREES SHALL BE REMOVED FROM THE TREE PROTECTION ZONE EITHER BY HAND OR WITH EQUIPMENT SITTING OUTSIDE THE TREE ROOT PROTECTION ZONE. EXTRACTION SHALL OCCUR BY LIFTING THE MATERIAL OUT, NOT BY SKIDDING IT ACROSS THE GROUND.
- J.L. IF TEMPORARY HAUL OR ACCESS ROADS MUST PASS OVER THE ROOT AREA OF TREES TO BE RETAINED A ROADBED OF 6 INCHES OF MULCH OR GRAVEL SHALL BE CREATED TO PROTECT THE SOIL. THE ROADBED MATERIAL SHALL BE REPLENISHED AS NECESSARY TO MAINTAIN A 6-INCH DEPTH.
- J.M. PRUNING. TREES SHALL BE PRUNED PRIOR TO THE START OF CONSTRUCTION. TREES SHALL BE CROWN CLEANED TO REMOVE THE DEADWOOD 2 INCHES IN DIAMETER AND OVER. TREES SHALL BE CROWN THINNED BY 10–20%. CROWNS MAY BE RAISED BY REMOVING BOTTOM BRANCHES AS NECESSARY UP TO 14 FEET HIGH TO GIVE CLEARANCE FOR ANY CONSTRUCTION TRAFFIC, ACTIVITIES, ETC. ALL WORK TO BE DONE IN ACCORDANCE WITH ANSI A300 PRUNING STANDARDS. REMOVE ANY LIMBS OF DOUBTFUL STRENGTH THAT COULD BE DANGEROUS TO PERSONS AND PROPERTY.

GENERAL NOTES

1. TREE PROTECTION FENCING SHALL BE INSTALLED PRIOR TO DEMOLITION AND SITE GRADING ACTIVITIES. SEE DETAIL SHEET P5.3. SILT FENCING MAY BE UTILIZED WHEN APPLICABLE.
2. ALL SHRUBS WITHIN SIGHT DISTANCE TRIANGLES SHALL BE MAINTAINED SO THAT THE FOLIAGE HEIGHT ABOVE THE PAVEMENT DOES NOT EXCEED 2.5 FEET. STREET TREES WITHIN SIGHT DISTANCE TRIANGLES SHALL BE LIMBED UP TO A HEIGHT OF 10 FEET CONSISTENT WITH ANSI A300 STANDARDS TO PROVIDE SIGHT DISTANCE VISIBILITY.
3. SEE SHEETS P5.1–P5.3 FOR TREE INVENTORY.
4. PRESERVED TREES WILL REQUIRE PRUNING TO IMPROVE CROWN STRUCTURE AND REMOVE DEAD BRANCHES, AND/OR REMOVAL OF SURROUNDING BLACKBERRY AND OTHER SPECIES TO INCREASE TREE HEALTH. RETAIN NATIVE VEGETATION WITHIN TREE PROTECTION AREAS. SEE TREE PROTECTION NOTES, THIS SHEET, FOR GENERAL PRUNING GUIDELINES.
5. FOLLOWING CLEARING AND GRADING ACTIVITIES, A CERTIFIED ARBORIST SHALL INSPECT RETAINED TREES FOR POTENTIALLY HAZARDOUS TREE CONDITIONS. COORDINATION WITH THE CITY SHALL OCCUR PRIOR TO ANY ADDITIONAL TREE REMOVALS FOR HAZARD ABATEMENT.
6. NOT ALL TREES WERE SURVEYED AND/OR INSPECTED WITHIN TRACT F, A CRITICAL AREA TRACT. ONLY TREES ADJACENT TO THE PROPOSED DEVELOPMENT ACTIVITIES WERE INSPECTED AND INCLUDED IN THE TREE SURVEY. THEREFORE, TRACT F IS EXCLUDED FROM THE SITE AREA FOR TREE DENSITY CALCULATIONS.
7. TREE PROTECTION AREAS MAY BE REVIEWED AGAIN PRIOR TO HOME CONSTRUCTION AND MODIFIED.

TREE PLAN

GROSS AREA:	10.03 AC
SITE AREA EXCLUDING ROW AND TRACT F:	5.63 AC
TOTAL TREE UNITS REQUIRED (5.63 X 20):	113
EXISTING TREES RETAINED/(TREE UNITS):	56/(190)
PROPOSED SITE TREES/(TREE UNITS):	52/(52)

NOTE: SEE LANDSCAPING PLAN (P9.0) FOR PROPOSED TREE PLANTING PLAN

KEYED NOTES (#)

1. REMOVE THE FOLLOWING TREES: 11025, 11026, 11028, 11031, 11034, 11036, 11406, 20129, 20134, 20135, 20138, 20145, 20150, 20155, 20157, 20176, 20180, 20181, 20366, 20531, 21001, 21006. DO NOT PULL STUMPS WITHIN TREE PROTECTION FENCING. STUMP MAY BE GROUND AND COVERED WITH SOIL.
2. IMPACTS TO OFF-SITE ROW OF TREES EXCEEDS RECOMMENDED CRITICAL ROOT AREA IMPACTS. A CERTIFIED ARBORIST IS TO BE PRESENT DURING EXCAVATION ACTIVITIES IN THIS AREA. COORDINATION WITH ADJACENT PARCEL OWNER SHOULD BE COMPLETED PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES. ADDITIONAL ROOT EXPLORATION MAY BE NECESSARY TO DETERMINE ROOT IMPACTS FOR EACH TREE. IF IMPACTS ARE TOO SEVERE, TREE REMOVAL MAY BE NECESSARY WITH OWNER'S PERMISSION. IF TREE REMOVAL IS NECESSARY AND THE OWNER DOES NOT APPROVE, CONSTRUCTION OF NW CASCADE STREET SHALL OCCUR WITH DEVELOPMENT OF PARCEL 127400-000.

LEGEND

	DECIDUOUS / CONIFEROUS
EXISTING TREE TO REMAIN	
EXISTING TREE TO BE REMOVED	
TREE ROOT PROTECTION ZONE (1 FOOT RADIUS PER INCH DBH)	
TREE PROTECTION/CONSTRUCTION FENCE	

CERTIFIED ARBORIST
ISA®
PRELIMINARY NOT FOR CONSTRUCTION
BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19
Bryce D Hanson

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

TREE PRESERVATION AND REMOVAL PLAN

DESIGNED BY:	ELN
DRAWN BY:	ELN
MANAGED BY:	JMM
CHECKED BY:	BDH
DATE:	11-20-18

REVISIONS

JOB NUMBER 5638

SHEET P5.0

AKS DRAWING FILE: 5638 P5.0.DWG | LAYOUT: P5.0

Detailed Tree Inventory for Hancock Springs

AKS JOB NO. 5638 Site Area = 5.63 acres

AKS Reference #	Total DBH (In)	Tree Species Common Name (Scientific name)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
10334	6	Norway Maple (Acer platanoides)	0	Off site, growing up against fence along property line, healthy	C		0
10336	6	Norway Maple (Acer platanoides)	0	Off site, growing up against fence along property line, healthy	C		0
10341	9,5	Paper Birch (Betula papyrifera)	2	Slight lean, crown clean recommended	C		2
10350	27	Noble Fir (Abies procera)	10	Stem forks into codominant stems at 30' & 45', dead branches in crown, crown clean recommended	C		10
10353	23	Douglas-fir (Pseudotsuga menziesii)	8	Stem forks into codominant stems at 40', dead branches in crown, crown clean recommended	C		8
10360	9	Western Redcedar (Thuja plicata)	0	Off site	C		0
10361	6	Western Redcedar (Thuja plicata)	0	Off site	C		0
10363	16	Douglas-fir (Pseudotsuga menziesii)	0	Off site	C		0
10394	32	Norway Maple (Acer platanoides)	12	Full crown, healthy	C	Located within proposed road grading	0
10411	8	Western Redcedar (Thuja plicata)	2	Growing against side of existing structure, surrounded by blackberry	C	Located within proposed road grading	0
10513	13	Red Alder (Alnus rubra)	3	Healthy	C	Located within proposed road grading	0
10514	11	Red Alder (Alnus rubra)	2	Moderate lean	B	Located within proposed road grading	0
10515	15	Red Alder (Alnus rubra)	4	Slight lean, topped	B	Located within proposed road grading	0
10516	9	Red Alder (Alnus rubra)	2	Slight lean, topped	B	Located within proposed road grading	0
10517	11	Red Alder (Alnus rubra)	2	Slight lean, stem forks at 15', topped	B	Located within proposed road grading	0
10518	8	Red Alder (Alnus rubra)	2	Stem forks at 10'	B	Located within proposed road grading	0
10519	9	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
10520	8	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10521	12	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
10522	9	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10523	9	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10524	8	Red Alder (Alnus rubra)	2	Healthy	C	Lot grading greatly impacts root zone	0
10525	9	Paper Birch (Betula papyrifera)	2	Healthy	C	Lot grading greatly impacts root zone	0
10526	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown, minor scarring on stem	C	Lot grading greatly impacts root zone	0
10529	12	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10530	14	Red Alder (Alnus rubra)	3	Moderate lean	B	Lot grading greatly impacts root zone	0
10531	10	Red Alder (Alnus rubra)	2	Topped, significant lean	B	Lot grading greatly impacts root zone	0
10532	72	Bigleaf Maple (Acer macrophyllum)	31	Three codominant stem begin above breast height, large dead branches in crown, large cavities in base	B	Located in center of proposed lot grading, poor tree health	0
10537	6	Red Alder (Alnus rubra)	2	Moderate lean	B	Located within proposed road grading	0
10539	8,4,5,3,2	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown with dead branches, slight lean, stem forks at 20', 2" & 3" stems are dead	B	Located within proposed road grading	0
10542	21	Bigleaf Maple (Acer macrophyllum)	7	Slight lean, dead branches in crown	C	Located within proposed road grading	0
10543	23	Bigleaf Maple (Acer macrophyllum)	8	Unbalanced crown with dead branches, slight lean, stem forks at 20'	B	Located within proposed road grading	0
10544	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown with dead branches	B	Located within proposed road grading	0
10545	37	Bigleaf Maple (Acer macrophyllum)	15	Has co-dominant stems, some dead branches, decay present	B	Located within proposed road grading	0
10546	9	Red Alder (Alnus rubra)	2	Slight lean, dead top, poor health	B	Located within proposed road grading	0
10547	6	Red Alder (Alnus rubra)	2	Moderate lean	B	Located within proposed road grading	0
10552	27	Bigleaf Maple (Acer macrophyllum)	0	Off site, unbalanced crown, codominant stems, decay in old branch collars, slight lean, scarring in stem	B		0
10553	25,6,6	Bigleaf Maple (Acer macrophyllum)	0	Off site, codominant stems, slight lean, scarring at 12'	B		0
10554	25	Bigleaf Maple (Acer macrophyllum)	0	Off site, codominant stems, included bark	C		0
10563	13	Bigleaf Maple (Acer macrophyllum)	3	Healthy	C	Lot grading greatly impacts root zone	0
10564	13	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 30', decay in cavity at base, slightly crooked	B	Lot grading greatly impacts root zone	0
10569	6	Red Alder (Alnus rubra)	2	Exhibits very poor health	B	Located within proposed road grading	0
10570	7	Red Alder (Alnus rubra)	2	Healthy	C	Located within proposed road grading	0
10572	7,7,4,4,4	Bigleaf Maple (Acer macrophyllum)	2	One 4" stem is dead, one 7" stem is topped	A	Located within proposed road grading	0
10578	6	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 15'	B	Located within proposed road grading	0
10579	9	Honey Locust (Gleditsia triacanthos)	2	Stem forks at 40', slightly crooked, slight lean	B	Located within proposed road grading	0
10580	9	Red Alder (Alnus rubra)	2	Signs of decay in stem, topped, declining health	B	Located within proposed road grading	0
10581	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean, topped	B	Located within proposed road grading	0
10584	23	Bigleaf Maple (Acer macrophyllum)	8	Unbalanced crown, some included bark, scarring in stem	B	Located within proposed road grading	0
10586	20	Bigleaf Maple (Acer macrophyllum)	6	Unbalanced crown, large dead branches in crown, crooked stem	B	Located within proposed road grading	0
10587	20	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10589	12	Bigleaf Maple (Acer macrophyllum)	2	Decay present at base, topped, slight lean, declining health	B	Lot grading greatly impacts root zone	0
10590	8	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean, crooked stem	B	Lot grading greatly impacts root zone	0
10591	12	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10592	17	Bigleaf Maple (Acer macrophyllum)	5	Codominant stems begin at 20', large dead branches in crown, scarring in stem	C	Lot grading greatly impacts root zone	0
10593	12	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10594	11	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 30', slight lean	B	Lot grading greatly impacts root zone	0
10595	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
10596	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 40', dead branches in crown	C	Lot grading greatly impacts root zone	0
10597	6	Bigleaf Maple (Acer macrophyllum)	2	Dead top	B	Lot grading greatly impacts root zone	0
10598	17	Bigleaf Maple (Acer macrophyllum)	5	Stem forks at 25' and 45', one stem is topped with large branch breakage near top	B	Lot grading greatly impacts root zone	0
10599	14	Bigleaf Maple (Acer macrophyllum)	3	Dead top	B	Lot grading greatly impacts root zone	0
10600	6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10601	8	Bigleaf Maple (Acer macrophyllum)	2	Slightly crooked, sweep in stem	B	Lot grading greatly impacts root zone	0
10602	15	Bigleaf Maple (Acer macrophyllum)	4	Dead top	B	Lot grading greatly impacts root zone	0
10603	16	Bigleaf Maple (Acer macrophyllum)	4	Crooked stem	C	Lot grading greatly impacts root zone	0
10604	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10605	13	Bigleaf Maple (Acer macrophyllum)	3	Dead top, slight lean	B	Lot grading greatly impacts root zone	0
10606	12,10	Bigleaf Maple (Acer macrophyllum)	4	Codominant stems above breast height, dead branches in crown	B	Lot grading greatly impacts root zone	0
10607	7,6,5,4	Bigleaf Maple (Acer macrophyllum)	2	Codominant stems above breast height, dead top, declining health	B	Lot grading greatly impacts root zone	0
10608	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
10610	7	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
10614	8	Red Alder (Alnus rubra)	2	Crooked stem, slight lean	B		2
10615	17,36	Bigleaf Maple (Acer macrophyllum)	16	Breakage and dead branches in crown, splits into three codominant stems above breast height, one stem topped	B		16
10619	12	Bigleaf Maple (Acer macrophyllum)	2	Decay in cavity at base	B	Lot grading greatly impacts root zone	0
10620	8	Red Alder (Alnus rubra)	2	Dead branches, top is dying	B	Lot grading greatly impacts root zone	0
10621	8	Bigleaf Maple (Acer macrophyllum)	2	Topped, decay in stem, moderate lean, crooked stem, declining health	A	Lot grading greatly impacts root zone	0
10622	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, dead top	B	Lot grading greatly impacts root zone	0
10623	9,9	Bigleaf Maple (Acer macrophyllum)	3	One stem forks near top, other stem is topped, decay present	B	Lot grading greatly impacts root zone	0
10624	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, crooked stem	B	Lot grading greatly impacts root zone	0
10625	17	Bigleaf Maple (Acer macrophyllum)	5	Unbalanced, codominant stems above breast height, one stem topped	B	Lot grading greatly impacts root zone	0
10626	10	Bigleaf Maple (Acer macrophyllum)	2	Large dead branches at top	C	Lot grading greatly impacts root zone	0
10627	15	Bigleaf Maple (Acer macrophyllum)	4	Stem forks at 45', decay in stem, crooked, scarring present, large dead branches in crown	B	Lot grading greatly impacts root zone	0
10628	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10629	12	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 40', one branch at fork dead	B	Lot grading greatly impacts root zone	0
10630	12	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
10631	6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10632	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10633	16	Bigleaf Maple (Acer macrophyllum)	4	Healthy	C	Lot grading greatly impacts root zone	0
10634	12	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, crooked	B	Lot grading greatly impacts root zone	0
10635	12,4	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
10637	8	Bigleaf Maple (Acer macrophyllum)	2	Topped, dead bark near break, declining health	B	Lot grading greatly impacts root zone	0
10638	14	Bigleaf Maple (Acer macrophyllum)	3	Slightly crooked	B	Lot grading greatly impacts root zone	0
10639	8,8	Bigleaf Maple (Acer macrophyllum)	2	Slightly crooked, one 8" stem dead	B	Lot grading greatly impacts root zone	0
10640	14	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10641	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10642	9	Bigleaf Maple (Acer macrophyllum)	2	Crooked stem, dead branches in crown	B	Lot grading greatly impacts root zone	0
10643	9	Bigleaf Maple (Acer macrophyllum)	2	Topped, no obvious dominant branches	B	Lot grading greatly impacts root zone	0
10644	13	Bigleaf Maple (Acer macrophyllum)	0	Dead, stem split in half	A	Tree is dead	0
10645	17	Bigleaf Maple (Acer macrophyllum)	5	Unbalanced crown, dead branches in crown, cavity in stem at eye height, decay present	B	Lot grading greatly impacts root zone	0
10646	9	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10647	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10648	7	Bigleaf Maple (Acer macrophyllum)	2	Topped, no obvious dominant branches	B	Lot grading greatly impacts root zone	0
10649	12	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, stem forks at 20', dead branches in crown	B	Lot grading greatly impacts root zone	0
10650	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, stem forks at 20'	B	Lot grading greatly impacts root zone	0
10651	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, stem forks at 20'	B	Lot grading greatly impacts root zone	0
10652	15	Bigleaf Maple (Acer macrophyllum)	4	Stem forks at 15'	B	Lot grading greatly impacts root zone	0
10653	13	Bigleaf Maple (Acer macrophyllum)	3	Dead branches in crown, one large branch contains almost all crown growth	B	Lot grading greatly impacts root zone	0
10654	17,15,13,14	Bigleaf Maple (Acer macrophyllum)	11	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10657	12,7	Bigleaf Maple (Acer macrophyllum)	3	Dead top, 7" stem shows declining health, unbalaced crown, 12" stem has sweep at base	B	Lot grading greatly impacts root zone	0
10660	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10661	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10662	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, dead top, stem forks near top	B	Located within proposed road grading	0
10663	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced, dead branches in crown, stem forks near top	B	Located within proposed road grading	0
10664	14	Bigleaf Maple (Acer macrophyllum)	3	Sparse crown, unbalanced	B	Located within proposed road grading	0
10665	12	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Located within proposed road grading	0
10666	8	Bigleaf Maple (Acer macrophyllum)	2	Topped, unbalanced crown, declining health	B	Located within proposed road grading	0
10667	9	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10668	25	Douglas-fir (Pseudotsuga menziesii)	9	Dead branches in crown	C	Located within proposed road grading	0
10669	14	Bigleaf Maple (Acer macrophyllum)	3	Large dead branches in crown, slight lean	B	Lot grading greatly impacts root zone	0
10670	7,7,7,6,4	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced, dead branches in crown, slight lean	B	Lot grading greatly impacts root zone	0
10674	9,7,7,6,4,4	Bigleaf Maple (Acer macrophyllum)	4	Unbalanced, dead branches in crown	B	Lot grading greatly impacts root zone	0
10675	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slightly crooked	B	Located within proposed road grading	0
10676	11,7	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10677	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 40', dead branches in crown	C	Located within proposed road grading	0
10678	11	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 35', unbalanced crown, dead top, slight lean, branches extend horizontally after fork	B	Located within proposed road grading	0
10679	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 40', unbalanced crown	B	Located within proposed road grading	0
10682	17	Bigleaf Maple (Acer macrophyllum)	5	Stem forks at 50', dead top, slight lean, slightly crooked	B	Located within proposed road grading	0
10683	12	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 45', slightly crooked	B	Located within proposed road grading	0
10684	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 20', topped	B	Located within proposed road grading	0
10691	20	Bigleaf Maple (Acer macrophyllum)	6	Codominant stems begin at 10', crooked stem	B	Lot grading greatly impacts root zone	0
10693	11	Bigleaf Maple (Acer macrophyllum)	2	Significant decay in stem, almost dead	A	Located within proposed road grading	0
10695	7	Bigleaf Maple (Acer macrophyllum)	2	Dead top, declining health	B	Located within proposed road grading	0
10696	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown	B	Located within proposed road grading	0
10697	7,4	Bigleaf Maple (Acer macrophyllum)	2	Dead top, slight lean	B	Located within proposed road grading	0
10698	6,7,8	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B	Located within proposed road grading	0
10702	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown, stem forks near top, dead branches in crown	B	Located within proposed road grading	0
10705	13,7	Bigleaf Maple (Acer macrophyllum)	4	7" stem unbalanced, slight lean, dead branches in crown	B	Located within proposed road grading	0
10707	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10708	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10709	13,14,6	Bigleaf Maple (Acer macrophyllum)	6	14" & 6" stems unbalanced, 14" stem has dead top, dead branches in crown	B	Lot grading greatly impacts root zone	0
10710	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, scarring in stem	B	Lot grading greatly impacts root zone	0
10711	7,7	Bigleaf Maple (Acer macrophyllum)	2	One stem broken, unbalanced, significant lean	A	Lot grading greatly impacts root zone	0
10712	11	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10713	17,19	Bigleaf Maple (Acer macrophyllum)	9	17" stem splits into codominant stems with one having a dead top, 19" stem unbalanced, decay in dead stem and branch sections	A	Lot grading greatly impacts root zone	0
10715	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10716	14	Bigleaf Maple (Acer macrophyllum)	3	Codominant stems begin above breast height, one stem dead	B	Located within proposed road grading	0
10717	14	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown, dead branches in crown	B	Located within proposed road grading	0
10718	14	Bigleaf Maple (Acer macrophyllum)	3	Slightly crooked	C	Located within proposed road grading	0
10719	13	Unknown Deciduous	3	Significant decay in stem, almost dead	A	Located within proposed road grading	0
10720	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10721	14	Bigleaf Maple (Acer macrophyllum)	3	Topped, large dead branch stubs	B	Located within proposed road grading	0
10723	20	Bigleaf Maple (Acer macrophyllum)	6	Large dead branches in crown, branches extend out far	C	Lot grading greatly impacts root zone	0
10724	22	Bigleaf Maple (Acer macrophyllum)	7	Large dead branches in crown, branches extend out far	C	Lot grading greatly impacts root zone	0
10725	6	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean	B	Located within proposed road grading	0

CERTIFIED ARBORIST
PRELIMINARY NOT FOR CONSTRUCTION
ISA
BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY TREE INVENTORY

DESIGNED BY: ELN
DRAWN BY: ELN
MANAGED BY: CJS
CHECKED BY: BDH
DATE: 11-20-18

REVISIONS

JOB NUMBER 5638

SHEET P5.1

Detailed Tree Inventory for Hancock Springs

AKS JOB NO. 5638 Site Area = 5.63 acres

AKS Reference #	Total DBH (In)	Tree Species Common Name (Scientific name)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
10726	14	Bigleaf Maple (Acer macrophyllum)	3	Scarring in stem	C	Located within proposed road grading	0
10727	12	Bigleaf Maple (Acer macrophyllum)	2	Topped, no obvious dominant branches	B	Located within proposed road grading	0
10728	6,7	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10729	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, topped, branch extends horizontally at top	B	Located within proposed road grading	0
10730	7	Red Alder (Alnus rubra)	2	Severely unbalanced and leaning	B	Located within proposed road grading	0
10731	19	Bigleaf Maple (Acer macrophyllum)	6	Dead branches in crown	C	Located within proposed road grading	0
10732	13	Bigleaf Maple (Acer macrophyllum)	3	Fair health	C	Located within proposed road grading	0
10733	30	Bigleaf Maple (Acer macrophyllum)	11	Codominant stems begin above breast height, one stem crooked	C	Lot grading greatly impacts root zone	0
10734	18	Bigleaf Maple (Acer macrophyllum)	5	Very unbalanced crown, possible dead top	B	Lot grading greatly impacts root zone	0
10737	8	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 20'	B	Lot grading greatly impacts root zone	0
10738	9	Bigleaf Maple (Acer macrophyllum)	2	Scarring at base	C	Located within proposed road grading	0
10739	26	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10740	13	Bigleaf Maple (Acer macrophyllum)	3	Large dead branches in crown, declining health	B	Located within proposed road grading	0
10741	15	Bigleaf Maple (Acer macrophyllum)	4	Unbalanced crown, stems forks near top, one branch of fork dead	B	Lot grading greatly impacts root zone	0
10743	36	Bigleaf Maple (Acer macrophyllum)	14	Two codominant stems begin above breast height, dead third stem	B		14
10744	28	Bigleaf Maple (Acer macrophyllum)	10	Previous codominant stem broke off, significant decay in leftover wood, unbalanced crown, crooked stem, forks at 20', dead branches in crown	B	Poor tree health	0
11024	14	Douglas-fir (Pseudotsuga menziesii)	3	Large branch over existing access road	C	Located within proposed road grading	0
11025	11,11,10	Lodgepole Pine (Pinus contorta)	5	Codominant stems above breast height	B	Located within proposed road grading	0
11026	13	Western Redcedar (Thuja plicata)	3	Codominant stems above breast height, brown rot decay at base	B	Poor tree health	0
11027	7,6,6,3	Western Redcedar (Thuja plicata)	2	Codominant stems above breast height, crown clean recommended	B		2
11028	12	Lodgepole Pine (Pinus contorta)	2	Healthy	C	Located within proposed road grading	0
11029	11,12	Western Redcedar (Thuja plicata)	4	Codominant stems above breast height, crown clean recommended	B		4
11030	12	Western Redcedar (Thuja plicata)	2	Crown clean recommended, healthy	C		2
11031	10	Lodgepole Pine (Pinus contorta)	0	Dead	A	Tree is dead	0
11032	11	Western Redcedar (Thuja plicata)	2	Crown clean recommended, healthy	C		2
11033	16	Western Redcedar (Thuja plicata)	4	Crown clean recommended, healthy	C		4
11034	11	Lodgepole Pine (Pinus contorta)	2	Crooked stem	B	Located within proposed road grading	0
11035	24	Douglas-fir (Pseudotsuga menziesii)	8	Crown clean recommended, healthy	C		8
11036	14	Lodgepole Pine (Pinus contorta)	3	Unbalanced crown, large branch over driveway, scarring in stem, crooked	B	Located within proposed road grading	0
11037	8	Western Redcedar (Thuja plicata)	2	Growing in shade of adjacent Douglas-fir, exhibits slow growth in branches	B		2
11040	16	Douglas-fir (Pseudotsuga menziesii)	4	Healthy	C	Located within proposed road grading	0
11041	19	Douglas-fir (Pseudotsuga menziesii)	6	Healthy	C	Located within proposed road grading	0
11042	21	Douglas-fir (Pseudotsuga menziesii)	7	Healthy	C	Located within proposed road grading	0
11043	7	Honey Locust (Gleditsia triacanthos)	2	Unbalanced crown	B	Located within proposed road grading	0
11082	10	Honey Locust (Gleditsia triacanthos)	0	Off site	C		0
11085	10	Honey Locust (Gleditsia triacanthos)	0	Off site, dead branches in crown	C		0
11086	7	Honey Locust (Gleditsia triacanthos)	0	Off site, exhibits healthy growth in response to topping	C		0
11090	6,2,2	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11298	6 stems of 4"	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended, one stem extends outside of crown	C		0
11316	6 stems of 4"	Hawthorn (Crataegus spp.)	2	Healthy	C	Within stormwater facility grading	0
11323	4 stems of 4"	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended	C		0
11324	6,8	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended	C		0
11325	15,13	Port Orford Cedar (Chamaecyparis lawsoniana)	0	Dead	A	Tree is dead	0
11331	12,6,8	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11332	7	Honey Locust (Gleditsia triacanthos)	0	Off site, small 2" stem attached leaning over road requires pruning or removal	C		0
11333	6,6	Honey Locust (Gleditsia triacanthos)	0	Off site	C		0
11336	16	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11337	20	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11343	9	Honey Locust (Gleditsia triacanthos)	2	Codominant stems above breast height	B	Located within proposed road grading	0
11347	17,17,15,12,12, 12,10,6,6	Canyon Live Oak (Quercus chrysolepis)	15	Large stems branch off in all directions, one stem split in half, old scars with decay present in multiple stems, stems are crooked and unbalanced, moderate to severe leaning	A	Sidewalk to be constructed 7' from tree, poor tree health	0
11402	10 stems of 6"	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended	C		0
11403	7,7,6	Aspen (Populus spp.)	2	Less than 10' in height, yellow leaves, dead branches in crown, crown clean recommended	C		2
11405	12,14	Holly (Ilex spp.)	5	Heavy crown clean recommended, scars on stem	C		5
11406	33	Aspen (Populus spp.)	13	Surrounded by heavy blackberry, many dead branches in crown, severe lean, decay present in old branch collars	B	Trunk leans over proposed storm trenching	0
20000	6,4	Black Walnut (Juglans nigra)	2	Healthy	C	Located within proposed road grading	0
20015	8	Western Redcedar (Thuja plicata)	2	Growing against side of existing structure, surrounded by blackberry	C	Located within proposed road grading	0
20016	7	Red Alder (Alnus rubra)	2	Sweep at base, growing against side of existing structure, surrounded by blackberry	B	Located within proposed road grading	0
20023	53	Cherry (Prunus spp.)	22.5	Almost dead	B	Located within proposed road grading	0
20097	27,33	Bigleaf Maple (Acer macrophyllum)	0	Off site, decay in stem cavity, pitch seeps	B		0
20099	35	Bigleaf Maple (Acer macrophyllum)	0	Off site, topped, large branch containing all foliage extends 20' into site, scarring on branch, decay present	B		0
20100	7	Sycamore (Platanus spp.)	0	Off site, moderate lean	C		0
20103	14	Sycamore (Platanus spp.)	0	Off site	C		0
20105	18	Sycamore (Platanus spp.)	0	Off site, some branches extend over site	C		0
20106	9,7	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20107	10	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20108	6	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B		2
20109	8	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B		2
20110	7	Red Alder (Alnus rubra)	2	Surrounded by blackberry, slight lean	B		2
20111	6	Red Alder (Alnus rubra)	2	Surrounded by blackberry, slight lean, crooked stem	B		2
20112	10	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20114	6	Red Alder (Alnus rubra)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20115	7	Red Alder (Alnus rubra)	2	Healthy	C	Lot grading greatly impacts root zone	0
20116	8	Red Alder (Alnus rubra)	2	Healthy	C	Lot grading greatly impacts root zone	0
20117	6	Red Alder (Alnus rubra)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20118	6	Red Alder (Alnus rubra)	2	Topped, slight lean, declining health	B	Lot grading greatly impacts root zone	0
20129	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20130	9	Red Alder (Alnus rubra)	2	Slightly crooked stem, dead branches in crown	B		2
20131	10	Red Alder (Alnus rubra)	2	Slight lean	B		2
20132	9	Red Alder (Alnus rubra)	2	Healthy	B		2
20133	6	Red Alder (Alnus rubra)	2	Sweep at base	B		2
20134	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20135	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20138	8	Red Alder (Alnus rubra)	2	Dead top	B	Poor tree health	0
20141	6	Red Alder (Alnus rubra)	2	Slight lean	B		2
20144	9,10,14	Bigleaf Maple (Acer macrophyllum)	6	Large dead branches in crown	B		6
20145	7	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20146	12,6	Bigleaf Maple (Acer macrophyllum)	3	6" stem dead, large dead branches in crown	B		3
20147	11	Bigleaf Maple (Acer macrophyllum)	2	Moderate lean	B		2
20148	6,7,8,9,11,4	Bigleaf Maple (Acer macrophyllum)	6	Large dead branches in crown, moderate lean	B		6
20149	7,8,8,11,12,4,4	Bigleaf Maple (Acer macrophyllum)	7	Large dead branches in crown	C		7
20150	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20151	9,10,13,13	Unknown Deciduous	8	Large dead branches in crown, crown clean recommended	B		8
20153	6	Red Alder (Alnus rubra)	2	Healthy	C		2
20155	6	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B	High risk of falling after development	0
20156	8	Red Alder (Alnus rubra)	2	Healthy	C		2
20157	8	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20158	8	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20159	9	Red Alder (Alnus rubra)	2	Dead branches in crown, codominant stems above breast height	B		2
20160	6	Red Alder (Alnus rubra)	2	Healthy	C		2
20175	8	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C		2
20176	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20180	13	Bigleaf Maple (Acer macrophyllum)	3	Healthy	C	Lot grading greatly impacts root zone	0
20181	21	Bigleaf Maple (Acer macrophyllum)	7	Large dead branches in crown, scarring in stem	C	Lot grading greatly impacts root zone	0
20185	18	Bigleaf Maple (Acer macrophyllum)	5	Dead hanging branches in crown	C		5
20192	6	Red Alder (Alnus rubra)	2	Crooked stem, moderate lean	B		2
20193	9	Red Alder (Alnus rubra)	2	Significant lean	A		2
20194	10,7	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C		2
20195	7	Bigleaf Maple (Acer macrophyllum)	2	Scarring in stem	B		2
20196	8	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B		2
20199	6	Red Alder (Alnus rubra)	2	Crooked stem	B		2
20202	6,12	Red Alder (Alnus rubra)	3	Dead branches in crown, sweep at base	B	Lot grading greatly impacts root zone	0
20203	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20204	16	Red Alder (Alnus rubra)	4	Dead branches in crown	C		4
20205	13	Red Alder (Alnus rubra)	3	Topped, dead branches in crown, declining health	B	Poor tree health	0
20216	6	Red Alder (Alnus rubra)	2	Slight lean, crooked stem	B		2
20218	7	Red Alder (Alnus rubra)	2	Slight lean	B		2
20220	9	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B		2
20221	9	Red Alder (Alnus rubra)	2	Unbalanced crown, severe lean	B	High risk of falling after development	0
20222	7	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20223	14	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced, dead branches in crown	B	Lot grading greatly impacts root zone	0
20224	6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20226	7,4	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20228	6	Honey Locust (Gleditsia triacanthos)	2	Dead branches in crown, crooked stem	B	Lot grading greatly impacts root zone	0
20231	32	Bigleaf Maple (Acer macrophyllum)	12	Dead top, forks at 50', declining health	B	Lot grading greatly impacts root zone	0
20234	8	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
20235	10	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20236	10	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20237	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20238	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20240	11	Unknown Deciduous	2	Healthy	C	Lot grading greatly impacts root zone	0
20241	11	Unknown Deciduous	2	Unbalanced, decay present in stem	B	Lot grading greatly impacts root zone	0
20242	12	Unknown Deciduous	2	Unbalanced crown, sweep at base, severe lean	B	Lot grading greatly impacts root zone	0
20243	12	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20244	7	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20245	8	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20246	7	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20247	10	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20248	8	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20249	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20250	10	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20252	6,4	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20253	6,6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20254	37	Douglas-fir (Pseudotsuga menziesii)	15	Dead branches in crown	C	Located in center of proposed lot grading	0
20263	8	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
20265	9	Red Alder (Alnus rubra)	2	Few leaves on branches, declining health	B	Lot grading greatly impacts root zone	0
20267	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean, crooked stem	B	Lot grading greatly impacts root zone	0
20268	6	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, moderate lean, crooked stem	B	Lot grading greatly impacts root zone	0
20274	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	B	Lot grading greatly impacts root zone	0
20275	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	B	Lot grading greatly impacts root zone	0
20276	6	Bigleaf Maple (Acer macrophyllum)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20277	20	Bigleaf Maple (Acer macrophyllum)	6	Dead branches in crown, crooked stem	C	Lot grading greatly impacts root zone	0
20278	7,7	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown, crooked stem	B	Lot grading greatly impacts root zone	0
20283	7	Red Alder (Alnus rubra)	2	Crooked stem	B		2
20284	6,5	Red Alder (Alnus rubra)	2	Slight lean	B		2
20285	9	Red Alder (Alnus rubra)	2	Slight lean	B		2

CERTIFIED ARBORIST
PRELIMINARY NOT FOR CONSTRUCTION
ISA
BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY TREE INVENTORY

DESIGNED BY: ELN
DRAWN BY: ELN
MANAGED BY: CJS
CHECKED BY: BDH
DATE: 11-20-18

REVISIONS

JOB NUMBER 5638

SHEET P5.2

Detailed Tree Inventory for Hancock Springs

AKS JOB NO. 5638 Site Area = 5.63 acres

AKS Reference #	Total DBH (In)	Tree Species Common Name (Scientific name)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
20288	24,20,12	Bigleaf Maple (Acer macrophyllum)	0	Off site, dead branches in crown, decay in stem, large branches extend over site	B		0
20302	13,12	Bigleaf Maple (Acer macrophyllum)	0	12" stem extends off site & dead, decay in stem cavity at base, unbalanced, dead branches in crown	B	Poor tree health	0
20322	7	Paper Birch (Betula papyrifera)	2	Moderate lean	B		2
20323	7	Paper Birch (Betula papyrifera)	2	Unbalanced crown, slight lean, crooked stem	B		2
20324	11	Cottonwood (Populus spp.)	2	Healthy	C		2
20335	7	Unknown Deciduous	2	Decay in stem cavity	B	Lot grading greatly impacts root zone	0
20340	15	Unknown Deciduous	4	Decay in stem cavity, dead branches in crown, declining health	B	Lot grading greatly impacts root zone	0
20341	10	Unknown Deciduous	2	Dead top, cavity in stem, decay in cavity, declining health	B	Lot grading greatly impacts root zone	0
20343	21	Paper Birch (Betula papyrifera)	7	Large dead branches with breakage	C	Lot grading greatly impacts root zone	0
20345	8,8,6,6,4,4	Bigleaf Maple (Acer macrophyllum)	4	Both 4" stems are dead, dead branches in crown	B	Lot grading greatly impacts root zone	0
20366	6,6,7,7	Unknown Deciduous	3	Dead top, crown clean recommended	B	Final lot grading will greatly affect root zone	0
20404	15,10,6	Elderberry (Sambucus spp.)	6	Surrounded by heavy blackberry, significant decay in stem, scarring in stem	A	Lot grading greatly impacts root zone	0
20438	19	Norway Maple (Acer platanoides)	6	25' crown radius, stem splits into 7-8 large branches at 7'	B	Lot grading greatly impacts root zone	0
20443	31	Western Redcedar (Thuja plicata)	12	Surrounded by blackberry, healthy	C	Final lot grading will result in fills of over 4' in depth across entire root zone	0
20448	7,5	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B	Lot grading greatly impacts root zone	0
20449	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20450	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20451	7	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B	Lot grading greatly impacts root zone	0
20453	7	Bigleaf Maple (Acer macrophyllum)	2	Dead top	B	Lot grading greatly impacts root zone	0
20454	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
20496	9	Hawthorn (Crataegus spp.)	2	Many dead branches	C	Storm access road grading	0
20497	3,4,17,23	Hawthorn (Crataegus spp.)	11	Many dead branches	C	Storm access road grading	0
20531	11	Red Alder (Alnus rubra)	2	Moderate lean	B	Within stormwater facility grading	0
20549	26	Bigleaf Maple (Acer macrophyllum)	9	Scar at 15', dead branches in crown	C	Within stormwater facility grading	0
20551	12	Red Alder (Alnus rubra)	2	Sparse crown	B	Lot grading greatly impacts root zone	0
20552	6,10	Bigleaf Maple (Acer macrophyllum)	2	6" stem is topped and has decay, broken branches in crown	B	Within stormwater facility grading	0
20560	10	Red Alder (Alnus rubra)	2	Dead top	B	Within stormwater facility grading	0
20561	9	Red Alder (Alnus rubra)	2	Unbalanced crown, Dead top	B	Within stormwater facility grading	0
20562	6	Red Alder (Alnus rubra)	2	Many dead branches, slight lean, surrounded by blackberry, declining health	B	Within stormwater facility grading	0
20563	11	Red Alder (Alnus rubra)	2	Many dead branches, slight lean, surrounded by blackberry, declining health	B	Within stormwater facility grading	0
20564	7	Red Alder (Alnus rubra)	2	Significant decay in stem, moderate lean, stem forks at 10', surrounded by blackberry, almost dead	A	Within stormwater facility grading	0
20565	12	Red Alder (Alnus rubra)	2	Slight lean, stem forks near top	B	Within stormwater facility grading	0
20566	12	Red Alder (Alnus rubra)	2	Topped, scars from breakage at top and 20'	B	Within stormwater facility grading	0
20568	16	Red Alder (Alnus rubra)	4	Surrounded by blackberry, poor crown structure	B	Within stormwater facility grading	0
20571	9	Red Alder (Alnus rubra)	2	Moderate lean	B	Within stormwater facility grading	0
20572	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20573	36	Bigleaf Maple (Acer macrophyllum)	14	Codominant stems above breast height, decay in stem, many large dead branches	B	Within stormwater facility grading	0
20576	17	Bigleaf Maple (Acer macrophyllum)	0	Large dead branches, corrected sweep	C	Within stormwater facility grading	0
20577	8	Red Alder (Alnus rubra)	0	Dead	A	Retained within critical area	0
20578	7	Red Alder (Alnus rubra)	0	Off site, slight lean	B		0
20583	10	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20589	6	Bigleaf Maple (Acer macrophyllum)	0	Off site, slight lean	B		0
20590	12	Red Alder (Alnus rubra)	0	Dead	A	Retained within critical area	0
20591	6	Red Alder (Alnus rubra)	0	Off site, dead	A		0
20593	10	Red Alder (Alnus rubra)	0	Dead branches in crown	C	Within stormwater facility grading	0
20595	33	Bigleaf Maple (Acer macrophyllum)	0	3 codominant stems above breast height, large dead branches, unbalanced, slight lean	B	Within stormwater facility grading	0
20596	10	Bigleaf Maple (Acer macrophyllum)	0	2 codominant stems above breast height, one stem topped, dead branches in crown	B	Within stormwater facility grading	0
20597	23	Bigleaf Maple (Acer macrophyllum)	0	2 codominant stems above breast height, one stem dead, decay present in scar on stem	B	Within stormwater facility grading	0
20598	10	Bigleaf Maple (Acer macrophyllum)	0	Dead top, moderate lean, scarring on stem, crooked stem	B	Within stormwater facility grading	0
20604	14	Red Alder (Alnus rubra)	3	Dead top	B	Within stormwater facility grading	0
20608	14	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20611	15,15	Bigleaf Maple (Acer macrophyllum)	0	Slight lean, crooked stem	B		0
20612	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Retained within critical area	0
20613	10,6	Bigleaf Maple (Acer macrophyllum)	0	6" stem dead, sweep near base	B		0
20626	12	Red Alder (Alnus rubra)	2	Slight lean, one large dead branch	C	Within stormwater facility grading	0
20672	8	Vine Maple (Acer circimatum)	0	Dead	A	Tree is dead	0
20673	6,6,6,6	Vine Maple (Acer circimatum)	0	Dead	A	Tree is dead	0
20676	26	Red Alder (Alnus rubra)	0	Codominant stems begin at 8', decay in cavity at base, slight lean, scarring in stem, pitch leaking from scar, declining health, surrounded by heavy blackberry	B	Within stormwater facility grading	0
20677	15,12	Apple (Malus, spp.)	0	Many large dead branches, decay throughout tree, severe lean, very crooked, declining health	A	Within stormwater facility grading	0
20683	15,9	Red Alder (Alnus rubra)	0	Dead top, 9" stem spreads out horizontally 25', surrounded by heavy blackberry	B	Within stormwater facility grading	0
20684	22	Red Alder (Alnus rubra)	0	Dead branches in crown	C	Within stormwater facility grading	0
20687	10	Red Alder (Alnus rubra)	0	Dead branches in crown	C	Within stormwater facility grading	0
21000	35	Bigleaf Maple (Acer macrophyllum)	0	Off site	C		0
21001	10	Black Cottonwood (Populus trichocarpa)	2	Decay in stem cavity	B	Poor tree health	0
21002	6	Unknown Deciduous	2	Dead branches in crown, decay in stem, severe lean, declining health	B	Lot grading greatly impacts root zone	0
21003	13	Unknown Deciduous	3	Unbalanced crown, decay in stem	B	Lot grading greatly impacts root zone	0
21004	10	Unknown Deciduous	2	Unbalanced crown, significant decay in stem, severe lean	B	Lot grading greatly impacts root zone	0
21005	6	Black Cottonwood (Populus trichocarpa)	2	Healthy	C	Lot grading greatly impacts root zone	0
21006	4 stems of 4"	Hawthorn (Crataegus spp.)	2	Healthy	C	Lot grading greatly impacts root zone	0
21007	8	Red Alder (Alnus rubra)	0	Off site, dead	A		0
21008	16	Bigleaf Maple (Acer macrophyllum)	0	Slight lean, scarring on stem, crooked stem, dead branches in crown	B		0

NOTE: Onsite trees existed during the site visits performed on 09/19/2018 - 09/21/2018.

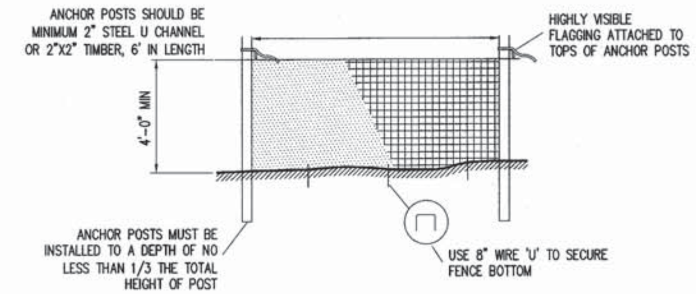
Total # of On Site Existing Trees= 294
Total On Site Existing Tree Units = 1027.5
Total # of On Site Trees Retained= 56
Total # of Tree Units Retained= 190.0
Minimum Tree Units Required per City Code = 113
(5.63 acres * 20 trees/acre)
Minimum # Trees to replant= 0

Total # of Existing Trees Removed= 238
Total Existing Tree Units Removed= 837.5

Windthrow Rating:

A=Least windthrow resistant
B=Moderate windthrow resistant
C=Most windthrow resistant

Hazard assessment was not performed for each tree during the arborist site assessment. If hazards were identified, they are described within the table above. See arborist report for more information.



TREE PROTECTION NOTES:

1. BLAZE ORANGE OR BLUE PLASTIC MESH FENCE FOR TREE PROTECTION DEVICE, ONLY.
2. BOUNDARIES OF PROTECTION AREA WILL BE ESTABLISHED IN THE FIELD BY THE ARBORIST PRIOR TO CONSTRUCTION
3. BOUNDARIES OF PROTECTION AREA SHOULD BE STAKED AND FLAGGED BY THE ARBORIST, OR UNDER THE SUPERVISION OF THE ARBORIST, PRIOR TO INSTALLING DEVICES.
4. AVOID DAMAGE TO CRITICAL ROOT ZONE. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING POSTS.
5. TREE PROTECTION TO BE INSTALLED PRIOR TO CONSTRUCTION AND REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETED.

PLASTIC MESH TREE PROTECTION FENCE

NOT TO SCALE

ARBORIST DISCLOSURE STATEMENT

ARBORISTS ARE TREE SPECIALISTS WHO USE THEIR EDUCATION, KNOWLEDGE, TRAINING, AND EXPERIENCE TO EXAMINE TREES, RECOMMEND MEASURES TO ENHANCE THE HEALTH OF TREES, AND ATTEMPT TO REDUCE THE RISK OF LIVING NEAR TREES. THE CLIENT AND JURISDICTION MAY CHOOSE TO ACCEPT OR DISREGARD THE RECOMMENDATIONS OF THE ARBORIST, OR SEEK ADDITIONAL ADVICE.

ARBORISTS CANNOT DETECT EVERY CONDITION THAT COULD POSSIBLY LEAD TO THE STRUCTURAL FAILURE OF A TREE. TREES ARE LIVING ORGANISMS THAT FAIL IN WAYS WE DO NOT FULLY UNDERSTAND. CONDITIONS ARE OFTEN HIDDEN WITHIN TREES AND BELOW GROUND. ARBORISTS CANNOT GUARANTEE THAT A TREE WILL BE HEALTHY OR SAFE UNDER ALL CIRCUMSTANCES, OR FOR A SPECIFIED PERIOD OF TIME. LIKEWISE, REMEDIAL TREATMENTS, LIKE MEDICINE, CANNOT BE GUARANTEED.

TREES CAN BE MANAGED, BUT THEY CANNOT BE CONTROLLED. TO LIVE NEAR TREES IS TO ACCEPT SOME DEGREE OF RISK. THE ONLY WAY TO ELIMINATE ALL RISK ASSOCIATED WITH TREES IS TO ELIMINATE ALL TREES.

AT THE COMPLETION OF CONSTRUCTION, ALL TREES MUST ONCE AGAIN BE REVIEWED TO EVALUATE THEIR HAZARD RATING. LAND CLEARING AND REMOVAL OF ADJACENT TREES CAN EXPOSE PREVIOUSLY UNSEEN DEFECTS AND OTHERWISE HEALTHY TREES CAN BE DAMAGED DURING CONSTRUCTION.

TREE INFORMATION GATHERED UNDER THE SUPERVISION OF BRYCE HANSON, CERTIFIED ARBORIST, WITH AKS ENGINEERING AND FORESTRY, LLC.

TREES SHOWN TO BE SAVED WILL BE EVALUATED BY THE PROJECT ARBORIST PRIOR TO, DURING, AND AFTER CONSTRUCTION. TREES ADVERSELY AFFECTED BY CONSTRUCTION AND/OR DETERMINED TO BE A SAFETY HAZARD WILL BE REMOVED.

CERTIFIED ARBORIST
ISA®
PRELIMINARY NOT FOR CONSTRUCTION
BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19
Bryce D Hanson

AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE STE 2520
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ENGINEERING · SURVEYING · NATURAL RESOURCES
FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY TREE INVENTORY

DESIGNED BY: ELN
DRAWN BY: ELN
MANAGED BY: JMM
CHECKED BY: BDH
DATE: 11.20.18

REVISIONS

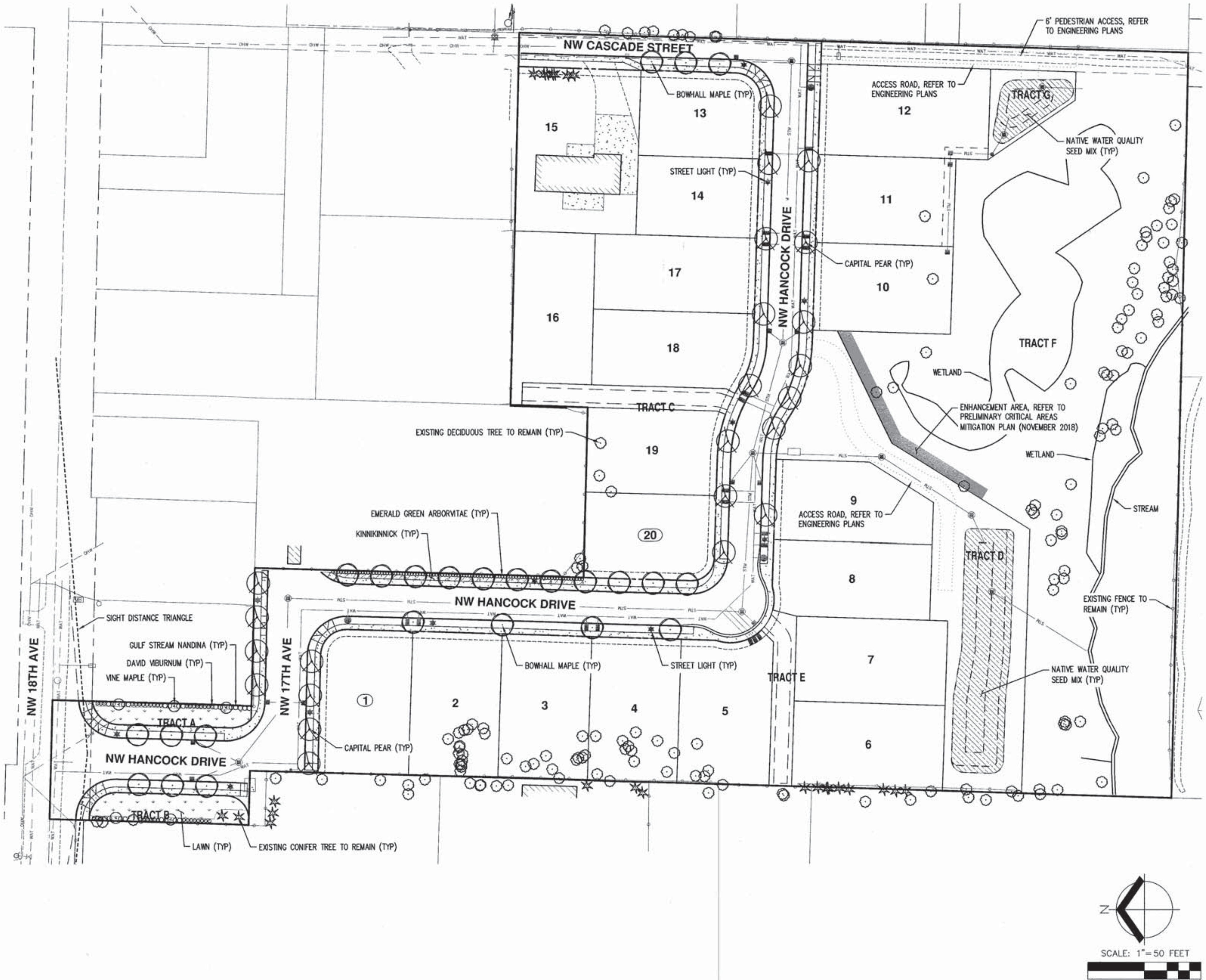
JOB NUMBER 5638

SHEET P5.3

AKS DRAWING FILE: 5638 P5.0.DWG | LAYOUT: P5.3

APPENDIX 'C'

(TREE PLANTING PLAN)



CONCEPTUAL PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE/CONTAINER	SPACING
	5	ACER CIRCINATUM	VINE MAPLE	5'-6' HT. B&B	AS SHOWN
	24	ACER RUBRUM 'BOWHALL'	BOWHALL MAPLE	2" CAL. B&B	AS SHOWN
	23	PYRUS CALLERYANA 'CAPITAL'	CAPITAL PEAR	2" CAL. B&B	AS SHOWN
SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE/CONTAINER**	**SPACING**
	23	NANDINA DOMESTICA 'GULF STREAM'	GULF STREAM NANDINA	3 GAL. CONT.	48" o.c.
	92	THUJA OCCIDENTALIS 'SMARAGD'	EMERALD GREEN ARBORVITAE	4-5' HT. CONT.	30" o.c.
	37	VIBURNUM DAVIDII	DAVID VIBURNUM	3 GAL CONT.	36" o.c.
GROUND COVERS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE/CONTAINER**	**SPACING**
	136	ARCTOSTAPHYLOS UVA-URSI	KINNIKINNICK	1 GAL CONT	30" o.c.
	APPROX. 4,651 SF	LAWN – NORTHWEST SUPREME LAWN SEED MIX – SUNMARK SEEDS (OR APPROVED EQUAL) – LOLIUM PERENNE VAR DASHER 3 (DASHER 3 PERENNIAL RYEGRASS) 35% – LOLIUM PERENNE VAR CUTTER II (CUTTER II PERENNIAL RYEGRASS) 35% – FESTUCA RUBRA VAR GARNET (GARNET CREEPING RED FESCUE) 15% – FESTUCA RUBRA SPP FALLAX VAR WINDWARD (WINDWARDS CHEWINGS FESCUE) 15%			
	APPROX. 11,916 SF	NATIVE WATER QUALITY SEED MIX – SUNMARK SEEDS (OR APPROVED EQUAL) – ELYMUS GLAUCUS (BLUE WILDRYE) 46% – FESTUCA RUBRA RUBRA (NATIVE RED FESCUE) 38% – DESCHAMPSIA CESPITOSA (TUFTED HAIRGRASS) 12% – GLYCERIA OCCIDENTALIS (NORTHWESTERN MANNAGRASS) 2% – BECKMANIA SYZIGACHNE (AMERICAN SLOUGHGRASS) 2% APPLY AT A RATE OF 1 LB. PER 1,000 SF OR AS RECOMMENDED BY SUPPLIER.			

GENERAL LANDSCAPE NOTES:

1. LANDSCAPE PLAN IS PRELIMINARY AND INTENDED TO SHOW DESIGN INTENT ONLY. REVISIONS OR SUBSTITUTIONS, INCLUDING CHANGES TO PLANT LOCATION, QUANTITIES, TYPES, AND SIZES MAY BE NECESSARY PRIOR TO FINAL APPROVAL BASED ON PLANT AVAILABILITY, SITE CONDITIONS, UTILITY CONFLICTS, ETC. ALL SUBSTITUTIONS SHALL CONFORM TO CITY OF CAMAS LANDSCAPE DESIGN STANDARDS.
2. ALL PLANTS AND PLANTINGS SHALL CONFORM TO CITY OF CAMAS DESIGN STANDARDS AND TO AMERICAN NURSERY STANDARDS ASN 1260.1. PLANT IN ACCORDANCE WITH ACCEPTED BEST-PRACTICE INDUSTRY STANDARDS SUCH AS THOSE ADOPTED BY THE WASHINGTON ASSOCIATION OF LANDSCAPE PROFESSIONALS (WALP).
3. CENTER TREES IN PLANTER STRIPS AND LANDSCAPE PLANTING BEDS WHERE POSSIBLE. KEEP OTHER TREE TRUNKS 3' O.C. MINIMUM FROM CURBS, SIDEWALKS, AND OTHER PAVING OR CENTERED IN PLANTING ISLAND. KEEP SHRUBS AND GROUNDCOVER A MINIMUM OF 24" O.C. FROM PAVING AND 3' O.C. FROM TREES. ADJUST PLANTINGS AS NECESSARY ON SITE TO AVOID CONFLICT WITH UTILITIES, HYDRANTS, LIGHT POLES, METERS, ETC..
4. HATCHED AREAS ARE MEANT TO CONVEY GENERAL PLANT LOCATION. PLANT COVERAGE, SPACING, AND LAYOUT SHALL BE CONSISTENT WITH THE SPACING LISTED IN THE PLANT LEGEND FOR FULL COVERAGE.
5. MULCH: APPLY 3" DEEP WELL-AGED MEDIUM GRIND OR SHREDDED DARK HEMLOCK BARK MULCH UNDER AND AROUND ALL TREES AND SHRUBS IN PLANTER STRIP AREAS NOT INCLUDED AS STORMWATER FACILITIES OR LAWN. WHERE TREES ARE IN LAWN AREAS, A MINIMUM 3' DIAMETER MULCH RING SHALL BE USED AROUND THE TREE TO PROTECT THE TRUNK FROM MOWER DAMAGE. CARE SHALL BE TAKEN TO AVOID COVERING FOLIAGE OR ROOT CROWNS OF PLANTS. PLANTS SHALL BE PLANTED AT A DEPTH TO ACCOMMODATE BARK MULCH APPLICATION.
6. IRRIGATION FOR HEALTHY PLANT ESTABLISHMENT AND SURVIVAL IS RECOMMENDED AND SHALL BE 'DESIGN-BUILD' BY LANDSCAPE CONTRACTOR.
7. REFER TO SHEET P5.0 FOR PRELIMINARY TREE PLAN.

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY LANDSCAPE AND LIGHTING PLAN

DESIGNED BY:	TEB
DRAWN BY:	TEB
MANAGED BY:	JMM
CHECKED BY:	KAH
DATE:	

STATE OF WASHINGTON · KRISTI ANN HAUSER · 1309 · EXP 12/24/2020 · REGISTERED LANDSCAPE ARCHITECT

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER
5638

SHEET
P9.0

AKS DRAWING FILE: 5638 P9.0.DWG | LAYOUT: P9.0

7. Traffic Study

Technical Memorandum

9/20/2018

WILLIAM R. FARLEY
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52489
REGISTERED
PROFESSIONAL ENGINEER

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To: Craig Moody
NW Classic Homes, LLC

From: Daniel Stumpf, EI
Kaitlin Littleford, EI
William Farley, PE

Date: September 20, 2018

Subject: Hancock Springs Preliminary Plat
Transportation Study

Introduction

This memorandum reports and evaluates the transportation impacts related to the proposed Hancock Springs development, located at 2926 NW 18th Avenue in Camas, Washington. The proposed development will include the construction of a 20-lot subdivision, maintaining one existing single-family dwelling and removing two currently unoccupied dwellings.

The purpose of this memorandum is to examine and address any transportation-related impacts from the proposed development. This study will review the proposed development's trip generation and its distribution, measure intersection sight distances at a proposed access along NW 18th Avenue, and evaluate left-turn lane warrants at the access intersection.

Location Description

Project Site Description

The subject site is located south of NW 18th Avenue, east of NW Hood Street, and west of NW Astor Street in Camas, Washington. The site includes five accessor parcels (lots 127371000, 127375000, 127377000, 127379000, and 127414000) which encompass an approximate total of 9.85 acres. The site is currently developed with three single-family detached dwellings, two of which are currently unoccupied. Upon redevelopment of the site, the two vacant dwellings will be removed while the third existing dwelling will be maintained.

The proposed development will take access onto NW 18th Avenue. Until such a time the adjacent properties to the north and east of parcel 127371000 are redeveloped, direct site access to NW Cascade Street will not be available.

Vicinity Roadways

The proposed development is expected to primarily impact the nearby vicinity roadways of NW 18th Avenue, NW Cascade Street, NW 16th Avenue, and NW Astor Street. Table 1 provides a description of each vicinity roadway.

Table 1: Vicinity Roadway Descriptions

Roadway	Jurisdiction	Functional Classification	Cross-Section	Speed	On-Street Parking	Bicycle Lanes	Curbs	Sidewalks
NW 18th Avenue	City of Camas	Arterial/ Collector	2 Lanes	35 mph Posted	Not Permitted	Partial Both Sides	Partial Both Sides	Partial Both Sides
NW Cascade Street	City of Camas	Local Street/ Collector	2 Lanes	25 mph Posted	Partially Permitted	None	Partial Both Sides	Partial Both Sides
NW 16th Avenue (east of site)	City of Camas	Local Street	2 Lanes	Not Posted	Not Permitted	None	Partial Both Sides	Partial Both Sides
NW Astor Street	City of Camas	Arterial/ Collector	2 to 3 Lanes	35 mph Posted	Not Permitted	Partial Both Sides	Partial Both Sides	Partial Both Sides

Note: Functional Classification based on *City of Camas Traffic Impact Fee Update*.

Figure 1 below presents an aerial image of the nearby vicinity with the project site outlined in yellow.

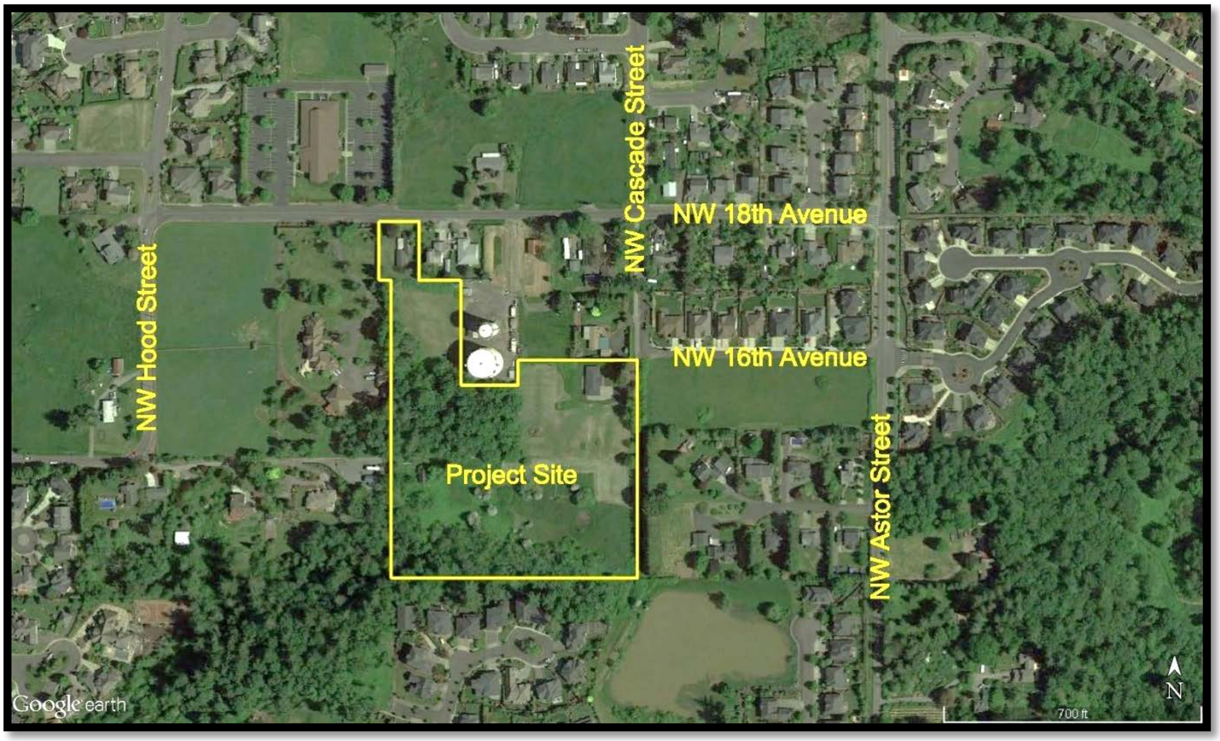


Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth)

Trip Generation and Distribution

The proposed Hancock Springs development will include the construction of a 20-lot subdivision, where two existing dwellings will be removed (both of which are unoccupied) and one existing dwelling maintained. To estimate the number of trips that will be generated by the proposed development, trip rates from the *Trip Generation Manual*[1] were used. Data from land-use code 210, *Single-Family Detached Housing*, was used to estimate the existing and proposed development's trip generation based on the number of dwelling units.

It should be noted that since the two of the existing dwellings are currently unoccupied, no site trip generation reductions were assumed with removal of the two dwelling units.

The trip generation calculations show that the proposed use is projected to generate an additional 14 morning peak hour, 19 evening peak hour, and 178 average weekday site trips. The trip generation estimates are summarized in Table 2 and detailed trip generation calculations are included as an attachment to this memorandum.

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10th Edition, 2017.

Table 2 – Trip Generation Summary

	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Existing Development	210	1 unit	0	1	1	1	0	1	10
Proposed Development	210	20 units	4	11	15	13	7	20	188
Net Increase		**19 units**	**4**	**10**	**14**	**12**	**7**	**19**	**178**

The directional distribution of site trips to/from the project site was estimated based on locations of likely trip destinations, locations of major transportation facilities in the site vicinity, and existing travel patterns at the study intersections. The following trip distribution was estimated and used for analysis:

- Approximately 80 percent of site trips will travel to/from the west along NW 18th Avenue; and
- Approximately 20 percent of site trips will travel to/from the east along NW 18th Avenue.

The trip assignment and distribution for the net new site trips generated by the proposed development are shown in Figure 4 on page 9 for the morning and evening peak hours.

Safety Analysis

Sight Distance Analysis

Intersection sight distance was measured for the proposed access intersection located along NW 18th Avenue. Sight distance was measured and evaluated in accordance with standards established in *A Policy on Geometric Design of Highways and Streets*[2]. According to AASHTO, the driver's eye is assumed to be 15 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.

Based on a posted speed limit of 35 mph, the minimum recommended intersection sight distance to ensure safe and efficient operation of the proposed access intersections is 390 feet to the east and west. Sight distance to the west was measured to be in excess of 400 feet, as shown in

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

Figure 2. Sight distance to the east was measured to be 360 feet, blocked by vegetation on the neighboring property, as shown in Figure 3.

Although sight distance to the east was measured to be less than the minimum recommended intersection sight distance standard, according to the AASHTO manual, stopping sight distance is considered the minimum requirement to ensure safe operation of an intersection. This is the distance that allows an oncoming driver to see a hazard on the roadway, react, and come to a complete stop if necessary to avoid a collision. Conversely, intersection sight distance is an operational measure intended to provide sufficient line of sight along the major-street so that a driver could turn from the minor-street approach without impeding traffic flow.

Based on the available measured intersection sight distance, there is sufficient stopping sight distance to accommodate a westbound approaching vehicle traveling at 45 mph (or 10 mph above the posted speed limit). Alternatively, if the obstructing vegetation to the east were properly maintained or cleared, sight distance is expected to meet the minimum recommended 390 feet intersection sight distance standard.

Based on the sight distance analysis, adequate sight distance is available at the proposed site access intersection to ensure safe operation along NW 18th Avenue. No sight distance mitigation is necessary or recommended.

Figure 2: Sight Distance at Site Access, Looking West

Figure 3: Sight Distance at Site Access, Looking East

Left-turn Lane Warrants

Traffic Volumes

In order to evaluate left-turn lane warrants at the proposed site access intersection, traffic counts were conducted at the intersection of NW 18th Avenue at NW Cascade Street on Thursday, September 6th, 2018, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. Data was used from the intersection's morning and evening peak hours. Volumes were balanced with the intersection of NW 18th Avenue at NW Cascade Street to determine the major-street volumes at the proposed access location.

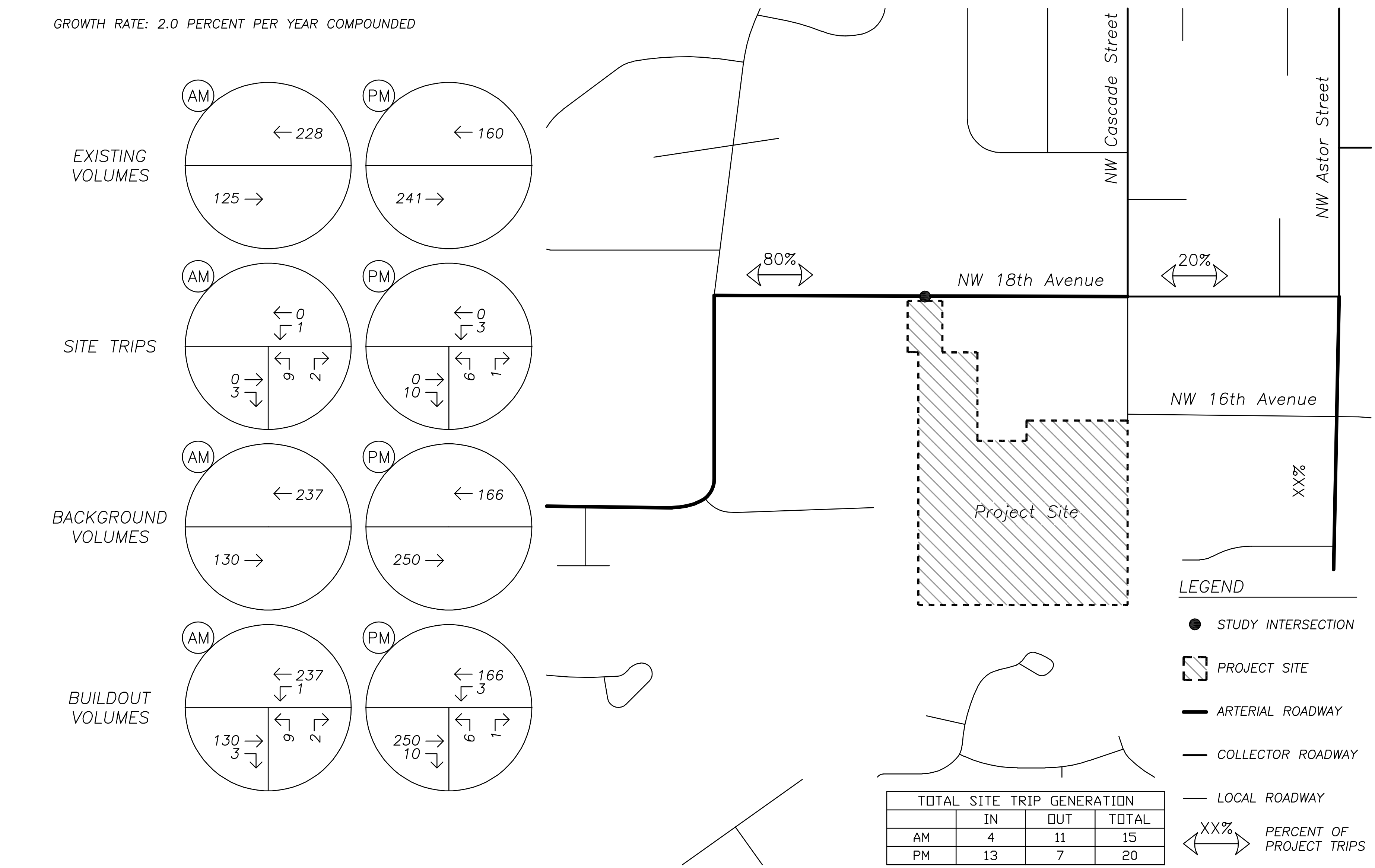
Traffic volumes along NW 18th Avenue were assumed to increase due to expected background growth associated with future/potential development within the surrounding area. To estimate future traffic conditions, a compounded growth rate of two percent per year for an assumed buildout condition of two years was applied to the measured traffic volumes to approximate year 2020 background conditions. Additionally, peak hour trips calculated to be generated by the proposed development, as described in the *Trip Generation and Distribution* section, were added to the projected 2020 background traffic volumes to estimate future traffic conditions with completion of the proposed project.

Figure 4 on page 9 shows the existing and future traffic volumes, with and without the addition of site trips, at the proposed access intersection location for the morning and evening peak hours.

Warrant Analysis

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 lane warrants are not projected to be met at the site access.



TOTAL SITE TRIP GENERATION			
	IN	OUT	TOTAL
AM	4	11	15
PM	13	7	20

TRAFFIC VOLUMES
Existing, Background, and Buildout Conditions
AM & PM Peak Hours

FIGURE 4

Conclusion

The trip generation calculations show that the proposed Hancock Springs development is projected to generate an additional 14 morning peak hour, 19 evening peak hour, and 178 average weekday site trips.

Adequate sight distance is available at the proposed site access intersection to ensure safe operation along NW 18th Avenue.

Left-turn lane warrants are not projected to be met at the site access.

The proposed Hancock Springs development is not projected to cause any significant traffic impacts to he transportation system within the site vicinity upon buildout and occupancy. Accordingly, no significant traffic delays or congestion is expected to result from the proposed development.

If you have any questions regarding this technical memorandum, please don't hesitate to contact us.

TRIP GENERATION CALCULATIONS
Existing Development

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Variable Value:	1

AM PEAK HOUR

Trip Rate: 0.74

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	**0**	**1**	**1**

PM PEAK HOUR

Trip Rate: 0.99

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	**1**	**0**	**1**

WEEKDAY

Trip Rate: 9.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**5**	**5**	**10**

SATURDAY

Trip Rate: 9.54

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**5**	**5**	**10**

Source: Trip Generation Manual, Tenth Edition

TRIP GENERATION CALCULATIONS
Proposed Development

Land Use:	Single-Family Detached Housing
Land Use Code:	210
Setting/Location	General Urban/Suburban
Variable:	Dwelling Units
Variable Value:	20

AM PEAK HOUR

Trip Rate: 0.74

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	**4**	**11**	**15**

PM PEAK HOUR

Trip Rate: 0.99

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	**13**	**7**	**20**

WEEKDAY

Trip Rate: 9.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**94**	**94**	**188**

SATURDAY

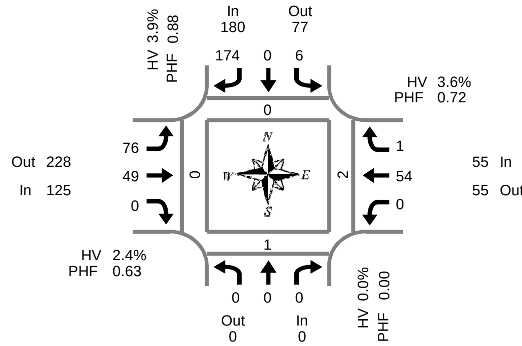
Trip Rate: 9.54

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**95**	**95**	**190**

Source: Trip Generation Manual, Tenth Edition

Total Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
7:05 AM to 8:05 AM

NW Cascade St & NW 18th Ave

Thursday, September 06, 2018
7:00 AM to 9:00 AM

5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	0	0	16	0	5	4	0	0	0	5	0	0	30	0	0	0	0
7:05 AM	0	0	0	0	0	0	22	0	11	2	0	0	0	10	1	0	46	0	0	1	0
7:10 AM	0	0	0	0	0	0	17	0	5	3	0	0	0	4	0	1	29	0	0	0	0
7:15 AM	0	0	0	0	0	0	12	0	7	4	0	0	0	4	0	0	27	0	0	0	0
7:20 AM	0	0	0	0	0	0	16	0	2	5	0	0	0	4	0	0	27	0	0	0	0
7:25 AM	0	0	0	0	1	0	12	0	3	2	0	0	0	1	0	0	19	0	0	0	0
7:30 AM	0	0	0	0	2	0	16	0	4	1	0	0	0	6	0	0	29	0	0	0	0
7:35 AM	0	0	0	0	0	0	12	0	8	3	0	0	0	2	0	0	25	0	1	0	0
7:40 AM	0	0	0	0	1	0	12	0	4	4	0	0	0	2	0	0	23	0	0	0	0
7:45 AM	0	0	0	0	1	0	11	0	6	1	0	0	0	2	0	0	21	0	0	0	0
7:50 AM	0	0	0	0	1	0	12	0	6	9	0	0	0	5	0	0	33	0	0	1	0
7:55 AM	0	0	0	0	0	0	11	0	6	4	0	0	0	7	0	0	28	0	0	0	0
8:00 AM	0	0	0	0	0	0	21	0	14	11	0	0	0	7	0	0	53	0	0	0	0
8:05 AM	0	0	0	0	0	0	10	0	10	14	0	0	0	3	1	0	38	2	0	0	0
8:10 AM	0	0	0	0	1	0	7	0	7	12	0	0	0	5	0	0	32	0	0	0	0
8:15 AM	0	0	0	0	0	0	6	0	9	8	0	0	0	6	0	0	29	0	0	0	0
8:20 AM	0	0	0	0	0	0	5	0	4	5	0	0	0	5	0	0	19	0	0	0	0
8:25 AM	0	0	0	0	0	0	14	0	1	0	0	0	0	2	0	0	17	0	0	0	0
8:30 AM	0	0	0	0	0	0	11	0	2	2	0	0	0	5	0	0	20	1	0	0	0
8:35 AM	0	0	0	0	1	0	9	0	2	7	0	0	0	8	0	0	27	0	2	2	0
8:40 AM	0	0	0	0	0	0	13	0	1	3	0	0	0	2	0	0	19	0	0	0	0
8:45 AM	0	0	0	0	0	0	12	0	5	5	0	0	0	5	0	0	27	0	0	0	0
8:50 AM	0	0	0	0	1	0	9	0	4	1	0	0	0	4	0	0	19	0	0	0	0
8:55 AM	0	0	0	0	0	0	7	0	3	1	0	0	0	2	0	0	13	0	0	0	0
Total Survey	0	0	0	0	9	0	293	0	129	111	0	0	0	106	2	1	650	3	3	4	0

15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	0	0	55	0	21	9	0	0	0	19	1	1	105	0	0	1	0
7:15 AM	0	0	0	0	1	0	40	0	12	11	0	0	0	9	0	0	73	0	0	0	0
7:30 AM	0	0	0	0	3	0	40	0	16	8	0	0	0	10	0	0	77	0	1	0	0
7:45 AM	0	0	0	0	2	0	34	0	18	14	0	0	0	14	0	0	82	0	0	1	0
8:00 AM	0	0	0	0	1	0	38	0	31	37	0	0	0	15	1	0	123	2	0	0	0
8:15 AM	0	0	0	0	0	0	25	0	14	13	0	0	0	13	0	0	65	0	0	0	0
8:30 AM	0	0	0	0	1	0	33	0	5	12	0	0	0	15	0	0	66	1	2	2	0
8:45 AM	0	0	0	0	1	0	28	0	12	7	0	0	0	11	0	0	59	0	0	0	0
Total Survey	0	0	0	0	9	0	293	0	129	111	0	0	0	106	2	1	650	3	3	4	0

Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	0	0	0	0	180	77	257	0	125	228	353	0	55	55	110	1	360	0	1	2	0
%HV	0.0%				3.9%				2.4%				3.6%				3.3%				
PHF	0.00				0.88				0.63				0.72				0.79				

By Movement	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	6	0	174	180	76	49	0	125	0	54	1	55	360
%HV	0.0%	0.0%	0.0%	0.0%	33.3%	0.0%	2.9%	3.9%	2.6%	2.0%	0.0%	2.4%	0.0%	3.7%	0.0%	3.6%	3.3%
PHF	0.00	0.00	0.00	0.00	0.50	0.00	0.85	0.88	0.73	0.51	0.00	0.63	0.00	0.71	0.25	0.72	0.79

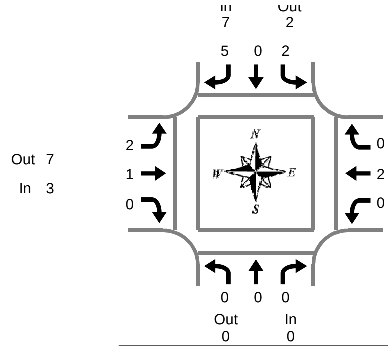
Rolling Hour Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
7:00 AM	0	0	0	0	6	0	169	0	67	42	0	0	0	52	1	1	337	0	1	2	0
7:15 AM	0	0	0	0	7	0	152	0	77	70	0	0	0	48	1	0	355	2	1	1	0
7:30 AM	0	0	0	0	6	0	137	0	79	72	0	0	0	52	1	0	347	2	1	1	0
7:45 AM	0	0	0	0	4	0	130	0	68	76	0	0	0	57	1	0	336	3	2	3	0
8:00 AM	0	0	0	0	3	0	124	0	62	69	0	0	0	54	1	0	313	3	2	2	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
7:05 AM to 8:05 AM

NW Cascade St & NW 18th Ave

Thursday, September 06, 2018
7:00 AM to 9:00 AM

Heavy Vehicle 5-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	1	0	1	2	0	0	0	0	0	0	0	0	2
7:35 AM	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	2
7:40 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
7:45 AM	0	0	0	0	1	0	1	2	1	0	0	1	0	0	0	0	3
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
8:00 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	1	2
8:05 AM	0	0	0	0	0	0	0	0	1	1	0	2	0	0	0	0	2
8:10 AM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
8:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
8:20 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
8:35 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	2
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:50 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	3	0	5	8	6	3	0	9	0	6	0	6	23

Heavy Vehicle 15-Minute Interval Summary
7:00 AM to 9:00 AM

Interval Start Time	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	1	0	2	3	1	1	0	2	0	0	0	0	5
7:45 AM	0	0	0	0	1	0	1	2	1	0	0	1	0	1	0	1	4
8:00 AM	0	0	0	0	1	0	1	2	1	1	0	2	0	2	0	2	6
8:15 AM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
8:30 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	2	0	2	3
8:45 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
Total Survey	0	0	0	0	3	0	5	8	6	3	0	9	0	6	0	6	23

Heavy Vehicle Peak Hour Summary
7:05 AM to 8:05 AM

By Approach	Northbound NW Cascade St			Southbound NW Cascade St			Eastbound NW 18th Ave			Westbound NW 18th Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	7	2	9	3	7	10	2	3	5	12
PHF	0.00			0.58			0.25			0.25			0.50

By Movement	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	2	0	5	7	2	1	0	3	0	2	0	2	12
PHF	0.00	0.00	0.00	0.00	0.50	0.00	0.63	0.58	0.25	0.25	0.00	0.25	0.00	0.25	0.00	0.25	0.50

Heavy Vehicle Rolling Hour Summary
7:00 AM to 9:00 AM

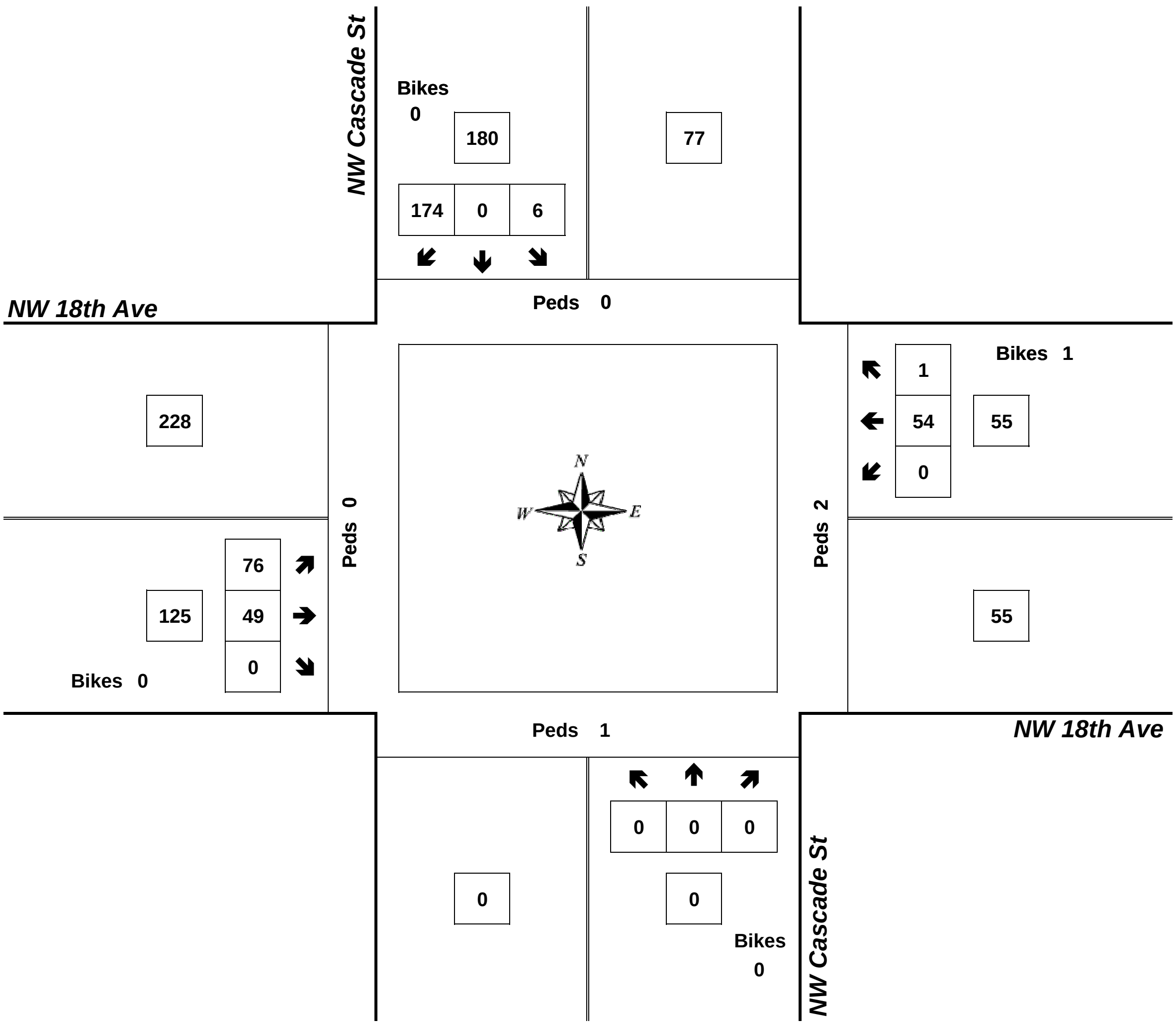
Interval Start Time	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	0	0	0	2	0	4	6	3	1	0	4	0	1	0	1	11
7:15 AM	0	0	0	0	3	0	4	7	3	2	0	5	0	3	0	3	15
7:30 AM	0	0	0	0	3	0	4	7	3	3	0	6	0	4	0	4	17
7:45 AM	0	0	0	0	2	0	2	4	3	2	0	5	0	6	0	6	15
8:00 AM	0	0	0	0	1	0	1	2	3	2	0	5	0	5	0	5	12

Peak Hour Summary

Clay Carney
(503) 833-2740

NW Cascade St & NW 18th Ave

7:05 AM to 8:05 AM
Thursday, September 06, 2018



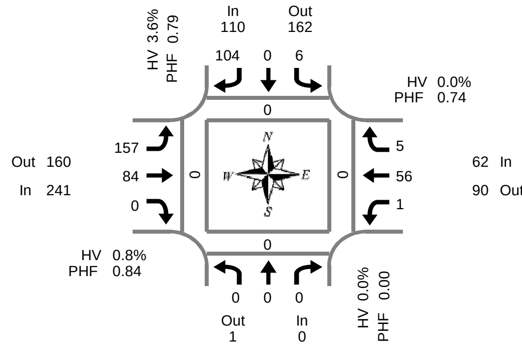
Approach	PHF	HV%	Volume
EB	0.63	2.4%	125
WB	0.72	3.6%	55
NB	0.00	0.0%	0
SB	0.88	3.9%	180
Intersection	0.79	3.3%	360

Count Period: 7:00 AM to 9:00 AM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

NW Cascade St & NW 18th Ave

Thursday, September 06, 2018
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Cascade St L	T	R	Bikes	Southbound NW Cascade St L	T	R	Bikes	Eastbound NW 18th Ave L	T	R	Bikes	Westbound NW 18th Ave L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	0	0	0	0	1	0	7	0	10	6	0	0	0	5	0	0	29	0	0	0	0
4:05 PM	0	0	0	0	1	0	4	0	8	5	0	0	0	4	0	0	22	0	0	0	0
4:10 PM	0	0	0	0	0	0	6	0	8	4	0	0	0	5	0	0	23	0	0	0	0
4:15 PM	0	0	0	0	1	0	11	0	8	2	0	0	0	4	0	0	26	0	0	0	0
4:20 PM	0	0	1	0	0	0	4	0	10	6	0	0	0	4	1	0	26	0	0	0	0
4:25 PM	0	0	0	0	0	0	9	0	10	8	0	0	0	4	0	0	31	0	0	0	0
4:30 PM	0	0	0	0	0	0	8	0	10	6	0	0	0	6	0	0	30	0	0	0	0
4:35 PM	0	0	0	0	2	0	5	0	12	6	0	0	0	3	0	0	28	0	0	0	0
4:40 PM	0	0	0	0	0	0	6	0	9	4	0	0	0	4	1	0	24	0	0	0	0
4:45 PM	0	0	0	0	0	0	5	0	12	7	0	0	0	1	0	0	25	1	0	0	0
4:50 PM	0	0	0	0	0	0	3	0	12	4	0	0	0	5	0	0	24	0	0	0	0
4:55 PM	0	0	0	0	0	0	8	0	8	9	0	0	0	2	0	0	27	0	0	0	0
5:00 PM	0	0	0	0	0	0	5	0	12	3	0	1	0	7	0	0	27	0	0	0	0
5:05 PM	0	0	0	0	0	0	7	0	7	8	0	0	0	4	0	0	26	0	0	0	0
5:10 PM	0	0	0	0	0	0	12	0	12	3	0	0	0	3	1	0	31	0	0	0	0
5:15 PM	0	0	0	0	0	0	8	0	10	5	0	0	0	8	0	0	31	0	0	0	0
5:20 PM	0	0	0	0	0	0	15	0	11	11	0	0	0	9	0	0	46	0	0	0	0
5:25 PM	0	0	0	0	0	0	10	0	23	9	0	0	0	1	0	0	43	0	0	0	0
5:30 PM	0	0	0	0	0	0	5	0	9	8	0	0	0	3	0	0	25	0	0	0	0
5:35 PM	0	0	0	0	0	0	6	0	18	2	0	0	0	4	0	0	30	0	0	0	0
5:40 PM	0	0	0	0	2	0	10	0	12	8	0	0	0	2	2	0	36	0	0	0	0
5:45 PM	0	0	0	0	0	0	8	0	16	7	0	0	0	4	0	0	35	0	0	0	0
5:50 PM	0	0	0	0	1	0	10	0	13	16	0	0	1	3	1	0	45	0	0	0	0
5:55 PM	0	0	0	0	3	0	8	0	14	4	0	0	0	8	1	0	38	0	0	0	0
Total Survey	0	0	1	0	11	0	180	0	274	151	0	1	1	103	7	0	728	1	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Cascade St L	T	R	Bikes	Southbound NW Cascade St L	T	R	Bikes	Eastbound NW 18th Ave L	T	R	Bikes	Westbound NW 18th Ave L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	0	0	0	0	2	0	17	0	26	15	0	0	0	14	0	0	74	0	0	0	0
4:15 PM	0	0	1	0	1	0	24	0	28	16	0	0	0	12	1	0	83	0	0	0	0
4:30 PM	0	0	0	0	2	0	19	0	31	16	0	0	0	13	1	0	82	0	0	0	0
4:45 PM	0	0	0	0	0	0	16	0	32	20	0	0	0	8	0	0	76	1	0	0	0
5:00 PM	0	0	0	0	0	0	24	0	31	14	0	1	0	14	1	0	84	0	0	0	0
5:15 PM	0	0	0	0	0	0	33	0	44	25	0	0	0	18	0	0	120	0	0	0	0
5:30 PM	0	0	0	0	2	0	21	0	39	18	0	0	0	9	2	0	91	0	0	0	0
5:45 PM	0	0	0	0	4	0	26	0	43	27	0	0	1	15	2	0	118	0	0	0	0
Total Survey	0	0	1	0	11	0	180	0	274	151	0	1	1	103	7	0	728	1	0	0	0

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound NW Cascade St In	Out	Total	Bikes	Southbound NW Cascade St In	Out	Total	Bikes	Eastbound NW 18th Ave In	Out	Total	Bikes	Westbound NW 18th Ave In	Out	Total	Bikes	Total	Pedestrians Crosswalk North	South	East	West
Volume	0	1	1	0	110	162	272	0	241	160	401	1	62	90	152	0	413	0	0	0	0
%HV	0.0%				3.6%				0.8%				0.0%				1.5%				
PHF	0.00				0.79				0.84				0.74				0.86				

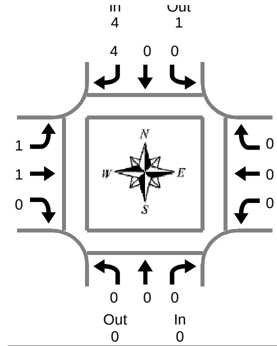
By Movement	Northbound NW Cascade St L	T	R	Total	Southbound NW Cascade St L	T	R	Total	Eastbound NW 18th Ave L	T	R	Total	Westbound NW 18th Ave L	T	R	Total	Total
Volume	0	0	0	0	6	0	104	110	157	84	0	241	1	56	5	62	413
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.8%	3.6%	0.6%	1.2%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	1.5%
PHF	0.00	0.00	0.00	0.00	0.38	0.00	0.74	0.79	0.79	0.68	0.00	0.84	0.25	0.70	0.42	0.74	0.86

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Cascade St L	T	R	Bikes	Southbound NW Cascade St L	T	R	Bikes	Eastbound NW 18th Ave L	T	R	Bikes	Westbound NW 18th Ave L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	0	0	1	0	5	0	76	0	117	67	0	0	0	47	2	0	315	1	0	0	0
4:15 PM	0	0	1	0	3	0	83	0	122	66	0	1	0	47	3	0	325	1	0	0	0
4:30 PM	0	0	0	0	2	0	92	0	138	75	0	1	0	53	2	0	362	1	0	0	0
4:45 PM	0	0	0	0	2	0	94	0	146	77	0	1	0	49	3	0	371	1	0	0	0
5:00 PM	0	0	0	0	6	0	104	0	157	84	0	1	1	56	5	0	413	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Out 4
In 2

Peak Hour Summary
5:00 PM to 6:00 PM

NW Cascade St & NW 18th Ave

Thursday, September 06, 2018
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
4:05 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
4:10 PM	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3
4:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	1	2
4:20 PM	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1	2
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:35 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:10 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:35 PM	0	0	0	0	0	0	1	1	1	1	0	2	0	0	0	0	3
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
5:50 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	4	0	6	10	1	4	0	5	0	3	0	3	18

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	1	0	1	2	0	2	0	2	0	1	0	1	5
4:15 PM	0	0	0	0	1	0	0	1	0	1	0	1	0	2	0	2	4
4:30 PM	0	0	0	0	2	0	0	2	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	1	1	1	1	0	2	0	0	0	0	3
5:45 PM	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	2
Total Survey	0	0	0	0	4	0	6	10	1	4	0	5	0	3	0	3	18

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound NW Cascade St			Southbound NW Cascade St			Eastbound NW 18th Ave			Westbound NW 18th Ave			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	4	1	5	2	4	6	0	1	1	6
PHF	0.00			0.50			0.25			0.00			0.38

By Movement	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	0	0	0	0	0	4	4	1	1	0	2	0	0	0	0	6
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.50	0.25	0.25	0.00	0.25	0.00	0.00	0.00	0.00	0.38

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

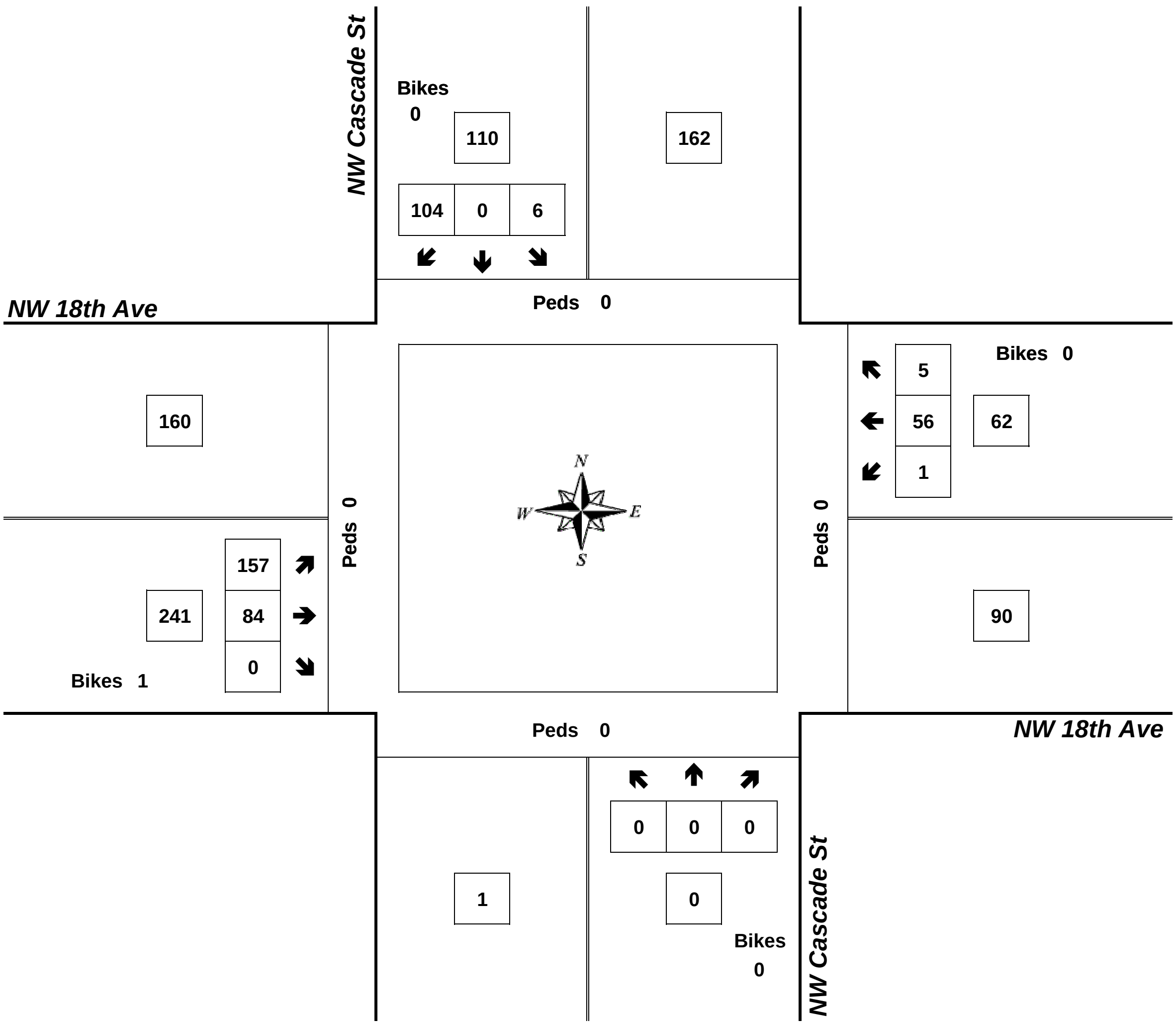
Interval Start Time	Northbound NW Cascade St				Southbound NW Cascade St				Eastbound NW 18th Ave				Westbound NW 18th Ave				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	0	0	0	4	0	2	6	0	3	0	3	0	3	0	3	12
4:15 PM	0	0	0	0	3	0	2	5	0	1	0	1	0	2	0	2	8
4:30 PM	0	0	0	0	2	0	2	4	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	0	0	0	3	3	1	1	0	2	0	0	0	0	5
5:00 PM	0	0	0	0	0	0	4	4	1	1	0	2	0	0	0	0	6

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

NW Cascade St & NW 18th Ave

5:00 PM to 6:00 PM
Thursday, September 06, 2018



Approach	PHF	HV%	Volume
EB	0.84	0.8%	241
WB	0.74	0.0%	62
NB	0.00	0.0%	0
SB	0.79	3.6%	110
Intersection	0.86	1.5%	413

Count Period: 4:00 PM to 6:00 PM

Left-Turn Lane Warrant Analysis

Project: Hancock Springs Preliminary Plat
Intersection: Site Access at NW 18th Avenue
Date: 9/20/2018
Scenario: 2020 - Buildout Conditions - AM Peak Hour

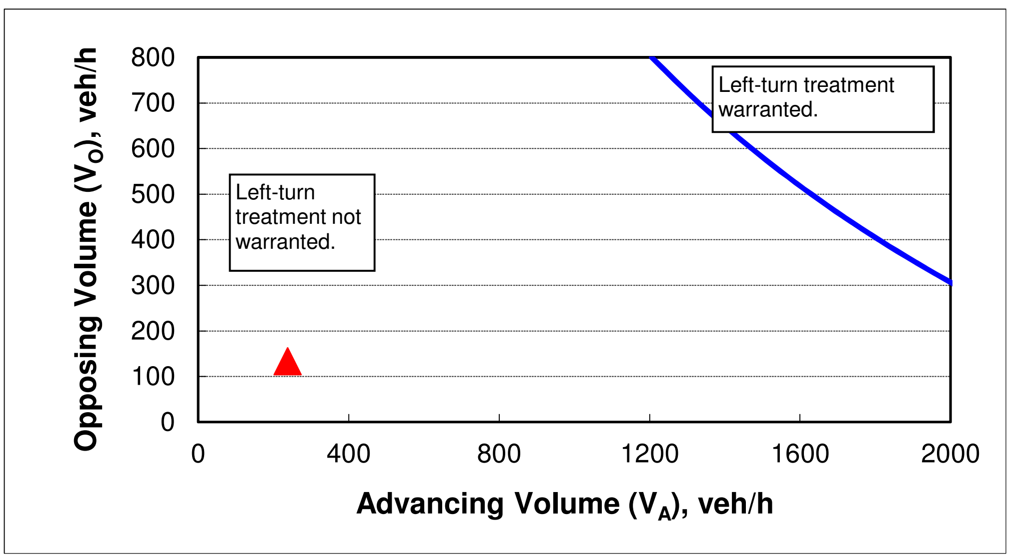
2-lane roadway (English)

INPUT

Variable	Value
85^{th} percentile speed, mph:	35
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	238
Opposing volume (V_O), veh/h:	133

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	2432
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: Hancock Springs Preliminary Plat
Intersection: Site Access at NW 18th Avenue
Date: 9/20/2018
Scenario: 2020 - Buildout Conditions - PM Peak Hour

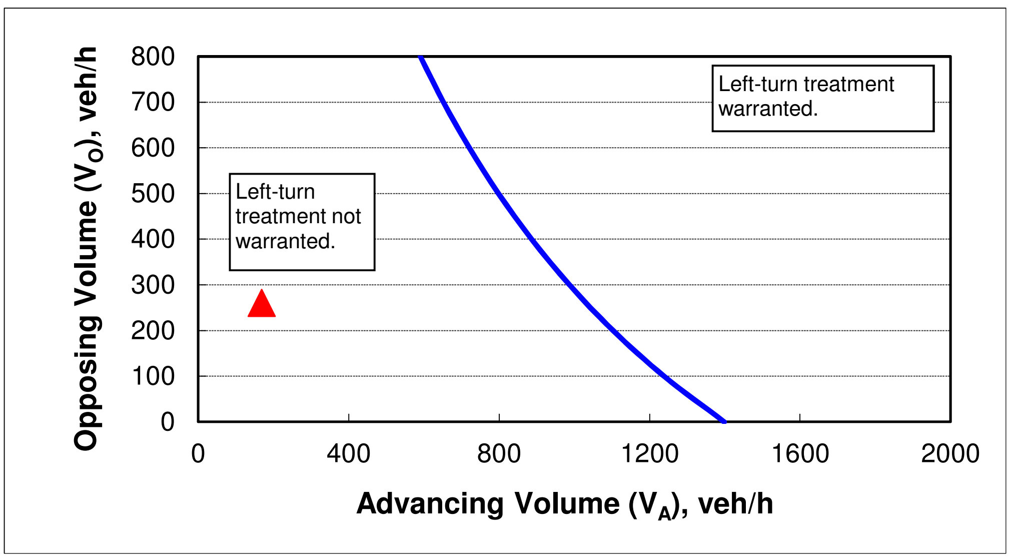
2-lane roadway (English)

INPUT

Variable	Value
85th percentile speed, mph:	35
Percent of left-turns in advancing volume (V_A), %:	2%
Advancing volume (V_A), veh/h:	169
Opposing volume (V_O), veh/h:	260

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1031
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

8. Geotechnical Report

REDMOND GEOTECHNICAL SERVICES

Geotechnical Investigation and Consultation Services

Proposed Hancock Springs Residential Development Site

Parcel #'s 127371000, 127377000 and 127414000

11724 NW 18th Avenue

Camas (Clark County), Washington

for

NW Classic Homes, LLC

Project No. 1708.001.G
September 28, 2018

REDMOND GEOTECHNICAL SERVICES

September 28, 2018

Mr. Chris Wall
NW Classic Homes, LLC
10100 NE 116th Circle
Vancouver, Washington 98682

Dear Mr. Wall:

Re: Geotechnical Investigation and Consultation Services, Proposed Hancock Springs Residential Development Site, Parcel No's. 127371000/127377000 and 127414000, 11724 NW 18th Avenue, Camas, (Clark County), Washington

Submitted herewith is our report entitled "Geotechnical Investigation and Consultation Services, Proposed Hancock Springs Residential Development Site, Parcel No's. 127371000/127377000 and 127414000, 11724 NW 18th Avenue, Camas (Clark County), Washington". The scope of our services was outlined in our formal proposal to Mr. Chris Wall of NW Classic Homes, LLC dated August 9, 2018. Written authorization of our services was provided by Mr. Chris Wall of NW Classic Homes, LLC on August 9, 2018.

During the course of our investigation, we have kept you and/or others advised of our schedule and preliminary findings. We appreciate the opportunity to assist you with this phase of the project. Should you have any questions regarding this report, please do not hesitate to call.

Sincerely,

Daniel M. Redmond, P.E., G.E.
President/Principal Engineer

DANIEL M. REDMOND
STATE OF WASHINGTON
28881
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 3-22-19

Cc: Mr. Michael Andreotti
AKS Engineering & Forestry, LLC

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GEOTECHNICAL INVESTIGATION AND CONSULTATION SERVICES PROPOSED HANCOCK SPRINGS RESIDENTIAL DEVELOPMENT SITE PARCEL NO'S. 127371000/127377000 AND 127414000 11724 NW 18TH AVENUE CAMAS (CLARK COUNTY), WASHINGTON

INTRODUCTION

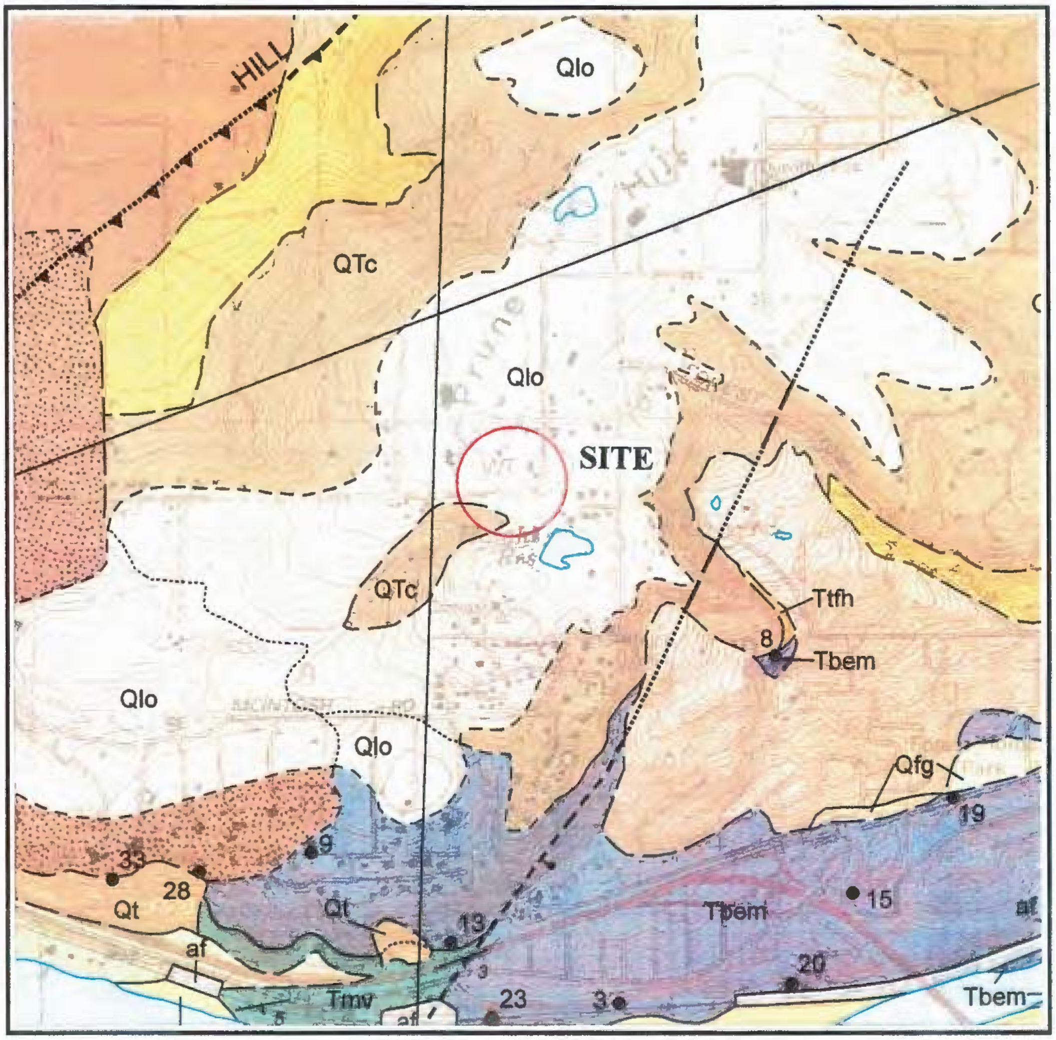
Redmond Geotechnical Services, LLC is please to submit to you the results of our Geotechnical Investigation and Consultation Services report at the site of the proposed Hancock Springs residential development site located generally to the south of NW 18th Avenue and west of NW Cascade Street in Camas (Clark County), Washington. The general location of the subject site is shown on the Site Vicinity and Geologic Map, Figure No. 1. The purpose of our geotechnical investigation and consultation services at this time was to explore the existing subsurface soils and/or groundwater conditions across the subject site and to develop and/or provide appropriate geotechnical design and construction recommendations for the proposed new single-family residential development project as well as to assess the presence and/or degree of any existing and/or ancient (historic) landslide(s) at the site with regard to potential stability problems and/or development.

PROJECT DESCRIPTION

Based on a review of the proposed site development plan, we understand that present plans for the project will consist of the construction of twenty-one (21) new sin gle-family residential home sites and/or lots. Reportedly, the new single-family residential homes will be two- and/or three-story wood frame structures with a base footprint of approximately 1,500 to 2,000 square feet.

Support for the new residential homes is anticipated to consist primarily of conventional shallow strip and/or continuous footings although some individual spread and/or column-type footings may also be required. Structural loading information for the project is unavailable at this time. However, based on our past experience with similar types of single-family wood-frame residential structures, we anticipate that maximum dead plus live continuous (strip) and individual (spread) column footing loads will be on the order of about 2.0 to 3.0 kips per lineal foot (klf) and 10 to 25 kips, respectively. Additionally, due to the sloping site grades across the site, we anticipate that some of the proposed new single-family residential homes may be constructed with partial and/or below grade basements. In this regard, the use of below grade and/or retaining walls may also be utilized for the project.

Earthwork and grading operations associated with bringing the property to finish design grades are unknown at this time but are generally anticipated to result in both cuts and/or fills of about five (5) feet or less.



CAMAS QUADRANGLE
WASHINGTON—OREGON
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 CAMAS 15' QUADRANGLE

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—COLUMBIA RIVER DATUM

SITE VICINITY AND GEOLOGIC MAP		
Project No. 1708.001.G	HANCOCK SPRINGS SUBDIVISION NW 18TH AVENUE	Figure No. 1

Other associated site improvements for the project will include the construction of new paved surfaces for both automobile parking and drive areas as well as new underground utility services. Additionally, we understand that the project will include some storm water detention and/or water quality ponds.

SCOPE OF WORK

The purpose of our geotechnical investigation studies was to evaluate the overall site subsurface soil and/or groundwater conditions underlying the site with regard to the proposed new single-family residential development at the site and any associated impacts or concerns with respect to the new construction as well as provide appropriate geotechnical design and construction recommendations for the project. Additionally, the purpose of the geologic hazards study was to assess the presence and/or degree of any existing and/or ancient (historic) landslide(s) at the site with regard to potential stability problems associated with development of the site. Specifically, the geotechnical investigation and geologic hazards study included the following scope of work items:

1. Review of available and relevant (pertinent) geologic information including available landslide mapping, historic topographic maps and historic aerial photographs as well as the Geologic Map of the Camas Quadrangle, Clark County, Washington.

2. A site vicinity geologic reconnaissance to observe the area geology and geologic features that could be related to past landslide activity in the area.

3. A detailed site reconnaissance of the subject property including a visual reconnaissance of existing road cuts and fills as well as pavement areas for indications of slope movement.

4. A subsurface exploration program of the soil and groundwater conditions underlying the site by means of six (6) exploratory test hole excavations (Figure No's. A-4 through A-6). The exploratory test holes were excavated with tracked excavation equipment to depths ranging from about five (5.0) to six (6.0) feet beneath existing site grades at the approximate locations as shown on the Site Exploration Map, Figure No. 2.

5. Laboratory testing to evaluate and identify pertinent physical and engineering properties of the subsurface soils encountered relative to the planned site development and construction at the site. The laboratory testing program included tests to help evaluate the natural (field) moisture content and dry density, maximum dry density and optimum moisture content, gradational characteristics and Atterberg Limits as well as direct shear strength and "R"-value tests (Figure No's. A-7 through A-11).

6. A literature review and engineering evaluation and assessment of the regional seismicity to evaluate the potential ground motion hazard(s) at the subject site. The evaluation and assessment included a review of the regional earthquake history and sources such as potential seismic sources, maximum credible earthquakes, and reoccurrence intervals as well as a discussion of the possible ground response to the selected design earthquake(s), fault rupture, landsliding, liquefaction, and tsunami and seiche flooding.

7. Engineering analyses utilizing the field and laboratory data as a basis for furnishing recommendations for foundation support of the proposed new single-family residential structures. Recommendations include maximum design allowable contact bearing pressure(s), depth of footing embedment, estimates of foundation settlement, lateral soil resistance, and foundation subgrade preparation as well as recommended foundation setbacks from slopes. Additionally, construction and/or permanent subsurface water drainage considerations have also been prepared. Further, our report includes recommendations regarding site preparation, placement and compaction of structural fill materials, suitability of the on-site soils for use as structural fill, criteria for import fill materials, and preparation of foundation, pavement and floor slab subgrades.

SITE CONDITIONS

Site Geology

Available geologic mapping of the area and/or subject site (Geologic Map of the Camas Quadrangle) indicates that the subsurface soils consist of Loess (Qlo) of Pleistocene age. Characteristics include massive unconsolidated deposits of light-gray to buff, micaceous, quartzofeldspathic eolian silt and fine sand; commonly contains isolated granules and small pebbles; generally capped with strongly developed red soils. Forms widespread mantle on uplands of map area but mapped only where thick (about 3 to 25 m) and extensive enough to obscure underlying units. Overlies basaltic andesite of Prune Hill but probably deposited during several episodes throughout late Quaternary time.

There are no known faults located directly beneath the subject property. The closest known fault is the Prune Hill Fault which is located approximately 0.8 miles to the north/northwest of the subject property. The potential activity of the Prune Hill Fault is unknown but is considered to be active.

Surface Conditions

The subject proposed new Hancock Springs single-family residential development property is located to the south of NW 18th Avenue and west of NW Cascade Street in Camas (Clark County), Washington.

At the time of our study, the northwesterly and southeasterly portions of the subject proposed Hancock Springs residential development site was generally improved and contained existing single-family residential structures. Surface vegetation across the site generally consists of a light to moderate growth of grass, weeds and brush as well as several small to large sized trees.

Topographically, the subject property is best characterized as relatively flat-lying to gently sloping terrain descending downward generally towards the south/southwest. Overall topographic relief across the entire site is estimated at about twenty-six (26) feet and ranges from a low about Elevation 730 feet near the southwesterly corner of the site to a high of about Elevation 756 feet near the northerly portion the subject site.

Subsurface Soil Conditions

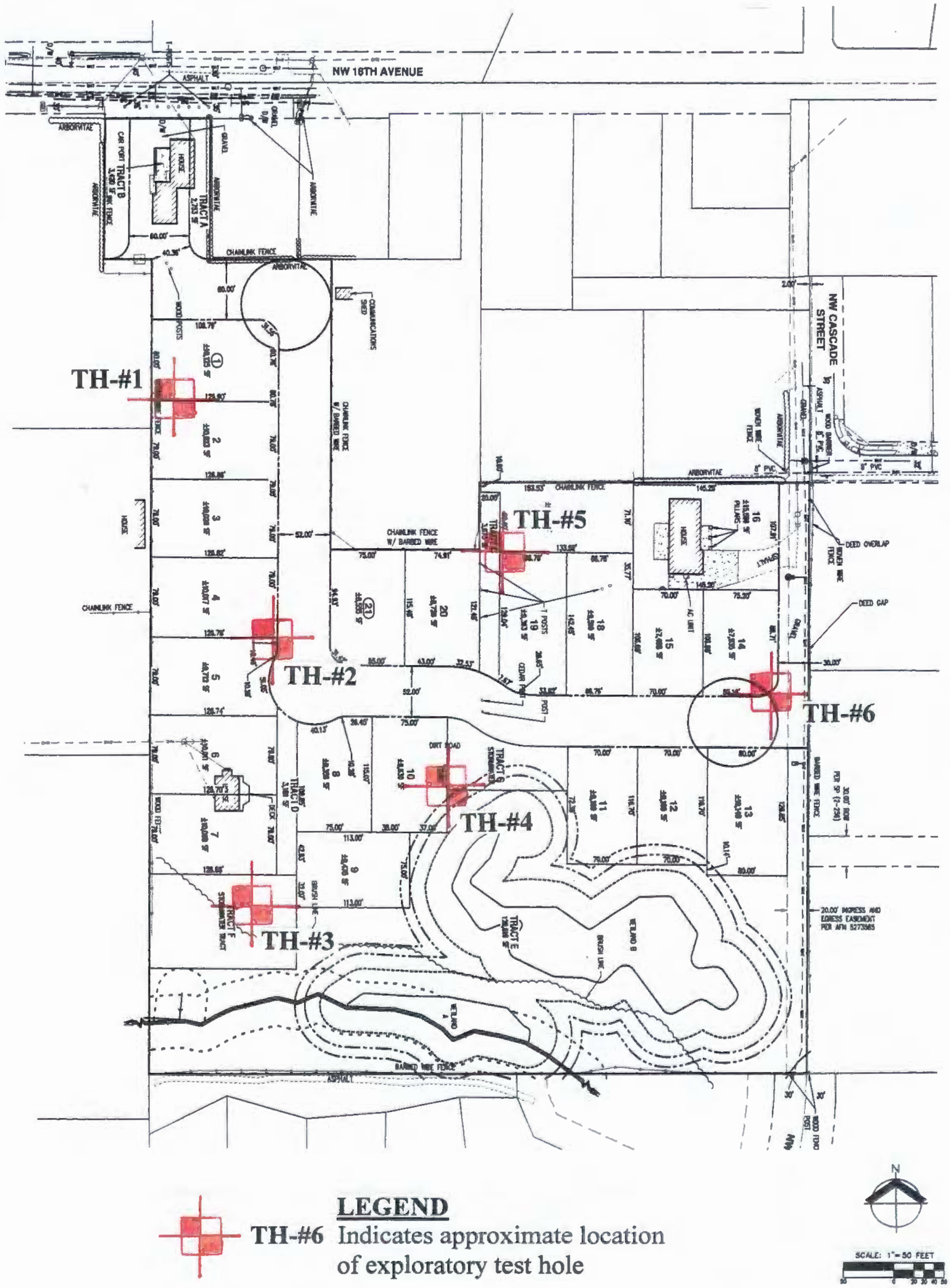
Our understanding of the subsurface soil conditions underlying the site was developed by means of a review of six (6) test hole explorations excavated to depths ranging from about five (5) to six (6) feet beneath existing site grades on August 15, 2018 with tracked excavating equipment. The location of the exploratory test holes were located in the field by marking off distances from existing and/or known site (land) features and are shown in relation to the proposed new residential home sites and/or site improvements on the Site Exploration Map, Figure No. 2. Detailed logs of the test hole explorations, presenting conditions encountered at each location explored, are presented in Appendix A, Figure No's. A-4 through A-6.

The exploratory test pit excavations were observed by staff from Redmond Geotechnical Services, LLC who logged each of the test pit explorations and obtained representative samples of the subsurface soils encountered across the site. Additionally, the elevation of the exploratory test pit excavations were referenced from the proposed Site Development Plan prepared by PLS Engineering and should be considered as approximate. All subsurface soils encountered at the site and/or within the exploratory test pit excavations were logged and classified in general conformance with the Unified Soil Classification System (USCS) which is outlined on Figure No. A-3.

The test pit explorations performed across the subject property revealed that the subject site is underlain by native soil deposits comprised primarily of "Residual" soil deposits of Pleistocene age. Specifically, the subsurface soils underlying the site consist of a surficial layer of topsoil materials comprised of dark brown, damp to moist, soft to very soft, organic to highly organic, sandy, clayey silt which extends to depth of approximately 10 to 12 inches beneath existing site grades. These topsoil materials were inturn underlain by residual soils comprised of medium to olive-brown with gray mottling, moist to very moist, medium stiff to stiff, clayey, sandy silt to the maximum depth explored of about six (6) feet beneath the existing surface grades. These underlying clayey, sandy silt subgrade soils are best characterized by relatively moderate strength and low compressibility.

Groundwater

Groundwater was not encountered within any of the exploratory test hole explorations performed across the subject property at the time of our field work to depths of up to six (6) feet beneath the existing site and/or surface grades. However, groundwater elevations at and/or across the site are expected to fluctuate seasonally in accordance with rainfall conditions and/or site utilization and may approach to near surface elevations during periods of heavy and/or prolonged rainfall.



LEGEND

TH-#6 Indicates approximate location of exploratory test hole

SCALE: 1"=50 FEET

SITE EXPLORATION PLAN

Project No. 1708.001.G	HANCOCK SPRINGS SUBDIVISION NW 18TH AVENUE	Figure No. 2

INFILTRATION TESTING

We performed one (1) field infiltration test at the site on August 15, 2018. The infiltration test was performed in test hole TH-#3 at a depth of five (5) feet beneath existing site grades. The subgrade soils encountered in test hole TH-#3 consisted of stiff, clayey, sandy silt. The field infiltration testing was performed in general conformance with current EPA and/or the Clark County Encased (Single-Sleeve) Falling Head Test Method which consisted of advancing a 6-inch inner diameter PVC pipe approximately 6 inches into the exposed soil horizon at the test location. Using a steady water flow, water was discharged into the pipe and allowed to penetrate and saturate the subgrade soils. The water level was adjusted over a two (2) hour period and allowed to achieve a saturated subgrade soil condition consistent with the bottom elevation of the surrounding test pit excavation. Following the required saturation period, water was again added into the pipe and the time and/or rate at which the water level dropped was monitored and recorded. Each measurable drop in the water level was recorded until a consistent infiltration rate was observed and/or repeated.

Based on the results of the field infiltration testing, we have found that the native clayey, sandy silt subgrade soil deposits posses an ultimate infiltration rate of less than 0.1 inches per hour (in/hr).

LABORATORY TESTING

Representative samples of the on-site subsurface soils were collected at selected depths and intervals from various test hole excavations and returned to our laboratory for further examination and testing and/or to aid in the classification of the subsurface soils as well as to help evaluate and identify their engineering strength and compressibility characteristics. The laboratory testing consisted of visual and textural sample inspection, moisture content and dry density determinations, maximum dry density and optimum moisture content, gradation analyses and Atterberg Limits as well as direct shear strength and "R"-value tests. Results of the various laboratory tests are presented in Appendix A, Figure No's. A- 7 through A-11.

SEISMICITY AND EARTHQUAKE SOURCES

The seismicity of the southwest Washington and northwest Oregon area, and hence the potential for ground shaking, is controlled by three (3) separate fault mechanisms. These include the Cascadia Subduction Zone (CSZ), the mid-depth intraplate zone, and the relatively shallow crustal zone. Descriptions of these potential earthquake sources are presented below.

The CSZ is located offshore and extends from northern California to British Columbia. Within this zone, the oceanic Juan de Fuca Plate is being subducted beneath the continental North American Plate to the east. The interface between these two (2) plates is located at a depth of approximately 15 to 20 kilometers (km). The seismicity of the CSZ is subject to several uncertainties, including the maximum earthquake magnitude and the recurrence intervals associated with various magnitude earthquakes. Anecdotal evidence of previous CSZ earthquakes has been observed within coastal marshes along the Washington and Oregon coastlines.

Sequences of interlayered peat and sands have been interpreted to be the result of large Subduction Zone earthquakes occurring at intervals on the order of 300 to 500 years, with the most recent event taking place approximately 300 years ago. A recent study by Geomatrix (1995) suggests that the maximum earthquake associated with the CSZ is moment magnitude (Mw) 8 to 9. This is based on an empirical expression relating moment magnitude to the area of fault rupture derived from earthquakes that have occurred within subduction zones in other parts of the world. An Mw 9 earthquake would involve a rupture of the entire CSZ. As discussed by Geomatrix (1995) this has not occurred in other subduction zones that have exhibited much higher levels of historical seismicity than the CSZ, and is considered unlikely. For the purpose of this study an earthquake of Mw 8.5 was assumed to occur within the CSZ.

The intraplate zone encompasses the portion of the subducting Juan de Fuca Plate located at a depth of approximately 30 to 50 km below western Washington and western Oregon. Very low levels of seismicity have been observed within the intraplate zone in western Oregon and western Washington. However, much higher levels of seismicity within this zone have been recorded in Washington and California. Several reasons for this seismic quiescence were suggested in the Geomatrix (1995) study and include changes in the direction of subduction between Oregon, Washington, and British Columbia as well as the effects of volcanic activity along the Cascade Range. Historical activity associated with the intraplate zone includes the 1949 Olympia magnitude 7.1 and the 1965 Puget Sound magnitude 6.5 earthquakes. Based on the data presented within the Geomatrix (1995) report, an earthquake of magnitude 7.25 has been chosen to represent the seismic potential of the intraplate zone.

The third source of seismicity that can result in ground shaking within the Oregon and southwest Washington area is near-surface crustal earthquakes occurring within the North American Plate. The historical seismicity of crustal earthquakes in this area is higher than the seismicity associated with the CSZ and the intraplate zone. The 1993 Scotts Mills (magnitude 5.6) and Klamath Falls (magnitude 6.0), Oregon earthquakes were crustal earthquakes.

Liquefaction

Seismic induced soil liquefaction is a phenomenon in which loose, granular soils and some silty soils, located below the water table, develop high pore water pressures and lose strength due to ground vibrations induced by earthquakes. Soil liquefaction can result in lateral flow of material into river channels, ground settlements and increased lateral and uplift pressures on underground structures. Buildings supported on soils that have liquefied often settle and tilt and may displace laterally. Soils located above the ground water table cannot liquefy, but granular soils located above the water table may settle during the earthquake shaking.

Our review of the subsurface soil test pit logs from our exploratory field explorations (TH-#1 through TH-#6) and laboratory test results indicate that the site is generally underlain by medium stiff to stiff, clayey, sandy silt soil deposits to depths of at least 6.0 feet beneath existing site grades.

As such, due to the medium stiff to stiff nature of the underlying clayey, sandy silt subgrade soils across the site as well as the cohesive characteristics of the clayey silt subgrade soil deposits beneath the site, it is our opinion that the native subgrade soil deposits have a low potential for liquefaction during the design earthquake motions previously described.

Landslides

No ancient and/or active landslides were observed or are known to be present on the subject site. Additionally, a review of the State of Washington and/or Clark County Landslide Hazards Maps have found no mapped landslides at and/or near to the subject site. Further, due to the relatively gently sloping nature of the subject property, the risk of seismic induced slope instability at the site resulting in landslides and/or lateral earth movements appear to present only a low potential geologic hazard.

Surface Rupture

Although the site is generally located within a region of the country known for seismic activity, no known faults exist directly beneath the subject site. However, the Prune Hill Fault is located approximately 0.8 miles to the north/northwest of the subject property. As such, the risk of surface rupture due to faulting should be considered.

Tsunami and Seiche

A tsunami, or seismic sea wave, is produced when a major fault under the ocean floor moves vertically and shifts the water column above it. A seiche is a periodic oscillation of a body of water resulting in changing water levels, sometimes caused by an earthquake. Tsunami and seiche are not considered a potential hazard at this site because the proposed residential development property is not located near to any large bodies of water.

Flooding and Erosion

Stream flooding is a potential hazard that should be considered in lowland areas of Clark County and Camas. The FEMA (Federal Emergency Management Agency) flood maps should be reviewed as part of the design for the proposed new single-family residential structures and site improvements. Elevations of structures on the site should be designed based upon consultants reports, FEMA (Federal Emergency Management Agency), and Clark County requirements for the 100-year flood levels of any nearby creeks and/or streams.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the results of our field explorations, laboratory testing, and engineering analysis, it is our opinion that the site is presently stable and generally suitable for the proposed new Hancock Springs single-family residential development and its/their associated site improvements described herein provided that the recommendations contained within this report are properly incorporated into the design and construction of the project.

The primary features of concern at the site and/or for the project are 1) the presence of existing gently sloping site grades across the subject site and 2) the moisture sensitivity of the near surface and/or native clayey, sandy silt subgrade soil deposits beneath the site.

In regard to the presence of gently sloping site grades across the subject property, we are generally of the opinion that these slopes are presently stable. Additionally, we are of the opinion that site grading to bring the subject property to final design grades should generally not result in a negative impact to the existing slopes provided that permanent cuts and/or fills for the project generally do not exceed about eight (8) feet in height and are constructed no steeper than 2H:1V. However, we anticipate that some site grading and earthwork (cuts and fills) of the subject property will be required in order to construct the new buildings and/or bring the proposed new site improvements to finish grade. As such, where existing slope gradients are greater than about 20 percent (5H to 1V), we are of the opinion that some re-grading and/or structural fill placement may be performed provided that the structural fills are properly benched and keyed into the existing slope.

With regard to the moisture sensitivity of the native (on-site) clayey, sandy silt soil deposits beneath the site, based on our current understand that site grading and fill placement will likely be required for the project, we are generally of the opinion that all site grading and earthwork operations be performed during the drier summer months which is typically June through September.

The following sections of this report provide specific recommendations regarding subgrade preparation and grading as well as foundation, floor slab and pavement design and construction for the new Hancock Springs residential development project.

Site Preparation

As an initial step in site preparation, we recommend that the proposed new Hancock Springs residential development property and its associated structural and/or site improvement area(s) be stripped and cleared of all existing improvements, any existing undocumented fill materials, surface debris, existing vegetation, topsoil materials, and/or any other deleterious materials present at the time of construction. In general, we envision that the site stripping to remove existing vegetation and topsoil materials will generally be about 10 to 12 inches. However, localized areas requiring deeper removals, such as any old tree stump remnants or undocumented fills, may be encountered and should be evaluated at the time of construction by the Geotechnical Engineer.

The stripped and cleared materials should be properly disposed of as they are generally considered unsuitable for use/reuse as fill materials.

Following the completion of the site stripping and clearing work and prior to the placement of any required structural fill materials and/or structural improvements, the exposed subgrade soils within the planned structural improvement area(s) should be inspected and approved by the Geotechnical Engineer and possibly proof-rolled with a half and/or fully loaded dump truck. Areas found to be soft or otherwise unsuitable should be over-excavated and removed or scarified and recompacted as structural fill. During wet and/or inclement weather conditions, proof rolling and/or scarification and recompaction as noted above may not be appropriate.

The on-site native clayey, sandy silt subgrade soil materials are generally considered suitable for use/reuse as structural fill materials provided that they are free of organic materials, debris, and rock fragments in excess of about 6 inches in dimension. However, if site grading is performed during wet or inclement weather conditions, the use of the on-site native subgrade soil materials which contain significant silt and clay sized particles will be difficult at best. In this regard, during wet or inclement weather conditions, we recommend that an import structural fill material be utilized which should consist of a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines. Representative samples of the materials which are to be used as structural fill materials should be submitted to the Geotechnical Engineer and/or laboratory for approval and determination of the maximum dry density and optimum moisture content for compaction.

In general, all site earthwork and grading activities should be scheduled for the drier summer months (June through September) if possible. However, if wet weather site preparation and grading is required, it is generally recommended that the stripping of topsoil materials be accomplished with a tracked excavator utilizing a large smooth-toothed bucket working from areas yet to be excavated. Additionally, the loading of strippings into trucks and/or protection of moisture sensitive subgrade soils will also be required during wet weather grading and construction. In this regard, we recommend that areas in which construction equipment will be traveling be protected by covering the exposed subgrade soils with a geotextile fabric such as Mirafi FW404 followed by at least 12 inches or more of crushed aggregate base rock. Further, the geotextile fabric should have a minimum Mullen burst strength of at least 250 pounds per square inch for puncture resistance and an apparent opening size (AOS) between the U.S. Standard No. 70 and No. 100 sieves.

All structural fill materials placed within the new building(s) and/or structural improvement areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Structural fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches. Additionally, all fill materials placed within five (5) lineal feet of the perimeter (limits) of the proposed residential structures and/or pavements should be considered structural fill.

Further, all structural fill materials placed on sloping ground which exceeds an existing slope gradient of about 20 percent (5H to 1V) should be properly benched and keyed into the native slope (see Typical Fill Slope Detail, Figure No. 3). All aspects of the site grading should be monitored and approved by a representative of Redmond Geotechnical Services, LLC.

Foundation Support

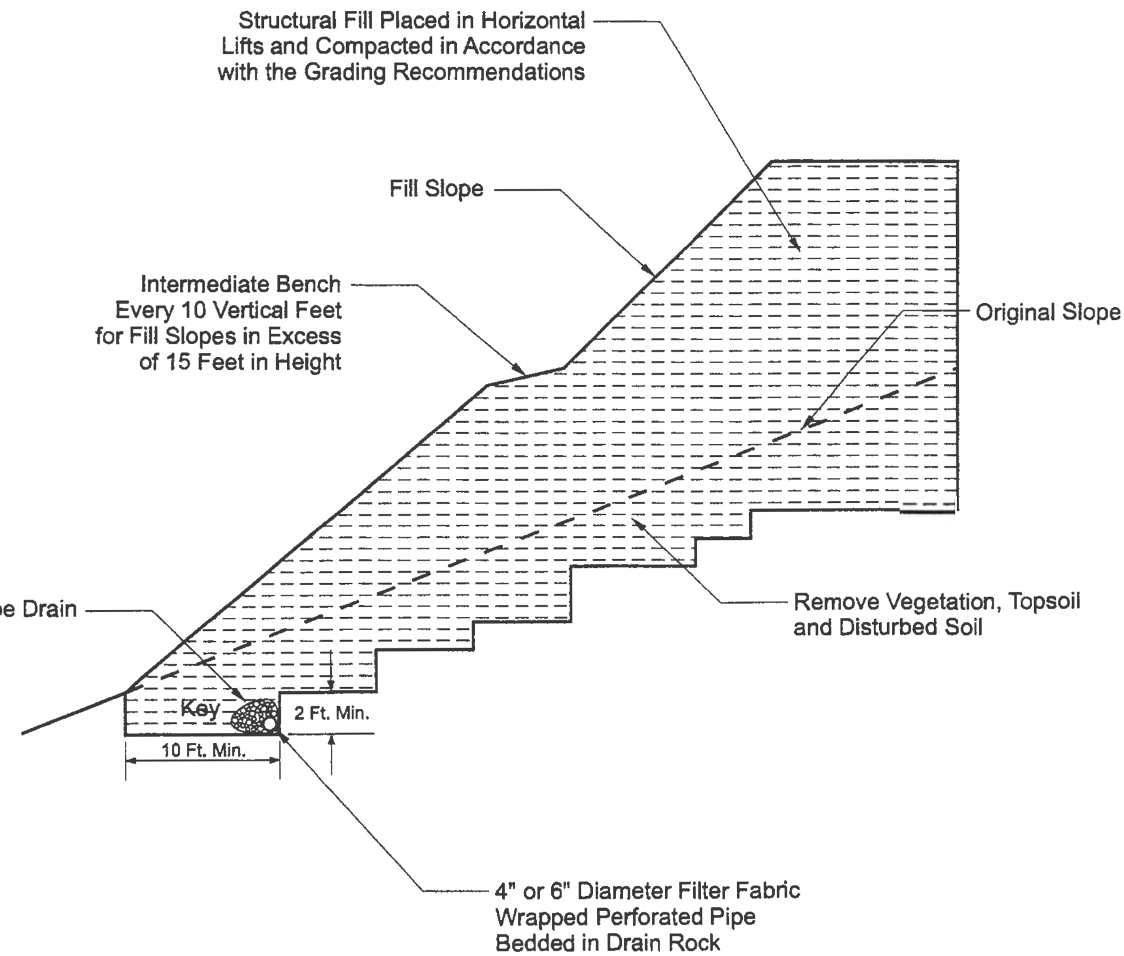
Based on the results of our investigation, it is our opinion that the site of the proposed new Hancock Springs residential development site is suitable for support of the two- and/or three-story wood-frame single-family residential structures provided that the following foundation design recommendations are followed. The following sections of this report present specific foundation design and construction recommendations for the planned new residential structures.

Shallow Foundations

In general, conventional shallow continuous (strip) footings and individual (spread) column footings may be supported by approved native (untreated) medium stiff, clayey, sandy silt subgrade soils and/or structural fill soil materials based on an allowable contact bearing pressure of about 2,000 pounds per square foot (psf). However, where higher allowable contact bearing pressures are desired and/or required, an allowable contact bearing pressure of up to 2,500 psf may be used for design where foundations are supported by a minimum of 6 inches of compacted crushed aggregate base rock (granular) structural fill material. These recommended allowable contact bearing pressures are intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads. In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (where required) should be embedded at least 18 inches below grade and have a minimum width of at least 24 inches. Additionally, foundations should be constructed no closer than about eight (8) feet from the top of existing and/or permanent 2H to 1V cut and/or fill slopes.

Total and differential settlements of foundations constructed as recommended above and supported by approved native subgrade soils or by properly compacted structural fill materials are expected to be well within the tolerable limits for this type of wood-frame residential structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footing element and the supporting subgrade bearing soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.30 and 0.45 for native clayey, sandy silt subgrade soils and/or import gravel fill materials, respectively. In addition, lateral loads may be resisted by passive earth pressures on footings poured "neat" against in-situ (native) subgrade soils or properly backfilled with structural fill materials based on an equivalent fluid density of 250 pounds per cubic foot (pcf). This recommended value includes a factor of safety of approximately 1.5 which is appropriate due to the amount of movement required to develop full passive resistance.



TYPICAL FILL SLOPE DETAIL

Project No. 1708.001.G	HANCOCK SPRINGS SUBDIVISION NW 18TH AVENUE	Figure No. 3

Floor Slab Support

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slab area be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should help provide a capillary break to prevent migration of moisture through the slab. Additional moisture protection, where needed, can be provided by using a 10-mil polyolefin geo-membrane sheeting such as Stego Wrap.

The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where floor slab subgrade materials are undisturbed, firm and stable and where the underslab aggregate base rock section has been prepared and compacted as recommended above, we recommend that a modulus of subgrade reaction of 150 pci be used for design.

Retaining/Below Grade Walls

Retaining and/or below grade walls should be designed to resist lateral earth pressures imposed by native soils or granular backfill materials as well as any adjacent surcharge loads. For walls which are unrestrained at the top and free to rotate about their base, we recommend that active earth pressures be computed on the basis of the following equivalent fluid densities:

Non-Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	35	30
3H:1V	60	50
2H:1V	80	70

For walls which are fully restrained at the top and prevented from rotation about their base, we recommend that at-rest earth pressures be computed on the basis of the following equivalent fluid densities:

Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	45	35
3H:1V	70	60
2H:1V	90	80

The above recommended values assume that the walls will be adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or if adjacent surcharge loading is present, the above recommended values will be significantly higher.

Backfill materials behind walls should be compacted to 90 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Special care should be taken to avoid over-compaction near the walls which could result in higher lateral earth pressures than those indicated herein. In areas within three (3) to five (5) feet behind walls, we recommend the use of hand-operated compaction equipment.

Asphalt Pavements

Flexible pavement design for the project was determined on the basis of projected (anticipated) traffic volume and loading conditions relative to laboratory subgrade soil strength ("R"-value) characteristics. Based on a laboratory subgrade "R"-value of 28 (Resilient Modulus = 5,000 to 10,000) and utilizing the Asphalt Institute Flexible Pavement Design Procedures and/or the American Association of State Highway and Transportation Officials (AASHTO) 1993 "Design of Pavement Structures" manual, we recommend that the asphaltic concrete pavement section(s) for the new residential development areas at the site consist of the following:

Material Type	Pavement Section (inches)
Asphaltic Concrete	3.5
Aggregate Base Rock	10.0

Note: Where heavy vehicle traffic is anticipated such as those required for fire and/or garbage trucks, we recommend that the automobile drive area pavement section be increased by adding 0.5 inches of asphaltic concrete and 2.0 inches of aggregate base rock. Additionally, the above recommended flexible pavement section(s) assumes a design life of 20 years.

Pavement Subgrade, Base Course & Asphalt Materials

The above recommended flexible pavement section was based on the design assumptions listed herein and on the assumption that construction of the new paved parking and/or drive areas will be completed during an extended period of reasonably dry weather. However, if construction of the paved areas is performed during wet and/or inclement weather conditions, we recommend that the aggregate base rock section be increased by at least 4 inches. Additionally, we recommend that the aggregate base rock materials be placed directly over an approved Geotextile Fabric such as Mirafi RS 2801/15/300 or an approved equivalent.

All thicknesses given are intended to be the minimum acceptable. Increased base rock sections and the use of a geotextile fabric may be required during wet and/or inclement weather conditions and/or in order to adequately support construction traffic and protect the subgrade during construction. Additionally, the above recommended pavement section assumes that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Further, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course.

Pavement base course materials should consist of well-graded 1-1/4 inch and/or 5/8-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete paving materials should conform to the requirements set forth in the latest edition of the Washington Department of Transportation, Standard Specifications for Highway Construction and/or the City of Camas Public Works Standards. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete paving materials should be compacted to at least 92 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

Excavation/Slopes

Temporary excavations of up to about four (4) feet in depth may be constructed with near vertical inclinations. Temporary excavations greater than about four (4) feet but less than eight (8) feet should be excavated with inclinations of at least 1 to 1 (horizontal to vertical) or properly braced/shored. Where excavations are planned to exceed about eight (8) feet, this office should be consulted. All shoring systems and/or temporary excavation bracing for the project should be the responsibility of the excavation and/or grading contractor.

Permanent cut and/or fill slopes should be constructed no steeper than about 2H to 1V.

Depending on the time of year in which trench excavations occur, trench dewatering may be required in order to maintain dry working conditions if the invert elevations of the proposed utilities are located at and/or below the groundwater level. If groundwater is encountered during utility excavation work, we recommend placing trench stabilization materials along the base of the excavation. Trench stabilization materials should consist of 1-foot of well-graded gravel, crushed gravel, or crushed rock with a maximum particle size of 4 inches and less than 5 percent fines passing the No. 200 sieve. The material should be free of organic matter and other deleterious material and placed in a single lift and compacted until well keyed.

Surface Drainage/Groundwater

We recommend that positive measures be taken to properly finish grade the site so that drainage waters from the residential structures and landscaping areas as well as adjacent properties or buildings are directed away from the new residential structures foundations and/or any retaining walls. All roof drainage should be directed into conduits that carry runoff water away from the residential structures to a suitable outfall. Roof downspouts should not be connected to foundation drains. A minimum ground slope of about 2 percent is generally recommended in unpaved areas around the residential structures.

Groundwater was not encountered within any of the exploratory test hole excavations performed across the site at the time of our field work to depths of up to six (6) feet. However, groundwater elevations in the area may fluctuate seasonally and are expected to temporarily pond/perch near the ground surface during periods of prolonged rainfall.

In this regard, based on our current understanding and/or anticipation of the site grading required to bring the subject site to finish design grades, we are generally of the opinion that a footing and/or foundation drainage system should be utilized around the perimeter of the proposed residential structures. Additionally, where concrete slab on-grade floors are utilized with any below grade structures, the use of an underslab drainage system may also be required. Further, a foundation drain is also recommended for any below grade and/or retaining walls. A typical recommended perimeter footing and/or retaining wall foundation drain detail is shown on Figure No. 4.

Design Infiltration Rates

Based on the results of our field infiltration testing, we recommend using the following infiltration rate to design any on-site near surface storm water infiltration and/or disposal systems for the project:

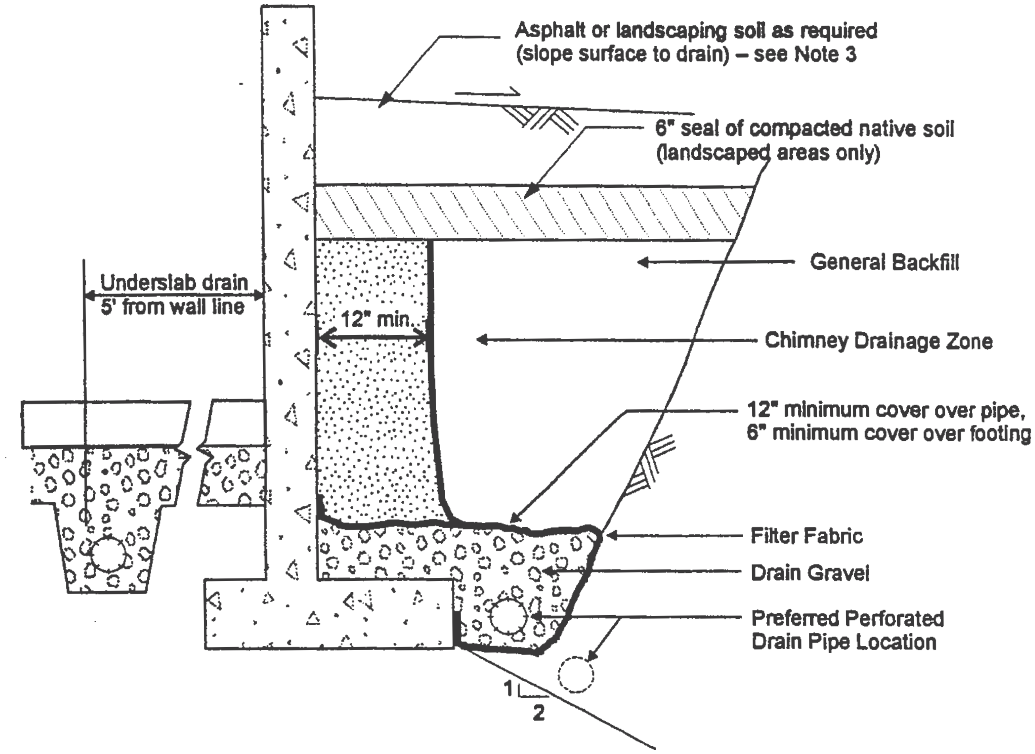
Subgrade Soil Type	Recommended Infiltration Rate
clayey, sandy SILT (ML)	0.05 inches per hour (in/hr)

Note: A safety factor of two (2) was used to calculate the above recommended design infiltration rate. Additionally, given the gradational variability of the on-site clayey, sandy sit subgrade soils beneath the site as well as the anticipation of some site grading for the project, it is generally recommended that field testing be performed during and/or following construction of any on-site storm water infiltration system(s) in order to confirm that the above recommended design infiltration rates are appropriate.

Seismic Design Considerations

Structures at the site should be designed to resist earthquake loading in accordance with the methodology described in the latest edition of the State of Washington Structural Specialty Code (WSSC) and/or Amendments to the 2015 International Building Code (IBC). The maximum considered earthquake ground motion for short period and 1.0 period spectral response may be determined from the Washington Structural Specialty Code and/or Figures 1613 (1) and 1613 (2) of the 2009 National Earthquake Hazard Reduction Program (NEHRP) "Recommended Provisions for Seismic Regulations for New Buildings and Other Structures" published by the Building Seismic Safety Council. We recommend Site Class "D" be used for design per Table 1613.5.2.

Using this information, the structural engineer can select the appropriate site coefficient values (F_a and F_v) from Tables 1613.5.3 (1) and 1613.5.3 (2) of the 2015 IBC to determine the maximum considered earthquake spectral response acceleration for the project.



SCHEMATIC - NOT TO SCALE

NOTES:

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾"-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

PERIMETER FOOTING/RETAINING WALL DRAIN DETAIL		
Project No. 1708.001.G	HANCOCK SPRINGS SUBDIVISION NW 18TH AVENUE	Figure No. 4

However, we have assumed the following response spectrum for the project:

Table 1. IBC Seismic Design Parameters

Site Class	S_S	S_1	Fa	Fv	S_{MS}	S_{M1}	S_{DS}	S_{D1}
D	0.915	0.381	1.134	1.638	1.038	0.624	0.692	0.416

Notes: 1. S_S and S_1 were established based on the USGS 2015 mapped maximum considered earthquake spectral acceleration maps for 2% probability of exceedence in 50 years.

2. Fa and Fv were established based on IBC 2015 tables 1613.5.3 (1) and 1613.5.3 (2) using the selected S_S and S_1 values.

CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond Geotechnical Services, LLC** be retained to provide construction monitoring and testing services during all earthwork operations for the proposed new Hancock Springs residential development. The purpose of our monitoring services would be to confirm that the site conditions reported herein are as anticipated, provide field recommendations as required based on the actual conditions encountered, document the activities of the grading contractor and assess his/her compliance with the project specifications and recommendations. It is important that our representative meet with the contractor prior to grading to help establish a plan that will minimize costly over-excavation and site preparation work. Of primary importance will be observations made during site preparation, cuts and structural fill placement, footing excavations and construction as well as retaining wall backfill and construction of subsurface drains.

CLOSURE AND LIMITATIONS

This report is intended for the exclusive use of the addressee and/or their representative(s) to use to design and construct the proposed new single-family residential structures and their associated site improvements described herein as well as to prepare any related construction documents. The conclusions and recommendations contained in this report are based on site conditions as they presently exist and assume that the explorations are representative of the subsurface conditions between the explorations and/or across the study area. The data, analyses, and recommendations herein may not be appropriate for other structures and/or purposes. We recommend that parties contemplating other structures and/or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report. Additionally, the above recommendations are contingent on Redmond Geotechnical Services, LLC being retained to provide all site inspections and construction monitoring services for this project. Redmond Geotechnical Services, LLC will not assume any responsibility and/or liability for any engineering judgment, inspection and/or testing services performed by others.

It is the owners/developers responsibility for insuring that the project designers and/or contractors involved with this project implement our recommendations into the final design plans, specifications and/or construction activities for the project. Further, in order to avoid delays during construction, we recommend that the final design plans and specifications for the project be reviewed by our office to evaluate as to whether our recommendations have been properly interpreted and incorporated into the project.

If during any future site grading and construction, subsurface conditions different from those encountered in the explorations are observed or appear to be present beneath excavations, we should be advised immediately so that we may review these conditions and evaluate whether modifications of the design criteria are required. We also should be advised if significant modifications of the proposed site development are anticipated so that we may review our conclusions and recommendations.

LEVEL OF CARE

The services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty or other conditions, either expressed or implied, is made.

ADDITIONAL SERVICES

We recommend that we review the proposed site grading plan(s) for the project in order to evaluate as to whether our recommendations have been properly incorporated into the design of the project as well as to assess whether the proposed site grading will adversely affect the stability of the subject property.

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APPENDIX A

TEST PIT LOGS & LABORATORY TEST RESULTS

APPENDIX

FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATION

Subsurface conditions at the site were explored by excavating six (6) exploratory test holes on August 15, 2018. The approximate location of the test hole explorations are shown in relation to the proposed new residential home sites and their associated site improvements on the Site Exploration Map, Figure No. 2.

The test holes were excavated using tracked excavating equipment in general conformance with ASTM Methods in Vol. 4.08, D-1586-94 and D-1587-83. The test holes were excavated to depths ranging from about 5.0 to 6.0 feet beneath existing site grades. Detailed logs of the exploratory test holes are presented on the Log of Test Pits, Figure No's. A-4 through A-6. The soils were classified in accordance with the Unified Soil Classification System (USCS), which is outlined on Figure No. A-3.

The exploration program was coordinated by a field engineer who monitored the excavating and exploration activity, obtained representative samples of the subsurface soils encountered, classified the soils by visual and textural examination, and maintained continuous logs of the subsurface conditions. Disturbed and/or undisturbed samples of the subsurface soils were obtained at appropriate depths and/or intervals and placed in plastic bags and/or with a thin walled ring sample.

Groundwater and/or seepage was not encountered within any of the exploratory test holes excavated across the site at the time of excavating to depths of up to six (6) feet beneath the existing surface grades.

LABORATORY TESTING

Pertinent physical and engineering characteristics of the soils encountered during our subsurface investigation were evaluated by a laboratory testing program to be used as a basis for selection of soil design parameters and for correlation purposes. Selected tests were conducted on representative soil samples. The program consisted of tests to evaluate the existing (in-situ) moisture-density, maximum dry density and optimum moisture content, gradational characteristics and Atterberg Limits as well as direct shear strength and "R"-value tests.

Dry Density and Moisture Content Determinations

Density and moisture content determinations were performed on both disturbed and relatively undisturbed samples from the test hole explorations in general conformance with ASTM Vol. 4.08 Part D-216. The results of these tests were used to calculate existing overburden pressures and to correlate strength and compressibility characteristics of the soils. Test results are shown on the test pit logs at the appropriate sample depths.

Maximum Dry Density

One (1) Maximum Dry Density and Optimum Moisture Content test was performed on a representative sample of the on-site clayey, sandy silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-1557. The tests were conducted to help establish various engineering properties for use as structural fill. The test results are presented on Figure No. A-9.

Atterberg Limits

Liquid Limit (LL) and Plastic Limit (PL) tests were performed on a representative sample of the clayey, sandy silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-4318-85. These tests were conducted to facilitate classification of the soils and for correlation purposes. Test results appear on Figure No. A-8.

Gradation Analysis

Gradation analyses were performed on a representative sample of the subsurface clayey, sandy silt soils in accordance with ASTM Vol. 4.08 Part D-422. The test results were used to classify the soil in accordance with the Unified Soil Classification System (USCS). The test results are shown graphically on Figure No. A-9.

Direct Shear Strength Test

One (1) Direct Shear Strength tests were performed on undisturbed and/or remolded sample at a continuous rate of shearing deflection (0.02 inches per minute) in accordance with ASTM Vol. 4.08 Part D-3080-79. The test results were used to determine engineering strength properties and are shown graphically on Figure No. A-10.

R-Value Test

One (1) "R"-value test was performed on a representative sample of the near surface subgrade soils in accordance with ASTM Vol. 4.08 Part D-2844. The test results were used to help evaluate the subgrade soils supporting and performance capabilities when subjected to traffic loading. The test results are shown graphically on Figure No. A-11.

The following figures are attached and complete the Appendix:

Figure No. A-3	Key To Exploratory Test Pit Logs
Figure No's. A-4 through A-6	Log of Test Pits
Figure No. A-7	Maximum Dry Density
Figure No. A-8	Atterberg Limits Test Results
Figure No. A-9	Gradation Test Results
Figure No. A-10	Direct Shear Strength Test Results
Figure No. A-11	"R"-value Test Results

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS — LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

DEFINITION OF TERMS

U.S. STANDARD SERIES SIEVE: 200, 40, 10, 4 — CLEAR SQUARE SIEVE OPENINGS: 3/4", 3", 12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

GRAIN SIZES

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT†
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

RELATIVE DENSITY

CLAYS AND PLASTIC SILTS	STRENGTH‡	BLOWS/FOOT†
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

CONSISTENCY

†Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).
‡Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

REDMOND GEOTECHNICAL SERVICES
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KEY TO EXPLORATORY TEST PIT LOGS
Unified Soil Classification System (ASTM D-2487)

HANCOCK SPRINGS SUBDIVISION
Camas, Washington

PROJECT NO.	DATE	Figure A-3
1708.001.G	9/28/18	

BACKHOE COMPANY: Folden Construction BUCKET SIZE: 24 inches DATE: 8/15/18

SOIL DESCRIPTION

TEST PIT NO. TH-#1 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp, soft, organic, sandy, clayey SILT (Topsoil)
	X			18.2	ML	Medium to olive-brown with gray mottling, damp to moist, medium stiff to stiff, clayey, sandy SILT Becomes very moist at 5 feet
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

TEST PIT NO. TH-#2 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp, soft, organic, sandy, clayey SILT (Topsoil)
					ML	Medium to olive-brown with gray mottling, damp to moist, medium stiff to stiff, clayey, sandy SILT Becomes very moist at 5 feet
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1708.001.G HANCOCK SPRINGS SUBDIVISION FIGURE NO. A-4

BACKHOE COMPANY: Folden Construction BUCKET SIZE: 24 inches DATE: 8/15/18

TEST PIT NO. TH_#3 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp to moist, soft to very soft, organic, sandy, clayey SILT (Topsoil)
	X			22.5	ML	Medium to olive-brown with gray mottling, moist to very moist, medium stiff to stiff, clayey, sandy SILT
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

TEST PIT NO. TH-#4 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp to moist, soft, organic, sandy, clayey SILT (Topsoil)
5					ML	Medium to olive-brown with gray mottling, damp to moist, medium stiff to stiff, clayey, sandy SILT Becomes very moist at 5 feet
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1708.001.G | HANCOCK SPRINGS SUBDIVISION | FIGURE NO. A-5

BACKHOE COMPANY: Folden Construction BUCKET SIZE: 24 inches DATE: 8/15/18

SOIL DESCRIPTION

TEST PIT NO. TH-#5 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp, soft, organic, sandy, clayey SILT (Topsoil)
	X			20.6	ML	Medium to olive-brown with gray mottling, damp to moist, medium stiff to stiff, clayey, sandy SILT Becomes very moist at 5 feet
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

TEST PIT NO. TH-#6 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp to moist, soft, organic, sandy, clayey SILT (Topsoil)
					ML	Medium to olive-brown with gray mottling, damp to moist, medium stiff to stiff, clayey, sandy SILT Becomes very moist at 5 feet
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1708.001.G | HANCOCK SPRINGS SUBDIVISION | FIGURE NO. A-6

MAXIMUM DENSITY TEST RESULTS

SAMPLE LOCATION	SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
TH-#3 @ 3.0'	Medium to olive-brown, clayey, sandy SILT (ML)	110.0	17.0

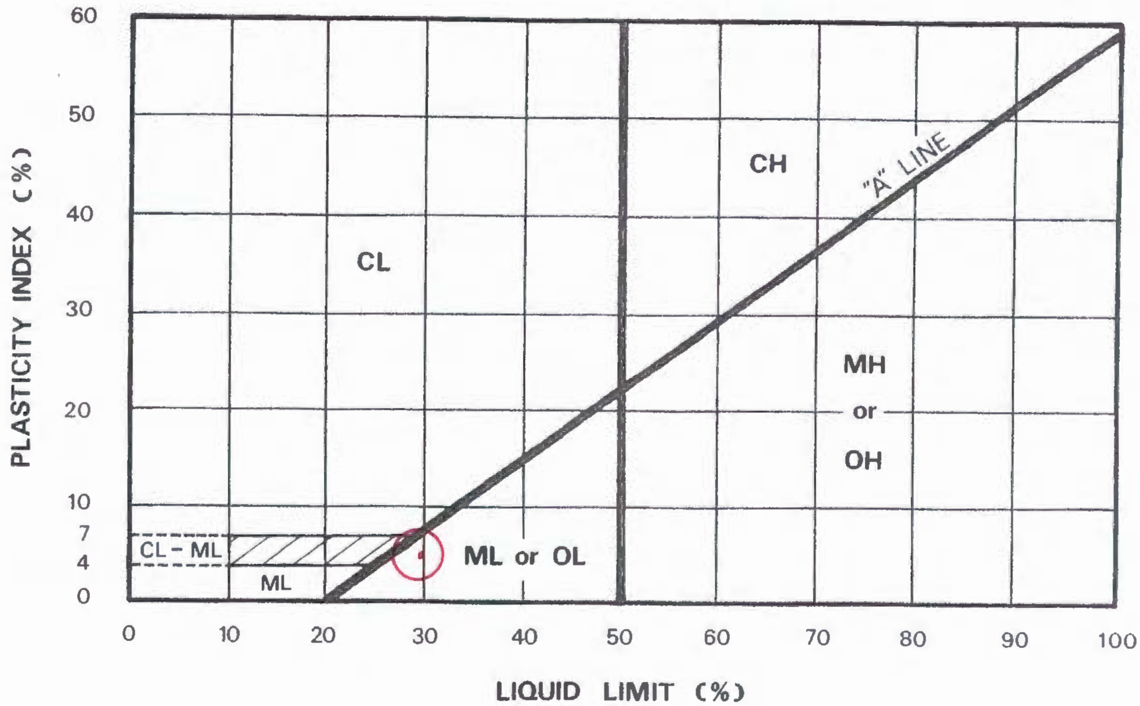
EXPANSION INDEX TEST RESULTS

SAMPLE LOCATION	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (pcf)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (%)	EXPANSION INDEX	EXPANSIVE CLASS.

MAXIMUM DENSITY & EXPANSION INDEX TEST RESULTS

PROJECT NO.: 1708.001.G	HANCOCK SPRINGS SUBDIVISION	FIGURE NO.: A-7

REDMOND GEOTECHNICAL SERVICES



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
⊙	TH-#3	3.0	22.5	29.8	4.6	67.3		ML

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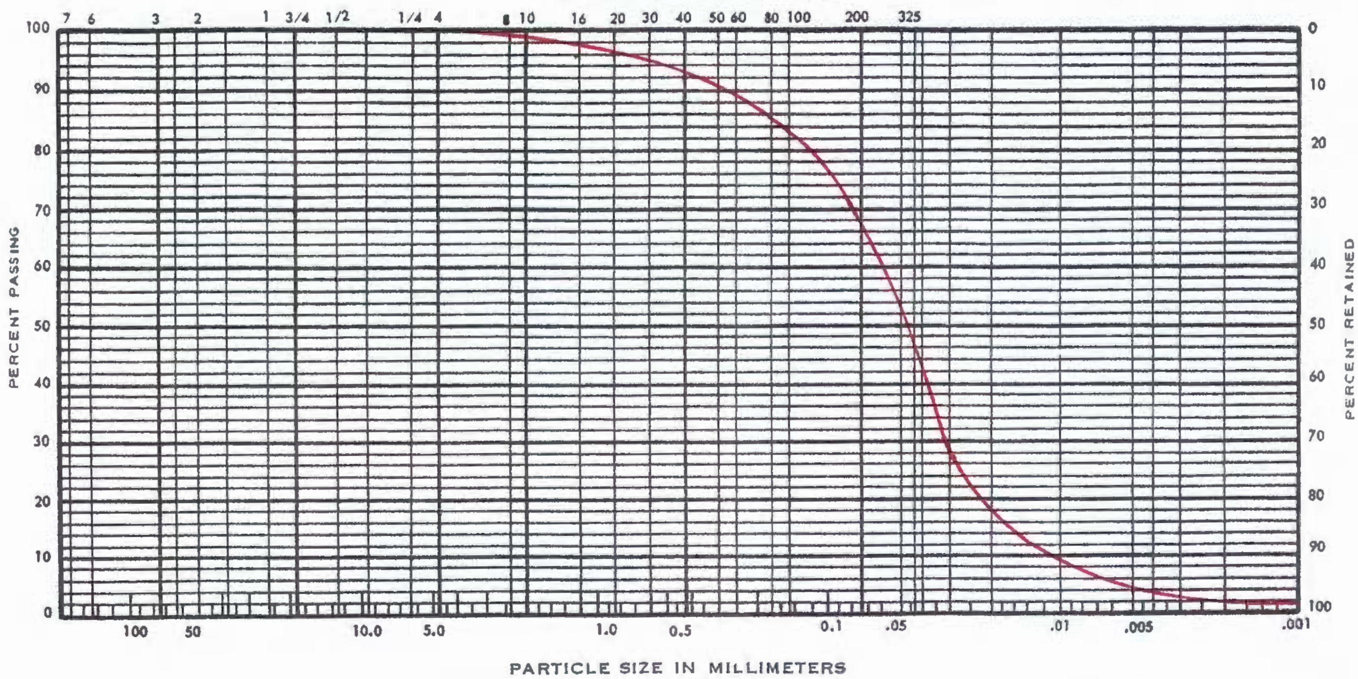
PLASTICITY CHART AND DATA

HANCOCK SPRINGS SUBDIVISION
Camas, Washington

PROJECT NO.	DATE	
1708.001.G	9/28/18	Figure A-8

UNIFIED SOIL CLASSIFICATION SYSTEM

(ASTM D 422-72)



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	ELEV. (feet)	UNIFIED SOIL CLASSIFICATION SYMBOL	SAMPLE DESCRIPTION
——	TH-#3	3.0		ML	Medium to olive-brown, clayey, sandy SILT

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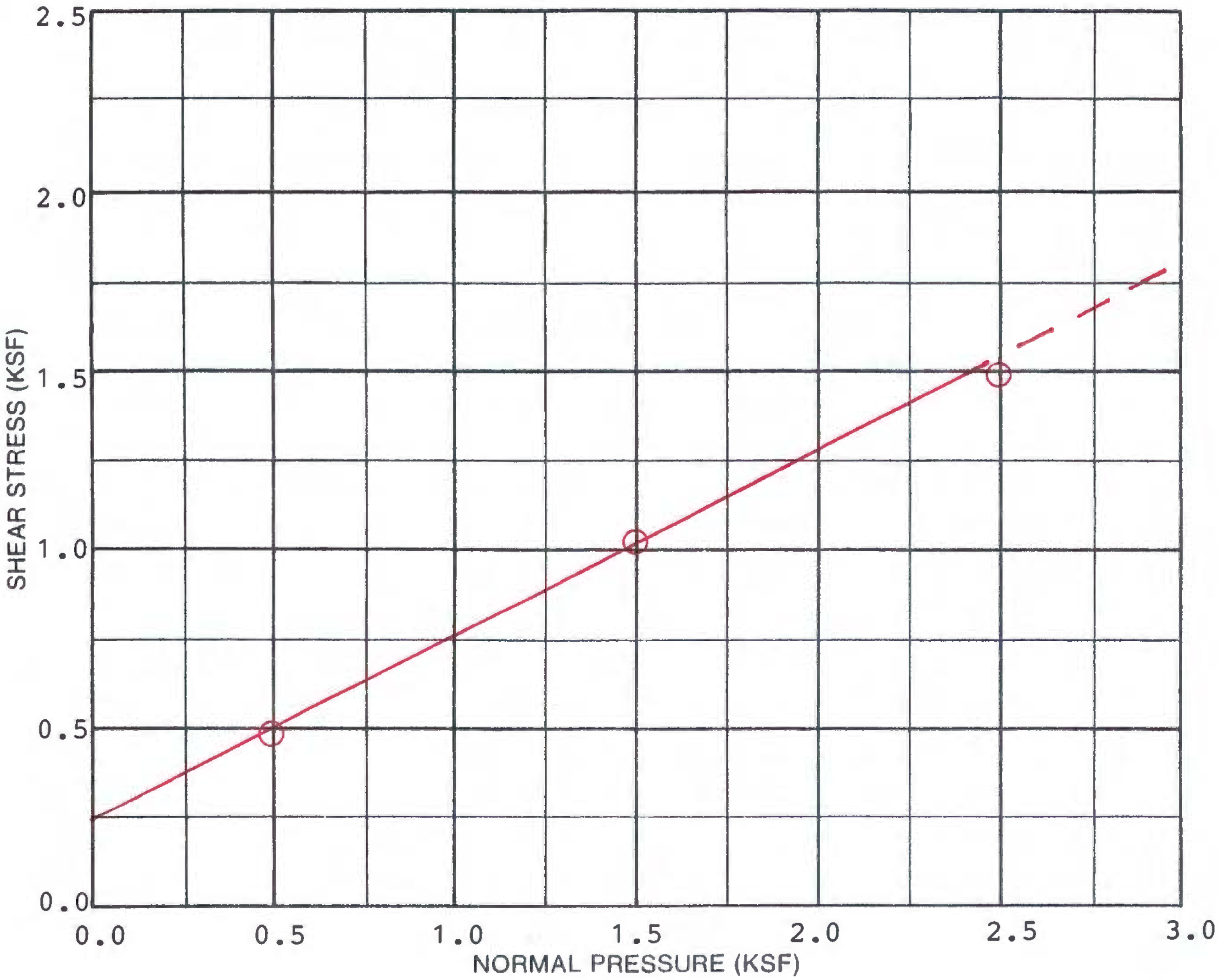
GRADATION TEST DATA		
HANCOCK SPRINGS SUBDIVISION Camas, Washington		
PROJECT NO.	DATE	FIGURE A-9
1708.001.G	9/28/28	



SAMPLE DATA	
DESCRIPTION: Medium to olive-brown, clayey, sandy SILT (ML) (Remolded)	
BORING NO.: TH-#3	
DEPTH (ft.): 3.0	ELEVATION (ft):

TEST RESULTS
APPARENT COHESION (C): 250 psf
APPARENT ANGLE OF INTERNAL FRICTION (φ): 28°

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.5	1.0	1.5	
INITIAL H_2O CONTENT (%)	17.0	17.0	17.0	
FINAL H_2O CONTENT (%)	17.6	13.2	8.9	
INITIAL DRY DENSITY (PCF)	98.0	98.0	98.0	
FINAL DRY DENSITY (PCF)	98.7	102.2	107.7	
STRAIN RATE: 0.02 inches per minute				

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DIRECT SHEAR TEST DATA

HANCOCK SPRINGS SUBDIVISION
Camas, Washington

PROJECT NO.	DATE	
1708.001.G	9/28/18	Figure A-10

RESULTS OF R (RESISTANCE) VALUE TESTS

SAMPLE LOCATION: TH-#3

SAMPLE DEPTH: 3.0 feet bgs

Specimen	A	B	C
Exudation Pressure (psi)	219	329	431
Expansion Dial (o.ooo1")	0	1	2
Expansion Pressure (psf)	0	3	8
Moisture Content (%)	17.6	14.4	11.1
Dry Density (pcf)	93.4	98.2	102.6
Resistance Value, "R"	18	29	36
"R"-Value at 300 psi Exudation Pressure = 28			

SAMPLE LOCATION:

SAMPLE DEPTH:

Specimen	A	B	C
Exudation Pressure (psi)			
Expansion Dial (0.0001")			
Expansion Pressure (psf)			
Moisture Content (%)			
Dry Density (pcf)			
Resistance Value "R"			
"R"-Value at 300 psi Exudation Pressure =			

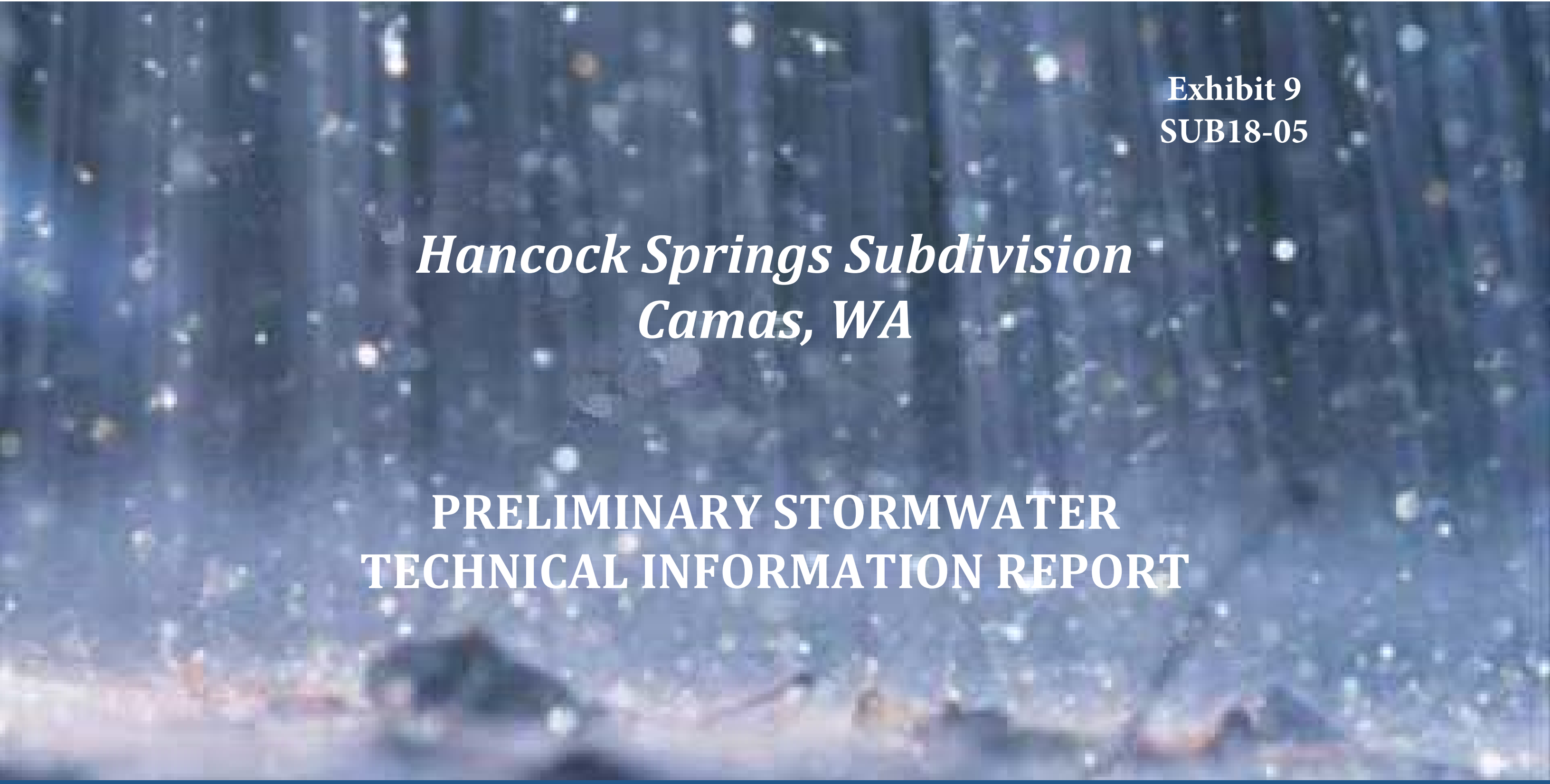

Exhibit 9
SUB18-05

Hancock Springs Subdivision
Camas, WA

PRELIMINARY STORMWATER TECHNICAL INFORMATION REPORT

Date:	November 2018
Applicant:	Craig Moody Northwest Classic Homes, LLC. 10100 NE 116th Circle Vancouver, WA 98662
Engineering Contact:	John Meier, PE (360) 882-0419 John@aks-eng.com
Engineering Firm:	AKS Engineering & Forestry, LLC
AKS Job No.:	5638

AKS ENGINEERING & FORESTRY

9600 NE 126th Avenue, Suite 2520
Vancouver, WA 98682
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www.aks-eng.com

Certificate of the Engineer

Hancock Springs Subdivision
Camas, Washington
Preliminary Technical Information Report

This Preliminary Technical Information Report and the data contained herein were prepared by the undersigned, whose seal, as a Professional Engineer licensed to practice as such, is affixed below. All information required by the City of Camas Stormwater Design Standards Manual is included in the Preliminary Stormwater Report. The proposed facilities are feasible as designed.

JOHN M. MEIER
STATE OF WASHINGTON
42614
REGISTERED
PROFESSIONAL ENGINEER

11-16-18

Table of Contents

Tables

Technical Appendices

References

Camas Stormwater Design Standards Manual, Resolution #1193 – "CSDSM"
Stormwater Management Manual Western Washington, December 2014 – "SWMMWW"

Preliminary Stormwater Report

HANCOCK SPRINGS SUBDIVISION

CAMAS, WA

A. Project Overview

A.1 PURPOSE OF REPORT

The purpose of this report is to analyze the effects the proposed development will have on the existing stormwater conveyance system; document the criteria, methodology, and informational sources used to design the proposed stormwater system; and present the results of the preliminary hydraulic analysis.

A.2 PROJECT LOCATION/DESCRIPTION

The Hancock Springs Subdivision site is located on five parcels of land in the northeast quarter of Section 9, Township 1 North, Range 3 East, Willamette Meridian, Clark County, Washington (Parcel #'s 127371-000, 127375-000, 127377-000, 127379-000, 127414-000). The site is approximately 10.03 acres in size, and contains an existing single-family dwelling, landscaping, vacant single-family dwellings, gravel driveways, open grass areas and forested areas. Currently stormwater infiltrates or sheet flows to the southwest corner of the site where it is conveyed off-site from a stream flowing from the east of the site to the west of the site. The stream is fed by Haight Reservoir to the south and east of the site.

The site is primarily undeveloped with slopes that range from approximately 2% in the north of the site, to approximately 30% in the future critical area tract in the southern and western portions of the site. Site vegetation consists of field grass, wetland plants, Himalayan blackberry, and dispersed deciduous and evergreen trees, mostly bigleaf maple and Douglas-fir.

There are two delineated wetlands located south of the proposed development. Both wetlands are Category IV wetlands while the onsite stream is a non-fishbearing stream. The wetlands and waters are to be protected by stream and aquatic system buffers. Water quality of the wetlands should not be degraded as treated discharge from the proposed site stormwater facilities will discharge into the non-fishbearing stream or dispersed from landscaped areas.

The site is surrounded by single-family residential zoning. There is some off-site runoff that contributes to the total site runoff volume that sheet flows from the north and west of the proposed development. This area was not included with the water quantity analysis for the site. By excluding this area at this time, the on-site detention pond is conservatively sized. Analysis of the off-site basin area will be included with the final stormwater plan.

Proposed site improvements include sidewalks, public streets, open spaces, stormwater detention facilities, and 20 single-family residences. All stormwater runoff from the site will be collected via catch basins or be dispersed and routed to the stormwater control facilities located in Tracts D and G. Pollution generating stormwater from the site will be treated by a mechanical filter vault located at the north end of Tract D, and then be conveyed to a detention pond also within Tract D. Non-pollution generating stormwater from lots 10, 11 and 12 will be collected from rear yards and roofs and be conveyed to a detention pond located within Tract G. Pollution generating surfaces from lots 10, 11 and 12 will sheet flow into the street and be collected with the rest of the site stormwater. See the development plans, Appendix C, and the Stormwater Basin Plans, Appendix D, for location and size of each basin.

According to Clark County GIS, there are no floodplains or shoreline management areas that exist or are adjacent to the site.

The stormwater system for the site is designed using the Western Washington Hydrology Model (WWHM 2012 Version 4.2.12).

B. Minimum Requirements

Proposed land disturbances will consist of fill, grading, excavation, removal of unsuitable soils, and construction of sidewalk, utilities, public streets, accompanying driveways, and residential structures. Due to the amount of new impervious surfaces exceeding 5,000 square feet, the project is required to meet Minimum Requirements 1 through 9 per Chapter 1.02 of the City of Camas Stormwater Design Standards Manual and Figure 2.2 in the Western Washington Phase II Municipal Stormwater Permit.

Tables B.1, B.2, and B.3 summarize stormwater basins within the project area. See Appendix D for Sub-Basin Delineation, Pre- and Post-Development.

Table B.1: Proposed Impervious Surface and Landscaping

Basin	Existing Impervious Surface Area (acres)	New Impervious Surface Area (acres)	Replaced Impervious Surface Area (acres)	Removed Impervious Surface Area (acres)	Native Vegetation Replaced w/ Landscaping (acres)	Total Land Disturbed (acres)
2S	0.000	3.735	0.000	0.000	2.811	6.546
3S	0.000	0.281	0.000	0.000	0.454	0.735

Note: Areas listed are in acres. Assumed 900-square-foot (0.021 acres) driveways and 3,500-square-foot (0.080 acres) roof areas.

Tables B.2 and B.3 show the mitigated site basins differentiated between pollution- and non-pollution-generating surfaces. Pollution-generating surfaces consist of driveways and public road access for all lots. Non-pollution-generating surfaces consist of residential structures and landscaping. Mixing between pollution-generating and non-pollution-generating surface water will occur within basin 2S. Some rear yard landscaping of lots 6-9 will not mix

No pollution-generating surface water exists within basin 3S since it is only capturing roofs and landscaped areas.

Table B.2: Pollution-Generating Surfaces

Basin	Impervious Surface Area (acres)	Pervious Surface Area (acres)	Total Area (acres)
2S	3.006	2.332	5.338
3S	0.000	0.000	0.000

Note: Listed areas are in acres. Assume 900 square-feet (0.021 acres) driveways. Basin 3S excludes driveway areas. All pollution generating areas for Lots 10-12 are sent to Basin 2S for treatment.

Table B.3: Non-Pollution-Generating Surfaces			
Basin	Impervious Surface Area (acres)	Pervious Surface Area (acres)	Total Area (acres)
2S	0.729	0.479	1.208
3S	0.281	0.454	0.735

Note: Stormwater runoff from lot 10-12 roof areas and rear yards shall be conveyed separately from roadway surfaces, therefore considered non-pollutant-generating. A roof area of 3,350 square feet (0.080 acres) was assumed.

Each developed basin's effective hard surfaces and their applicability to meeting Minimum Requirements 6-8 are summarized in Table B.4.

Table B.4: Effective Impervious Surface Area				
Basin	Effective Impervious Surfaces Area (acres)	MR #6 Required (Y/N)	MR #7 Required (Y/N)	MR #8 Required (Y/N)
2S	3.735	Y	Y	N
3S	0.281	Y	Y	N

The stormwater analysis includes general modeling of the site based upon pre- and post-development conditions. Soil conditions on site are classified as SG4 soils or Type D soils, based upon infiltration tests performed. The site will utilize stormwater detention to meet flow control measures.

C. Soils Evaluation

According to the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) web soil survey, soils on site consist of Powell silt loam (PoB) with 0% to 8% slopes, Powell silt loam (PoD) with 8% to 20% slopes and Powell silt loam (PoE) with 20% to 30% slopes. Powell silt loam is classified as a Hydrologic Group D soil. The hydrologic soil groups are divided into five separate categories based on permeability and runoff potential for use in modeling the stormwater runoff in WWHM2012. Based on actual infiltration rates, the Soil Group was confirmed to be SG4. The Soil Group was based on Otak's WWHM Model final report. Geotechnical Documents provided by Redmond Geotechnical Services can be found in Appendix H.

D. Source Control

Section 2.2 of Volume IV of the Stormwater Management Manual for Western Washington (SWMMWW) contains the following applicable source control best management practices (BMPs) for residential development. The source control BMPs and applicable notes to control stormwater runoff impacted by these activities will be included in the Erosion Control Plans and Details and in the Stormwater Pollution Prevention Plan (SWPPP).

- S407: Dust Control at Disturbed Land Areas and Unpaved Roadways and Parking Lots
- S411: BMPs for Landscaping and Lawn/Vegetation Management

E. On-Site Stormwater Management BMPs

Figure I-2.5.1 of the SWMMWW was used to determine that LID's are not feasible for this project because of the very low infiltration rates that were available. A mechanical filter vault structure and a detention pond facility is proposed to meet water quality and quantity requirements for all on-site areas. Site runoff from pollution generating impervious surfaces will be collected and treated by the water quality structure and conveyed to the detention pond located within Tract D. All stormwater runoff from each lot was assumed to mix with the proposed hard surfaces and was included in the area calculations for water quality as pollution generating.

F. Runoff Treatment Analysis and Design

Surface water from pollution generating surfaces will be treated with a mechanical filter vault within Tract D for basic treatment based on Volume V, Chapter 2 of the SWMMWW. The proposed vault will serve as the runoff treatment BMP for the site and will provide water quality treatment as calculated by WWHM for the runoff from Basin 1, see Appendix G for Water Quality calculations. See the Basin Maps in Appendix D for basin locations. The mechanical filter vault will contain internal bypass components, which facilitates off-line treatment. Therefore, all flows that are greater than the water quality flow rate will bypass the water quality component and flow directly into the stormwater detention pond. The off-line flow rate of the site was determined to be 0.5292 cfs. A 6' by 11' Oldcastle Perkfilter vault was sized based on the required flow rate. The vault will have 10-12" stacked cartridges that allow a water quality treatment flow rate of 0.53 cfs.

G. Flow Control Analysis and Design

Stormwater flow control will be provided as required in the National Pollutant Discharge Elimination System (NPDES) Phase II Permit and achieved by collecting stormwater in catch basins and routing the water into a detention pond facility sized to hold 50% of the 2-year peak flow, up to the full 50-year peak flow from the site. Stormwater detention is the means of flow control in this system.

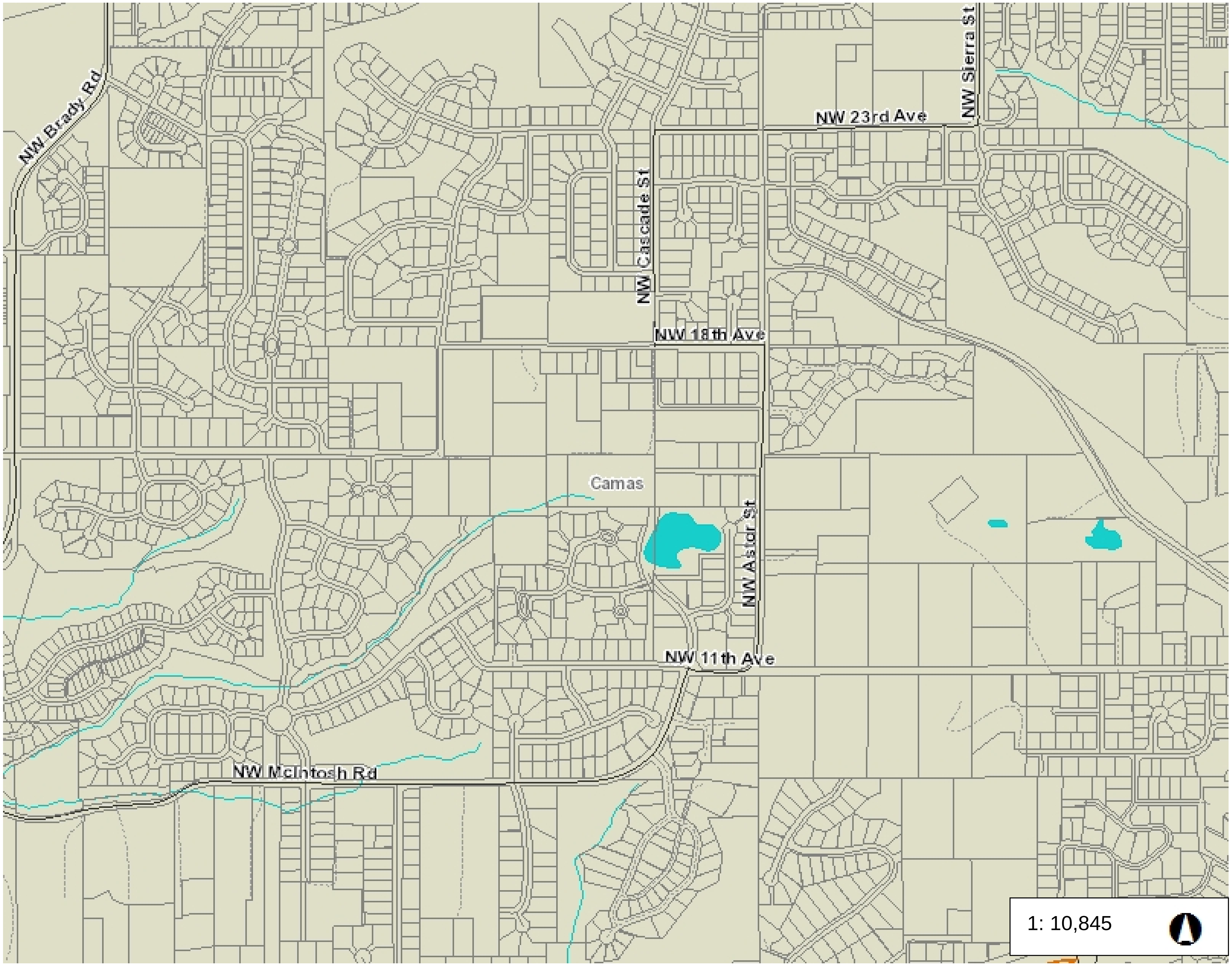
All stormwater quantities for the site have been designed in conformance with the 2014 Stormwater Management Manual for Western Washington. Infiltration BMPs were not selected based on infiltration testing performed by Redmond Geotechnical Services, which indicated low infiltration rates for on-site soils conditions (Appendix H). In conjunction with the test results, the USDA soil survey map rates the site as containing Hydrologic Group D soils.

H. Wetland Protection

The site contains two category IV wetlands associated with the natural drainage on site. Water quality of the wetlands should not be degraded as treated discharge from the proposed site stormwater facilities in Tract D and G will discharge from a flow control structure to match pre-developed flow rates. Hydrophytic vegetation will be maintained or enhanced within the wetland, see the project wetland mitigation plan for more information on site enhancements.

Appendix A: Map Submittals

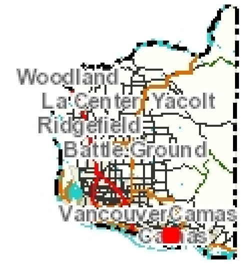
5638 Hancock Springs Vicinity Map



1: 10,845

1,807.6 0 903.78 1,807.6 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov



Legend

- Taxlots
- Cities Boundaries
- Urban Growth Boundaries

Notes:

Soil Map—Clark County, Washington
((5638 Hancock Springs Subdivision)

Map Scale: 1:1,810 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0, 25, 50, 100, 150

Feet: 0, 50, 100, 200, 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

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: Clark County, Washington
Survey Area Data: Version 16, Sep 10, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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
PoB	Powell silt loam, 0 to 8 percent slopes	4.3	36.3%
PoD	Powell silt loam, 8 to 20 percent slopes	7.4	61.6%
PoE	Powell silt loam, 20 to 30 percent slopes	0.2	2.1%
Totals for Area of Interest		**12.0**	**100.0%**

Appendix B: New Development Flow Chart

Figure 1.1: Flow Chart for Determining Stormwater Requirements

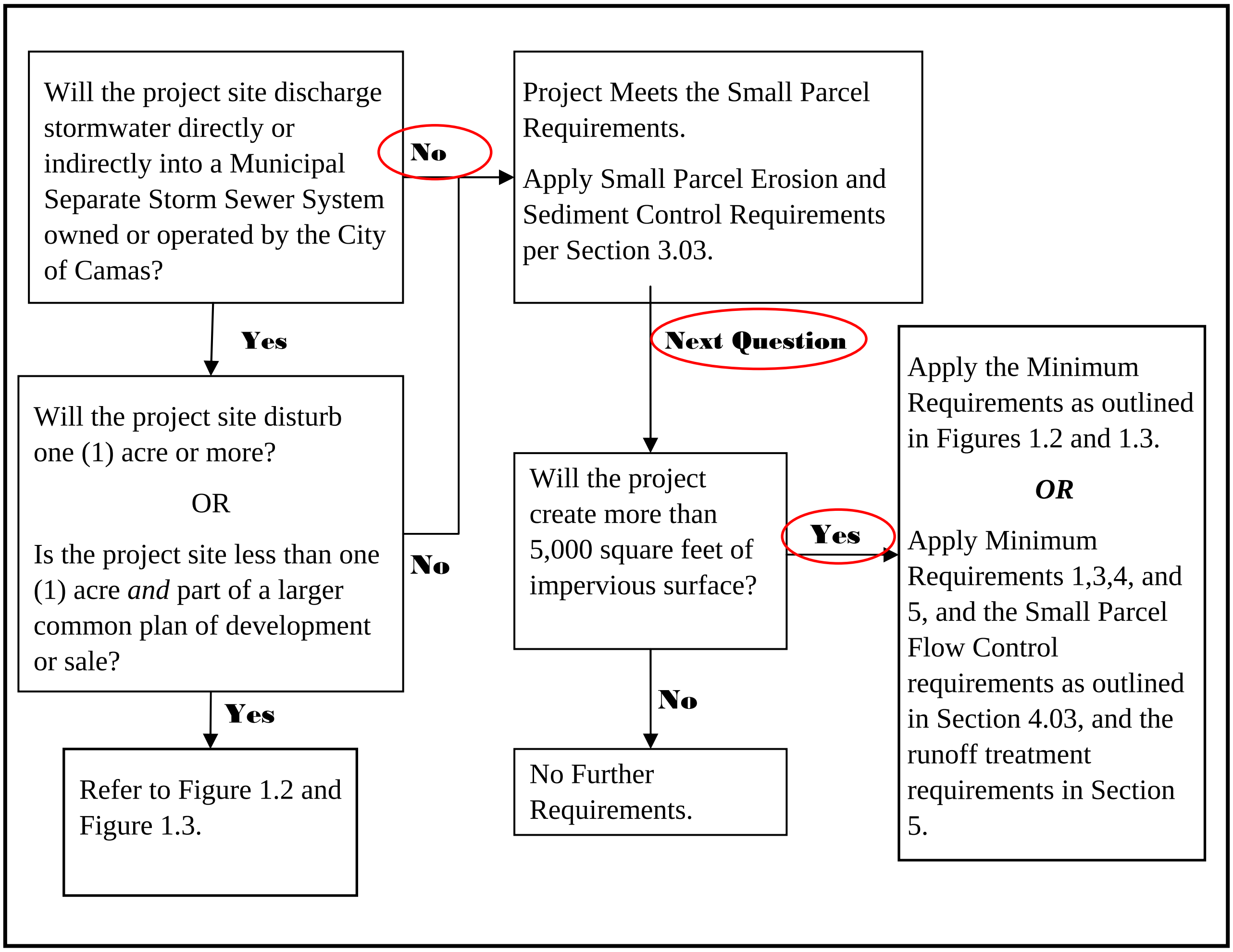
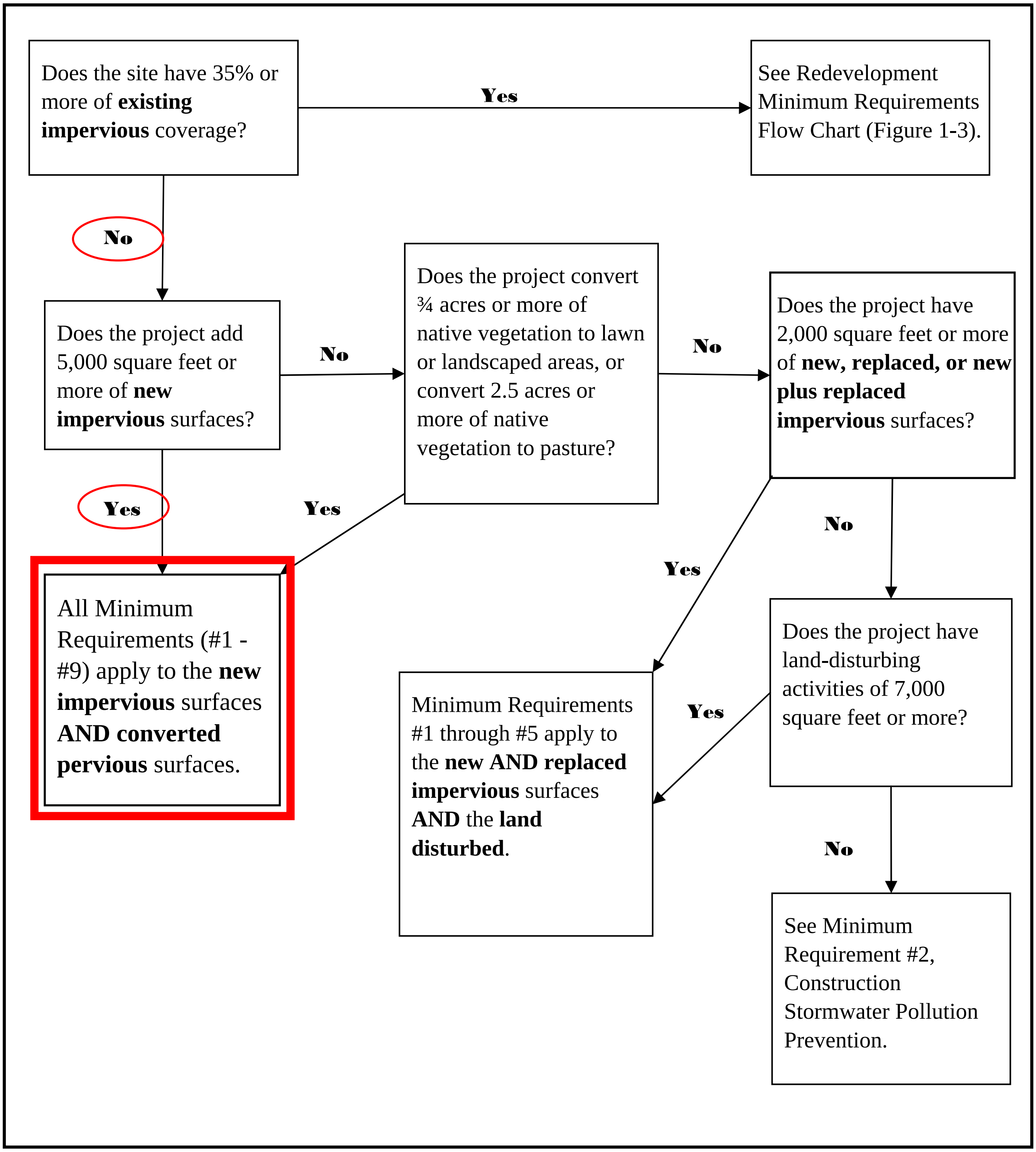
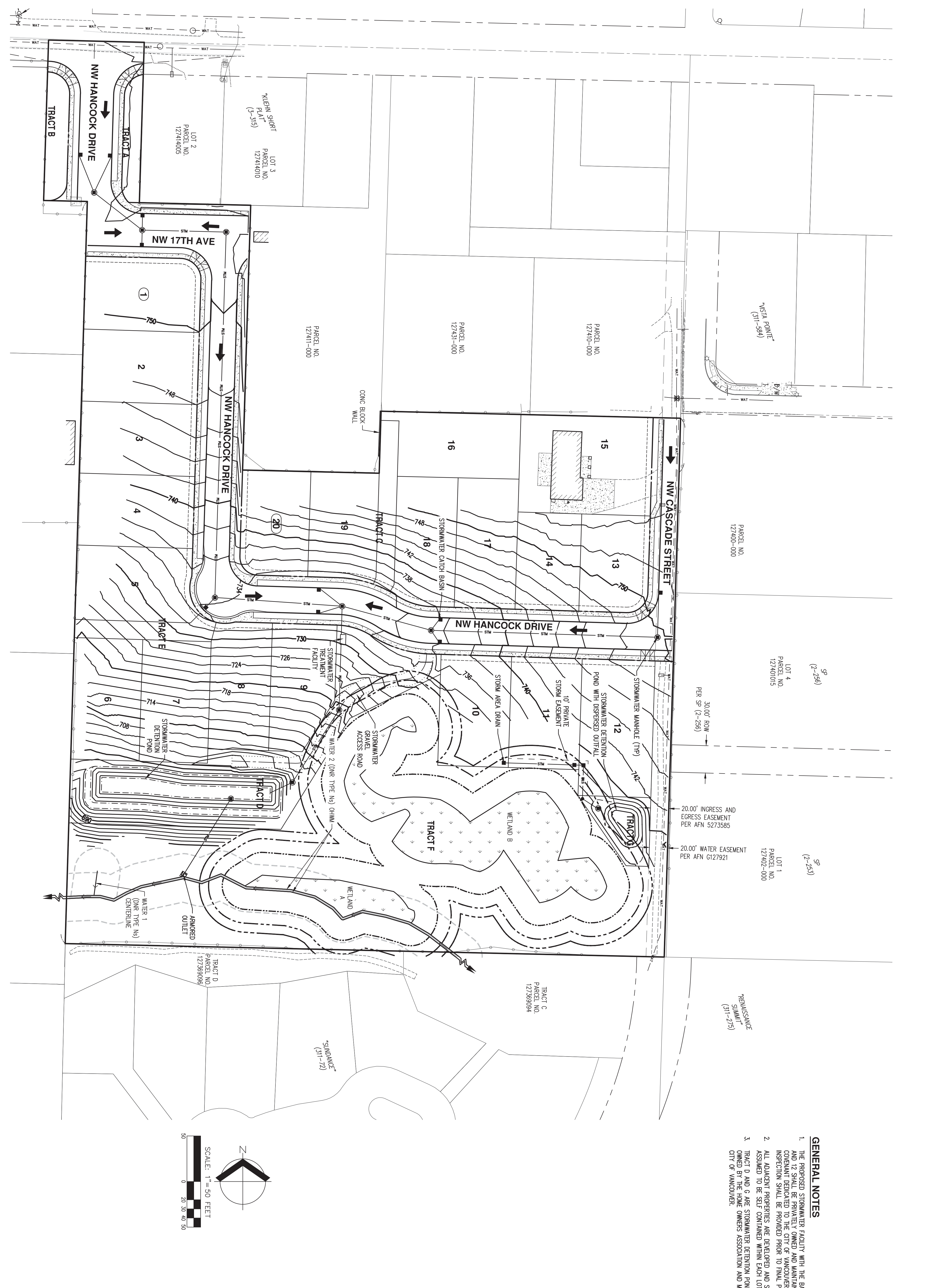


Figure 1.2: New Development Minimum Requirements Flow Chart



Appendix C: Development Plans



GENERAL NOTES

1. THE PROPOSED STORMWATER FACILITY WITH THE BACK OF LOTS 10, 11 AND 12 SHALL BE PRIVATELY OWNED AND MAINTAINED BY THOSE LOTS. A COVENANT DEDICATED TO THE CITY OF VANCOUVER FOR ACCESS AND INSPECTION SHALL BE PROVIDED PRIOR TO FINAL PLAT RECORDING.
2. ALL ADJACENT PROPERTIES ARE DEVELOPED AND STORMWATER RUNOFF IS ASSUMED TO BE SELF CONTAINED WITHIN EACH LOT.
3. TRACT D AND G ARE STORMWATER DETENTION PONDS THAT WILL BE OWNED BY THE HOME OWNERS ASSOCIATION AND MAINTAINED BY THE CITY OF VANCOUVER.

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY STORMWATER PLAN

DESIGNED BY: CJS
DRAWN BY: NAL
MANAGED BY: CJS
CHECKED BY: JMM
DATE:

JOHN M. MARTIN, STATE OF WASHINGTON, 42814, REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 5638
SHEET
P7.0

Appendix D: Stormwater Basin Plans

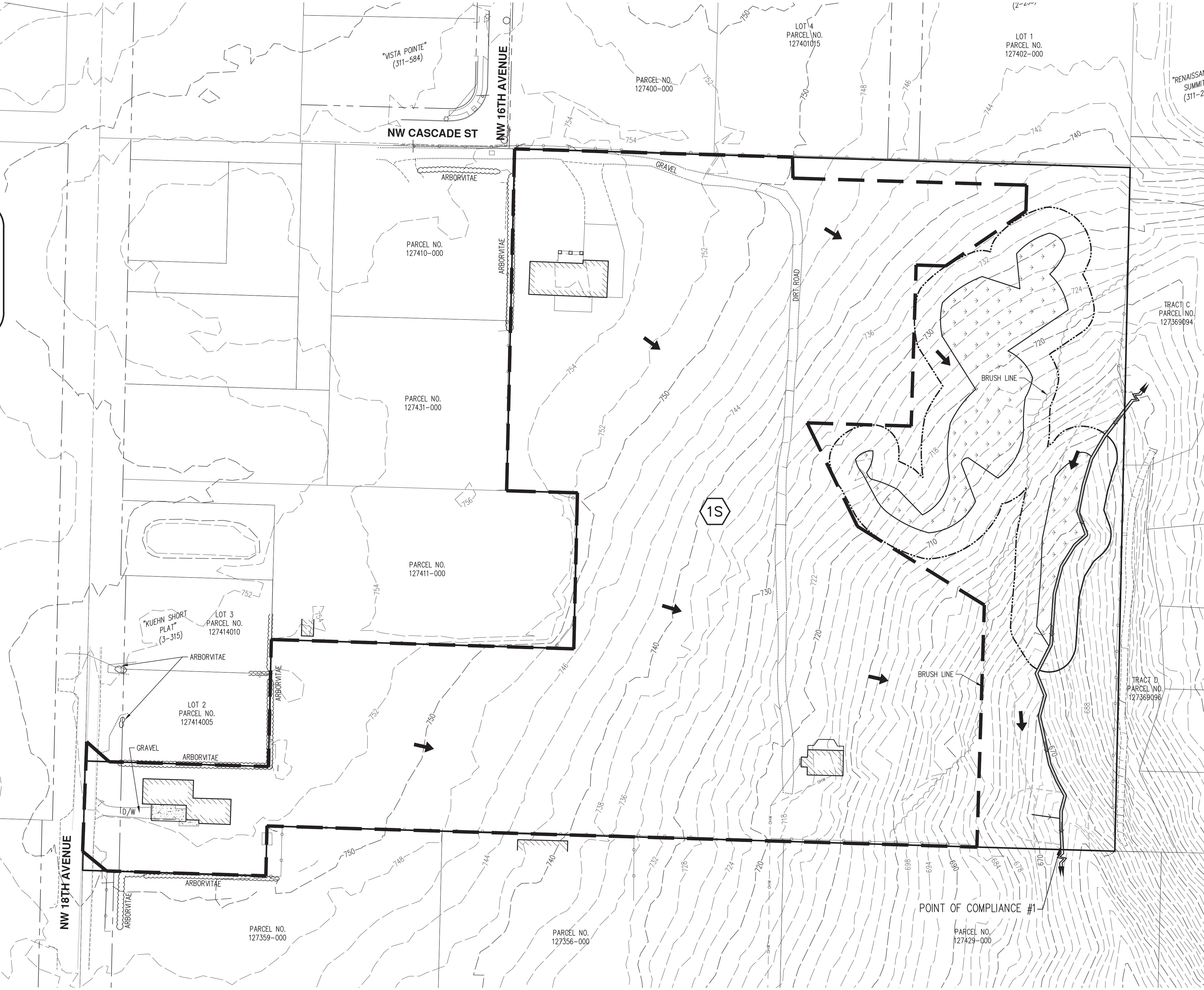
LEGEND

EXISTING GROUND CONTOUR (2 FT)	
EXISTING GROUND CONTOUR (10 FT)	350
FINISHED GRADE CONTOUR (2 FT)	
FINISHED GRADE CONTOUR (10 FT)	345
DRAINAGE FLOW DIRECTION	

BASIN NOTES: #S

1. PRE-DEVELOPED BASIN 1S
   TOTAL AREA: 7.2806 AC
   PERVIOUS AREA: 7.2806 AC
   IMPERVIOUS AREA: 0.0 AC

SCALE: 1"=50 FEET
50 0 20 30 40 50



AKS

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRE-DEVELOPED BASIN PLAN

DESIGNED BY: CJS
DRAWN BY: CJS
MANAGED BY: JMM
CHECKED BY: JMM
DATE: 11/14/2018

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 5638

SHEET D-1

AKS DRAWING FILE: 5638 20181030 STORMWATER BASINS.DWG | LAYOUT: PRE DEV

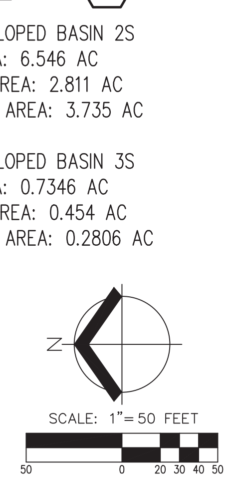
LEGEND

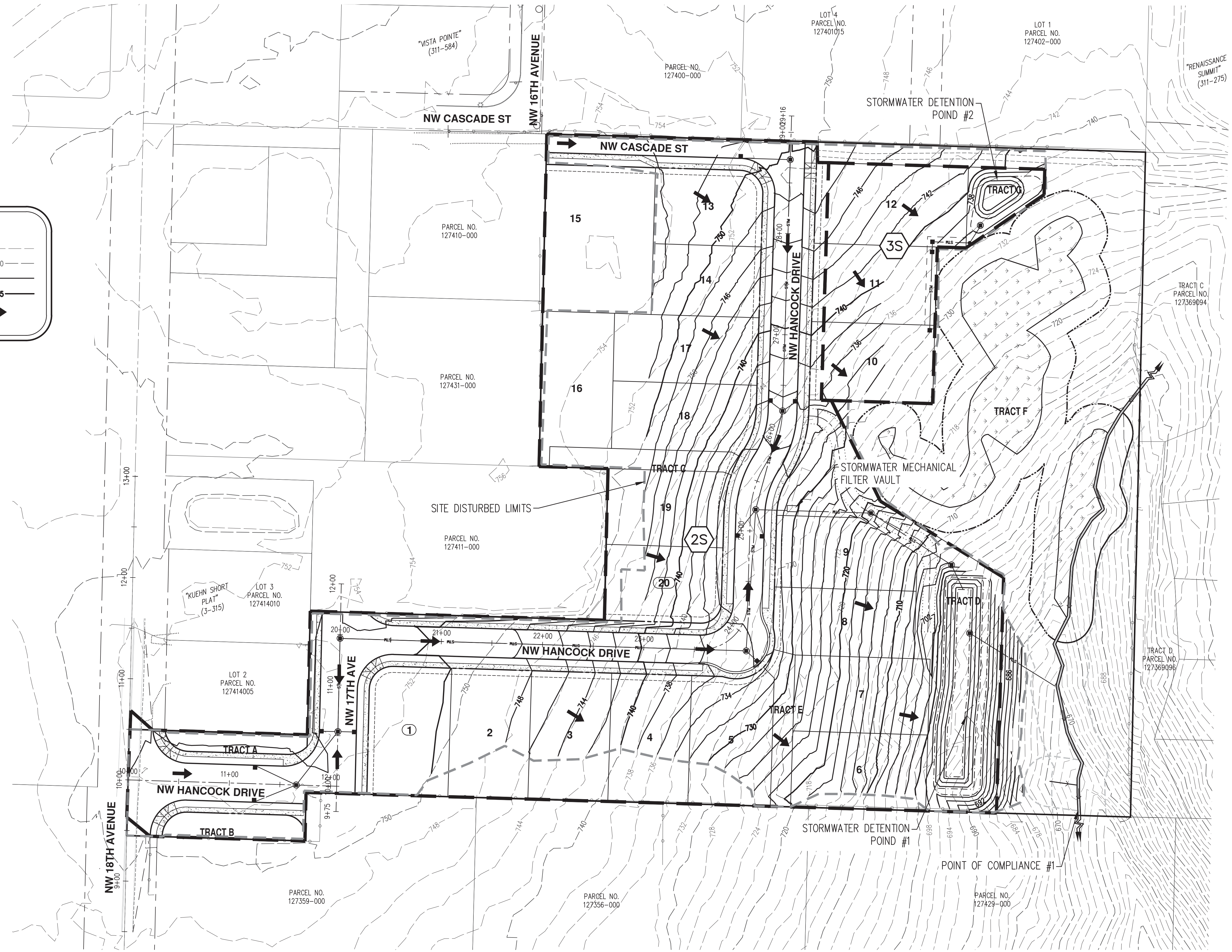
EXISTING GROUND CONTOUR (2 FT)	
EXISTING GROUND CONTOUR (10 FT)	350
FINISHED GRADE CONTOUR (2 FT)	
FINISHED GRADE CONTOUR (10 FT)	345
DRAINAGE FLOW DIRECTION	

BASIN NOTES: #S

1. POST–DEVELOPED BASIN 2S
   TOTAL AREA: 6.546 AC
   PERVIOUS AREA: 2.811 AC
   IMPERVIOUS AREA: 3.735 AC

2. POST–DEVELOPED BASIN 3S
   TOTAL AREA: 0.7346 AC
   PERVIOUS AREA: 0.454 AC
   IMPERVIOUS AREA: 0.2806 AC





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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

POST-DEVELOPED BASIN PLAN

DESIGNED BY:	CJS
DRAWN BY:	CJS
MANAGED BY:	JMM
CHECKED BY:	JMM
DATE: 11/14/2018	

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 5638

SHEET D-2

AKS DRAWING FILE: 5638 20181030 STORMWATER BASINS.DWG | LAYOUT: POST DEV

Appendix E: WWHM Analysis

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	5638 WWHM Preliminary Stormwater
Site Name:	Hancock Springs
Site Address:	
City:	Camas
Report Date:	11/14/2018
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.30
Version Date:	2016/02/25
Version:	4.2.12

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data
Predeveloped Land Use

Basin 1S

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Mod	7.2806
Pervious Total	7.2806
Impervious Land Use	acre
Impervious Total	0
Basin Total	7.2806

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 2S

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Lawn, Mod	2.811
Pervious Total	2.811
Impervious Land Use	acre
ROADS MOD	1.695
ROOF TOPS FLAT	1.54
DRIVEWAYS MOD	0.413
POND	0.087
Impervious Total	3.735
Basin Total	6.546

Element Flows To:

Surface	Interflow	Groundwater
West Pond #1	West Pond #1	

Basin 3S

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Lawn, Mod	0.454
Pervious Total	0.454
Impervious Land Use	acre
ROOF TOPS FLAT	0.2446
POND	0.036
Impervious Total	0.2806
Basin Total	0.7346

Element Flows To:

Surface	Interflow	Groundwater
East Pond #2	East Pond #2	

Mitigated Routing

West Pond #1

Bottom Length:	46.00 ft.
Bottom Width:	46.00 ft.
Depth:	6 ft.
Volume at riser head:	0.3638 acre-feet.
Side slope 1:	2 To 1
Side slope 2:	2 To 1
Side slope 3:	2 To 1
Side slope 4:	2 To 1
Discharge Structure	
Riser Height:	5 ft.
Riser Diameter:	18 in.
Notch Type:	Rectangular
Notch Width:	0.250 ft.
Notch Height:	1.000 ft.
Orifice 1 Diameter:	4.125 in. Elevation:0 ft.
Element Flows To:	
Outlet 1	Outlet 2

Pond Hydraulic Table

Stage(feet)	**Area(ac.)**	**Volume(ac-ft.)**	**Discharge(cfs)**	**Infilt(cfs)**
0.0000	0.048	0.000	0.000	0.000
0.0667	0.049	0.003	0.119	0.000
0.1333	0.049	0.006	0.168	0.000
0.2000	0.050	0.009	0.206	0.000
0.2667	0.050	0.013	0.238	0.000
0.3333	0.051	0.016	0.266	0.000
0.4000	0.052	0.020	0.292	0.000
0.4667	0.052	0.023	0.315	0.000
0.5333	0.053	0.027	0.337	0.000
0.6000	0.053	0.030	0.357	0.000
0.6667	0.054	0.034	0.377	0.000
0.7333	0.055	0.037	0.395	0.000
0.8000	0.055	0.041	0.413	0.000
0.8667	0.056	0.045	0.429	0.000
0.9333	0.056	0.049	0.446	0.000
1.0000	0.057	0.052	0.461	0.000
1.0667	0.058	0.056	0.476	0.000
1.1333	0.058	0.060	0.491	0.000
1.2000	0.059	0.064	0.505	0.000
1.2667	0.059	0.068	0.519	0.000
1.3333	0.060	0.072	0.533	0.000
1.4000	0.061	0.076	0.546	0.000
1.4667	0.061	0.080	0.559	0.000
1.5333	0.062	0.084	0.571	0.000
1.6000	0.063	0.089	0.584	0.000
1.6667	0.063	0.093	0.596	0.000
1.7333	0.064	0.097	0.607	0.000
1.8000	0.065	0.101	0.619	0.000
1.8667	0.065	0.106	0.630	0.000
1.9333	0.066	0.110	0.642	0.000
2.0000	0.066	0.115	0.653	0.000
2.0667	0.067	0.119	0.663	0.000

2.1333	0.068	0.124	0.674	0.000
2.2000	0.068	0.128	0.684	0.000
2.2667	0.069	0.133	0.695	0.000
2.3333	0.070	0.137	0.705	0.000
2.4000	0.071	0.142	0.715	0.000
2.4667	0.071	0.147	0.725	0.000
2.5333	0.072	0.152	0.734	0.000
2.6000	0.073	0.157	0.744	0.000
2.6667	0.073	0.161	0.754	0.000
2.7333	0.074	0.166	0.763	0.000
2.8000	0.075	0.171	0.772	0.000
2.8667	0.075	0.176	0.781	0.000
2.9333	0.076	0.181	0.790	0.000
3.0000	0.077	0.187	0.799	0.000
3.0667	0.077	0.192	0.808	0.000
3.1333	0.078	0.197	0.817	0.000
3.2000	0.079	0.202	0.826	0.000
3.2667	0.080	0.208	0.834	0.000
3.3333	0.080	0.213	0.843	0.000
3.4000	0.081	0.218	0.851	0.000
3.4667	0.082	0.224	0.859	0.000
3.5333	0.083	0.229	0.868	0.000
3.6000	0.083	0.235	0.876	0.000
3.6667	0.084	0.240	0.884	0.000
3.7333	0.085	0.246	0.892	0.000
3.8000	0.086	0.252	0.900	0.000
3.8667	0.086	0.258	0.908	0.000
3.9333	0.087	0.263	0.915	0.000
4.0000	0.088	0.269	0.923	0.000
4.0667	0.089	0.275	0.945	0.000
4.1333	0.089	0.281	0.978	0.000
4.2000	0.090	0.287	1.017	0.000
4.2667	0.091	0.293	1.062	0.000
4.3333	0.092	0.299	1.110	0.000
4.4000	0.092	0.305	1.162	0.000
4.4667	0.093	0.312	1.216	0.000
4.5333	0.094	0.318	1.272	0.000
4.6000	0.095	0.324	1.330	0.000
4.6667	0.096	0.331	1.390	0.000
4.7333	0.096	0.337	1.450	0.000
4.8000	0.097	0.344	1.512	0.000
4.8667	0.098	0.350	1.573	0.000
4.9333	0.099	0.357	1.636	0.000
5.0000	0.100	0.363	1.698	0.000
5.0667	0.100	0.370	1.979	0.000
5.1333	0.101	0.377	2.483	0.000
5.2000	0.102	0.384	3.123	0.000
5.2667	0.103	0.390	3.849	0.000
5.3333	0.104	0.397	4.614	0.000
5.4000	0.104	0.404	5.371	0.000
5.4667	0.105	0.411	6.071	0.000
5.5333	0.106	0.418	6.676	0.000
5.6000	0.107	0.426	7.159	0.000
5.6667	0.108	0.433	7.519	0.000
5.7333	0.109	0.440	7.785	0.000
5.8000	0.109	0.447	8.116	0.000
5.8667	0.110	0.455	8.381	0.000
5.9333	0.111	0.462	8.637	0.000

6.0000	0.112	0.470	8.883	0.000
6.0667	0.113	0.477	9.122	0.000

East Pond #2

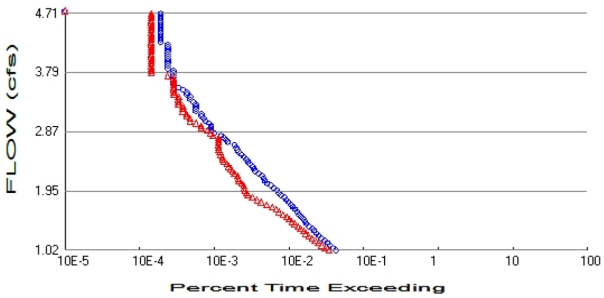
Bottom Length: 23.00 ft.
Bottom Width: 23.00 ft.
Depth: 4 ft.
Volume at riser head: 0.0594 acre-feet.
Side slope 1: 2 To 1
Side slope 2: 2 To 1
Side slope 3: 2 To 1
Side slope 4: 2 To 1
Discharge Structure
Riser Height: 3 ft.
Riser Diameter: 12 in.
Notch Type: Rectangular
Notch Width: 0.300 ft.
Notch Height: 0.875 ft.
Orifice 1 Diameter: 1.35 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2

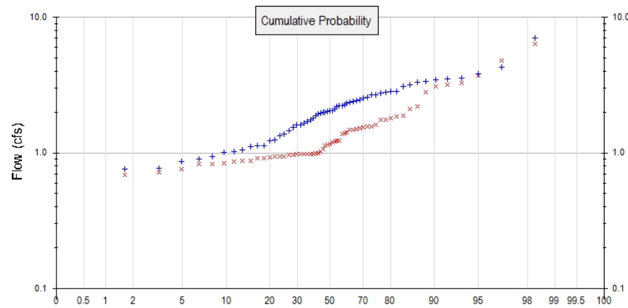
Pond Hydraulic Table

Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.012	0.000	0.000	0.000
0.0444	0.012	0.000	0.010	0.000
0.0889	0.012	0.001	0.014	0.000
0.1333	0.012	0.001	0.018	0.000
0.1778	0.012	0.002	0.020	0.000
0.2222	0.013	0.002	0.023	0.000
0.2667	0.013	0.003	0.025	0.000
0.3111	0.013	0.004	0.027	0.000
0.3556	0.013	0.004	0.029	0.000
0.4000	0.013	0.005	0.031	0.000
0.4444	0.014	0.005	0.033	0.000
0.4889	0.014	0.006	0.034	0.000
0.5333	0.014	0.007	0.036	0.000
0.5778	0.014	0.007	0.037	0.000
0.6222	0.014	0.008	0.039	0.000
0.6667	0.015	0.009	0.040	0.000
0.7111	0.015	0.009	0.041	0.000
0.7556	0.015	0.010	0.043	0.000
0.8000	0.015	0.011	0.044	0.000
0.8444	0.016	0.011	0.045	0.000
0.8889	0.016	0.012	0.046	0.000
0.9333	0.016	0.013	0.047	0.000
0.9778	0.016	0.014	0.048	0.000
1.0222	0.016	0.014	0.050	0.000
1.0667	0.017	0.015	0.051	0.000
1.1111	0.017	0.016	0.052	0.000
1.1556	0.017	0.017	0.053	0.000
1.2000	0.017	0.017	0.054	0.000
1.2444	0.018	0.018	0.055	0.000
1.2889	0.018	0.019	0.056	0.000
1.3333	0.018	0.020	0.057	0.000
1.3778	0.018	0.021	0.058	0.000
1.4222	0.018	0.021	0.059	0.000
1.4667	0.019	0.022	0.059	0.000

1.5111	0.019	0.023	0.060	0.000
1.5556	0.019	0.024	0.061	0.000
1.6000	0.019	0.025	0.062	0.000
1.6444	0.020	0.026	0.063	0.000
1.6889	0.020	0.027	0.064	0.000
1.7333	0.020	0.028	0.065	0.000
1.7778	0.020	0.029	0.065	0.000
1.8222	0.021	0.029	0.066	0.000
1.8667	0.021	0.030	0.067	0.000
1.9111	0.021	0.031	0.068	0.000
1.9556	0.021	0.032	0.069	0.000
2.0000	0.022	0.033	0.069	0.000
2.0444	0.022	0.034	0.070	0.000
2.0889	0.022	0.035	0.071	0.000
2.1333	0.022	0.036	0.073	0.000
2.1778	0.023	0.037	0.085	0.000
2.2222	0.023	0.038	0.103	0.000
2.2667	0.023	0.039	0.126	0.000
2.3111	0.023	0.040	0.152	0.000
2.3556	0.024	0.041	0.181	0.000
2.4000	0.024	0.043	0.212	0.000
2.4444	0.024	0.044	0.246	0.000
2.4889	0.024	0.045	0.281	0.000
2.5333	0.025	0.046	0.318	0.000
2.5778	0.025	0.047	0.356	0.000
2.6222	0.025	0.048	0.395	0.000
2.6667	0.026	0.049	0.435	0.000
2.7111	0.026	0.050	0.477	0.000
2.7556	0.026	0.052	0.519	0.000
2.8000	0.026	0.053	0.562	0.000
2.8444	0.027	0.054	0.605	0.000
2.8889	0.027	0.055	0.649	0.000
2.9333	0.027	0.056	0.693	0.000
2.9778	0.028	0.058	0.737	0.000
3.0222	0.028	0.059	0.795	0.000
3.0667	0.028	0.060	0.943	0.000
3.1111	0.028	0.061	1.151	0.000
3.1556	0.029	0.063	1.399	0.000
3.2000	0.029	0.064	1.670	0.000
3.2444	0.029	0.065	1.947	0.000
3.2889	0.030	0.067	2.211	0.000
3.3333	0.030	0.068	2.448	0.000
3.3778	0.030	0.069	2.644	0.000
3.4222	0.030	0.071	2.795	0.000
3.4667	0.031	0.072	2.905	0.000
3.5111	0.031	0.074	3.019	0.000
3.5556	0.031	0.075	3.115	0.000
3.6000	0.032	0.076	3.208	0.000
3.6444	0.032	0.078	3.297	0.000
3.6889	0.032	0.079	3.383	0.000
3.7333	0.033	0.081	3.467	0.000
3.7778	0.033	0.082	3.548	0.000
3.8222	0.033	0.084	3.627	0.000
3.8667	0.034	0.085	3.704	0.000
3.9111	0.034	0.087	3.778	0.000
3.9556	0.034	0.088	3.851	0.000
4.0000	0.034	0.090	3.923	0.000
4.0444	0.035	0.091	3.992	0.000

Analysis Results
POC 1





+ Predeveloped   x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 7.2806
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 3.265
Total Impervious Area: 4.0156

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	2.047995
5 year	3.153996
10 year	3.75089
25 year	4.356135
50 year	4.714925
100 year	5.009475

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	1.242446
5 year	1.92613
10 year	2.505029
25 year	3.404194
50 year	4.212382
100 year	5.15421

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	1.540	1.227
1950	1.986	1.124
1951	2.691	1.000
1952	1.616	1.545
1953	2.202	0.941
1954	3.368	0.989
1955	1.692	0.910
1956	3.104	3.164
1957	2.745	1.194
1958	2.037	2.811

1959	1.232	0.763
1960	1.132	0.963
1961	2.832	1.416
1962	1.980	1.026
1963	2.216	0.979
1964	2.056	0.985
1965	1.763	1.477
1966	2.466	1.218
1967	2.229	0.976
1968	2.667	1.403
1969	2.553	3.718
1970	7.062	6.335
1971	1.127	0.829
1972	1.801	0.975
1973	1.873	1.478
1974	2.836	3.279
1975	1.613	0.941
1976	2.435	1.377
1977	0.073	0.683
1978	3.546	1.877
1979	2.313	1.856
1980	1.339	0.879
1981	3.175	2.096
1982	2.100	1.753
1983	3.841	1.608
1984	1.239	0.860
1985	0.893	1.061
1986	1.106	0.962
1987	1.953	1.145
1988	0.933	0.826
1989	1.009	0.924
1990	0.859	0.837
1991	2.268	0.976
1992	2.346	0.908
1993	2.784	2.190
1994	2.010	1.515
1995	1.659	1.793
1996	3.491	4.824
1997	4.255	3.086
1998	3.438	1.230
1999	2.398	1.575
2000	1.372	0.717
2001	0.757	0.676
2002	3.308	1.159
2003	2.519	1.560
2004	0.769	0.872
2005	1.024	0.938
2006	1.941	0.985
2007	1.058	1.762
2008	1.461	1.499

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	7.0617	6.3353
2	4.2546	4.8243
3	3.8407	3.7177
4	3.5455	3.2795

5	3.4907	3.1644
6	3.4380	3.0859
7	3.3682	2.8112
8	3.3079	2.1895
9	3.1755	2.0963
10	3.1045	1.8770
11	2.8355	1.8558
12	2.8318	1.7926
13	2.7843	1.7623
14	2.7448	1.7530
15	2.6915	1.6077
16	2.6666	1.5745
17	2.5525	1.5600
18	2.5187	1.5452
19	2.4664	1.5154
20	2.4345	1.4992
21	2.3979	1.4778
22	2.3456	1.4766
23	2.3127	1.4158
24	2.2678	1.4031
25	2.2287	1.3768
26	2.2159	1.2299
27	2.2016	1.2275
28	2.1005	1.2179
29	2.0561	1.1940
30	2.0371	1.1589
31	2.0096	1.1445
32	1.9857	1.1245
33	1.9801	1.0611
34	1.9530	1.0257
35	1.9409	1.0003
36	1.8730	0.9894
37	1.8006	0.9851
38	1.7631	0.9849
39	1.6918	0.9792
40	1.6593	0.9760
41	1.6160	0.9760
42	1.6125	0.9753
43	1.5397	0.9628
44	1.4614	0.9615
45	1.3719	0.9413
46	1.3393	0.9408
47	1.2395	0.9376
48	1.2319	0.9240
49	1.1316	0.9103
50	1.1272	0.9084
51	1.1062	0.8793
52	1.0575	0.8723
53	1.0240	0.8604
54	1.0086	0.8374
55	0.9328	0.8293
56	0.8930	0.8257
57	0.8588	0.7634
58	0.7693	0.7171
59	0.7571	0.6827
60	0.0726	0.6758

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
1.0240	896	723	80	Pass
1.0613	823	633	76	Pass
1.0986	756	578	76	Pass
1.1358	688	514	74	Pass
1.1731	626	472	75	Pass
1.2104	576	430	74	Pass
1.2477	536	389	72	Pass
1.2850	494	354	71	Pass
1.3223	456	330	72	Pass
1.3595	431	301	69	Pass
1.3968	393	277	70	Pass
1.4341	363	250	68	Pass
1.4714	346	230	66	Pass
1.5087	324	210	64	Pass
1.5459	305	196	64	Pass
1.5832	287	175	60	Pass
1.6205	271	155	57	Pass
1.6578	253	142	56	Pass
1.6951	237	126	53	Pass
1.7324	226	106	46	Pass
1.7696	211	90	42	Pass
1.8069	193	79	40	Pass
1.8442	182	68	37	Pass
1.8815	165	59	35	Pass
1.9188	152	57	37	Pass
1.9560	145	54	37	Pass
1.9933	131	53	40	Pass
2.0306	120	52	43	Pass
2.0679	107	49	45	Pass
2.1052	100	45	45	Pass
2.1425	96	44	45	Pass
2.1797	91	43	47	Pass
2.2170	83	39	46	Pass
2.2543	75	37	49	Pass
2.2916	71	35	49	Pass
2.3289	69	33	47	Pass
2.3662	62	31	50	Pass
2.4034	59	28	47	Pass
2.4407	56	27	48	Pass
2.4780	52	27	51	Pass
2.5153	49	26	53	Pass
2.5526	44	25	56	Pass
2.5898	43	24	55	Pass
2.6271	41	24	58	Pass
2.6644	39	24	61	Pass
2.7017	32	24	75	Pass
2.7390	30	24	80	Pass
2.7763	28	24	85	Pass
2.8135	26	20	76	Pass
2.8508	21	19	90	Pass
2.8881	19	17	89	Pass
2.9254	19	14	73	Pass
2.9627	19	14	73	Pass

2.9999	18	12	66	Pass
3.0372	16	10	62	Pass
3.0745	15	10	66	Pass
3.1118	14	9	64	Pass
3.1491	14	9	64	Pass
3.1864	12	8	66	Pass
3.2236	12	8	66	Pass
3.2609	12	8	66	Pass
3.2982	12	7	58	Pass
3.3355	11	7	63	Pass
3.3728	10	7	70	Pass
3.4101	10	7	70	Pass
3.4473	9	6	66	Pass
3.4846	9	6	66	Pass
3.5219	8	6	75	Pass
3.5592	7	6	85	Pass
3.5965	6	6	100	Pass
3.6337	6	6	100	Pass
3.6710	6	6	100	Pass
3.7083	6	6	100	Pass
3.7456	6	5	83	Pass
3.7829	6	3	50	Pass
3.8202	6	3	50	Pass
3.8574	5	3	60	Pass
3.8947	5	3	60	Pass
3.9320	5	3	60	Pass
3.9693	5	3	60	Pass
4.0066	5	3	60	Pass
4.0438	5	3	60	Pass
4.0811	5	3	60	Pass
4.1184	5	3	60	Pass
4.1557	5	3	60	Pass
4.1930	5	3	60	Pass
4.2303	5	3	60	Pass
4.2675	4	3	75	Pass
4.3048	4	3	75	Pass
4.3421	4	3	75	Pass
4.3794	4	3	75	Pass
4.4167	4	3	75	Pass
4.4540	4	3	75	Pass
4.4912	4	3	75	Pass
4.5285	4	3	75	Pass
4.5658	4	3	75	Pass
4.6031	4	3	75	Pass
4.6404	4	3	75	Pass
4.6776	4	3	75	Pass
4.7149	4	3	75	Pass

Appendix
Predeveloped Schematic

Mitigated Schematic

Disclaimer

Legal Notice

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Local (360)943-0304

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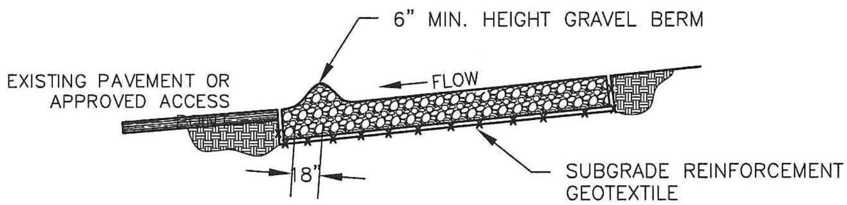
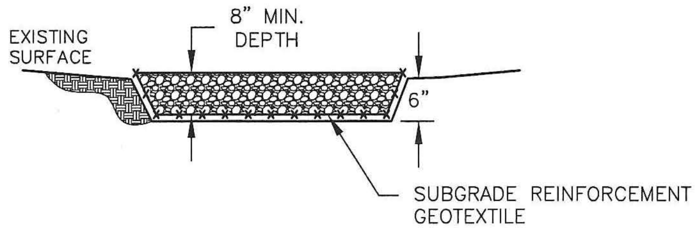
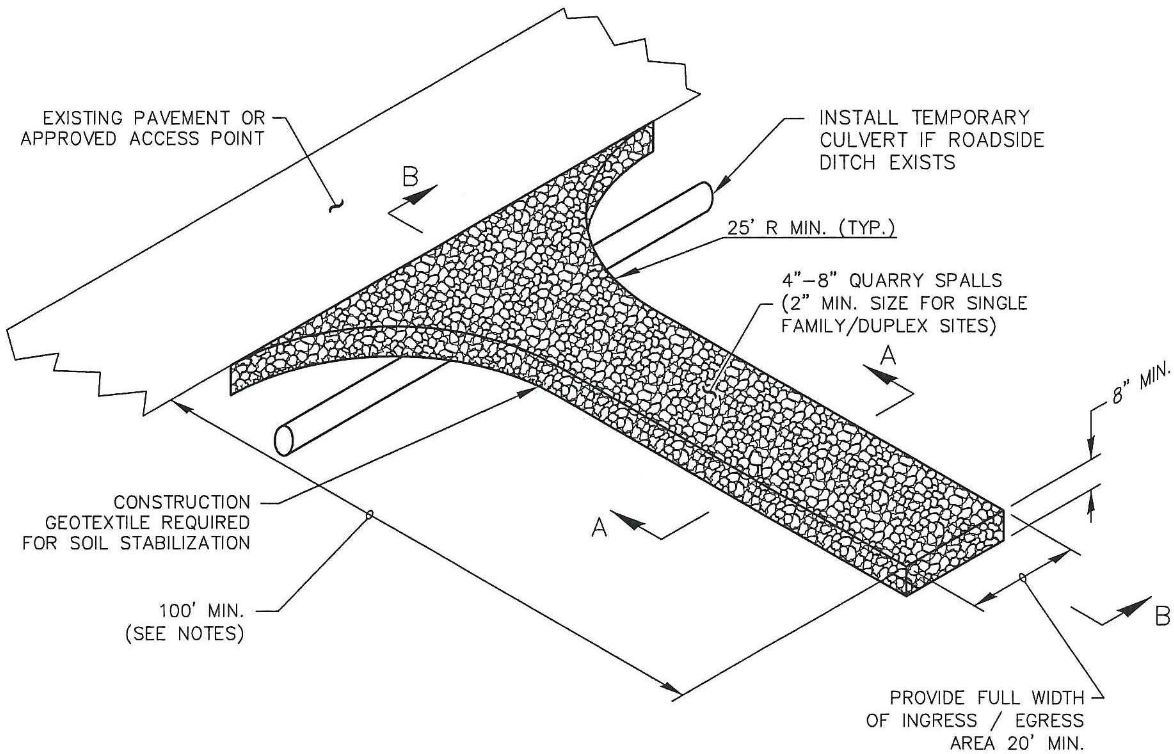
Appendix F: BMP Details



SECTION B–B



SECTION A–A



ISOMETRIC VIEW

NOTES:
1. 100 FOOT MINIMUM MAY BE REDUCED TO 50 FOOT MINIMUM FOR SITES WITH LESS THAN ONE ACRE OF EXPOSED SOIL, IF APPROVED BY SITE INSPECTOR.
2. 20 FOOT MINIMUM LENGTH FOR SINGLE FAMILY AND DUPLEX RESIDENTIAL.
3. ROCK SHALL BE REMOVED AND REPLACED, OR ADDITIONAL ROCK ADDED IF ENTRANCE FAILS TO FUNCTION AS INTENDED.

REV. NO.	DATE	BY	APPR.
1	8/17/07	SCD	JC
2	1/1/11	SCD	JC
3	3/1/12	SCD	JC

CITY OF CAMAS ~ EROSION CONTROL DETAIL

STABILIZED CONSTRUCTION ENTRANCE

3-1-12

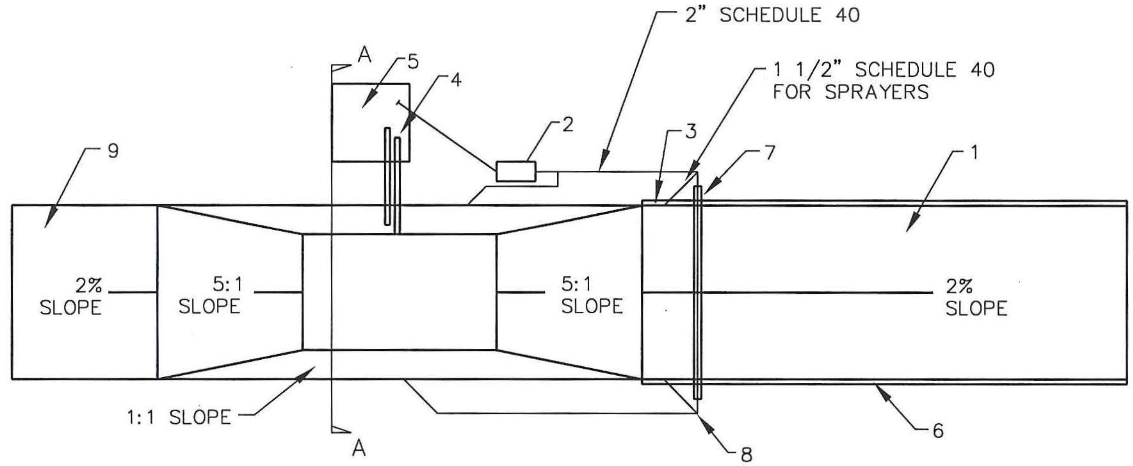
DETAIL APPROVED BY DATE

NOT TO SCALE

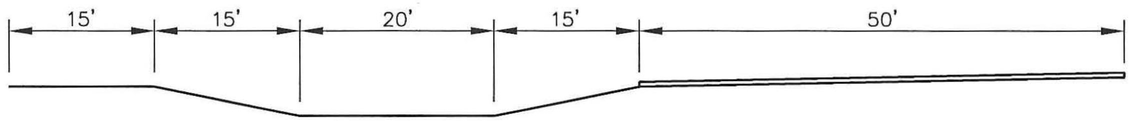
DETAIL NO.

EC6

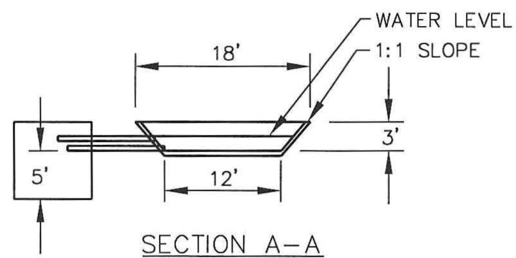
EC–CONENTRY.DWG



WHEEL WASH PLAN



ELEVATION VIEW



SECTION A–A

NOTES:

1. ASPHALT CONSTRUCTION ENTRANCE 6 IN. ASPHALT TREATED BASE (ATB).
2. 3 IN. TRASH PUMP WITH FLOATS ON THE SUCTION HOSE.
3. MIDPOINT SPRAY NOZZLES, IF NEEDED.
4. 6 IN. SEWER PIPE WITH BUTTERFLY VALVES. BOTTOM ONE IS A DRAIN. LOCATE TOP PIPE'S INVERT 1–FT. ABOVE BOTTOM OF WHEEL WASH.
5. 8 FT. X 8 FT. SUMP WITH 5–FT. OF CATCHMENT BUILD SO IT CAN BE CLEANED WITH TRACKHOE.
6. 6 IN. ASPHALT CURB ON THE LOW ROAD SIDE TO DIRECT WATER BACK TO POND.
7. 6 IN. SLEEVE UNDER ROAD.
8. BALL VALVES.
9. 15 FT. ATB APRON TO PROTECT GROUND FROM SPLASHING WATER.
10. SEDIMENT LADEN WATER SHALL BE PUMPED INTO A BAKER TANK AND REMOVED.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC

CITY OF CAMAS ~ EROSION CONTROL DETAIL

WHEEL WASH

Jan E. Cauthen 1-4-11

DETAIL APPROVED BY DATE

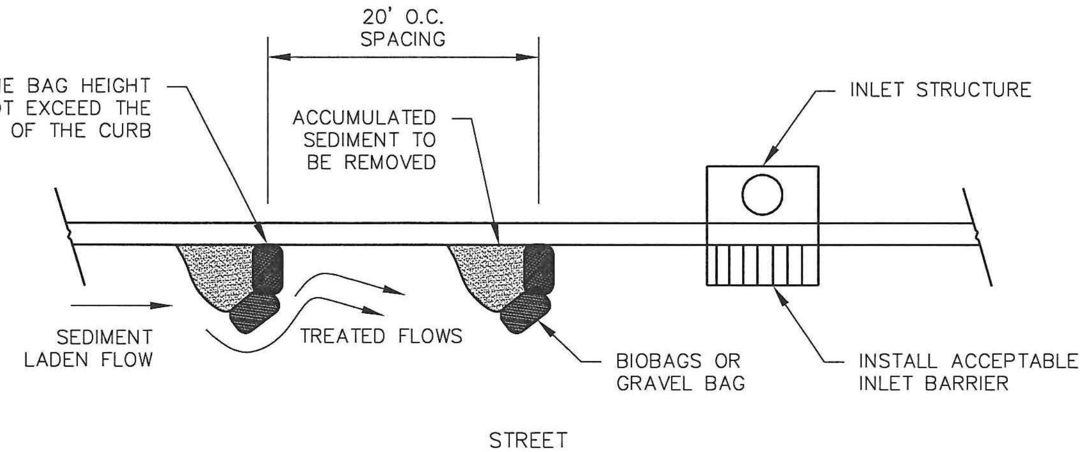
NOT TO SCALE

DETAIL NO.

EC7

EC–WHEELWASH.DWG

APPROXIMATE SPACING BETWEEN BARRIERS



BIOBAGS OR GRAVEL BAG FILTERS

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC

CITY OF CAMAS ~ EROSION CONTROL DETAIL

INLET PROTECTION – CURB SEDIMENT TRAPS

1-4-11

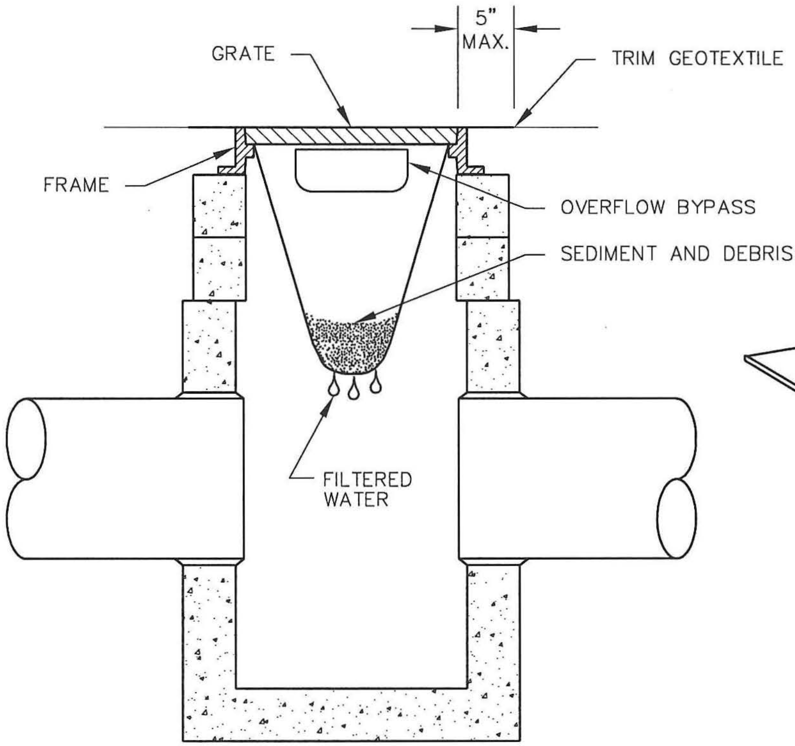
DETAIL APPROVED BY DATE

NOT TO SCALE

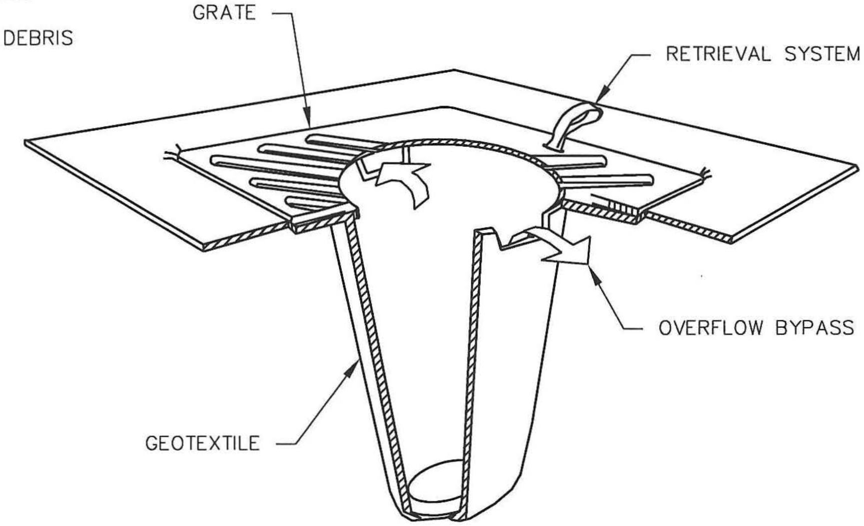
DETAIL NO.

EC8

EC-INLETS.DWG



CROSS SECTION



ISOMETRIC VIEW

NOTES:

1. INSERTS TO BE REMOVED AND CLEANED OR REPLACED ONCE A MONTH DURING RAINY SEASON.
2. SIZE THE BELOW GRATE INLET DEVICE (BGID) FOR THE STORM WATER STRUCTURE IT WILL SERVICE.
3. THE BGID SHALL HAVE A BUILT-IN HIGH-FLOW RELIEF SYSTEM (OVERFLOW BYPASS).
4. THE RETRIEVAL SYSTEM MUST ALLOW REMOVAL OF THE BGID WITHOUT SPILLING THE COLLECTED MATERIAL.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC

CITY OF CAMAS ~ EROSION CONTROL DETAIL

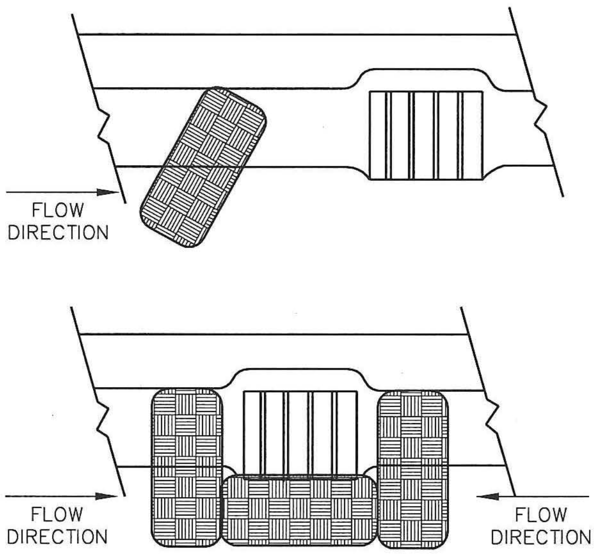
INLET PROTECTION – CATCH BASIN INSERT

DETAIL APPROVED BY: Jim E. Carothers   DATE: 1-4-11

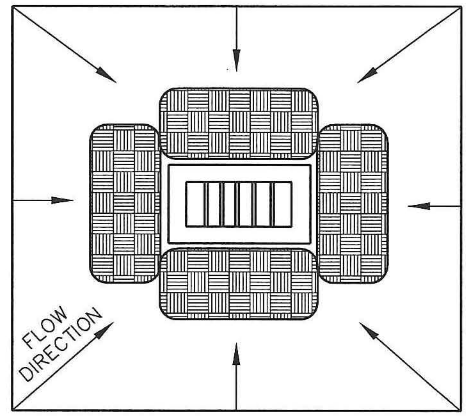
NOT TO SCALE

DETAIL NO.
EC9

EC–INLETS.DWG

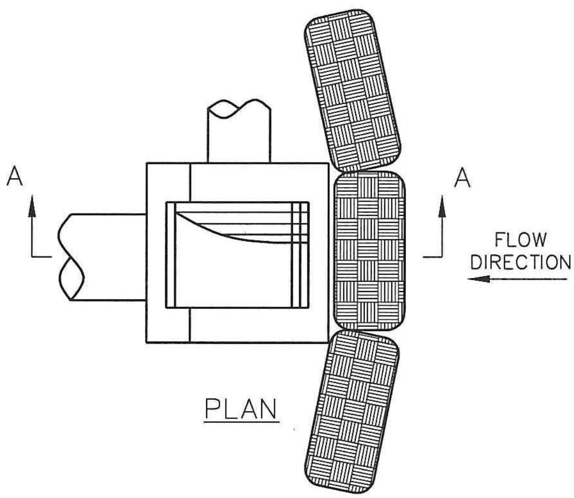


CATCH BASIN

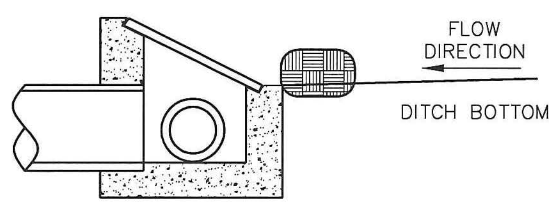


AREA DRAIN

NOTES:
1. MAY BE USED SHORT TERM WITH UTILITY WORK AND WITH PHASING OF DEVELOPMENT (E.G. HOME BUILDERS).
2. REPLACE WITH NEW BAGS AS EXISTING BAGS BECOME SILT LADEN.



PLAN



SECTION A–A

DITCH INLET

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC

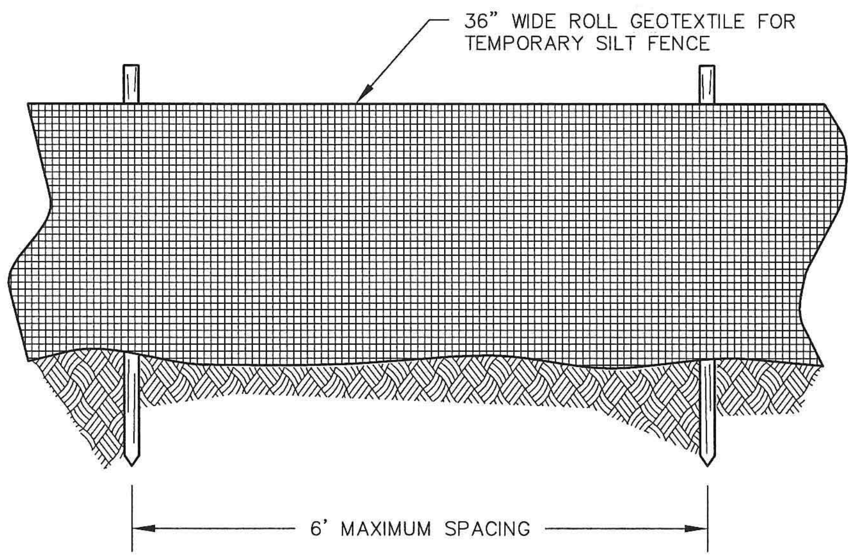
CITY OF CAMAS ~ EROSION CONTROL DETAIL
INLET PROTECTION – BIOBAGS

DETAIL APPROVED BY 1-4-11 DATE

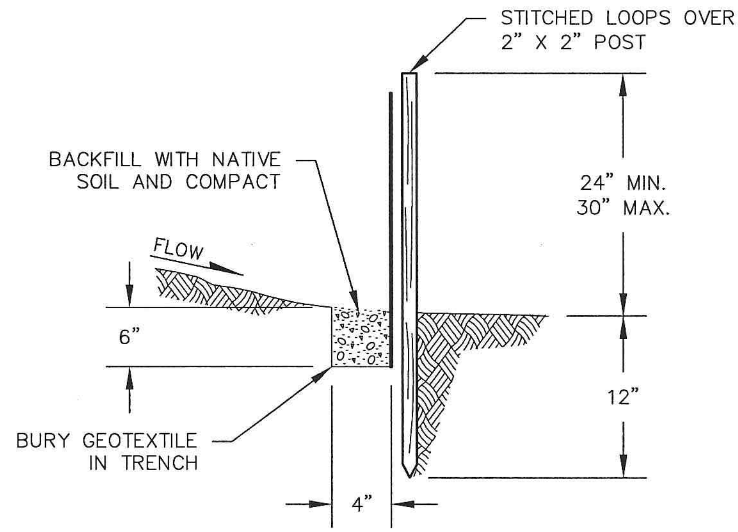
NOT TO SCALE

DETAIL NO.
EC11

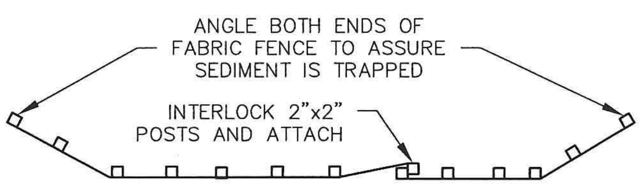
EC–INLETS.DWG



ELEVATION VIEW



SIDE VIEW



TOP VIEW

NOTES:

1. MAXIMIZE DETENTION OF STORMWATER BY PLACING FENCE AS FAR AWAY FROM THE TOE OF SLOPE AS POSSIBLE WITHOUT ENCROACHING ON SENSITIVE AREAS OR OUTSIDE OF THE CLEARING BOUNDARIES.
2. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
3. COMPACT ALL AREAS OF FABRIC TRENCH.
4. POSTS SHALL BE WOOD, DIMENSIONAL FIR OR PINE, 2"X2" NOMINAL.
5. STITCHED LOOPS SHALL BE INSTALLED ON UPHILL SIDE OF FENCE.
6. INSTALL SEDIMENT FENCING ALONG CONTOURS WHENEVER POSSIBLE.
7. INSTALL THE ENDS OF THE SEDIMENT FENCE TO POINT SLIGHTLY UP-SLOPE TO PREVENT SEDIMENT FROM FLOWING AROUND THE ENDS OF THE FENCE.
8. SEDIMENT BUILDUP IN EXCESS OF 8-INCHES SHALL BE REMOVED.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC
3	3/1/12	SCD	JC

CITY OF CAMAS ~ EROSION CONTROL DETAIL

SILT FENCE

3-1-12

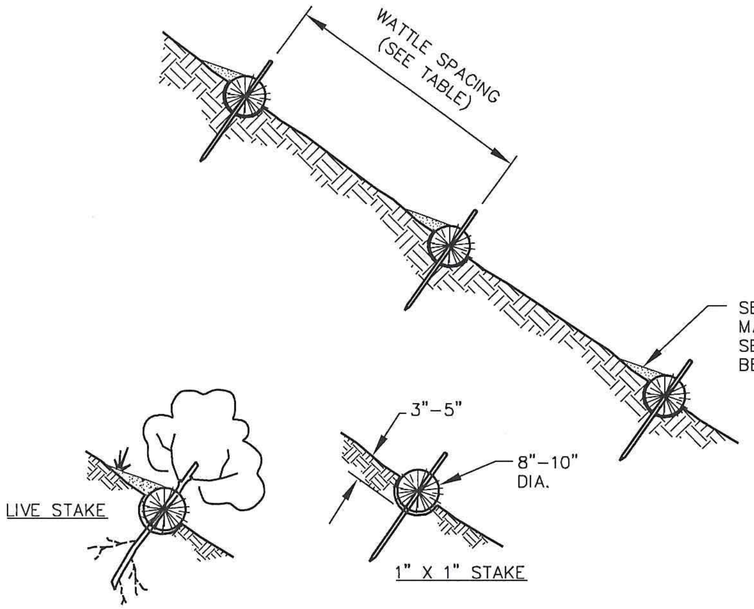
DETAIL APPROVED BY DATE

NOT TO SCALE

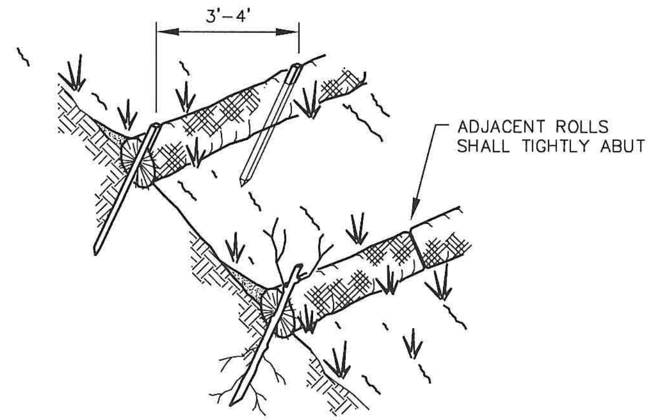
DETAIL NO.

EC12

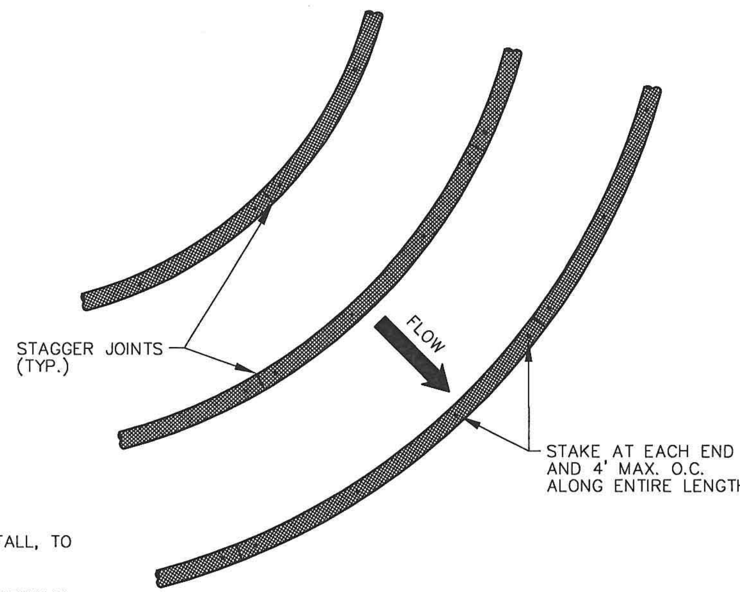
EC-SEDFENCE.DWG



ELEVATION VIEW



WATTLE SPACING TABLE	
SLOPE	MAXIMUM SPACING
1:1 – 1.5:1	3–4 FEET
1.5:1 – 2:1	4–5 FEET
2:1 – 2.5:1	5–6 FEET
2.5:1 – 4:1	6–8 FEET
3.5:1 – 4:1	8–12 FEET
4.5:1 – 5:1	10–20 FEET



PLAN VIEW

NOTES:

1. INSTALL WATTLES ALONG CONTOURS IN A 3"–5" DEEP TRENCH.
2. WATTLES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. SPEC. 9–14.5(5).
3. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RUNOFF PRODUCING RAINFALL, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
4. LIVE STAKES MAY BE USED FOR PERMANENT INSTALLATIONS.
5. INSTALL WATTLES SNUGLY INTO THE TRENCH. ABUT ADJACENT WATTLES TIGHTLY, END TO END, WITHOUT OVERLAPPING THE ENDS.
6. PILOT HOLES MAY BE DRIVEN THROUGH THE WATTLE AND INTO THE SOIL, WHEN SOIL CONDITIONS REQUIRE.
7. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC

CITY OF CAMAS WASHINGTON

CITY OF CAMAS ~ EROSION CONTROL DETAIL

STRAW WATTLES ON SLOPE

Jan E. Carothers 1-4-11

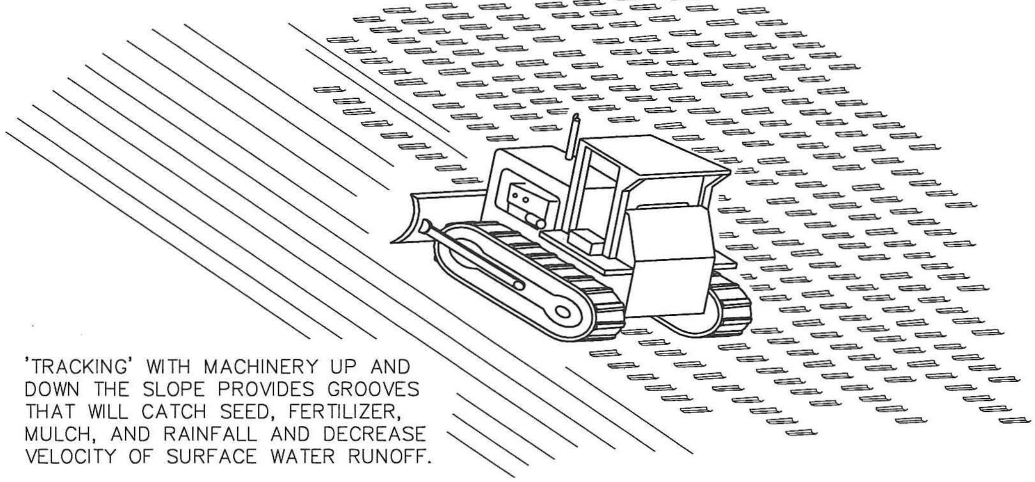
DETAIL APPROVED BY DATE

NOT TO SCALE

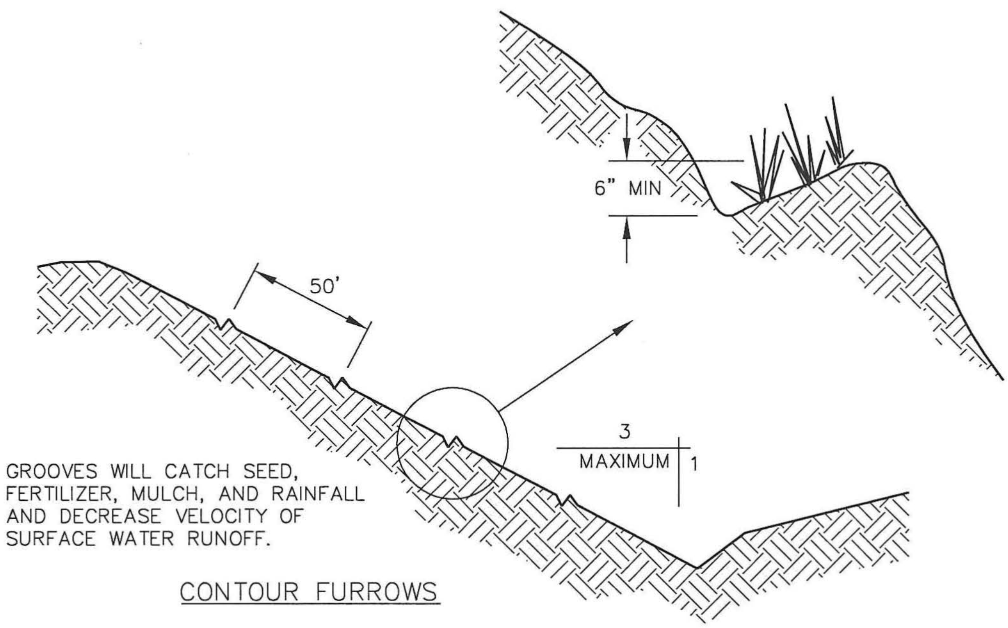
DETAIL NO.

EC14

EC–WATTLE.DWG



TRACKING



CONTOUR FURROWS

NOTES:

1 TRACKING IS DONE BY OPERATING EQUIPMENT UP AND DOWN THE SLOPE TO LEAVE HORIZONTAL DEPRESSIONS IN THE SOIL.
2. TRACKED SURFACES SHALL BE SEEDED IMMEDIATELY AFTER TRACKING.
3. SLOPES WHERE MOWING IS PLANNED SHOULD NOT BE EXCESSIVELY ROUGHENED.

REV. NO.	DATE	BY	APPR.
1	9/18/07	SCD	JC
2	1/1/11	SCD	JC

CITY OF CAMAS ~ EROSION CONTROL DETAIL

SURFACE ROUGHENING – TRACKING & FURROWS

1-4-11

DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO.

EC17

EC-ROUGHEN.DWG

Appendix G: Water Quality WWHM Analysis

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	5638 WWHM Water Quality
Site Name:	Hancock Springs WQ
Site Address:	
City:	Camas
Report Date:	11/1/2018
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.30
Version Date:	2016/02/25
Version:	4.2.12

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Mod	5.338
Pervious Total	5.338
Impervious Land Use	acre
Impervious Total	0
Basin Total	5.338

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

WQ Basin

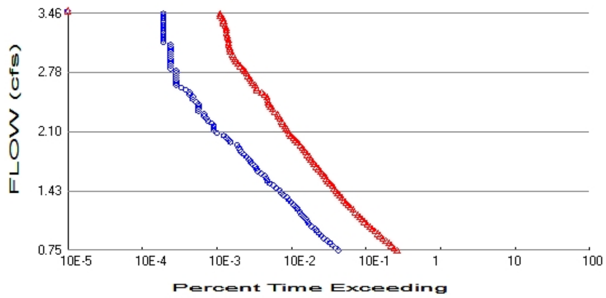
Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Lawn, Mod	2.332
Pervious Total	2.332
Impervious Land Use	acre
ROADS MOD	1.548
ROOF TOPS FLAT	1.045
DRIVEWAYS MOD	0.413
Impervious Total	3.006
Basin Total	5.338

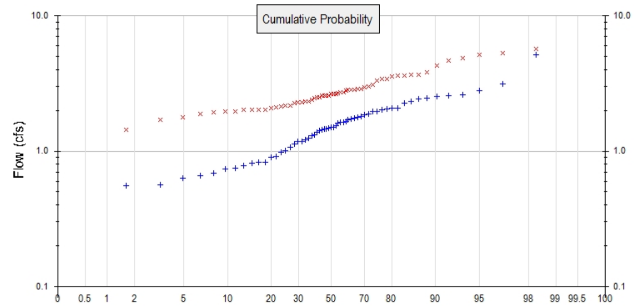
Element Flows To:

Surface	Interflow	Groundwater

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 5.338
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 2.332
Total Impervious Area: 3.006

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	Flow(cfs)
2 year	1.501552
5 year	2.312452
10 year	2.750083
25 year	3.193838
50 year	3.456896
100 year	3.672854

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	Flow(cfs)
2 year	2.643584
5 year	3.462486
10 year	4.010935
25 year	4.713368
50 year	5.244561
100 year	5.7832

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	Predeveloped	Mitigated
1949	1.129	2.883
1950	1.456	2.336
1951	1.973	2.647
1952	1.185	2.692
1953	1.614	2.389
1954	2.470	3.680
1955	1.240	2.030
1956	2.276	2.803
1957	2.012	3.095
1958	1.494	3.587

1959	0.903	2.011
1960	0.830	2.024
1961	2.076	2.630
1962	1.452	2.315
1963	1.625	2.725
1964	1.508	1.974
1965	1.293	2.162
1966	1.808	2.504
1967	1.634	2.565
1968	1.955	4.833
1969	1.871	4.276
1970	5.178	5.711
1971	0.826	1.884
1972	1.320	2.963
1973	1.373	2.140
1974	2.079	2.457
1975	1.182	1.771
1976	1.785	2.307
1977	0.053	1.172
1978	2.600	3.416
1979	1.696	3.642
1980	0.982	1.931
1981	2.328	2.999
1982	1.540	2.842
1983	2.816	3.592
1984	0.909	1.695
1985	0.655	2.094
1986	0.811	3.312
1987	1.432	2.277
1988	0.684	2.569
1989	0.740	2.566
1990	0.630	2.555
1991	1.663	2.847
1992	1.720	2.818
1993	2.041	3.550
1994	1.473	2.064
1995	1.217	2.863
1996	2.559	3.843
1997	3.119	4.690
1998	2.521	5.144
1999	1.758	2.166
2000	1.006	1.974
2001	0.555	1.442
2002	2.425	3.424
2003	1.847	2.639
2004	0.564	2.028
2005	0.751	2.503
2006	1.423	2.737
2007	0.775	2.291
2008	1.071	5.326

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	5.1775	5.7110
2	3.1194	5.3265
3	2.8159	5.1443
4	2.5995	4.8328

5	2.5593	4.6899
6	2.5207	4.2760
7	2.4695	3.8431
8	2.4253	3.6804
9	2.3282	3.6417
10	2.2762	3.5922
11	2.0790	3.5871
12	2.0762	3.5499
13	2.0414	3.4239
14	2.0124	3.4164
15	1.9733	3.3116
16	1.9551	3.0950
17	1.8715	2.9988
18	1.8467	2.9626
19	1.8083	2.8828
20	1.7850	2.8634
21	1.7581	2.8470
22	1.7197	2.8415
23	1.6956	2.8185
24	1.6627	2.8034
25	1.6341	2.7372
26	1.6247	2.7252
27	1.6142	2.6918
28	1.5400	2.6471
29	1.5075	2.6392
30	1.4936	2.6304
31	1.4734	2.5694
32	1.4559	2.5659
33	1.4518	2.5650
34	1.4319	2.5547
35	1.4231	2.5044
36	1.3733	2.5028
37	1.3202	2.4574
38	1.2927	2.3890
39	1.2404	2.3363
40	1.2166	2.3151
41	1.1848	2.3074
42	1.1823	2.2915
43	1.1288	2.2768
44	1.0715	2.1660
45	1.0058	2.1615
46	0.9819	2.1404
47	0.9087	2.0944
48	0.9032	2.0635
49	0.8297	2.0298
50	0.8264	2.0277
51	0.8111	2.0238
52	0.7753	2.0107
53	0.7508	1.9742
54	0.7395	1.9739
55	0.6839	1.9308
56	0.6548	1.8843
57	0.6296	1.7713
58	0.5640	1.6946
59	0.5551	1.4422
60	0.0533	1.1721

Duration Flows

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.7508	896	5455	608	Fail
0.7781	823	5016	609	Fail
0.8054	756	4599	608	Fail
0.8328	689	4235	614	Fail
0.8601	626	3871	618	Fail
0.8874	576	3549	616	Fail
0.9148	536	3261	608	Fail
0.9421	492	2996	608	Fail
0.9695	457	2758	603	Fail
0.9968	431	2535	588	Fail
1.0241	392	2352	600	Fail
1.0515	364	2169	595	Fail
1.0788	347	2001	576	Fail
1.1061	324	1859	573	Fail
1.1335	305	1731	567	Fail
1.1608	287	1611	561	Fail
1.1881	271	1494	551	Fail
1.2155	253	1399	552	Fail
1.2428	238	1302	547	Fail
1.2701	226	1214	537	Fail
1.2975	211	1132	536	Fail
1.3248	193	1058	548	Fail
1.3521	182	1000	549	Fail
1.3795	165	932	564	Fail
1.4068	152	875	575	Fail
1.4341	145	830	572	Fail
1.4615	131	781	596	Fail
1.4888	120	743	619	Fail
1.5161	107	685	640	Fail
1.5435	100	646	646	Fail
1.5708	96	616	641	Fail
1.5981	91	580	637	Fail
1.6255	83	549	661	Fail
1.6528	75	515	686	Fail
1.6802	71	490	690	Fail
1.7075	69	453	656	Fail
1.7348	62	427	688	Fail
1.7622	59	405	686	Fail
1.7895	56	382	682	Fail
1.8168	52	365	701	Fail
1.8442	49	343	700	Fail
1.8715	44	325	738	Fail
1.8988	43	307	713	Fail
1.9262	41	295	719	Fail
1.9535	39	274	702	Fail
1.9808	32	254	793	Fail
2.0082	30	236	786	Fail
2.0355	28	223	796	Fail
2.0628	26	205	788	Fail
2.0902	21	195	928	Fail
2.1175	19	187	984	Fail
2.1448	19	180	947	Fail
2.1722	19	171	900	Fail
2.1995	18	162	900	Fail

2.2268	16	156	975	Fail
2.2542	15	148	986	Fail
2.2815	14	141	1007	Fail
2.3088	14	137	978	Fail
2.3362	12	124	1033	Fail
2.3635	12	117	975	Fail
2.3908	12	111	925	Fail
2.4182	12	104	866	Fail
2.4455	11	103	936	Fail
2.4729	10	101	1010	Fail
2.5002	10	98	980	Fail
2.5275	9	91	1011	Fail
2.5549	9	84	933	Fail
2.5822	8	73	912	Fail
2.6095	7	71	1014	Fail
2.6369	6	68	1133	Fail
2.6642	6	63	1050	Fail
2.6915	6	61	1016	Fail
2.7189	6	58	966	Fail
2.7462	6	54	900	Fail
2.7735	6	52	866	Fail
2.8009	6	50	833	Fail
2.8282	5	47	939	Fail
2.8555	5	43	860	Fail
2.8829	5	40	800	Fail
2.9102	5	38	760	Fail
2.9375	5	36	720	Fail
2.9649	5	35	700	Fail
2.9922	5	34	680	Fail
3.0195	5	32	640	Fail
3.0469	5	31	620	Fail
3.0742	5	31	620	Fail
3.1015	5	30	600	Fail
3.1289	4	30	750	Fail
3.1562	4	30	750	Fail
3.1836	4	29	725	Fail
3.2109	4	29	725	Fail
3.2382	4	28	700	Fail
3.2656	4	28	700	Fail
3.2929	4	28	700	Fail
3.3202	4	27	675	Fail
3.3476	4	26	650	Fail
3.3749	4	26	650	Fail
3.4022	4	25	625	Fail
3.4296	4	23	575	Fail
3.4569	4	23	575	Fail

The development has an increase in flow durations from 1/2 Predeveloped 2 year flow to the 2 year flow or more than a 10% increase from the 2 year to the 50 year flow.
The development has an increase in flow durations for more than 50% of the flows for the range of the duration analysis.

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.6637 acre-feet
On-line facility target flow:	0.9739 cfs.
Adjusted for 15 min:	0.9739 cfs.
Off-line facility target flow:	0.5292 cfs.
Adjusted for 15 min:	0.5292 cfs.

Appendix
Predeveloped Schematic

Mitigated Schematic

Disclaimer

Legal Notice

Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

Appendix H: Geotechnical Documents

REDMOND GEOTECHNICAL SERVICES

Geotechnical Investigation and Consultation Services

Proposed Hancock Springs Residential Development Site

Parcel #'s 127371000, 127377000 and 127414000

11724 NW 18th Avenue

Camas (Clark County), Washington

for

NW Classic Homes, LLC

Project No. 1708.001.G
September 28, 2018

REDMOND GEOTECHNICAL SERVICES

September 28, 2018

Mr. Chris Wall
NW Classic Homes, LLC
10100 NE 116th Circle
Vancouver, Washington 98682

Dear Mr. Wall:

Re: Geotechnical Investigation and Consultation Services, Proposed Hancock Springs Residential Development Site, Parcel No's. 127371000/127377000 and 127414000, 11724 NW 18th Avenue, Camas, (Clark County), Washington

Submitted herewith is our report entitled "Geotechnical Investigation and Consultation Services, Proposed Hancock Springs Residential Development Site, Parcel No's. 127371000/127377000 and 127414000, 11724 NW 18th Avenue, Camas (Clark County), Washington". The scope of our services was outlined in our formal proposal to Mr. Chris Wall of NW Classic Homes, LLC dated August 9, 2018. Written authorization of our services was provided by Mr. Chris Wall of NW Classic Homes, LLC on August 9, 2018.

During the course of our investigation, we have kept you and/or others advised of our schedule and preliminary findings. We appreciate the opportunity to assist you with this phase of the project. Should you have any questions regarding this report, please do not hesitate to call.

Sincerely,

Daniel M. Redmond, P.E., G.E.
President/Principal Engineer

DANIEL M. REDMOND
STATE OF WASHINGTON
28881
REGISTERED
PROFESSIONAL ENGINEER
EXPIRES 3-22-19

Cc: Mr. Michael Andreotti
AKS Engineering & Forestry, LLC

PO Box 20547 • Portland, Oregon 97294 • Fax 503/286-7176 • Phone 503/285-0598

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GEOTECHNICAL INVESTIGATION AND CONSULTATION SERVICES
PROPOSED HANCOCK SPRINGS RESIDENTIAL DEVELOPMENT SITE
PARCEL NO'S. 127371000/127377000 AND 127414000
11724 NW 18TH AVENUE
CAMAS (CLARK COUNTY), WASHINGTON

INTRODUCTION

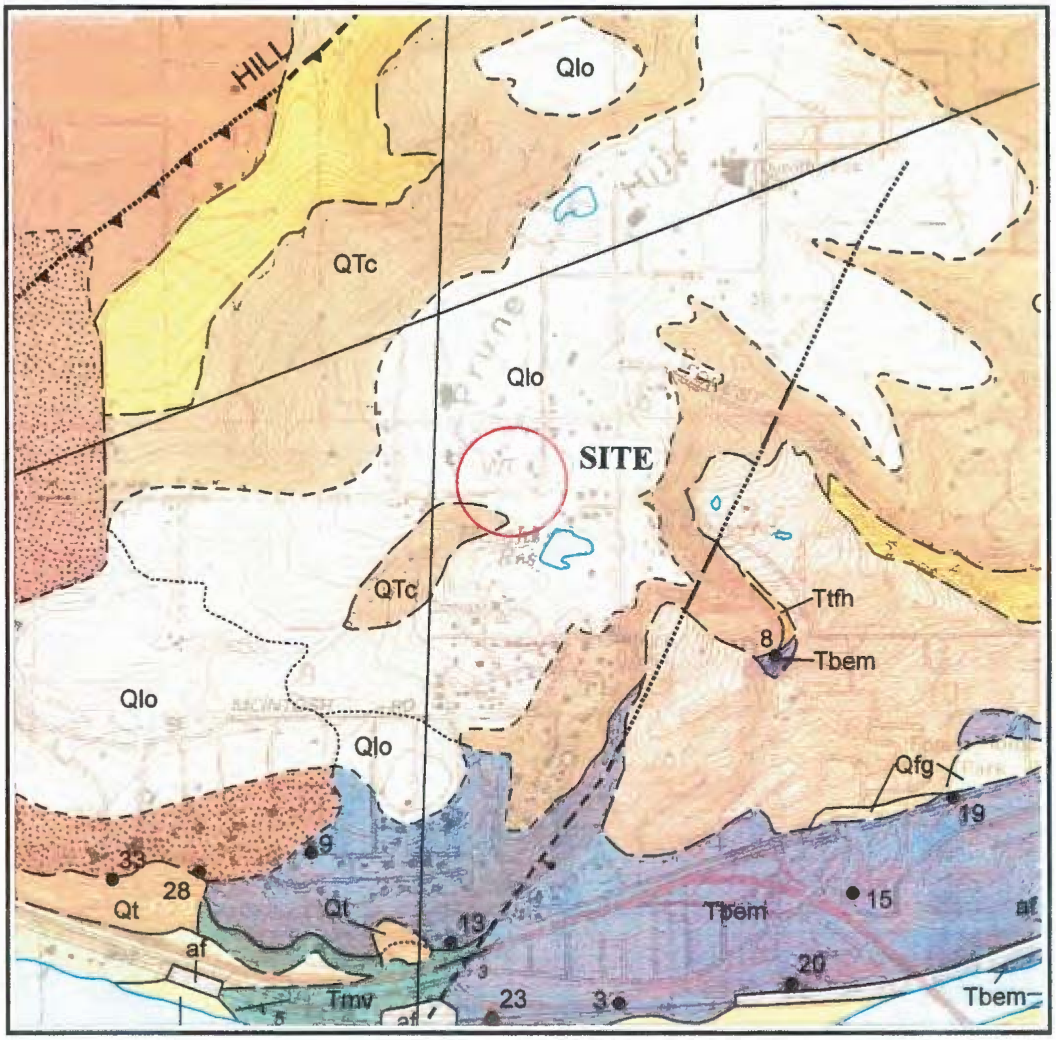
Redmond Geotechnical Services, LLC is please to submit to you the results of our Geotechnical Investigation and Consultation Services report at the site of the proposed Hancock Springs residential development site located generally to the south of NW 18th Avenue and west of NW Cascade Street in Camas (Clark County), Washington. The general location of the subject site is shown on the Site Vicinity and Geologic Map, Figure No. 1. The purpose of our geotechnical investigation and consultation services at this time was to explore the existing subsurface soils and/or groundwater conditions across the subject site and to develop and/or provide appropriate geotechnical design and construction recommendations for the proposed new single-family residential development project as well as to assess the presence and/or degree of any existing and/or ancient (historic) landslide(s) at the site with regard to potential stability problems and/or development.

PROJECT DESCRIPTION

Based on a review of the proposed site development plan, we understand that present plans for the project will consist of the construction of twenty-one (21) new sin gle-family residential home sites and/or lots. Reportedly, the new single-family residential homes will be two- and/or three-story wood frame structures with a base footprint of approximately 1,500 to 2,000 square feet.

Support for the new residential homes is anticipated to consist primarily of conventional shallow strip and/or continuous footings although some individual spread and/or column-type footings may also be required. Structural loading information for the project is unavailable at this time. However, based on our past experience with similar types of single-family wood-frame residential structures, we anticipate that maximum dead plus live continuous (strip) and individual (spread) column footing loads will be on the order of about 2.0 to 3.0 kips per lineal foot (klf) and 10 to 25 kips, respectively. Additionally, due to the sloping site grades across the site, we anticipate that some of the proposed new single-family residential homes may be constructed with partial and/or below grade basements. In this regard, the use of below grade and/or retaining walls may also be utilized for the project.

Earthwork and grading operations associated with bringing the property to finish design grades are unknown at this time but are generally anticipated to result in both cuts and/or fills of about five (5) feet or less.



CAMAS QUADRANGLE
WASHINGTON—OREGON
7.5 MINUTE SERIES (TOPOGRAPHIC)
SW/4 CAMAS 15' QUADRANGLE

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
DEPTH CURVES AND SOUNDINGS IN FEET—COLUMBIA RIVER DATUM

SITE VICINITY AND GEOLOGIC MAP

Project No. 1708.001.G	**HANCOCK SPRINGS SUBDIVISION NW 18TH AVENUE**	Figure No. 1

Other associated site improvements for the project will include the construction of new paved surfaces for both automobile parking and drive areas as well as new underground utility services. Additionally, we understand that the project will include some storm water detention and/or water quality ponds.

SCOPE OF WORK

The purpose of our geotechnical investigation studies was to evaluate the overall site subsurface soil and/or groundwater conditions underlying the site with regard to the proposed new single-family residential development at the site and any associated impacts or concerns with respect to the new construction as well as provide appropriate geotechnical design and construction recommendations for the project. Additionally, the purpose of the geologic hazards study was to assess the presence and/or degree of any existing and/or ancient (historic) landslide(s) at the site with regard to potential stability problems associated with development of the site. Specifically, the geotechnical investigation and geologic hazards study included the following scope of work items:

1. Review of available and relevant (pertinent) geologic information including available landslide mapping, historic topographic maps and historic aerial photographs as well as the Geologic Map of the Camas Quadrangle, Clark County, Washington.

2. A site vicinity geologic reconnaissance to observe the area geology and geologic features that could be related to past landslide activity in the area.

3. A detailed site reconnaissance of the subject property including a visual reconnaissance of existing road cuts and fills as well as pavement areas for indications of slope movement.

4. A subsurface exploration program of the soil and groundwater conditions underlying the site by means of six (6) exploratory test hole excavations (Figure No's. A-4 through A-6). The exploratory test holes were excavated with tracked excavation equipment to depths ranging from about five (5.0) to six (6.0) feet beneath existing site grades at the approximate locations as shown on the Site Exploration Map, Figure No. 2.

5. Laboratory testing to evaluate and identify pertinent physical and engineering properties of the subsurface soils encountered relative to the planned site development and construction at the site. The laboratory testing program included tests to help evaluate the natural (field) moisture content and dry density, maximum dry density and optimum moisture content, gradational characteristics and Atterberg Limits as well as direct shear strength and "R"-value tests (Figure No's. A-7 through A-11).

6. A literature review and engineering evaluation and assessment of the regional seismicity to evaluate the potential ground motion hazard(s) at the subject site. The evaluation and assessment included a review of the regional earthquake history and sources such as potential seismic sources, maximum credible earthquakes, and reoccurrence intervals as well as a discussion of the possible ground response to the selected design earthquake(s), fault rupture, landsliding, liquefaction, and tsunami and seiche flooding.

7. Engineering analyses utilizing the field and laboratory data as a basis for furnishing recommendations for foundation support of the proposed new single-family residential structures. Recommendations include maximum design allowable contact bearing pressure(s), depth of footing embedment, estimates of foundation settlement, lateral soil resistance, and foundation subgrade preparation as well as recommended foundation setbacks from slopes. Additionally, construction and/or permanent subsurface water drainage considerations have also been prepared. Further, our report includes recommendations regarding site preparation, placement and compaction of structural fill materials, suitability of the on-site soils for use as structural fill, criteria for import fill materials, and preparation of foundation, pavement and floor slab subgrades.

SITE CONDITIONS

Site Geology

Available geologic mapping of the area and/or subject site (Geologic Map of the Camas Quadrangle) indicates that the subsurface soils consist of Loess (Qlo) of Pleistocene age. Characteristics include massive unconsolidated deposits of light-gray to buff, micaceous, quartzofeldspathic eolian silt and fine sand; commonly contains isolated granules and small pebbles; generally capped with strongly developed red soils. Forms widespread mantle on uplands of map area but mapped only where thick (about 3 to 25 m) and extensive enough to obscure underlying units. Overlies basaltic andesite of Prune Hill but probably deposited during several episodes throughout late Quaternary time.

There are no known faults located directly beneath the subject property. The closest known fault is the Prune Hill Fault which is located approximately 0.8 miles to the north/northwest of the subject property. The potential activity of the Prune Hill Fault is unknown but is considered to be active.

Surface Conditions

The subject proposed new Hancock Springs single-family residential development property is located to the south of NW 18th Avenue and west of NW Cascade Street in Camas (Clark County), Washington.

At the time of our study, the northwesterly and southeasterly portions of the subject proposed Hancock Springs residential development site was generally improved and contained existing single-family residential structures. Surface vegetation across the site generally consists of a light to moderate growth of grass, weeds and brush as well as several small to large sized trees.

Topographically, the subject property is best characterized as relatively flat-lying to gently sloping terrain descending downward generally towards the south/southwest. Overall topographic relief across the entire site is estimated at about twenty-six (26) feet and ranges from a low about Elevation 730 feet near the southwesterly corner of the site to a high of about Elevation 756 feet near the northerly portion the subject site.

Subsurface Soil Conditions

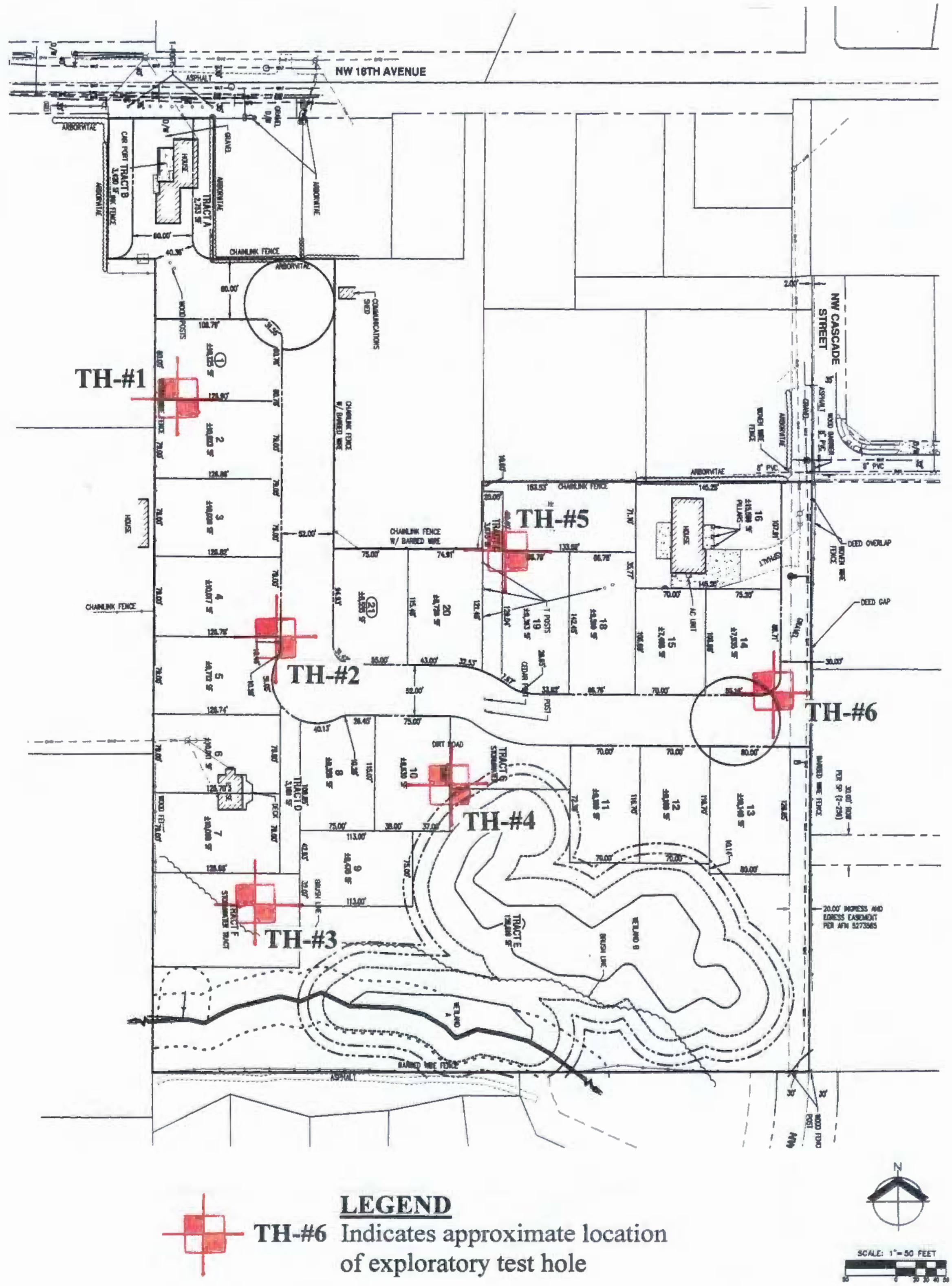
Our understanding of the subsurface soil conditions underlying the site was developed by means of a review of six (6) test hole explorations excavated to depths ranging from about five (5) to six (6) feet beneath existing site grades on August 15, 2018 with tracked excavating equipment. The location of the exploratory test holes were located in the field by marking off distances from existing and/or known site (land) features and are shown in relation to the proposed new residential home sites and/or site improvements on the Site Exploration Map, Figure No. 2. Detailed logs of the test hole explorations, presenting conditions encountered at each location explored, are presented in Appendix A, Figure No's. A-4 through A-6.

The exploratory test pit excavations were observed by staff from Redmond Geotechnical Services, LLC who logged each of the test pit explorations and obtained representative samples of the subsurface soils encountered across the site. Additionally, the elevation of the exploratory test pit excavations were referenced from the proposed Site Development Plan prepared by PLS Engineering and should be considered as approximate. All subsurface soils encountered at the site and/or within the exploratory test pit excavations were logged and classified in general conformance with the Unified Soil Classification System (USCS) which is outlined on Figure No. A-3.

The test pit explorations performed across the subject property revealed that the subject site is underlain by native soil deposits comprised primarily of "Residual" soil deposits of Pleistocene age. Specifically, the subsurface soils underlying the site consist of a surficial layer of topsoil materials comprised of dark brown, damp to moist, soft to very soft, organic to highly organic, sandy, clayey silt which extends to depth of approximately 10 to 12 inches beneath existing site grades. These topsoil materials were inturn underlain by residual soils comprised of medium to olive-brown with gray mottling, moist to very moist, medium stiff to stiff, clayey, sandy silt to the maximum depth explored of about six (6) feet beneath the existing surface grades. These underlying clayey, sandy silt subgrade soils are best characterized by relatively moderate strength and low compressibility.

Groundwater

Groundwater was not encountered within any of the exploratory test hole explorations performed across the subject property at the time of our field work to depths of up to six (6) feet beneath the existing site and/or surface grades. However, groundwater elevations at and/or across the site are expected to fluctuate seasonally in accordance with rainfall conditions and/or site utilization and may approach to near surface elevations during periods of heavy and/or prolonged rainfall.



SITE EXPLORATION PLAN

Project No. 1708.001.G	HANCOCK SPRINGS SUBDIVISION NW 18TH AVENUE	Figure No. 2

INFILTRATION TESTING

We performed one (1) field infiltration test at the site on August 15, 2018. The infiltration test was performed in test hole TH-#3 at a depth of five (5) feet beneath existing site grades. The subgrade soils encountered in test hole TH-#3 consisted of stiff, clayey, sandy silt. The field infiltration testing was performed in general conformance with current EPA and/or the Clark County Encased (Single-Sleeve) Falling Head Test Method which consisted of advancing a 6-inch inner diameter PVC pipe approximately 6 inches into the exposed soil horizon at the test location. Using a steady water flow, water was discharged into the pipe and allowed to penetrate and saturate the subgrade soils. The water level was adjusted over a two (2) hour period and allowed to achieve a saturated subgrade soil condition consistent with the bottom elevation of the surrounding test pit excavation. Following the required saturation period, water was again added into the pipe and the time and/or rate at which the water level dropped was monitored and recorded. Each measurable drop in the water level was recorded until a consistent infiltration rate was observed and/or repeated.

Based on the results of the field infiltration testing, we have found that the native clayey, sandy silt subgrade soil deposits posses an ultimate infiltration rate of less than 0.1 inches per hour (in/hr).

LABORATORY TESTING

Representative samples of the on-site subsurface soils were collected at selected depths and intervals from various test hole excavations and returned to our laboratory for further examination and testing and/or to aid in the classification of the subsurface soils as well as to help evaluate and identify their engineering strength and compressibility characteristics. The laboratory testing consisted of visual and textural sample inspection, moisture content and dry density determinations, maximum dry density and optimum moisture content, gradation analyses and Atterberg Limits as well as direct shear strength and "R"-value tests. Results of the various laboratory tests are presented in Appendix A, Figure No's. A- 7 through A-11.

SEISMICITY AND EARTHQUAKE SOURCES

The seismicity of the southwest Washington and northwest Oregon area, and hence the potential for ground shaking, is controlled by three (3) separate fault mechanisms. These include the Cascadia Subduction Zone (CSZ), the mid-depth intraplate zone, and the relatively shallow crustal zone. Descriptions of these potential earthquake sources are presented below.

The CSZ is located offshore and extends from northern California to British Columbia. Within this zone, the oceanic Juan de Fuca Plate is being subducted beneath the continental North American Plate to the east. The interface between these two (2) plates is located at a depth of approximately 15 to 20 kilometers (km). The seismicity of the CSZ is subject to several uncertainties, including the maximum earthquake magnitude and the recurrence intervals associated with various magnitude earthquakes. Anecdotal evidence of previous CSZ earthquakes has been observed within coastal marshes along the Washington and Oregon coastlines.

Sequences of interlayered peat and sands have been interpreted to be the result of large Subduction Zone earthquakes occurring at intervals on the order of 300 to 500 years, with the most recent event taking place approximately 300 years ago. A recent study by Geomatrix (1995) suggests that the maximum earthquake associated with the CSZ is moment magnitude (Mw) 8 to 9. This is based on an empirical expression relating moment magnitude to the area of fault rupture derived from earthquakes that have occurred within subduction zones in other parts of the world. An Mw 9 earthquake would involve a rupture of the entire CSZ. As discussed by Geomatrix (1995) this has not occurred in other subduction zones that have exhibited much higher levels of historical seismicity than the CSZ, and is considered unlikely. For the purpose of this study an earthquake of Mw 8.5 was assumed to occur within the CSZ.

The intraplate zone encompasses the portion of the subducting Juan de Fuca Plate located at a depth of approximately 30 to 50 km below western Washington and western Oregon. Very low levels of seismicity have been observed within the intraplate zone in western Oregon and western Washington. However, much higher levels of seismicity within this zone have been recorded in Washington and California. Several reasons for this seismic quiescence were suggested in the Geomatrix (1995) study and include changes in the direction of subduction between Oregon, Washington, and British Columbia as well as the effects of volcanic activity along the Cascade Range. Historical activity associated with the intraplate zone includes the 1949 Olympia magnitude 7.1 and the 1965 Puget Sound magnitude 6.5 earthquakes. Based on the data presented within the Geomatrix (1995) report, an earthquake of magnitude 7.25 has been chosen to represent the seismic potential of the intraplate zone.

The third source of seismicity that can result in ground shaking within the Oregon and southwest Washington area is near-surface crustal earthquakes occurring within the North American Plate. The historical seismicity of crustal earthquakes in this area is higher than the seismicity associated with the CSZ and the intraplate zone. The 1993 Scotts Mills (magnitude 5.6) and Klamath Falls (magnitude 6.0), Oregon earthquakes were crustal earthquakes.

Liquefaction

Seismic induced soil liquefaction is a phenomenon in which loose, granular soils and some silty soils, located below the water table, develop high pore water pressures and lose strength due to ground vibrations induced by earthquakes. Soil liquefaction can result in lateral flow of material into river channels, ground settlements and increased lateral and uplift pressures on underground structures. Buildings supported on soils that have liquefied often settle and tilt and may displace laterally. Soils located above the ground water table cannot liquefy, but granular soils located above the water table may settle during the earthquake shaking.

Our review of the subsurface soil test pit logs from our exploratory field explorations (TH-#1 through TH-#6) and laboratory test results indicate that the site is generally underlain by medium stiff to stiff, clayey, sandy silt soil deposits to depths of at least 6.0 feet beneath existing site grades.

As such, due to the medium stiff to stiff nature of the underlying clayey, sandy silt subgrade soils across the site as well as the cohesive characteristics of the clayey silt subgrade soil deposits beneath the site, it is our opinion that the native subgrade soil deposits have a low potential for liquefaction during the design earthquake motions previously described.

Landslides

No ancient and/or active landslides were observed or are known to be present on the subject site. Additionally, a review of the State of Washington and/or Clark County Landslide Hazards Maps have found no mapped landslides at and/or near to the subject site. Further, due to the relatively gently sloping nature of the subject property, the risk of seismic induced slope instability at the site resulting in landslides and/or lateral earth movements appear to present only a low potential geologic hazard.

Surface Rupture

Although the site is generally located within a region of the country known for seismic activity, no known faults exist directly beneath the subject site. However, the Prune Hill Fault is located approximately 0.8 miles to the north/northwest of the subject property. As such, the risk of surface rupture due to faulting should be considered.

Tsunami and Seiche

A tsunami, or seismic sea wave, is produced when a major fault under the ocean floor moves vertically and shifts the water column above it. A seiche is a periodic oscillation of a body of water resulting in changing water levels, sometimes caused by an earthquake. Tsunami and seiche are not considered a potential hazard at this site because the proposed residential development property is not located near to any large bodies of water.

Flooding and Erosion

Stream flooding is a potential hazard that should be considered in lowland areas of Clark County and Camas. The FEMA (Federal Emergency Management Agency) flood maps should be reviewed as part of the design for the proposed new single-family residential structures and site improvements. Elevations of structures on the site should be designed based upon consultants reports, FEMA (Federal Emergency Management Agency), and Clark County requirements for the 100-year flood levels of any nearby creeks and/or streams.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the results of our field explorations, laboratory testing, and engineering analysis, it is our opinion that the site is presently stable and generally suitable for the proposed new Hancock Springs single-family residential development and its/their associated site improvements described herein provided that the recommendations contained within this report are properly incorporated into the design and construction of the project.

The primary features of concern at the site and/or for the project are 1) the presence of existing gently sloping site grades across the subject site and 2) the moisture sensitivity of the near surface and/or native clayey, sandy silt subgrade soil deposits beneath the site.

In regard to the presence of gently sloping site grades across the subject property, we are generally of the opinion that these slopes are presently stable. Additionally, we are of the opinion that site grading to bring the subject property to final design grades should generally not result in a negative impact to the existing slopes provided that permanent cuts and/or fills for the project generally do not exceed about eight (8) feet in height and are constructed no steeper than 2H:1V. However, we anticipate that some site grading and earthwork (cuts and fills) of the subject property will be required in order to construct the new buildings and/or bring the proposed new site improvements to finish grade. As such, where existing slope gradients are greater than about 20 percent (5H to 1V), we are of the opinion that some re-grading and/or structural fill placement may be performed provided that the structural fills are properly benched and keyed into the existing slope.

With regard to the moisture sensitivity of the native (on-site) clayey, sandy silt soil deposits beneath the site, based on our current understand that site grading and fill placement will likely be required for the project, we are generally of the opinion that all site grading and earthwork operations be performed during the drier summer months which is typically June through September.

The following sections of this report provide specific recommendations regarding subgrade preparation and grading as well as foundation, floor slab and pavement design and construction for the new Hancock Springs residential development project.

Site Preparation

As an initial step in site preparation, we recommend that the proposed new Hancock Springs residential development property and its associated structural and/or site improvement area(s) be stripped and cleared of all existing improvements, any existing undocumented fill materials, surface debris, existing vegetation, topsoil materials, and/or any other deleterious materials present at the time of construction. In general, we envision that the site stripping to remove existing vegetation and topsoil materials will generally be about 10 to 12 inches. However, localized areas requiring deeper removals, such as any old tree stump remnants or undocumented fills, may be encountered and should be evaluated at the time of construction by the Geotechnical Engineer.

The stripped and cleared materials should be properly disposed of as they are generally considered unsuitable for use/reuse as fill materials.

Following the completion of the site stripping and clearing work and prior to the placement of any required structural fill materials and/or structural improvements, the exposed subgrade soils within the planned structural improvement area(s) should be inspected and approved by the Geotechnical Engineer and possibly proof-rolled with a half and/or fully loaded dump truck. Areas found to be soft or otherwise unsuitable should be over-excavated and removed or scarified and recompacted as structural fill. During wet and/or inclement weather conditions, proof rolling and/or scarification and recompaction as noted above may not be appropriate.

The on-site native clayey, sandy silt subgrade soil materials are generally considered suitable for use/reuse as structural fill materials provided that they are free of organic materials, debris, and rock fragments in excess of about 6 inches in dimension. However, if site grading is performed during wet or inclement weather conditions, the use of the on-site native subgrade soil materials which contain significant silt and clay sized particles will be difficult at best. In this regard, during wet or inclement weather conditions, we recommend that an import structural fill material be utilized which should consist of a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines. Representative samples of the materials which are to be used as structural fill materials should be submitted to the Geotechnical Engineer and/or laboratory for approval and determination of the maximum dry density and optimum moisture content for compaction.

In general, all site earthwork and grading activities should be scheduled for the drier summer months (June through September) if possible. However, if wet weather site preparation and grading is required, it is generally recommended that the stripping of topsoil materials be accomplished with a tracked excavator utilizing a large smooth-toothed bucket working from areas yet to be excavated. Additionally, the loading of strippings into trucks and/or protection of moisture sensitive subgrade soils will also be required during wet weather grading and construction. In this regard, we recommend that areas in which construction equipment will be traveling be protected by covering the exposed subgrade soils with a geotextile fabric such as Mirafi FW404 followed by at least 12 inches or more of crushed aggregate base rock. Further, the geotextile fabric should have a minimum Mullen burst strength of at least 250 pounds per square inch for puncture resistance and an apparent opening size (AOS) between the U.S. Standard No. 70 and No. 100 sieves.

All structural fill materials placed within the new building(s) and/or structural improvement areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Structural fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches. Additionally, all fill materials placed within five (5) lineal feet of the perimeter (limits) of the proposed residential structures and/or pavements should be considered structural fill.

Further, all structural fill materials placed on sloping ground which exceeds an existing slope gradient of about 20 percent (5H to 1V) should be properly benched and keyed into the native slope (see Typical Fill Slope Detail, Figure No. 3). All aspects of the site grading should be monitored and approved by a representative of Redmond Geotechnical Services, LLC.

Foundation Support

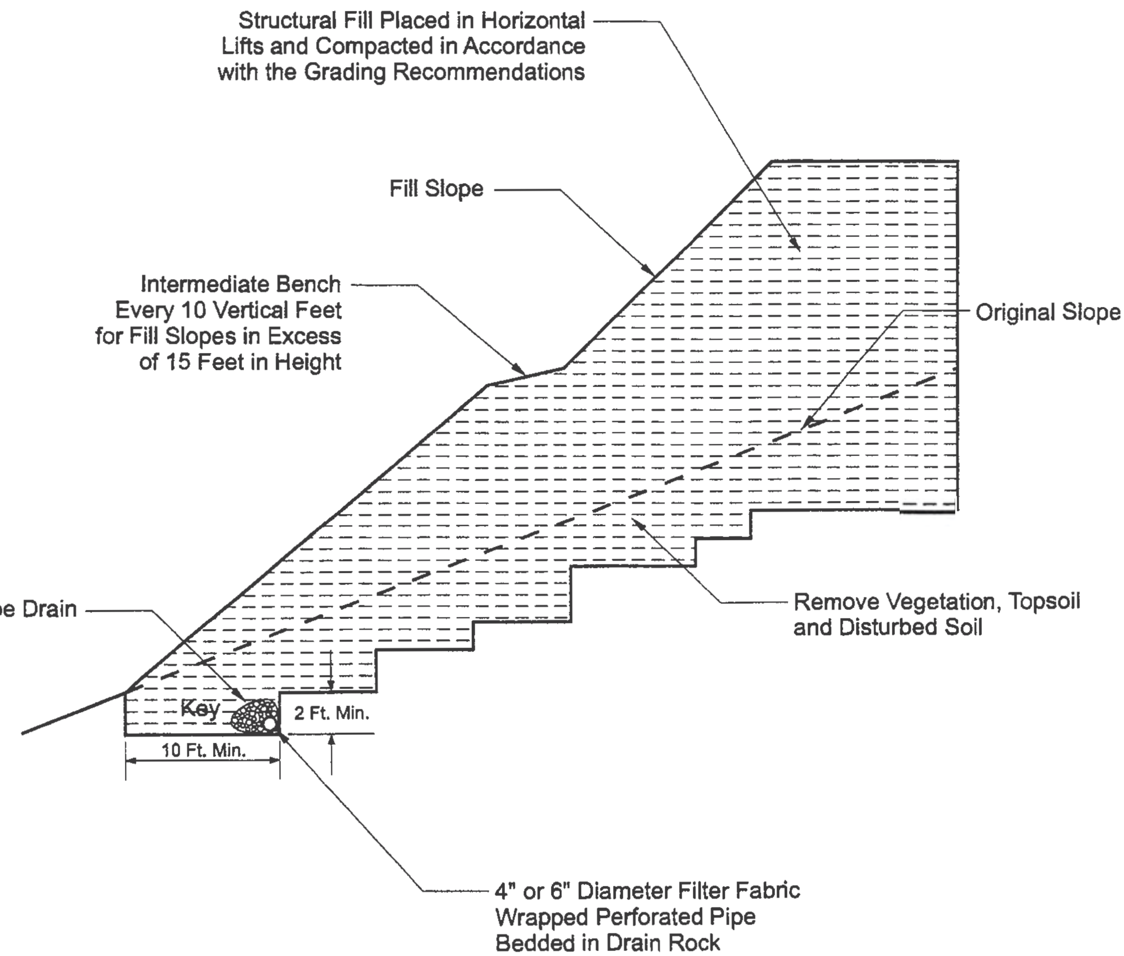
Based on the results of our investigation, it is our opinion that the site of the proposed new Hancock Springs residential development site is suitable for support of the two- and/or three-story wood-frame single-family residential structures provided that the following foundation design recommendations are followed. The following sections of this report present specific foundation design and construction recommendations for the planned new residential structures.

Shallow Foundations

In general, conventional shallow continuous (strip) footings and individual (spread) column footings may be supported by approved native (untreated) medium stiff, clayey, sandy silt subgrade soils and/or structural fill soil materials based on an allowable contact bearing pressure of about 2,000 pounds per square foot (psf). However, where higher allowable contact bearing pressures are desired and/or required, an allowable contact bearing pressure of up to 2,500 psf may be used for design where foundations are supported by a minimum of 6 inches of compacted crushed aggregate base rock (granular) structural fill material. These recommended allowable contact bearing pressures are intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads. In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (where required) should be embedded at least 18 inches below grade and have a minimum width of at least 24 inches. Additionally, foundations should be constructed no closer than about eight (8) feet from the top of existing and/or permanent 2H to 1V cut and/or fill slopes.

Total and differential settlements of foundations constructed as recommended above and supported by approved native subgrade soils or by properly compacted structural fill materials are expected to be well within the tolerable limits for this type of wood-frame residential structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footing element and the supporting subgrade bearing soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.30 and 0.45 for native clayey, sandy silt subgrade soils and/or import gravel fill materials, respectively. In addition, lateral loads may be resisted by passive earth pressures on footings poured "neat" against in-situ (native) subgrade soils or properly backfilled with structural fill materials based on an equivalent fluid density of 250 pounds per cubic foot (pcf). This recommended value includes a factor of safety of approximately 1.5 which is appropriate due to the amount of movement required to develop full passive resistance.



TYPICAL FILL SLOPE DETAIL

Project No. 1708.001.G	HANCOCK SPRINGS SUBDIVISION NW 18TH AVENUE	Figure No. 3

Floor Slab Support

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slab area be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should help provide a capillary break to prevent migration of moisture through the slab. Additional moisture protection, where needed, can be provided by using a 10-mil polyolefin geo-membrane sheeting such as Stego Wrap.

The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where floor slab subgrade materials are undisturbed, firm and stable and where the underslab aggregate base rock section has been prepared and compacted as recommended above, we recommend that a modulus of subgrade reaction of 150 pci be used for design.

Retaining/Below Grade Walls

Retaining and/or below grade walls should be designed to resist lateral earth pressures imposed by native soils or granular backfill materials as well as any adjacent surcharge loads. For walls which are unrestrained at the top and free to rotate about their base, we recommend that active earth pressures be computed on the basis of the following equivalent fluid densities:

Non-Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	35	30
3H:1V	60	50
2H:1V	80	70

For walls which are fully restrained at the top and prevented from rotation about their base, we recommend that at-rest earth pressures be computed on the basis of the following equivalent fluid densities:

Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	45	35
3H:1V	70	60
2H:1V	90	80

The above recommended values assume that the walls will be adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or if adjacent surcharge loading is present, the above recommended values will be significantly higher.

Backfill materials behind walls should be compacted to 90 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Special care should be taken to avoid over-compaction near the walls which could result in higher lateral earth pressures than those indicated herein. In areas within three (3) to five (5) feet behind walls, we recommend the use of hand-operated compaction equipment.

Asphalt Pavements

Flexible pavement design for the project was determined on the basis of projected (anticipated) traffic volume and loading conditions relative to laboratory subgrade soil strength ("R"-value) characteristics. Based on a laboratory subgrade "R"-value of 28 (Resilient Modulus = 5,000 to 10,000) and utilizing the Asphalt Institute Flexible Pavement Design Procedures and/or the American Association of State Highway and Transportation Officials (AASHTO) 1993 "Design of Pavement Structures" manual, we recommend that the asphaltic concrete pavement section(s) for the new residential development areas at the site consist of the following:

Material Type	Pavement Section (inches)
Asphaltic Concrete	3.5
Aggregate Base Rock	10.0

Note: Where heavy vehicle traffic is anticipated such as those required for fire and/or garbage trucks, we recommend that the automobile drive area pavement section be increased by adding 0.5 inches of asphaltic concrete and 2.0 inches of aggregate base rock. Additionally, the above recommended flexible pavement section(s) assumes a design life of 20 years.

Pavement Subgrade, Base Course & Asphalt Materials

The above recommended flexible pavement section was based on the design assumptions listed herein and on the assumption that construction of the new paved parking and/or drive areas will be completed during an extended period of reasonably dry weather. However, if construction of the paved areas is performed during wet and/or inclement weather conditions, we recommend that the aggregate base rock section be increased by at least 4 inches. Additionally, we recommend that the aggregate base rock materials be placed directly over an approved Geotextile Fabric such as Mirafi RS 2801/15/300 or an approved equivalent.

All thicknesses given are intended to be the minimum acceptable. Increased base rock sections and the use of a geotextile fabric may be required during wet and/or inclement weather conditions and/or in order to adequately support construction traffic and protect the subgrade during construction. Additionally, the above recommended pavement section assumes that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Further, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course.

Pavement base course materials should consist of well-graded 1-1/4 inch and/or 5/8-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete paving materials should conform to the requirements set forth in the latest edition of the Washington Department of Transportation, Standard Specifications for Highway Construction and/or the City of Camas Public Works Standards. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete paving materials should be compacted to at least 92 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

Excavation/Slopes

Temporary excavations of up to about four (4) feet in depth may be constructed with near vertical inclinations. Temporary excavations greater than about four (4) feet but less than eight (8) feet should be excavated with inclinations of at least 1 to 1 (horizontal to vertical) or properly braced/shored. Where excavations are planned to exceed about eight (8) feet, this office should be consulted. All shoring systems and/or temporary excavation bracing for the project should be the responsibility of the excavation and/or grading contractor.

Permanent cut and/or fill slopes should be constructed no steeper than about 2H to 1V.

Depending on the time of year in which trench excavations occur, trench dewatering may be required in order to maintain dry working conditions if the invert elevations of the proposed utilities are located at and/or below the groundwater level. If groundwater is encountered during utility excavation work, we recommend placing trench stabilization materials along the base of the excavation. Trench stabilization materials should consist of 1-foot of well-graded gravel, crushed gravel, or crushed rock with a maximum particle size of 4 inches and less than 5 percent fines passing the No. 200 sieve. The material should be free of organic matter and other deleterious material and placed in a single lift and compacted until well keyed.

Surface Drainage/Groundwater

We recommend that positive measures be taken to properly finish grade the site so that drainage waters from the residential structures and landscaping areas as well as adjacent properties or buildings are directed away from the new residential structures foundations and/or any retaining walls. All roof drainage should be directed into conduits that carry runoff water away from the residential structures to a suitable outfall. Roof downspouts should not be connected to foundation drains. A minimum ground slope of about 2 percent is generally recommended in unpaved areas around the residential structures.

Groundwater was not encountered within any of the exploratory test hole excavations performed across the site at the time of our field work to depths of up to six (6) feet. However, groundwater elevations in the area may fluctuate seasonally and are expected to temporarily pond/perch near the ground surface during periods of prolonged rainfall.

In this regard, based on our current understanding and/or anticipation of the site grading required to bring the subject site to finish design grades, we are generally of the opinion that a footing and/or foundation drainage system should be utilized around the perimeter of the proposed residential structures. Additionally, where concrete slab on-grade floors are utilized with any below grade structures, the use of an underslab drainage system may also be required. Further, a foundation drain is also recommended for any below grade and/or retaining walls. A typical recommended perimeter footing and/or retaining wall foundation drain detail is shown on Figure No. 4.

Design Infiltration Rates

Based on the results of our field infiltration testing, we recommend using the following infiltration rate to design any on-site near surface storm water infiltration and/or disposal systems for the project:

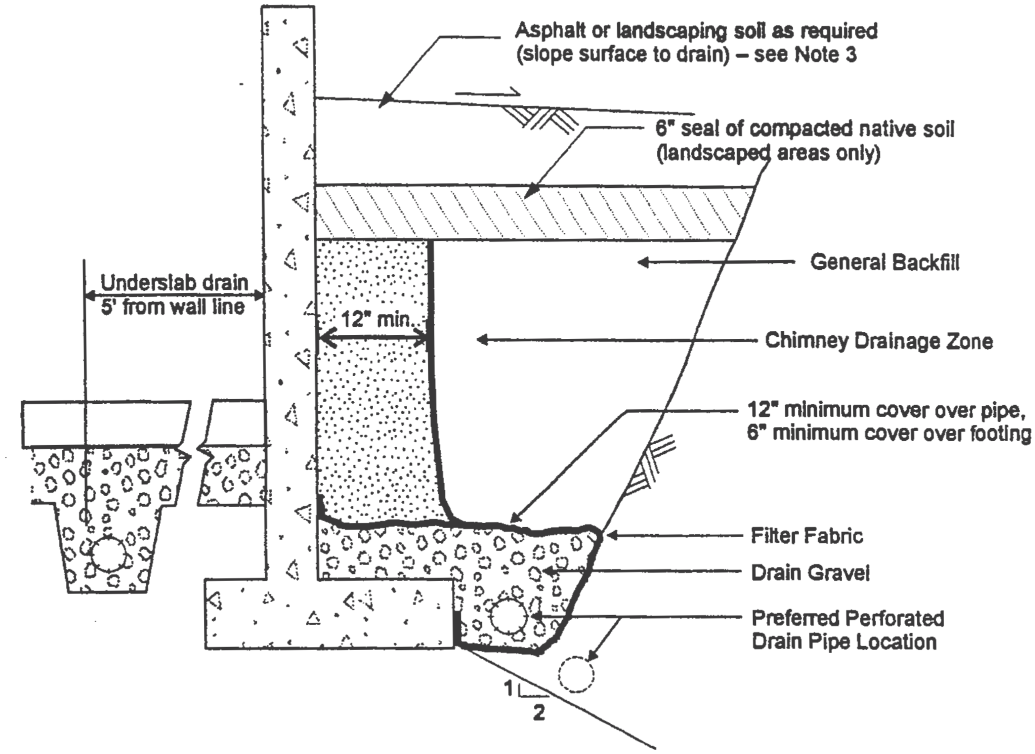
Subgrade Soil Type	Recommended Infiltration Rate
clayey, sandy SILT (ML)	0.05 inches per hour (in/hr)

Note: A safety factor of two (2) was used to calculate the above recommended design infiltration rate. Additionally, given the gradational variability of the on-site clayey, sandy sit subgrade soils beneath the site as well as the anticipation of some site grading for the project, it is generally recommended that field testing be performed during and/or following construction of any on-site storm water infiltration system(s) in order to confirm that the above recommended design infiltration rates are appropriate.

Seismic Design Considerations

Structures at the site should be designed to resist earthquake loading in accordance with the methodology described in the latest edition of the State of Washington Structural Specialty Code (WSSC) and/or Amendments to the 2015 International Building Code (IBC). The maximum considered earthquake ground motion for short period and 1.0 period spectral response may be determined from the Washington Structural Specialty Code and/or Figures 1613 (1) and 1613 (2) of the 2009 National Earthquake Hazard Reduction Program (NEHRP) "Recommended Provisions for Seismic Regulations for New Buildings and Other Structures" published by the Building Seismic Safety Council. We recommend Site Class "D" be used for design per Table 1613.5.2.

Using this information, the structural engineer can select the appropriate site coefficient values (F_a and F_v) from Tables 1613.5.3 (1) and 1613.5.3 (2) of the 2015 IBC to determine the maximum considered earthquake spectral response acceleration for the project.



SCHEMATIC - NOT TO SCALE

NOTES:

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾""-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

PERIMETER FOOTING/RETAINING WALL DRAIN DETAIL		
Project No. 1708.001.G	HANCOCK SPRINGS SUBDIVISION NW 18TH AVENUE	Figure No. 4

However, we have assumed the following response spectrum for the project:

Table 1. IBC Seismic Design Parameters

Site Class	S_S	S_1	Fa	Fv	S_{MS}	S_{M1}	S_{DS}	S_{D1}
D	0.915	0.381	1.134	1.638	1.038	0.624	0.692	0.416

Notes: 1. S_S and S_1 were established based on the USGS 2015 mapped maximum considered earthquake spectral acceleration maps for 2% probability of exceedence in 50 years.

2. Fa and Fv were established based on IBC 2015 tables 1613.5.3 (1) and 1613.5.3 (2) using the selected S_S and S_1 values.

CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond Geotechnical Services, LLC** be retained to provide construction monitoring and testing services during all earthwork operations for the proposed new Hancock Springs residential development. The purpose of our monitoring services would be to confirm that the site conditions reported herein are as anticipated, provide field recommendations as required based on the actual conditions encountered, document the activities of the grading contractor and assess his/her compliance with the project specifications and recommendations. It is important that our representative meet with the contractor prior to grading to help establish a plan that will minimize costly over-excavation and site preparation work. Of primary importance will be observations made during site preparation, cuts and structural fill placement, footing excavations and construction as well as retaining wall backfill and construction of subsurface drains.

CLOSURE AND LIMITATIONS

This report is intended for the exclusive use of the addressee and/or their representative(s) to use to design and construct the proposed new single-family residential structures and their associated site improvements described herein as well as to prepare any related construction documents. The conclusions and recommendations contained in this report are based on site conditions as they presently exist and assume that the explorations are representative of the subsurface conditions between the explorations and/or across the study area. The data, analyses, and recommendations herein may not be appropriate for other structures and/or purposes. We recommend that parties contemplating other structures and/or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report. Additionally, the above recommendations are contingent on Redmond Geotechnical Services, LLC being retained to provide all site inspections and construction monitoring services for this project. Redmond Geotechnical Services, LLC will not assume any responsibility and/or liability for any engineering judgment, inspection and/or testing services performed by others.

It is the owners/developers responsibility for insuring that the project designers and/or contractors involved with this project implement our recommendations into the final design plans, specifications and/or construction activities for the project. Further, in order to avoid delays during construction, we recommend that the final design plans and specifications for the project be reviewed by our office to evaluate as to whether our recommendations have been properly interpreted and incorporated into the project.

If during any future site grading and construction, subsurface conditions different from those encountered in the explorations are observed or appear to be present beneath excavations, we should be advised immediately so that we may review these conditions and evaluate whether modifications of the design criteria are required. We also should be advised if significant modifications of the proposed site development are anticipated so that we may review our conclusions and recommendations.

LEVEL OF CARE

The services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty or other conditions, either expressed or implied, is made.

ADDITIONAL SERVICES

We recommend that we review the proposed site grading plan(s) for the project in order to evaluate as to whether our recommendations have been properly incorporated into the design of the project as well as to assess whether the proposed site grading will adversely affect the stability of the subject property.

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APPENDIX A

TEST PIT LOGS & LABORATORY TEST RESULTS

APPENDIX

FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATION

Subsurface conditions at the site were explored by excavating six (6) exploratory test holes on August 15, 2018. The approximate location of the test hole explorations are shown in relation to the proposed new residential home sites and their associated site improvements on the Site Exploration Map, Figure No. 2.

The test holes were excavated using tracked excavating equipment in general conformance with ASTM Methods in Vol. 4.08, D-1586-94 and D-1587-83. The test holes were excavated to depths ranging from about 5.0 to 6.0 feet beneath existing site grades. Detailed logs of the exploratory test holes are presented on the Log of Test Pits, Figure No's. A-4 through A-6. The soils were classified in accordance with the Unified Soil Classification System (USCS), which is outlined on Figure No. A-3.

The exploration program was coordinated by a field engineer who monitored the excavating and exploration activity, obtained representative samples of the subsurface soils encountered, classified the soils by visual and textural examination, and maintained continuous logs of the subsurface conditions. Disturbed and/or undisturbed samples of the subsurface soils were obtained at appropriate depths and/or intervals and placed in plastic bags and/or with a thin walled ring sample.

Groundwater and/or seepage was not encountered within any of the exploratory test holes excavated across the site at the time of excavating to depths of up to six (6) feet beneath the existing surface grades.

LABORATORY TESTING

Pertinent physical and engineering characteristics of the soils encountered during our subsurface investigation were evaluated by a laboratory testing program to be used as a basis for selection of soil design parameters and for correlation purposes. Selected tests were conducted on representative soil samples. The program consisted of tests to evaluate the existing (in-situ) moisture-density, maximum dry density and optimum moisture content, gradational characteristics and Atterberg Limits as well as direct shear strength and "R"-value tests.

Dry Density and Moisture Content Determinations

Density and moisture content determinations were performed on both disturbed and relatively undisturbed samples from the test hole explorations in general conformance with ASTM Vol. 4.08 Part D-216. The results of these tests were used to calculate existing overburden pressures and to correlate strength and compressibility characteristics of the soils. Test results are shown on the test pit logs at the appropriate sample depths.

Maximum Dry Density

One (1) Maximum Dry Density and Optimum Moisture Content test was performed on a representative sample of the on-site clayey, sandy silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-1557. The tests were conducted to help establish various engineering properties for use as structural fill. The test results are presented on Figure No. A-9.

Atterberg Limits

Liquid Limit (LL) and Plastic Limit (PL) tests were performed on a representative sample of the clayey, sandy silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-4318-85. These tests were conducted to facilitate classification of the soils and for correlation purposes. Test results appear on Figure No. A-8.

Gradation Analysis

Gradation analyses were performed on a representative sample of the subsurface clayey, sandy silt soils in accordance with ASTM Vol. 4.08 Part D-422. The test results were used to classify the soil in accordance with the Unified Soil Classification System (USCS). The test results are shown graphically on Figure No. A-9.

Direct Shear Strength Test

One (1) Direct Shear Strength tests were performed on undisturbed and/or remolded sample at a continuous rate of shearing deflection (0.02 inches per minute) in accordance with ASTM Vol. 4.08 Part D-3080-79. The test results were used to determine engineering strength properties and are shown graphically on Figure No. A-10.

R-Value Test

One (1) "R"-value test was performed on a representative sample of the near surface subgrade soils in accordance with ASTM Vol. 4.08 Part D-2844. The test results were used to help evaluate the subgrade soils supporting and performance capabilities when subjected to traffic loading. The test results are shown graphically on Figure No. A-11.

The following figures are attached and complete the Appendix:

Figure No. A-3	Key To Exploratory Test Pit Logs
Figure No's. A-4 through A-6	Log of Test Pits
Figure No. A-7	Maximum Dry Density
Figure No. A-8	Atterberg Limits Test Results
Figure No. A-9	Gradation Test Results
Figure No. A-10	Direct Shear Strength Test Results
Figure No. A-11	"R"-value Test Results

PRIMARY DIVISIONS				GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS	MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
				GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
			GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
				GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
		SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
				SP	Poorly graded sands or gravelly sands, little or no fines.
			SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
				SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS	MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
				OL	Organic silts and organic silty clays of low plasticity.
		SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
				CH	Inorganic clays of high plasticity, fat clays.
				OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS				Pt	Peat and other highly organic soils.

DEFINITION OF TERMS

U.S. STANDARD SERIES SIEVE: 200, 40, 10, 4 — CLEAR SQUARE SIEVE OPENINGS: 3/4", 3", 12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

GRAIN SIZES

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT†
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

RELATIVE DENSITY

CLAYS AND PLASTIC SILTS	STRENGTH‡	BLOWS/FOOT†
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

CONSISTENCY

†Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).
‡Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

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KEY TO EXPLORATORY TEST PIT LOGS
Unified Soil Classification System (ASTM D-2487)

HANCOCK SPRINGS SUBDIVISION
Camas, Washington

PROJECT NO.	DATE	Figure A-3
1708.001.G	9/28/18	

BACKHOE COMPANY: Folden Construction BUCKET SIZE: 24 inches DATE: 8/15/18

SOIL DESCRIPTION

TEST PIT NO. TH-#1 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp, soft, organic, sandy, clayey SILT (Topsoil)
	X			18.2	ML	Medium to olive-brown with gray mottling, damp to moist, medium stiff to stiff, clayey, sandy SILT Becomes very moist at 5 feet
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

TEST PIT NO. TH-#2 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp, soft, organic, sandy, clayey SILT (Topsoil)
					ML	Medium to olive-brown with gray mottling, damp to moist, medium stiff to stiff, clayey, sandy SILT Becomes very moist at 5 feet
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1708.001.G HANCOCK SPRINGS SUBDIVISION FIGURE NO. A-4

BACKHOE COMPANY: Folden Construction BUCKET SIZE: 24 inches DATE: 8/15/18

SOIL DESCRIPTION

TEST PIT NO. TH_#3 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp to moist, soft to very soft, organic, sandy, clayey SILT (Topsoil)
	X			22.5	ML	Medium to olive-brown with gray mottling, moist to very moist, medium stiff to stiff, clayey, sandy SILT
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

TEST PIT NO. TH-#4 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp to moist, soft, organic, sandy, clayey SILT (Topsoil)
					ML	Medium to olive-brown with gray mottling, damp to moist, medium stiff to stiff, clayey, sandy SILT Becomes very moist at 5 feet
5						
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1708.001.G HANCOCK SPRINGS SUBDIVISION FIGURE NO. A-5

BACKHOE COMPANY: Folden Construction BUCKET SIZE: 24 inches DATE: 8/15/18

SOIL DESCRIPTION

TEST PIT NO. TH-#5 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp, soft, organic, sandy, clayey SILT (Topsoil)
	X			20.6	ML	Medium to olive-brown with gray mottling, damp to moist, medium stiff to stiff, clayey, sandy SILT Becomes very moist at 5 feet
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

TEST PIT NO. TH-#6 ELEVATION

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, damp to moist, soft, organic, sandy, clayey SILT (Topsoil)
					ML	Medium to olive-brown with gray mottling, damp to moist, medium stiff to stiff, clayey, sandy SILT Becomes very moist at 5 feet
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1708.001.G | HANCOCK SPRINGS SUBDIVISION | FIGURE NO. A-6

MAXIMUM DENSITY TEST RESULTS

SAMPLE LOCATION	SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
TH-#3 @ 3.0'	Medium to olive-brown, clayey, sandy SILT (ML)	110.0	17.0

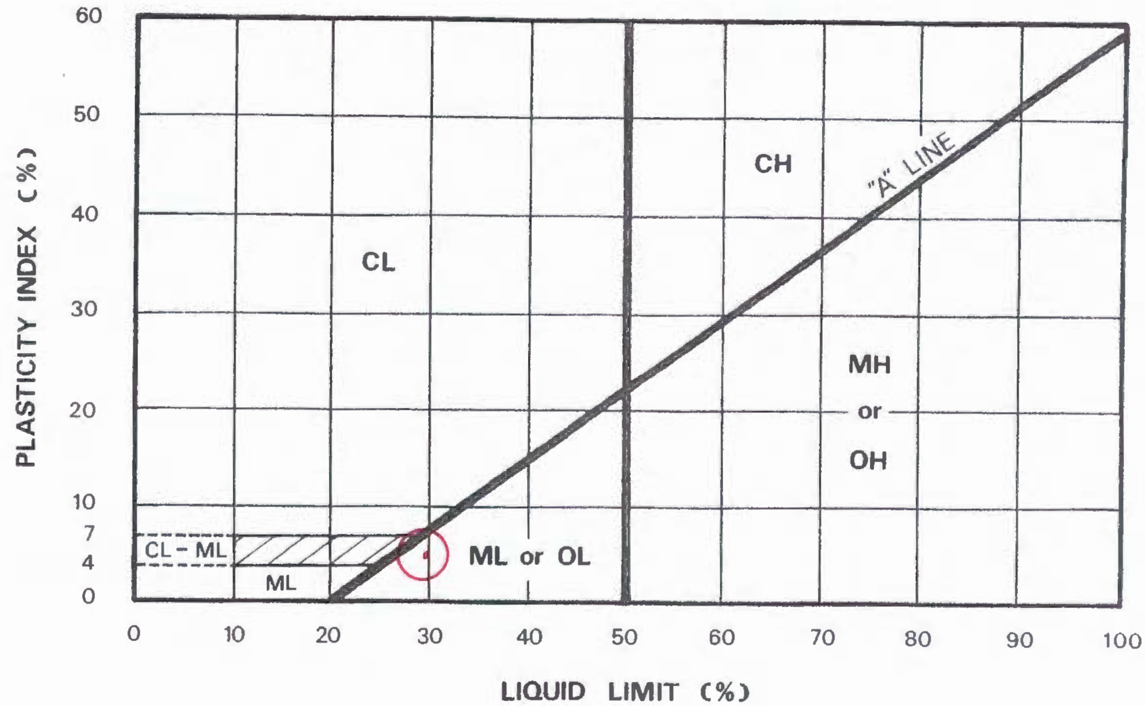
EXPANSION INDEX TEST RESULTS

SAMPLE LOCATION	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (pcf)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (%)	EXPANSION INDEX	EXPANSIVE CLASS.

MAXIMUM DENSITY & EXPANSION INDEX TEST RESULTS

PROJECT NO.: 1708.001.G | HANCOCK SPRINGS SUBDIVISION | FIGURE NO.: A-7

REDMOND GEOTECHNICAL SERVICES



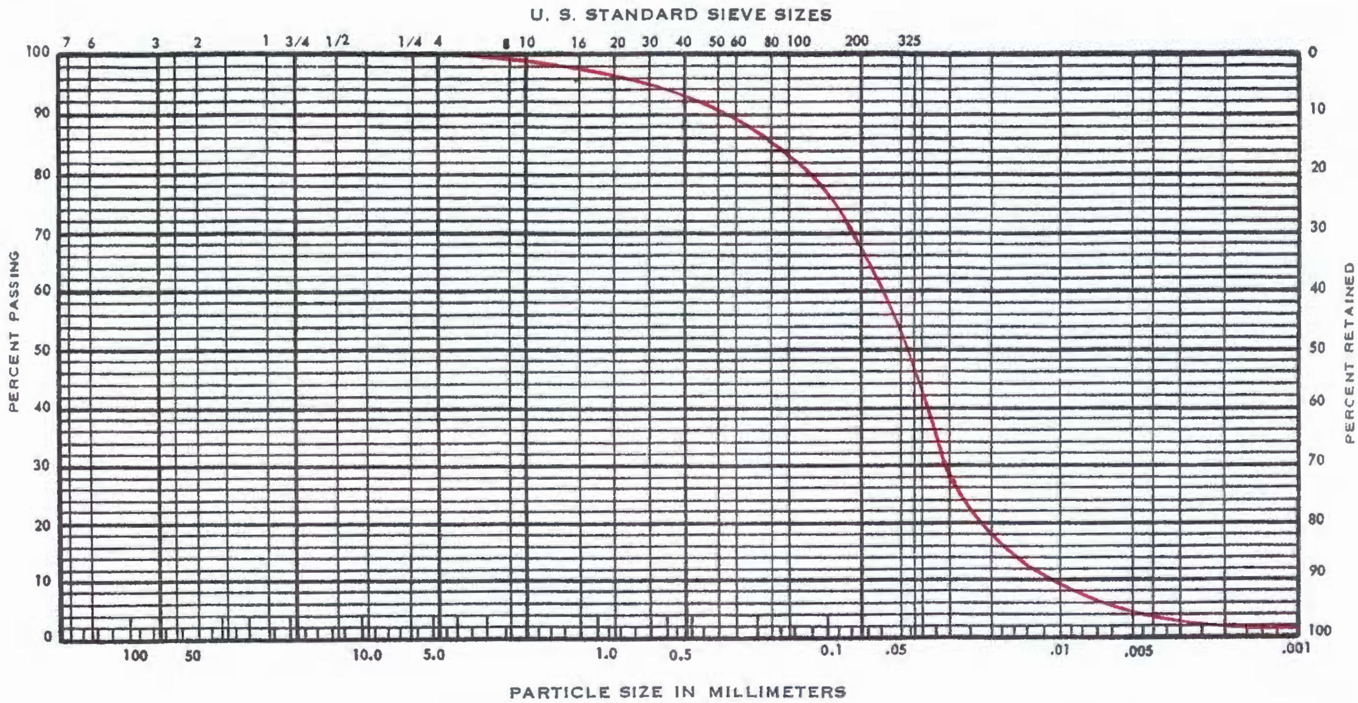
KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
⊙	TH-#3	3.0	22.5	29.8	4.6	67.3		ML

REDMOND GEOTECHNICAL SERVICES
PO Box 20547 • Portland, Oregon 97294

PLASTICITY CHART AND DATA		
HANCOCK SPRINGS SUBDIVISION Camas, Washington		
PROJECT NO.	DATE	Figure A-8
1708.001.G	9/28/18	

UNIFIED SOIL CLASSIFICATION SYSTEM

(ASTM D 422-72)



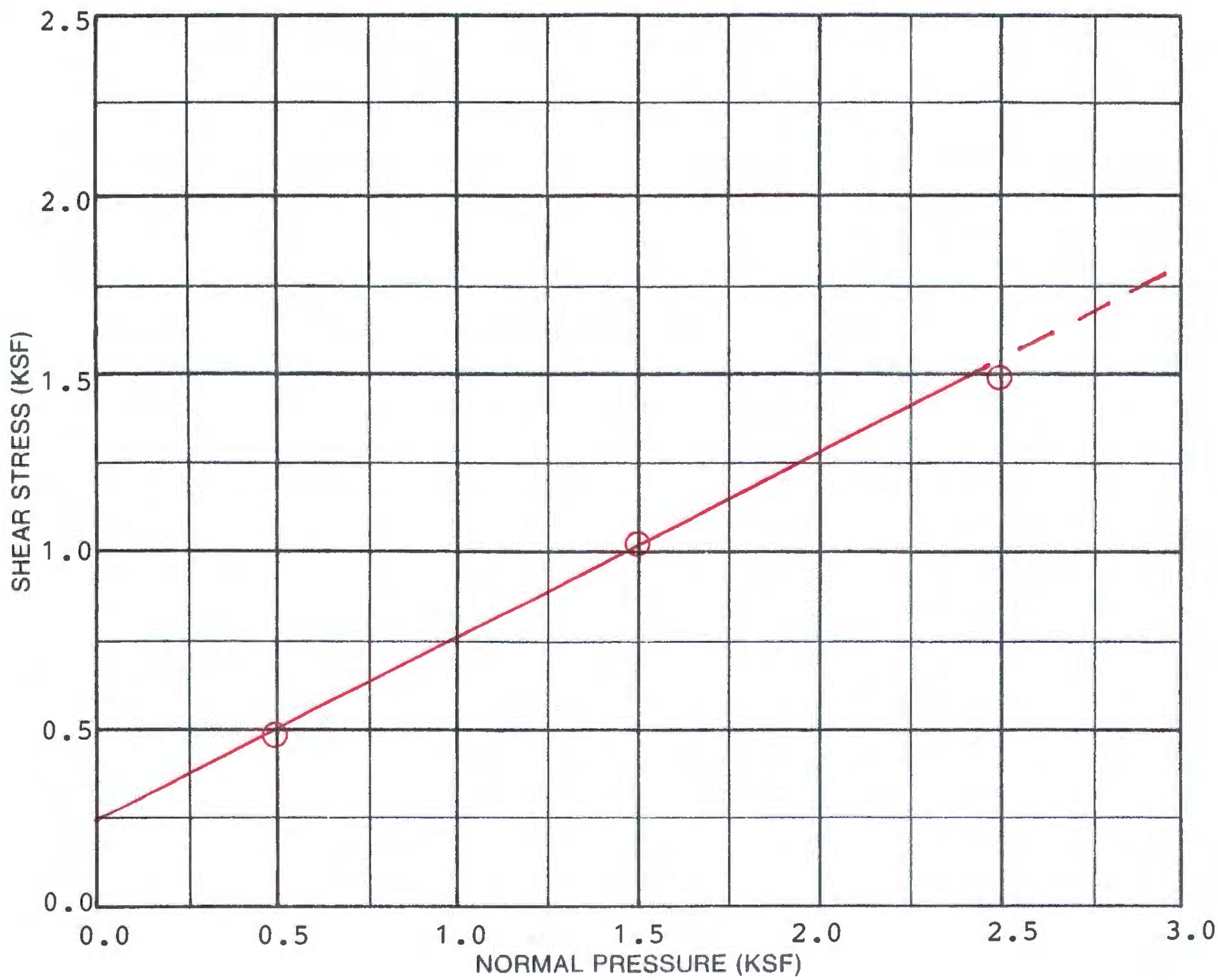
COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	ELEV. (feet)	UNIFIED SOIL CLASSIFICATION SYMBOL	SAMPLE DESCRIPTION
——	TH-#3	3.0		ML	Medium to olive-brown, clayey, sandy SILT

REDMOND GEOTECHNICAL SERVICES

PO Box 20547 • Portland, Oregon 97294

GRADATION TEST DATA		
HANCOCK SPRINGS SUBDIVISION Camas, Washington		
PROJECT NO.	DATE	FIGURE A-9
1708.001.G	9/28/28	



SAMPLE DATA	
DESCRIPTION: Medium to olive-brown, clayey, sandy SILT (ML) (Remolded)	
BORING NO.: TH-#3	
DEPTH (ft.): 3.0	ELEVATION (ft):

TEST RESULTS
APPARENT COHESION (C): 250 psf
APPARENT ANGLE OF INTERNAL FRICTION (φ): 28°

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.5	1.0	1.5	
INITIAL H_2O CONTENT (%)	17.0	17.0	17.0	
FINAL H_2O CONTENT (%)	17.6	13.2	8.9	
INITIAL DRY DENSITY (PCF)	98.0	98.0	98.0	
FINAL DRY DENSITY (PCF)	98.7	102.2	107.7	
STRAIN RATE: 0.02 inches per minute				

REDMOND GEOTECHNICAL SERVICES
PO Box 20547 • Portland, Oregon 97294

DIRECT SHEAR TEST DATA

HANCOCK SPRINGS SUBDIVISION
Camas, Washington

PROJECT NO.	DATE	Figure A-10
1708.001.G	9/28/18	

RESULTS OF R (RESISTANCE) VALUE TESTS

SAMPLE LOCATION: TH-#3

SAMPLE DEPTH: 3.0 feet bgs

Specimen	A	B	C
Exudation Pressure (psi)	219	329	431
Expansion Dial (o.ooo1")	0	1	2
Expansion Pressure (psf)	0	3	8
Moisture Content (%)	17.6	14.4	11.1
Dry Density (pcf)	93.4	98.2	102.6
Resistance Value, "R"	18	29	36
"R"-Value at 300 psi Exudation Pressure = 28			

SAMPLE LOCATION:

SAMPLE DEPTH:

Specimen	A	B	C
Exudation Pressure (psi)			
Expansion Dial (0.0001")			
Expansion Pressure (psf)			
Moisture Content (%)			
Dry Density (pcf)			
Resistance Value "R"			
"R"-Value at 300 psi Exudation Pressure =			

BEND, OR
3052 NW Merchant Way, Suite 100
Bend, OR 97703
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KEIZER, OR
3700 River Road N, Suite 1
Keizer, OR 97303
(503) 400-6028

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

VANCOUVER, WA
9600 NE 126th Avenue, Suite 2520
Vancouver, WA 98682
(360) 882-0419

www.aks-eng.com

Exhibit 10
SUB18-05

Date: 3/26/2019
To: Robert Maul, City of Camas
From: Michael Andreotti, RLA
Project: Hancock Springs Subdivision (SUB18-05)
AKS Job No.: 5638
Site Location: 2926 NW 18th Avenue, Camas, WA 98607

Subject: Early Issues Updates

This memo is to address the changes made to the development plans for the Hancock Springs Subdivision based on comments received from the City of Camas.

1. The ‘T’ intersection of NW Hancock Drive and NW 17th Avenue requires full improvements and a 70-foot centerline radius.
   The ‘T’ intersection was removed, and a 70-foot centerline radius was provided. To minimize impacts to adjacent properties the sidewalk is attached on both sides of NW Hancock drive through the radius. Right-of-way dedication from Parcel 127359-000 is required. Included with this memo is a letter of agreement from the property owner to dedicate this right-of-way, as this property was not part of the original application.

2. NW 17th Avenue will not extend to the east and the intersection at the east end of NW 17th Avenue with NW Hancock Drive requires a 70-foot centerline radius.
   The extension of NW 17th Avenue was removed, and a 70-foot centerline radius is provided. Due to the removal of the two ‘T’ intersections, NW 17th Avenue was removed and the entire road through the development is NW Hancock Drive from NW 18th Avenue to NW Cascade Street.

3. The 90 degree turn to the east on NW Hancock Drive requires a 70-foot centerline radius.
   The turn to the east is designed with a 70-foot centerline radius.

4. Future pedestrian circulation to the west through Tract E is required.
   As stated in Note 3 on sheet P3.0, Tract E will have a public pedestrian easement for future circulation to the west.

5. A temporary turnaround is required at the east end of NW Hancock Drive.
   A temporary hammerhead turnaround at the end of NW Hancock Drive is provided, utilizing NW Cascade Street and the pedestrian/stormwater access along the east side of Tract G. The sidewalk along the west side of NW Cascade Street is attached and reinforced, with a mountable curb to provide a 20-foot wide paved surface along the half street. The access easement along the east side of Tract G has 20 feet of pavement for 100 feet from the centerline of NW Hancock Drive.

6. Access to the stormwater facility in Tract G is required to be paved to a 12-foot width.
   Access to the stormwater facility has a 20-foot paved width to the end of the temporary turnaround, where pavement tapers from 20 feet to 12 feet. The pavement remains 12 feet wide to the south end of Tract H (formerly Tract G).

Exhibit 11
SUB18-05

City of Camas WASHINGTON

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

December 18, 2018

Craig Moody
Northwest Classis Homes, LLC
10100 NE 116th Circle
Vancouver, WA 98662
Sent via email craig.moody@shoot360.com

RE: Hancock Springs Subdivision (SUB18-05)

Dear Craig Moody,

Thank you for your application submittal for the Hancock Springs Subdivision project. There are items that remain to be addressed with your application. The purpose of this letter is to inform you that the above application submitted on November 21, 2018 has been deemed incomplete in accordance with Camas Municipal Code (CMC) Section 18.55.130. You have 180 days from the date of application to submit the missing information pursuant to CMC 18.55.130.C. If the below requested information is submitted, staff will again verify whether the application is complete.

Items necessary for completeness:

1. The applicant must post a development notice sign on the subject property per CMC 18.55.110(H) and provide conformation to the City.
2. An archaeological report has not been submitted to the City nor are there proof of mailing or emailing to the tribes, in accordance with CMC 16.31.160. Only a one page email correspondence was provided, which doesn't comply with this subsection. There are no copies provided or proof of mailing to the tribes.
3. The following information shall be addressed on the site and development plans pursuant to CMC 17.11.030.B.6:
   a. The following standards in CMC Section 17.01.050 shall be included on the preliminary plat map:
      - (B)(3) The plat shall identify potential buildable area, to include identification of required setbacks.
      - (B)(4) A land inventory in accordance with CMC 17.01.050.B.4.
        - (b) Total developed acreage
        - (c)Total lot area

   o. Location of all existing fire hydrants within 500 feet of the proposal

Once the application is deemed complete, the City will begin its review of the project application and provide subsequent comments. If you have any questions, please contact me at (360) 817-7255.

Respectfully,

Robert Maul,
Planning Manager

COMMUNITY DEVELOPMENT DEPARTMENT
616 NE 4th Avenue
Camas, WA 98607
www.ci.camas.wa.us

January 4, 2019

Michael Andreotti
AKS Engineering & Forestry, LLC
9600 NE 126th Ave. Suite 2520
Vancouver, WA 98682
Sent via email andreottim@aks-eng.com

RE: Hancock Springs Subdivision (SUB18-05)

Dear Michael Andreotti,

The purpose of this letter is to inform you that the above application submitted on December 26, 2018 has been deemed complete in accordance with Camas Municipal Code (CMC) Section 18.55.130. Staff will begin reviewing the application and contact you should we have questions/comments.

If you have any questions, please contact me at (360) 817-1568.

Respectfully,

Madeline Sutherland,
Assistant Planner

Cc: Robert Maul, Planning Manager
Anita Ashton, Engineering Project Manager

Exhibit 13
SUB18-05

Michael Andreotti

From: Bill Roulette <bill@aar-crm.com>
Sent: Wednesday, November 21, 2018 8:34 AM
To: kate@yakama.com; cultural.resources@grandronde.org; Jessica A. Curteman (Jessica.Curteman@grandronde.org); NaturalResources@ctuir.org; tearafarrow@ctuir.com; Robert.brunoe@ctwsbnr.org; culture@cowlitz.org; permitreview@cowlitz.org; nreynolds@cowlitz.org; NPTEC@nezperce.org; sspencer@shoalwaterbay-nsn.gov
Cc: Michael Andreotti
Subject: City of Camas archaeologial predetermination survey of the Hancock Springs development area
Attachments: 18-2017 Hancock Springs Subdivision.pdf

All,

At your convenience, please send me an email acknowledging that you have received the report referenced below, which is attached to this email. A simple "yes" should suffice.

The report is a city of Camas archaeological predetermination survey related to a residential subdivision project that is to be called Hancock Springs.

No archaeological resources were identified in the project area. It contains two historic-era homes (one with an associated garage) that have been assessed as not eligible to be listed on the NRHP.

CITY OF CAMAS ARCHAEOLOGICAL PREDETERMINATION SURVEY
Applied Archaeological Research, Inc. Report No. 2017

Parcel Nos.: 127414000, 127377000, 127379000, 127375000, 127371000

Owner: Charles W. Lawrence
Address: 3010 NW 18th Avenue
Camas, WA 98607

Project Contact: Chris Wall
Northwest Classic Homes, LLC
10100 NE 116th Circle
Vancouver, WA 98662

File/Permit Number:

Staff Planner:

Date: March 22, 2018

Location: The project area is located in the northern part of the city of Camas, Washington, approximately 1.5 miles southwest of Lacamas Lake and 0.8 mile north of State Route (SR) 14.

Quadrangle: 1993 Camas, WA-OR, 7.5-minute topographic quadrangle (Figure 1).

Township/Range/Section/Quarter Section: NE ¼ Section 9, Township 1 North, Range 3 East, Willamette Meridian (WM)

Number of Acres: 9.85 acres

Description of Proposed Activity: Parcels 127414000, 127377000, 127379000, 127375000, and 127371000 are proposed to be developed into the Hancock Springs residential subdivision that will include approximately 22 lots of variable size. A proposed 50-foot-wide road that will be named NW Hancock Drive will extend to the south of NW 18th Ave and then east following the current route of an existing gravel driveway and connect the lots to NW 15th Circle (Figure 2).

Reason Archaeological Predetermination is needed: To comply with State Environmental Policy Act as implemented by Camas Municipal Code 16.31.

Field Inspection: *Date of Inspection:* March 2, 2018

Bill R.

Bill Roulette / President / Principal Investigator
Applied Archaeological Research, Inc.
4001 NE Halsey Street, Suite Portland, OR 97232
Phone 503 281 9451 / Email bill@aar-crm.com

Sarah Fox

From: John Meier <John@aks-eng.com>
Sent: Tuesday, November 20, 2018 4:43 PM
To: Robert Maul; Michael Andreotti
Cc: Alex Burzynski; Sarah Fox
Subject: RE: Hancock Springs

Exhibit 14
SUB18-05

Thanks Robert.

John M. Meier, P.E.
Principal

AKS ENGINEERING & FORESTRY, LLC
9600 NE 126th Avenue, Suite 2520 | Vancouver, WA 98682
P: 360.882.0419 Ext. 322 | F: 360.882.0426 | www.aks-eng.com
Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

From: Robert Maul <RMaul@cityofcamas.us>
Sent: Tuesday, November 20, 2018 4:21 PM
To: Michael Andreotti <andreottim@aks-eng.com>
Cc: John Meier <John@aks-eng.com>; Alex Burzynski <burzynskia@aks-eng.com>; Sarah Fox <SFox@cityofcamas.us>
Subject: RE: Hancock Springs

Thanks, Michael. I'm good with waiving the pre-app.

From: Michael Andreotti [mailto:andreottim@aks-eng.com]
Sent: Tuesday, November 20, 2018 10:52 AM
To: Robert Maul
Cc: John Meier; Alex Burzynski; Sarah Fox
Subject: RE: Hancock Springs

Robert –

Attached is a PDF of the preliminary plat. Please let me know if there is additional information you would like to see.

Thanks,

Michael Andreotti, RLA
Land Use Planner
AKS ENGINEERING & FORESTRY, LLC
P: 360.882.0419 Ext. 316 | F: 360.882.0426 | www.aks-eng.com | andreottim@aks-eng.com

---

From: Robert Maul <RMaul@cityofcamas.us>
Sent: Tuesday, November 20, 2018 8:51 AM
To: Michael Andreotti <andreottim@aks-eng.com>
Cc: John Meier <John@aks-eng.com>; Alex Burzynski <burzynskia@aks-eng.com>; Sarah Fox <SFox@cityofcamas.us>
Subject: RE: Hancock Springs

Good morning, Michael. Can you please email me a pdf of what you plan on submitting? thx

---

From: Michael Andreotti [mailto:andreottim@aks-eng.com]
Sent: Friday, November 16, 2018 2:04 PM
To: Robert Maul
Cc: John Meier; Alex Burzynski; Sarah Fox
Subject: FW: Hancock Springs

Robert –

We are getting ready to submit our preliminary application for Hancock Springs. Per my correspondence with Sarah below, we just noticed that the 180 day period for the pre-application passed on Tuesday.

We would like to request that a new pre-application for this project be waived if we submit the preliminary land use application next week. We have addressed all code changes from Ord. 18-014 as noted by Sarah.

Thanks,

Michael Andreotti, RLA
Land Use Planner
AKS ENGINEERING & FORESTRY, LLC
P: 360.882.0419 Ext. 316 | F: 360.882.0426 | www.aks-eng.com | andreottim@aks-eng.com

---

From: Sarah Fox <SFox@cityofcamas.us>
Sent: Friday, November 16, 2018 12:24 PM
To: Michael Andreotti <andreottim@aks-eng.com>
Cc: John Meier <John@aks-eng.com>; Alex Burzynski <burzynskia@aks-eng.com>
Subject: RE: Hancock Spring

Hi Michael,
There have been some changes to the code since the pre-application meeting—namely the passage of the Urban Tree Ordinance (Ord. 18-014). Does your application address the current regulations?

If so, then you could send an email to our Planning Manager. It is at his discretion whether or not to waive the pre-application meeting requirement.

From: Michael Andreotti [mailto:andreottim@aks-eng.com]
Sent: Friday, November 16, 2018 10:45 AM
To: Sarah Fox <SFox@cityofcamas.us>
Cc: John Meier <John@aks-eng.com>; Alex Burzynski <burzynskia@aks-eng.com>
Subject: Hancock Spring

Sarah –

We just noticed that the 180 day period for the pre-application passed on Tuesday for Hancock Springs (PA18-30). We basically have the preliminary application package ready to submit, can we get the pre-application waived per section 18.55.060.E if we submit for preliminary application next week?

Thanks,

Michael Andreotti, RLA
Land Use Planner

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Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

January 29, 2019

City of Camas
Community Development Department |Planning
616 NE Fourth Avenue
Camas, WA 98607

RE: 2704 NW 18th Avenue Boundary Line Adjustment Narrative

To Whom it May Concern,

Below is a brief narrative that includes a statement of the purpose for the boundary line adjustment, demonstrating how the request can or will meet the approval criteria in Section 17.07.040, Camas, WA Code of Ordinances.

Purpose: The purpose for the boundary line adjustment is to relocate the boundary of 2704 NW 18th Avenue (Parcel No. 127371000) to the location of Lot 15 in the proposed subdivision of "Hancock Springs" (SUB18-05).

17.07.040 - Approval Criteria:
A. No additional lots, sites, parcels, tracts, or divisions are created.
The adjustment between Parcels 127371000 and 127377000 results in 2 parcels, no additional parcels will be created.

B. The adjustment will not create nonconforming lots, with respect to zoning dimension and area standards, zoning setbacks and lot area coverage standards identified in CMC Chapter 18.09 or to fire, building, other applicable codes.
With the exception of Maximum Lot Size (12,000 square feet) the resulting adjusted lots conform with Residential 10,000 (R-10) zoning dimension and area standards, zoning setbacks and lot area coverage standards.

C. The degree of nonconformance on existing nonconforming lots with respect to zoning dimension and area standards, zoning setbacks, and floor area ratio are not increased, except that a one time exception may be allowed to create a lot that exceeds the maximum lot size permitted in the underlying zone. Any future partitioning/reduction of the oversized lot must comply with the lot size requirements of the underlying zone.
Currently Parcels 127371000 and 127377000 are over the Maximum Lot Size standard, the proposed boundary line adjustment will reduce the degree of nonconformance of Parcel 127371000, the average lot area of Parcels 127371000 and 127377000 will remain the same.

D. All lots have legal access to a public road. Existing required private road improvements and easements are not diminished below city street standards for lots that are served by a private road, and shall not create unreasonably restrictive or hazardous access to a property;
Parcels 127371000 and 127377000 take access to NW 18th Avenue through existing ingress/egress easements, this access will not be affected by the boundary line adjustment.

E. The boundary line adjustment will not result in a lot that contains area in two zone designations.
Parcels 127371000 and 127377000 are both zoned Residential 10,000 (R-10).

F. Boundary lines adjustments that are used to circumvent subdivision or short subdivision procedures set forth in this title are not allowed. Factors which indicate that the boundary line adjustment process is being used in a manner inconsistent with statutory intent include: numerous and frequent adjustments to existing contiguous lot boundaries, and/or a large number of contiguous lots being proposed for boundary line adjustments at the same time.
The proposed boundary line adjustment will occur prior to, but is associate with, SUB18-05. Lot 15 of the subdivision will be created with this BLA application. As part of this application, the right-of-way for NW Cascade Street will be dedicated along the frontage of adjusted parcel 127371000 and the applicant commits to construct the half-wide improvements for NW Cascade Street fronting parcel 127371000. This construction will occur with the construction of SUB18-05. Therefore, the proposed boundary line adjustment does not contain any of the factors listed above.

G. Approval of a boundary line adjustments shall not result in the need for a reasonable use exception as defined in CMC 16.51.
Parcels 127371000 and 127377000 do not contain any critical areas and a reasonable use exception is not required.

H. Existing easements for utilities conform to adopted standards for their intended function, or they are extended, moved or otherwise altered to an approved location. The applicant shall be responsible for the relocation of any installed utilities.
The septic drainfield for Parcel 127371000 will be contained in an easement over Parcel 127377000 until the house on Parcel 127371000 is connected to a public sewer. Public sewer will be constructed in the right-of-way for NW Cascade Street as part of SUB18-05.

Sincerely,
AKS ENGINEERING & FORESTRY, LLC

Jim Hannon, PLS
9600 NE 126th Avenue, Suite 2520
Vancouver, WA 98682
(360) 882-0419 | james@aks-eng.com

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VANCOUVER, WA
9600 NE 126th Avenue, Suite 2520
Vancouver, WA 98682
(360) 882-0419

EXHIBIT __
LEGAL DESCTIPTION
ADJUSTED PARCEL 127371-000

A tract of land located in the Northwest quarter of the Northeast quarter of the Northeast quarter of Section 9, Township 1 North, Range 3 East of the Willamette Meridian, City of Camas, Clark County, Washington, described as follows:

Commencing at the southwest corner of Lot 1 per the plat “Kuehn Short Plat” recorded in Book 3, Page 315 of plats being a 1/2” iron rebar with a yellow plastic cap inscribed “MINISTER 12563”; thence along the south line of said plat South 88°40’04” East 47.94 feet; thence continuing along the south line of said plat South 88°40’04” East 179.17 feet to the west line of Auditor’s File Number G344999; thence along said west line South 01°45’46” West 290.52 feet to the south line of said Auditor’s File Number, thence along said south line South 88°39’15” East 149.87 feet to the east line of said Auditor’s File Number; thence along said east line North 01°44’00” East 68.03 feet to the south line of Auditor’s File Number 8606180118; thence along said south line South 88°40’04” East 153.51 feet to the Point of Beginning; thence along the south lines of Auditor’s File Number 8606180118 and Auditor’s File Number 4890482 South 88°40’04” East 145.03 feet; thence leaving said south line South 01°31’34” West 59.26 feet; thence South 01°45’40” West 48.80 feet; thence North 88°14’20” West 145.27 feet; thence North 01°45’46” East 106.97 feet to the Point of Beginning.

The above described tract contains 15,612 square feet, more or less.

JAMES O. HANNON
STATE OF WASHINGTON
54200
REGISTERED
PROFESSIONAL LAND SURVEYOR

EXHIBIT __
LEGAL DESCTIPTION
ADJUSTED PARCEL 127377-000

A tract of land located in the Northwest quarter of the Northeast quarter of the Northeast quarter of Section 9, Township 1 North, Range 3 East of the Willamette Meridian, City of Camas, Clark County, Washington, described as follows:

Commencing at the southwest corner of Lot 1 per the plat “Kuehn Short Plat” recorded in Book 3, Page 315 of plats being a 1/2” iron rebar with a yellow plastic cap inscribed “MINISTER 12563”; thence along the south line of said plat South 88°40’04” East 47.94 feet to the Point of Beginning; thence continuing along the south line of said plat South 88°40’04” East 179.17 feet to the west line of Auditor’s File Number G344999; thence along said west line South 01°45’46” West 290.52 feet to the south line of said Auditor’s File Number, thence along said south line South 88°39’15” East 149.87 feet to the east line of said Auditor’s File Number; thence along said east line North 01°44’00” East 68.03 feet to the south line of Auditor’s File Number 8606180118; thence along said south line South 88°40’04” East 153.51 feet; thence leaving said south line South 01°45’46” West 106.97 feet; thence South 88°14’20” East 175.27 feet to the east line of Parcel A per Auditor’s File Number 5273585; thence along said east line South 01°45’40” West 159.76 feet to the south line of said Parcel A; thence along said south line and the south line of Parcel B per said Auditor’s File Number 5273585 North 88°42’43” West 657.33 feet to the west line of said Parcel B; thence along said west line North 01°42’26” East 491.07 feet to the Point of Beginning.

The above described tract contains 4.30 acres, more or less.

JAMES O. HANNON
STATE OF WASHINGTON
54200
REGISTERED
PROFESSIONAL LAND SURVEYOR

AKS ENGINEERING & FORESTRY

BEND, OR
3052 NW Merchant Way, Suite 100
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4300 Cherry Avenue NE
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(503) 400-6028

TUALATIN, OR
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(503) 563-6151

VANCOUVER, WA
9600 NE 126th Avenue, Suite 2520
Vancouver, WA 98682
(360) 882-0419

www.aks-eng.com

EXHIBIT __
LEGAL DESCTIPTION
RIGHT-OF-WAY TO CITY OF CAMAS

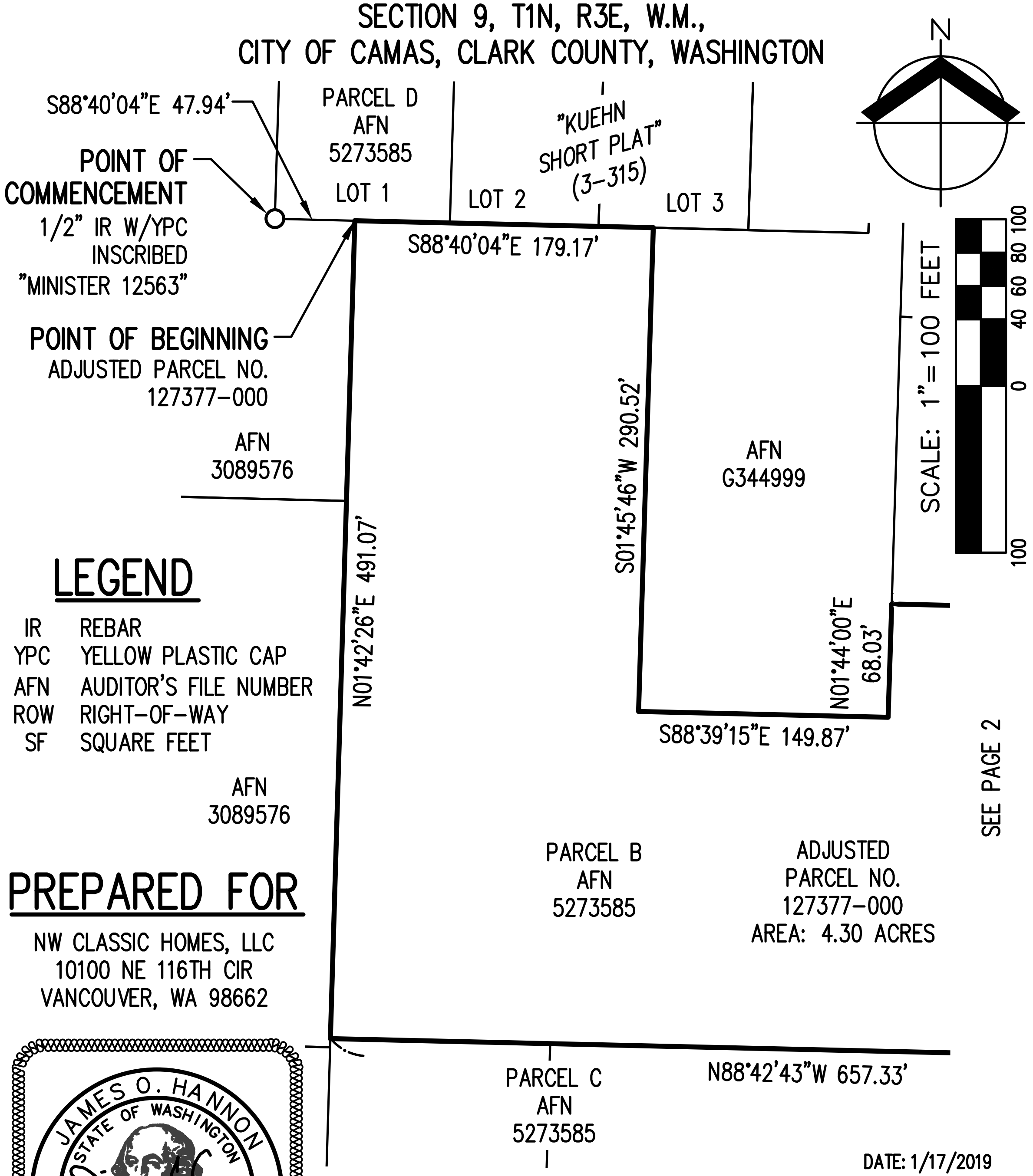
A tract of land located in the Northwest quarter of the Northeast quarter of the Northeast quarter of Section 9, Township 1 North, Range 3 East of the Willamette Meridian, City of Camas, Clark County, Washington, described as follows:

Commencing at the southwest corner of Lot 1 per the plat “Kuehn Short Plat” recorded in Book 3, Page 315 of plats being a 1/2” iron rebar with a yellow plastic cap inscribed “MINISTER 12563”; thence along the south line of said plat South 88°40’04” East 47.94 feet; thence continuing along the south line of said plat South 88°40’04” East 179.17 feet to the west line of Auditor’s File Number G344999; thence along said west line South 01°45’46” West 290.52 feet to the south line of said Auditor’s File Number, thence along said south line South 88°39’15” East 149.87 feet to the east line of said Auditor’s File Number; thence along said east line North 01°44’00” East 68.03 feet to the south line of Auditor’s File Number 8606180118; thence along the south lines of Auditor’s File Numbers 8606180118 and 4890482 South 88°40’04” East 328.54 feet to the west line of Auditor’s File Number 8712180133 also being the Point of Beginning; thence along said west line South 01°31’34” West 59.42 feet; thence along the east line of Parcel A per Auditor’s File Number 5273585 South 01°45’40” West 48.86 feet; thence leaving said east line North 88°14’20” West 30.00 feet; thence North 01°45’40” East 48.80 feet; Thence North 01°31’34” East 59.26 feet to the south line of said Auditor’s File Number 4890482; thence along said south line South 88°40’04” East 30.00 feet to the Point of Beginning.

The above described tract contains 3,245 square feet, more or less.

EXHIBIT __

LOCATED IN THE NW 1/4 OF THE NE 1/4 OF THE NE 1/4 OF SECTION 9, T1N, R3E, W.M., CITY OF CAMAS, CLARK COUNTY, WASHINGTON

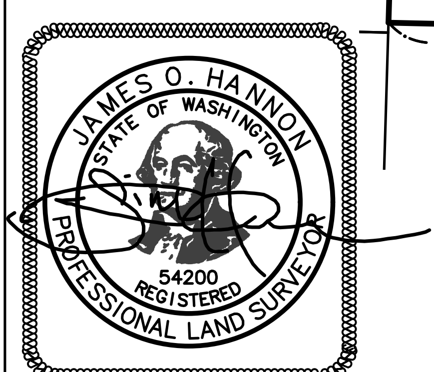


LEGEND

IR	REBAR
YPC	YELLOW PLASTIC CAP
AFN	AUDITOR'S FILE NUMBER
ROW	RIGHT-OF-WAY
SF	SQUARE FEET

PREPARED FOR

NW CLASSIC HOMES, LLC
10100 NE 116TH CIR
VANCOUVER, WA 98662



DATE: 1/17/2019

BOUNDARY LINE ADJUSTMENT

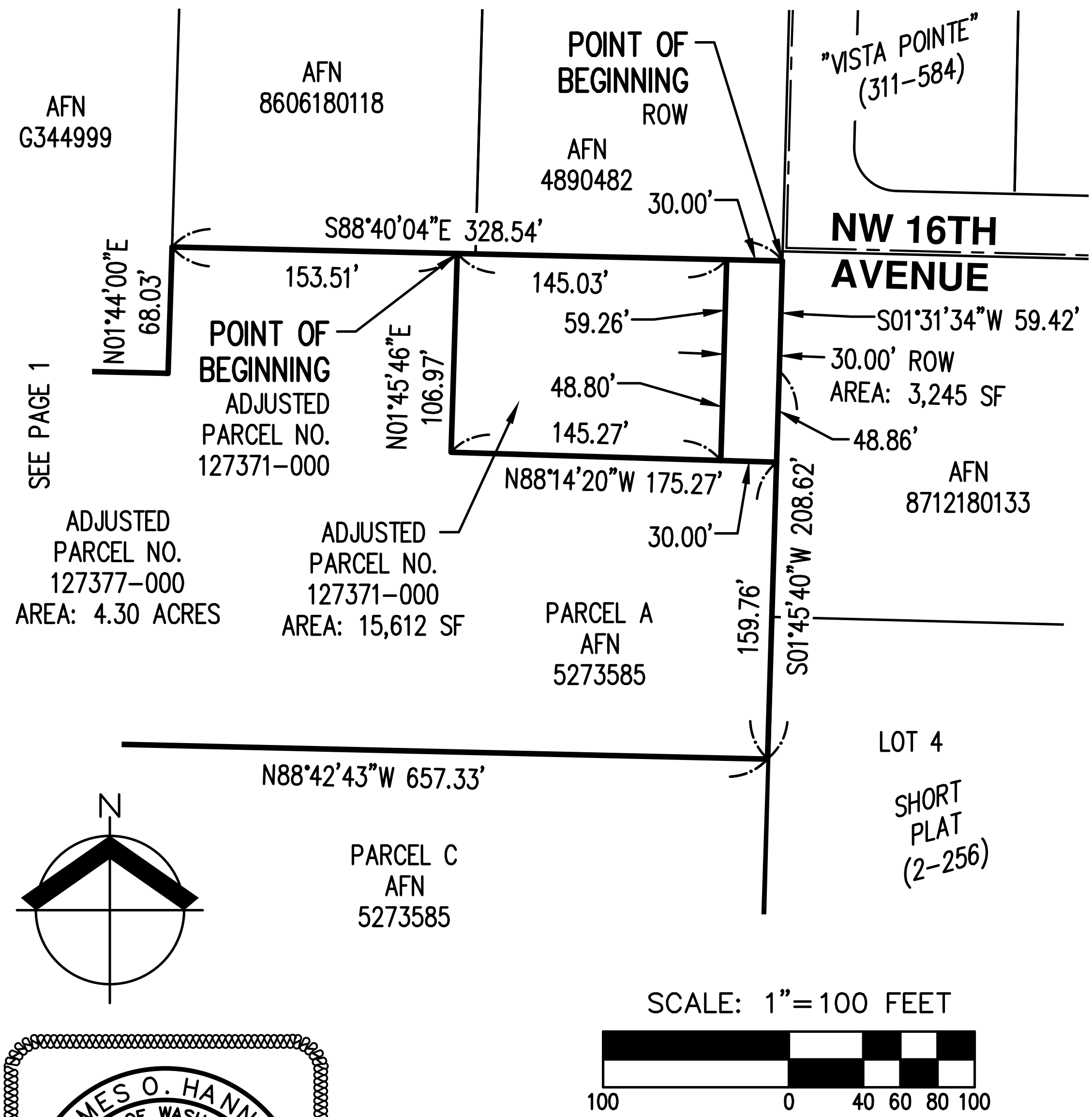
DRAWN BY: BRE	CHECKED BY: JOH	DWG: 5638 BLA EXHIBIT	JOB: 5638

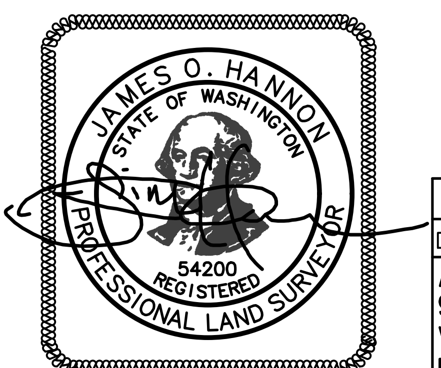
AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE, SUITE 2520
VANCOUVER, WA 98682 www.aks-eng.com
PHONE: 360.882.0419 FAX: 360.882.0426

AKS

EXHIBIT __

LOCATED IN THE NW 1/4 OF THE NE 1/4 OF THE NE 1/4 OF SECTION 9, T1N, R3E, W.M., CITY OF CAMAS, CLARK COUNTY, WASHINGTON





DATE: 1/17/2019

BOUNDARY LINE ADJUSTMENT			
DRAWN BY: BRE	CHECKED BY: JOH	DWG: 5638 BLA EXHIBIT	JOB: 5638

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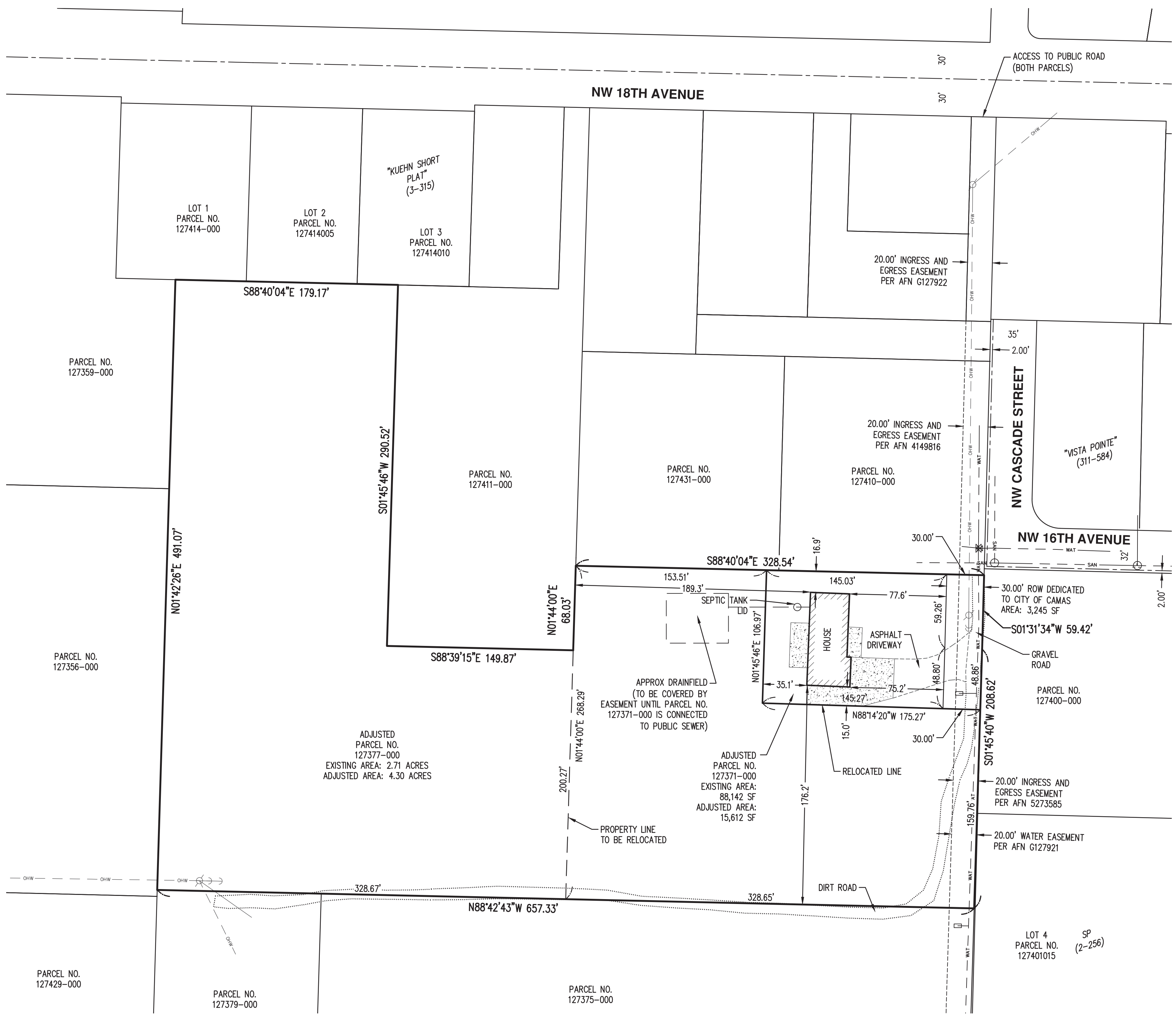

LEGEND

- WATER METER
- WATER VALVE
- SANITARY SEWER MANHOLE
- GUY WIRE ANCHOR
- UTILITY POLE
- RIGHT-OF-WAY LINE
- BOUNDARY LINE
- PROPERTY LINE
- CENTERLINE
- EASEMENT
- EXISTING PROP LINE
- OVERHEAD WIRE — OHW
- SANITARY SEWER LINE — SAN
- WATER LINE — WAT
- EDGE OF GRAVEL
- EDGE OF ASPHALT

N

SCALE: 1" = 50 FEET

50 0 20 30 40 50

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HANCOCK SPRINGS

CAMAS WASHINGTON

PARCEL NO. 127371000, 127377000 NE 1/4 S9, T1N, R3E WM

BLA SITE PLAN

DESIGNED BY:
DRAWN BY: BRE
MANAGED BY: JOH
CHECKED BY: JOH
DATE: 1/17/2019

JAMES O. HANNON STATE OF WASHINGTON 54200 REGISTERED PROFESSIONAL LAND SURVEYOR

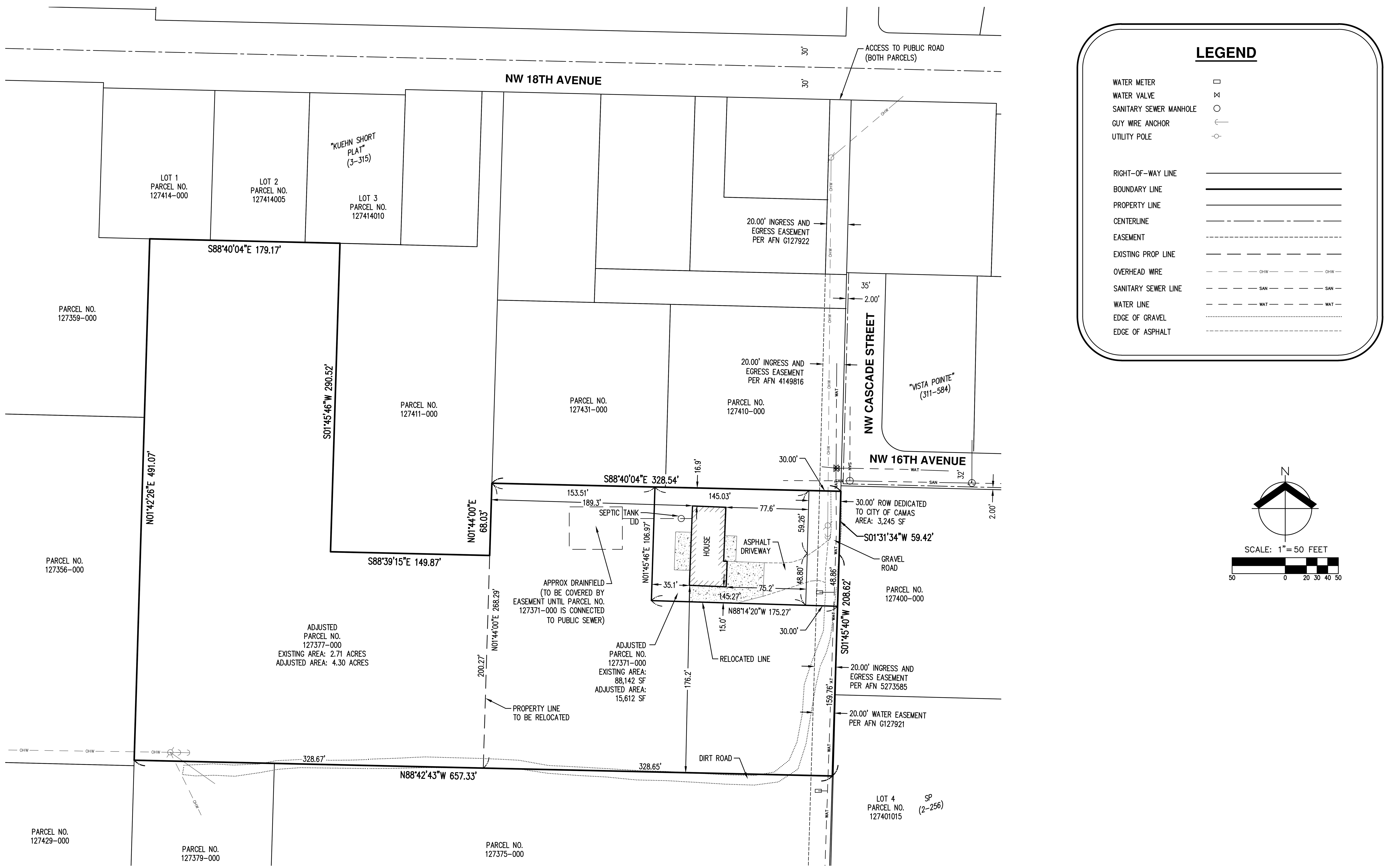
REVISIONS

JOB NUMBER 5638

SHEET 1 OF 1

AKS DRAWING FILE: 5638 BLA SITE PLAN.DWG | LAYOUT: LAYOUT1

Exhibit 16
SUB18-05



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HANCOCK SPRINGS

CAMAS WASHINGTON
NE 1/4 S9, T1N, R3E WM
PARCEL NO. 127371000, 127377000

BLA SITE PLAN

DESIGNED BY:
DRAWN BY: BRE
MANAGED BY: JOH
CHECKED BY: JOH
DATE: 1/17/2019

JAMES O. HANNON
STATE OF WASHINGTON
54200
REGISTERED PROFESSIONAL LAND SURVEYOR

REVISIONS

JOB NUMBER
5638

SHEET
1 OF 1

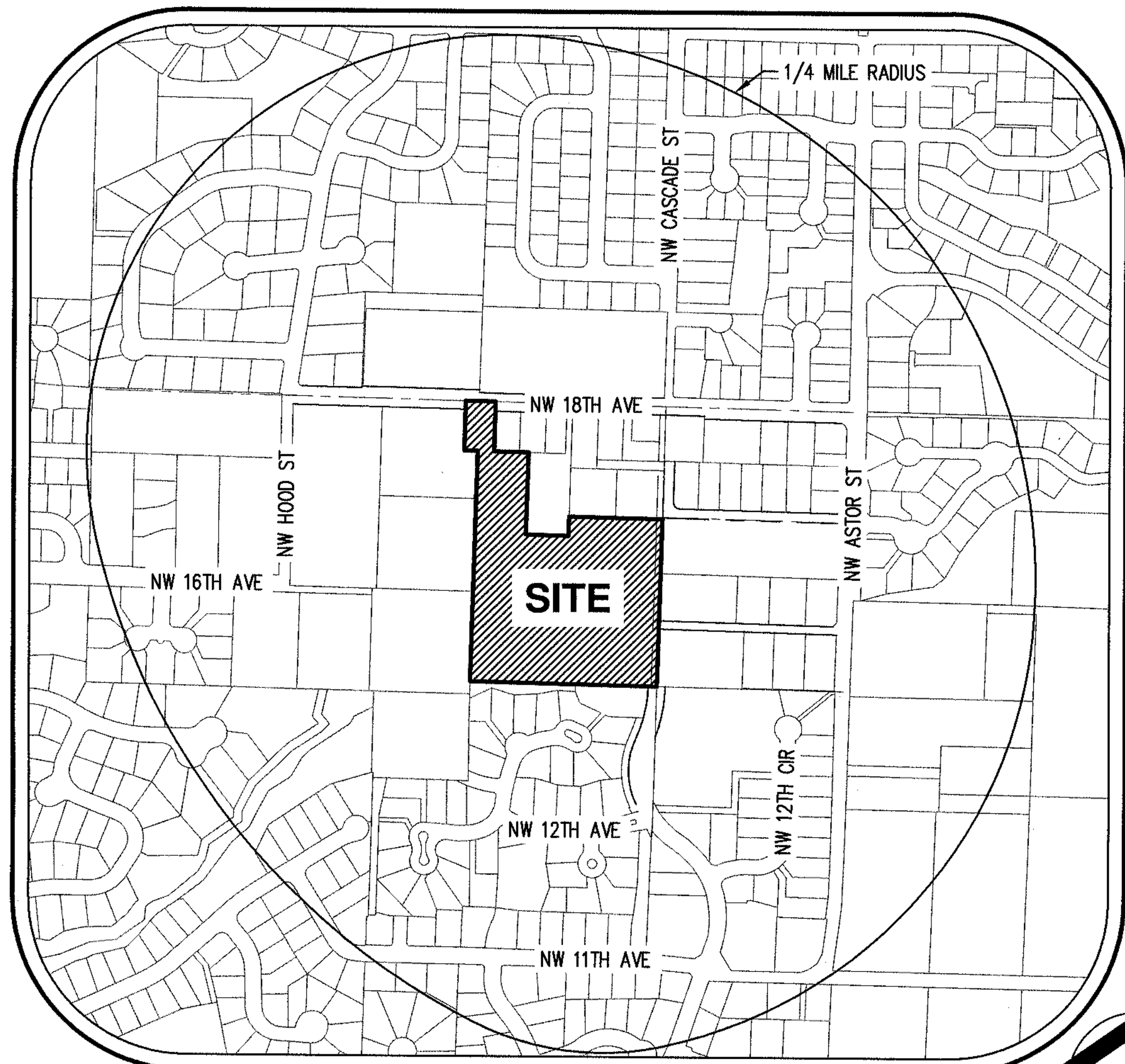
AKS DRAWING FILE: 5638 BLA SITE PLAN.DWG | LAYOUT: LAYOUT1

Exhibit 17
SUB18-05

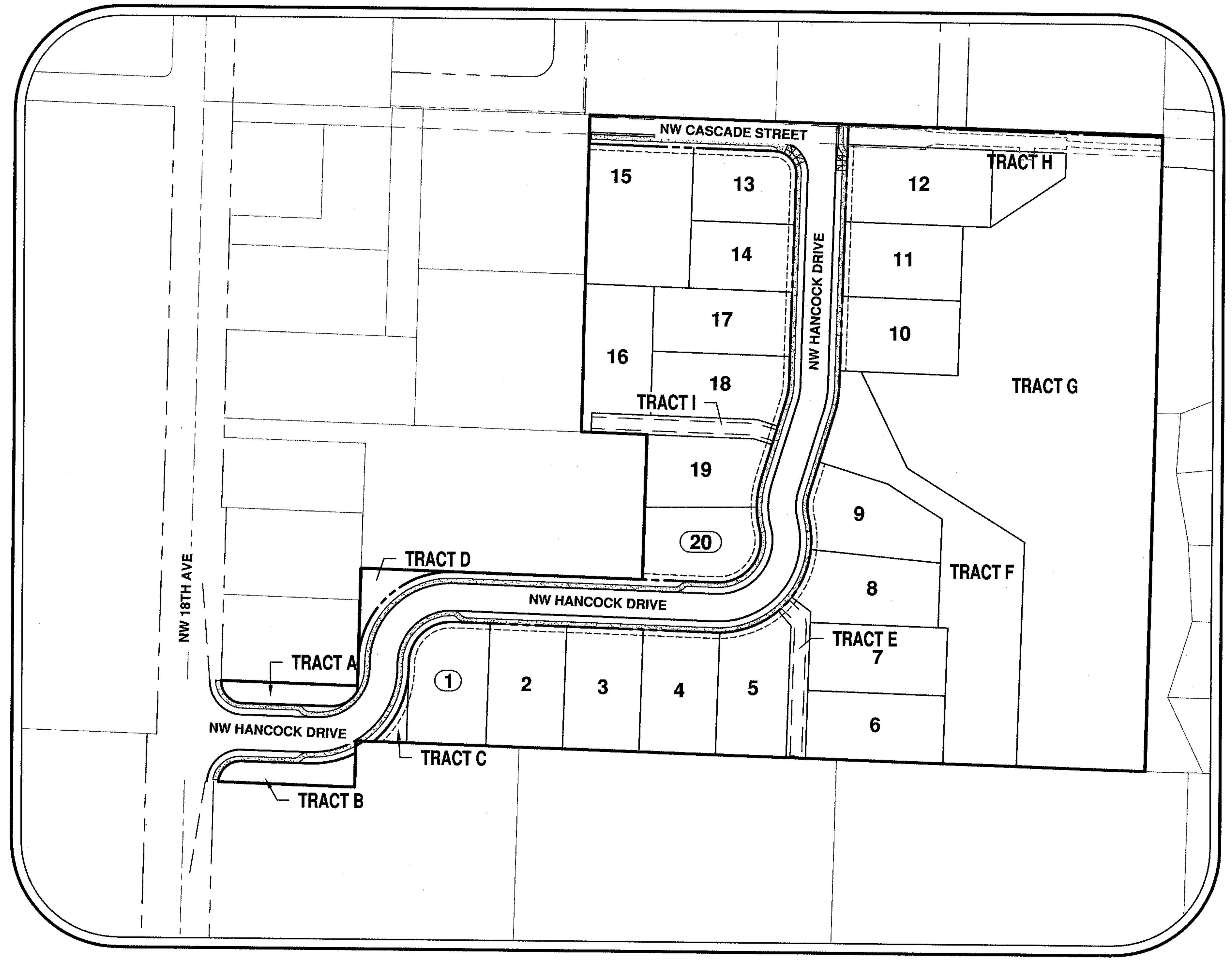
Exhibit 18
SUB18-05

HANCOCK SPRINGS SUBDIVISION

PRELIMINARY SUBDIVISION PLANS



VICINITY MAP
N.T.S.



SITE MAP
1"=100'

LEGEND

EXISTING | PROPOSED

- DECIDUOUS TREE
- CONIFEROUS TREE
- FIRE HYDRANT
- WATER BLOWOFF
- WATER METER
- WATER VALVE
- DOUBLE CHECK VALVE
- AIR RELEASE VALVE
- SANITARY SEWER CLEAN OUT
- SANITARY SEWER MANHOLE
- SIGN
- STREET LIGHT
- MAILBOX
- STORM DRAIN CLEAN OUT
- STORM DRAIN CATCH BASIN
- STORM DRAIN AREA DRAIN
- STORM DRAIN MANHOLE
- GAS METER
- GAS VALVE
- GUY WIRE ANCHOR
- UTILITY POLE
- POWER VAULT
- POWER JUNCTION BOX
- POWER PEDESTAL
- COMMUNICATIONS VAULT
- 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 (PWR)
- OVERHEAD WIRE (OHW)
- COMMUNICATIONS LINE (COM)
- FIBER OPTIC LINE (CFO)
- GAS LINE (GAS)
- STORM DRAIN LINE (STM)
- SANITARY SEWER LINE (SAN)
- WATER LINE (WAT)

SHEET INDEX

APPLICANT
NORTHWEST CLASSIC HOMES, LLC
CONTACT: CRAIG MOODY
PH: 360-263-4125
E-MAIL: CRAIG.MOODY@SHOOT360.COM

OWNER
CHARLES LAWRENCE
3010 NW 18TH AVENUE
CAMAS, WA 98607

CONTACT
AKS ENGINEERING & FORESTRY, LLC.
CONTACT: MICHAEL ANDREOTTI
9600 NE 126TH AVENUE, SUITE 2520
VANCOUVER, WA 98682
PH: 360-882-0419
FAX: 360-882-0426
E-MAIL: ANDREOTTIM@AKS-ENG.COM

PROPERTY DESCRIPTION
LOCATED IN THE NORTHEAST 1/4 OF SECTION 09, TOWNSHIP 1 NORTH, RANGE 3 EAST, WILLAMETTE MERIDIAN, CLARK COUNTY, WASHINGTON.
PROPERTY SERIAL #'S 127414-000, 127377-000, 127379-000, 127375-000, AND 127371-000.

PROPERTY ADDRESS
2924 NW 18TH AVENUE
CAMAS, WA 98607

EXISTING LAND USE
SINGLE FAMILY RESIDENCE ON 127371-000,
VACANT RESIDENCES ON 127414-000 AND 127379-000,
VACANT LAND ON 127377-000 AND 127375-000.
ZONED R-12 AND R-10

PROJECT PURPOSE
SUBDIVIDE 5 PARCELS INTO 20 DETACHED SINGLE-FAMILY RESIDENTIAL LOTS WITH ASSOCIATED ROAD IMPROVEMENTS AND CRITICAL AREA TRACT.

SITE AREA
10.03 AC (436,926 SF)

VERTICAL DATUM
ELEVATIONS ARE BASED ON CLARK COUNTY BENCHMARK NO. 4010,. LOCATED AT THE SW CORNER OF NW PARKER ST AND NW PACIFIC RIM BLVD. ELEVATION = 399.72 FEET (NGVD29 (47)).

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HANCOCK SPRINGS SUBDIVISION
CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

COVER SHEET

DESIGNED BY: CJS
DRAWN BY: NAL
MANAGED BY: JMM
CHECKED BY: JMM
DATE: 3/26/19

JOHN M. ... STATE OF WASHINGTON 42614 REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

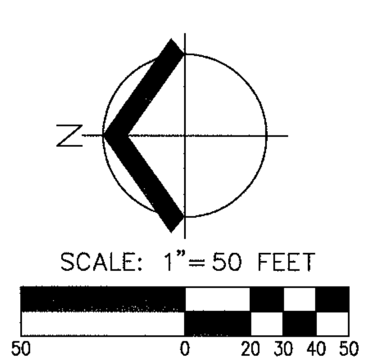
JOB NUMBER
5638

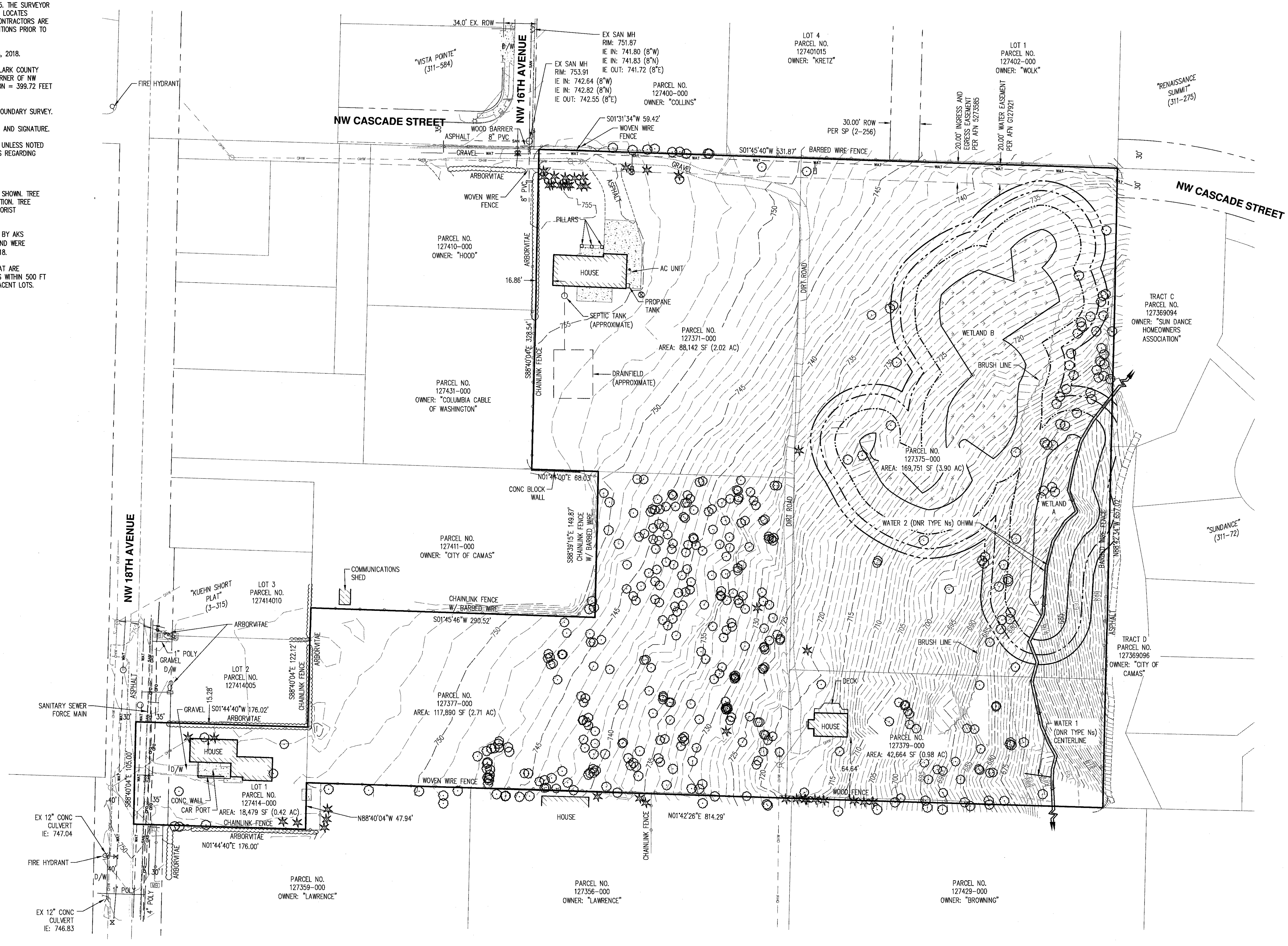
SHEET
P1.0

AKS DRAWING FILE: 5638 P1.0.DWG | LAYOUT: P1.0

NOTES:

1. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS AS PROVIDED BY OTHERS, PROVIDED PER UTILITY LOCATE TICKET NUMBER 18213283 AND 18213335. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND 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 MAY 29 – JUNE 8, 2018.
3. VERTICAL DATUM: ELEVATIONS ARE BASED ON CLARK COUNTY BENCHMARK NO. 4010,. LOCATED AT THE SW CORNER OF NW PARKER ST AND NW PACIFIC RIM BLVD. ELEVATION = 399.72 FEET (NGVD29 (47)).
4. THIS MAP DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY.
5. SURVEY IS ONLY VALID WITH SURVEYOR'S STAMP AND SIGNATURE.
6. BUILDING FOOTPRINTS ARE MEASURED TO SIDING UNLESS NOTED OTHERWISE. CONTACT SURVEYOR WITH QUESTIONS REGARDING BUILDING TIES.
7. CONTOUR INTERVAL IS 1 FOOT.
8. TREES WITH DIAMETER OF 6" AND GREATER ARE SHOWN. TREE DIAMETERS WERE DETERMINED BY VISUAL INSPECTION. TREE INFORMATION IS SUBJECT TO CHANGE UPON ARBORIST INSPECTION.
9. WETLAND BOUNDARIES SHOWN WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON 3/6/2018 AND WERE PROFESSIONALLY SURVEYED BY AKS ON 3/9/2018.
10. PLAN SHOWS FIRE HYDRANTS WITHIN 500 FT THAT ARE ACCESSIBLE TO THE SITE. OTHER FIRE HYDRANTS WITHIN 500 FT OF THE SITE ARE NOT ACCESSIBLE DUE TO ADJACENT LOTS.





AKS

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

EXISTING CONDITIONS

DESIGNED BY:	
DRAWN BY:	BRE
MANAGED BY:	JOH
CHECKED BY:	JOH
DATE: 12/21/2018	

JAMES O. HANNON · STATE OF WASHINGTON · 54200 REGISTERED · PROFESSIONAL LAND SURVEYOR

REVISIONS

JOB NUMBER 5638

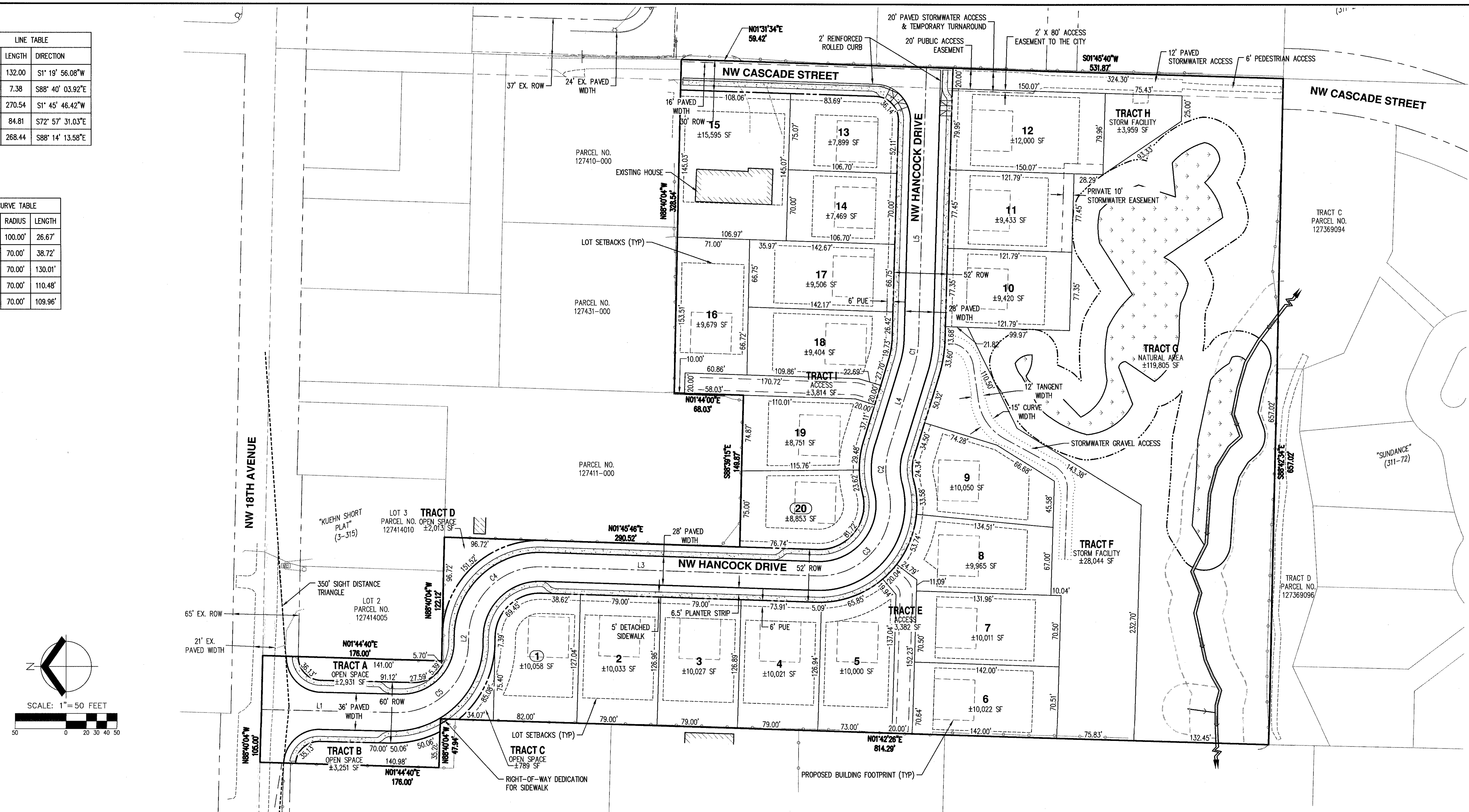
SHEET

P2.0

AKS DRAWING FILE: 5638 P2.0.DWG | LAYOUT: P2.0

LINE TABLE		
LINE #	LENGTH	DIRECTION
L1	132.00	S1° 19' 56.08"W
L2	7.38	S88° 40' 03.92"E
L3	270.54	S1° 45' 46.42"W
L4	84.81	S72° 57' 31.03"E
L5	268.44	S88° 14' 13.58"E

CURVE TABLE		
CURVE	RADIUS	LENGTH
C1	100.00'	26.67'
C2	70.00'	38.72'
C3	70.00'	130.01'
C4	70.00'	110.48'
C5	70.00'	109.96'



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

SINGLE FAMILY DETACHED SETBACK TABLE	
MINIMUM LOT FRONTAGE	20'
MINIMUM LOT FRONTAGE CUL-DE-SAC	30'
MAXIMUM LOT COVERAGE	35%
MAXIMUM HEIGHT	35'
FRONT YARD SETBACK	20'
REAR YARD SETBACK	25'
SIDE YARD SETBACK	5'
STREET SIDE YARD SETBACK	20'
GARAGE SETBACK	20'

SITE STATISTICS

GROSS AREA (TOTAL ACREAGE):	436,926 SF (10.03 AC)
TOTAL DEVELOPED AREA:	317,116 SF (7.28 AC)
TOTAL LOT AREA:	198,196 SF (4.55 AC)
INFRASTRUCTURE AREA:	70,737 SF (1.62 AC)
STORM DRAINAGE FACILITIES:	32,003 SF (0.73 AC)
ACCESS TRACTS:	7,196 SF (0.17 AC)
OPEN SPACE TRACTS:	8,984 SF (0.21 AC)
CRITICAL AREAS:	119,805 SF (2.75 AC)
NET DEVELOPABLE AREA:	308,132 SF (7.07 AC)

DENSITY CALCULATION

MAXIMUM LOTS ALLOWED (7.07*4.3):	30 LOTS
PROPOSED LOTS:	20 LOTS
PROPOSED DENSITY:	1.99 DU/AC

GENERAL NOTES

1. OPEN SPACE TRACTS A, B, C, & D TO BE OWNED AND MAINTAINED BY THE HOME OWNERS ASSOCIATION (HOA)
2. ACCESS TRACTS E & I TO BE OWNED AND MAINTAINED BY THE HOA
3. ACCESS TRACT E TO HAVE A PUBLIC PEDESTRIAN EASEMENT FOR FUTURE PEDESTRIAN ACCESS TO THE WEST
4. STORMWATER TRACTS F & H TO BE OWNED BY THE HOA AND MAINTAINED BY THE CITY OF CAMAS
5. NATURAL AREA TRACT G TO BE OWNED BY THE HOA
6. BUILDING ENVELOPES SHALL BE PER SETBACK TABLE
7. S.T.E.P. TANKS TO BE LOCATED IN FRONT YARDS OF PROPOSED LOTS

APPLICANT

NORTHWEST CLASSIC HOMES, LLC
CONTACT: CRAIG MOODY
PH: 360-263-4125
E-MAIL: CRAIG.MOODY@SHOOT360.COM

OWNER

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3010 NW 18TH AVENUE
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PROPERTY DESCRIPTION

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PROPERTY SERIAL #'S 127371-000, 127375-000, 127377-000, 127379-000, 127414-000

EXISTING LAND USE

SINGLE FAMILY RESIDENCE ON 127371-000,
VACANT RESIDENCES ON 127414-000 AND 127379-000,
VACANT LAND ON 127377-000 AND 127375-000.
ZONED R-12 AND R-10

PROJECT PURPOSE

SUBDIVIDE 5 PARCELS INTO 20 DETACHED SINGLE-FAMILY RESIDENTIAL LOTS WITH ASSOCIATED ROAD IMPROVEMENTS AND CRITICAL AREA TRACT.

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY PLAT

DESIGNED BY:	CJS
DRAWN BY:	NAL
MANAGED BY:	JMM
CHECKED BY:	JMM
DATE:	3/26/2019

REVISIONS

JOB NUMBER 5638

SHEET P3.0

AKS DRAWING FILE: 5638 P3.0.DWG | LAYOUT: P3.0

LEGEND

- EXISTING GROUND CONTOUR (2 FT)
- EXISTING GROUND CONTOUR (10 FT) — 350
- FINISHED GRADE CONTOUR (2 FT)
- FINISHED GRADE CONTOUR (10 FT) — 345
- SEDIMENT FENCE (TO BE INSTALLED PRIOR TO GRADING)
- INLET PROTECTION (TYP) PER COMBINATION DETAIL
- DRAINAGE FLOW DIRECTION
- GRAVEL CONSTRUCTION ENTRANCE
- DISTURBED LIMITS
- TREE PROTECTION/CONSTRUCTION FENCE
- POTENTIAL STAGING/SOIL STOCKPILE AREA

GENERAL NOTES

1. DEMOLITION AND REMOVAL OF ALL STRUCTURES TOGETHER WITH DECOMMISIONING OF ALL WELLS , SEPTIC TANKS, AND UNDERGROUND STORAGE TANKS (IF ANY EXIST) SHALL BE COMPLETED PRIOR TO SITE GRADING.
2. DECOMMSSION EXISTING SEPTIC SYSTEM PER CITY OF CAMAS REQUIREMENTS
3. DECOMMISSION EXISTING WELL PER CITY OF CAMAS REQUIREMENTS

DEMOLITION KEYED NOTES

1. REMOVE EXISTING DIRT/GRAVEL ROAD.
2. REMOVE EXISTING BUILDING AND ASSOCIATED HARDSCAPE.
3. REMOVE EXISTING OVERHEAD WIRE/POLE.
4. EXISTING TREE TO REMAIN (TYP).
5. REMOVE EXISTING TREE. (TYP)

EROSION CONTROL KEYED NOTES

1. INSTALL INLET PROTECTION (TYP).
2. POTENTIAL STOCKPILE AREA.
3. CONSTRUCTION ENTRANCE.
4. INSTALL SEDIMENT FENCE (TYP).
5. DISTURBED LIMITS (TYP).

PRELIMINARY GRADING QUANTITIES:

CUT: 13,000 C.Y.
FILL: 13,000 C.Y.

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY DEMOLITION, ESC, GRADING PLAN

DESIGNED BY:	CJS
DRAWN BY:	NAL
MANAGED BY:	JMM
CHECKED BY:	JMM

DATE: 3/26/2015

PRELIMINARY FOR CONSTRUCTION — JOHN M. ... STATE OF WASHINGTON 42614 REGISTERED PROFESSIONAL ENGINEER

REVISIONS

JOB NUMBER 5638

SHEET P4.0

AKS DRAWING FILE: 5638 P4.0.DWG | LAYOUT: P4.0

TREE PROTECTION NOTES

A. PLACING MATERIALS NEAR TREES – NO PERSON MAY CONDUCT ANY ACTIVITY WITHIN THE PROTECTED AREA OF ANY TREE DESIGNATED TO REMAIN, INCLUDING, BUT NOT LIMITED TO, PARKING EQUIPMENT, PLACING SOLVENTS, STORING BUILDING MATERIALS AND SOIL DEPOSITS, DUMPING CONCRETE WASHOUT, ETC.

B. ATTACHMENTS TO TREES – DURING CONSTRUCTION, NO PERSON SHALL ATTACH ANY OBJECT TO ANY TREE DESIGNATED FOR PROTECTION.

C. PROTECTIVE BARRIER – BEFORE DEVELOPMENT, LAND CLEARING, FILLING OR ANY LAND ALTERATION FOR WHICH A TREE REMOVAL PERMIT IS REQUIRED, THE CONTRACTOR:

C.A. SHALL ERECT AND MAINTAIN READILY VISIBLE PROTECTIVE TREE FENCING ALONG THE OUTER EDGE AND COMPLETELY SURROUNDING THE PROTECTED AREA OF ALL PROTECTED TREES OR GROUP OF TREES. FENCES SHALL BE CONSTRUCTED PER THE DETAIL ON THIS SHEET.

C.B. MAY BE REQUIRED TO COVER WITH MULCH TO A DEPTH OF AT LEAST SIX (6) INCHES OR WITH PLYWOOD OR SIMILAR MATERIAL IN THE AREAS ADJOINING THE CRITICAL ROOT ZONE OF A TREE IN ORDER TO PROTECT ROOTS FROM DAMAGE CAUSED BY HEAVY EQUIPMENT.

C.C. SHALL PROHIBIT EXCAVATION OR COMPACTING OF EARTH OR OTHER POTENTIALLY DAMAGING ACTIVITIES WITHIN THE BARRIERS.

C.D. MAY BE REQUIRED TO MINIMIZE ROOT DAMAGE BY EXCAVATING A TWO (2) FOOT DEEP TRENCH, AT EDGE OF CRITICAL ROOT ZONE, TO CLEANLY SEVER THE ROOTS OF TREES TO BE RETAINED. ROOTS ONE (1) INCH DIAMETER OR GREATER SHALL BE CLEANLY CUT WITH A SAW OR PRUNERS.

C.E. MAY BE REQUIRED TO HAVE CORRECTIVE PRUNING PERFORMED ON PROTECTED TREES IN ORDER TO AVOID DAMAGE FROM MACHINERY OR BUILDING ACTIVITY. MAY BE REQUIRED TO MAINTAIN TREES THROUGHOUT THE CONSTRUCTION PERIOD BY WATERING AND FERTILIZING.

C.F. SHALL MAINTAIN THE PROTECTIVE BARRIERS IN PLACE UNTIL THE PROJECT ARBORIST AUTHORIZES THEIR REMOVAL OR A FINAL CERTIFICATE OF OCCUPANCY IS ISSUED, WHICHEVER OCCURS FIRST.

C.G. SHALL ENSURE THAT ANY LANDSCAPING DONE IN THE PROTECTED ZONE SUBSEQUENT TO THE REMOVAL OF THE BARRIERS SHALL BE ACCOMPLISHED WITH LIGHT MACHINERY OR HAND LABOR.

D. GRADE

D.A. THE GRADE SHALL NOT BE ELEVATED OR REDUCED WITHIN THE CRITICAL ROOT ZONE OF TREES TO BE PRESERVED WITHOUT THE PROJECT ARBORISTS'S AUTHORIZATION. THE PROJECT ARBORIST MAY ALLOW COVERAGE OF UP TO ONE HALF OF THE AREA OF THE TREE'S CRITICAL 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.

D.B. IF THE GRADE ADJACENT TO A PRESERVED TREE IS RAISED SUCH THAT IT COULD SLOUGH OR ERODE INTO THE TREES CRITICAL ROOT ZONE, IT SHALL BE PERMANENTLY STABILIZED TO PREVENT SUFFOCATION OF THE ROOTS.

D.C. THE APPLICANT SHALL NOT INSTALL AN IMPERVIOUS SURFACE WITHIN THE CRITICAL ROOT ZONE OF ANY TREE TO BE RETAINED WITHOUT THE AUTHORIZATION OF THE PROJECT ARBORIST. THE PROJECT 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.

D.D. TO THE GREATEST EXTENT PRACTICAL, UTILITY TRENCHES SHALL BE LOCATED OUTSIDE OF THE CRITICAL ROOT ZONE OF TREES TO BE RETAINED. THE PROJECT ARBORIST MAY REQUIRE THAT UTILITIES BE TUNNELED UNDER THE ROOTS OF TREES TO BE RETAINED IF THE PROJECT ARBORIST DETERMINES THAT TRENCHING WOULD SIGNIFICANTLY REDUCE THE CHANCES OF THE TREE'S SURVIVAL.

D.E. TREE 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 TO EROSION FOR THE LEAST POSSIBLE TIME. TO CONTROL EROSION, SHRUBS, GROUND COVER, AND STUMPS SHALL BE MAINTAINED ON THE INDIVIDUAL LOTS, WHERE FEASIBLE. WHERE NOT FEASIBLE, APPROPRIATE EROSION CONTROL PRACTICES SHALL BE IMPLEMENTED PURSUANT TO CAMAS MUNICIPAL CODE CHAPTER 14.06.

E. DIRECTIONAL FELLING OF TREES SHALL BE USED TO AVOID DAMAGE TO TREES DESIGNATED FOR RETENTION.

F. ADDITIONAL REQUIREMENTS – THE PROJECT ARBORIST MAY REQUIRE ADDITIONAL TREE PROTECTION MEASURES WHICH ARE CONSISTENT WITH ACCEPTED URBAN FORESTRY PRACTICES.

G. ENCROACHMENT INTO THE ROOT PROTECTION ZONE IS ALLOWED WITH PROJECT ARBORIST APPROVAL AS DESCRIBED IN THE FOLLOWING NOTES:

G.A. EXCAVATION IN THE TOP 24 INCHES OF THE SOIL IN THE CRITICAL ROOT ZONE AREA SHOULD BEGIN AT THE EXCAVATION LINE THAT IS CLOSEST TO THE TREE.

G.B. THE EXCAVATION SHOULD BE DONE BY HAND/SHOVEL OR WITH A BACKHOE AND A MAN WITH A SHOVEL, PRUNING SHEARS, AND A PRUNING SAW.

G.C. IF DONE BY HAND, ALL ROOTS 1 INCH OR LARGER SHOULD BE PRUNED AT THE EXCAVATION LINE.

G.D. IF DONE WITH BACKHOE (MOST LIKELY SCENARIO), THEN THE OPERATOR SHALL START THE CUT AT THE EXCAVATION LINE AND CAREFULLY "FEEL" FOR ROOT/RESISTANCE. WHEN THERE IS RESISTANCE, THE MAN WITH THE SHOVEL HAND DIGS AROUND THE ROOTS AND PRUNES THE ROOTS LARGER THAN 1 INCH DIAMETER.

G.E. THE BACKHOE IS TO REMAIN OFF OF THE TREE ROOTS TO BE PRESERVED AT ALL TIMES.

G.F. ALL ROOTS SHALL BE CUT CLEANLY WITH PRUNING SHEARS OR A PRUNING SAW.

G.G. PROJECT ARBORIST MUST BE ONSITE DURING ANY WORK WITHIN THE TREE ROOT PROTECTION ZONE.

G.H. THE CITY PLANNER MUST BE CONTACTED 24 HOURS PRIOR TO WORKING WITHIN THE TREE ROOT PROTECTION ZONE.

H. TREE PROTECTION ZONE IS DEFINED AS ALL AREAS BOUND AND PROTECTING THE OPTIMAL TREE PROTECTION ZONE.

I. TIMELINE FOR CLEARING, GRADING, AND INSTALLATION OF TREE PROTECTION MEASURES: WORK WILL BEGIN IMMEDIATELY FOLLOWING FINAL APPROVAL BY THE CITY. TREE PROTECTION MEASURES WILL BE DONE DURING CLEARING AND ANY GRADING WILL FOLLOW.

J. PRUNING/TREE REMOVAL NOTES: THE WORK TO BE COMPLETED UNDER THIS PROJECT SHALL CONSIST OF TREE REMOVAL AND TREE TRIMMING AS LISTED.

J.A. THE CONTRACTOR SHALL PROVIDE ADEQUATE CREW OF MEN, 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 AND WHO SHALL BE RESPONSIBLE FOR THE CREW'S ACTIVITIES AND WHO SHALL RECEIVE INSTRUCTION FROM THE OWNER OR THE OWNER'S REPRESENTATIVE AND DIRECT THE CREW TO ACCOMPLISH SUCH WORK.

J.B. WHENEVER A TREE, WHICH IS NOT SCHEDULED TO BE REMOVED, MUST BE TRIMMED OR PRUNED, THE CONTRACTOR SHALL INSURE THAT SUCH TRIMMING AND PRUNING IS CARRIED OUT UNDER THE DIRECT SUPERVISION OF A LICENSED ARBORIST. ALL PRUNING AND TRIMMING SHALL BE PERFORMED IN ACCORDANCE WITH THE PROVISIONS OF ANSI A 300 "STANDARD PRACTICES FOR TREE, SHRUB AND OTHER WOODY PLANT MAINTENANCE".

J.C. THE CONTRACTOR SHALL BE REQUIRED TO CUT TREES TO A HEIGHT OF APPROXIMATELY 12". THE STUMPS AND ROOTS SHALL BE GROUND DOWN A MINIMUM OF TWELVE (12) INCHES BELOW NORMAL GROUND LEVEL.

J.D. 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.

J.E. 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 THEY SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO EXISTING UTILITIES.

J.F. ANY MATERIAL RESULTING FROM THE TRIMMING OR REMOVAL OF ANY TREES SHALL BECOME THE RESPONSIBILITY OF THE CONTRACTOR.

J.G. HAZARDOUS TREES–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 OWNERS REPRESENTATIVE. SUCH TREES SHALL INCLUDE THOSE THAT ARE OVER MATURE, DISEASED, OR SHOWING SIGNS OF DECAY OR OTHER STRUCTURAL WEAKNESS.

J.H. 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.

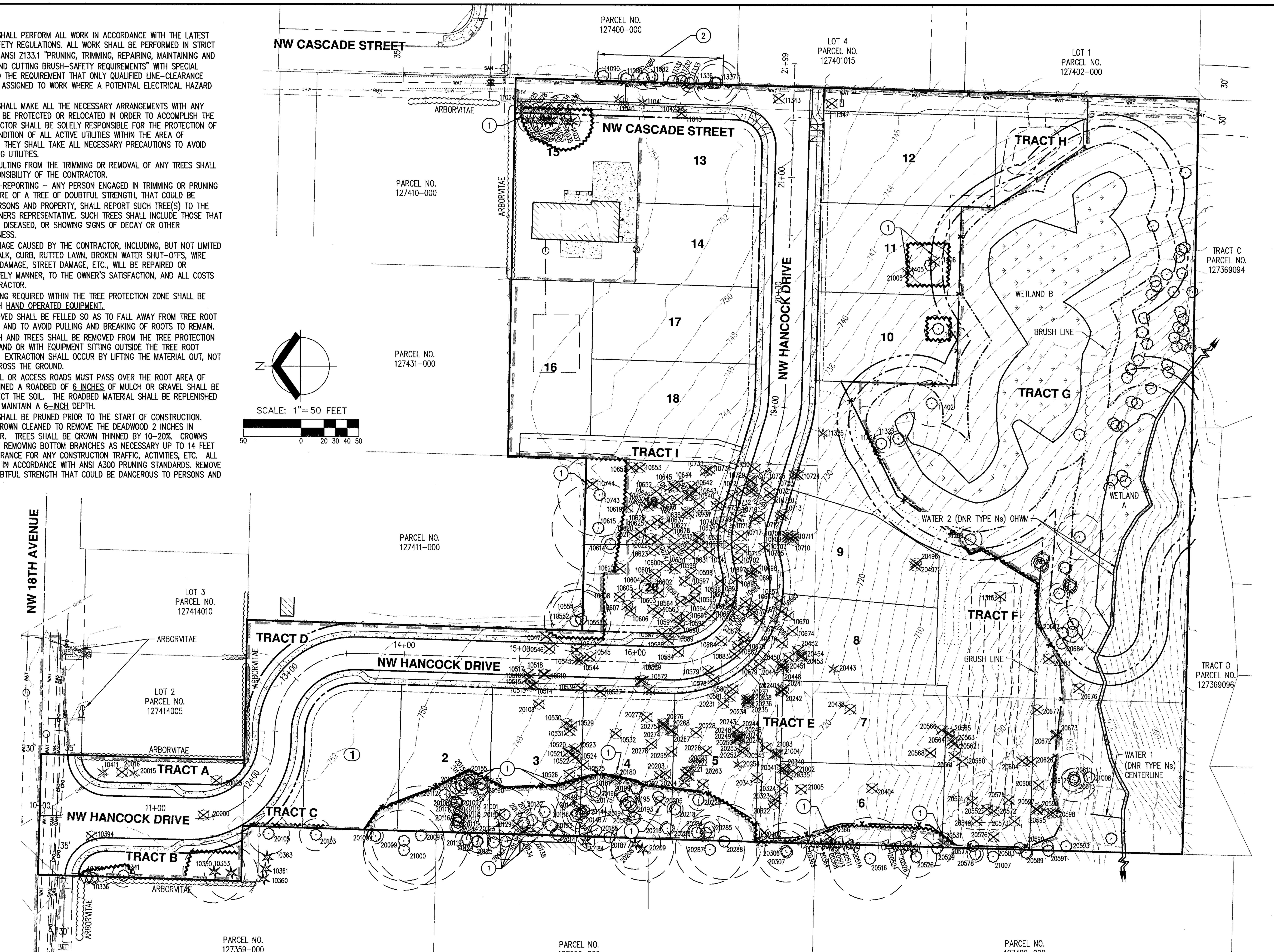
J.I. ANY BRUSH CLEARING REQUIRED WITHIN THE TREE PROTECTION ZONE SHALL BE ACCOMPLISHED WITH HAND OPERATED EQUIPMENT.

J.J. TREES TO BE REMOVED SHALL BE FELLED SO AS TO FALL AWAY FROM TREE ROOT PROTECTION ZONES AND TO AVOID PULLING AND BREAKING OF ROOTS TO REMAIN.

J.K. ALL DOWNED BRUSH AND TREES SHALL BE REMOVED FROM THE TREE PROTECTION ZONE EITHER BY HAND OR WITH EQUIPMENT SITTING OUTSIDE THE TREE ROOT PROTECTION ZONE. EXTRACTION SHALL OCCUR BY LIFTING THE MATERIAL OUT, NOT BY SKIDDING IT ACROSS THE GROUND.

J.L. IF TEMPORARY HAUL OR ACCESS ROADS MUST PASS OVER THE ROOT AREA OF TREES TO BE RETAINED A ROADBED OF 6 INCHES OF MULCH OR GRAVEL SHALL BE CREATED TO PROTECT THE SOIL. THE ROADBED MATERIAL SHALL BE REPLENISHED AS NECESSARY TO MAINTAIN A 6–INCH DEPTH.

J.M. PRUNING. TREES SHALL BE PRUNED PRIOR TO THE START OF CONSTRUCTION. TREES SHALL BE CROWN CLEANED TO REMOVE THE DEADWOOD 2 INCHES IN DIAMETER AND OVER. TREES SHALL BE CROWN THINNED BY 10–20%. CROWNS MAY BE RAISED BY REMOVING BOTTOM BRANCHES AS NECESSARY UP TO 14 FEET HIGH TO GIVE CLEARANCE FOR ANY CONSTRUCTION TRAFFIC, ACTIVITIES, ETC. ALL WORK TO BE DONE IN ACCORDANCE WITH ANSI A300 PRUNING STANDARDS. REMOVE ANY LIMBS OF DOUBTFUL STRENGTH THAT COULD BE DANGEROUS TO PERSONS AND PROPERTY.



GENERAL NOTES

1. TREE PROTECTION FENCING SHALL BE INSTALLED PRIOR TO DEMOLITION AND SITE GRADING ACTIVITIES. SEE DETAIL SHEET P5.3. SILT FENCING MAY BE UTILIZED WHEN APPLICABLE.
2. ALL SHRUBS WITHIN SIGHT DISTANCE TRIANGLES SHALL BE MAINTAINED SO THAT THE FOLIAGE HEIGHT ABOVE THE PAVEMENT DOES NOT EXCEED 2.5 FEET. STREET TREES WITHIN SIGHT DISTANCE TRIANGLES SHALL BE LIMBED UP TO A HEIGHT OF 10 FEET CONSISTENT WITH ANSI A300 STANDARDS TO PROVIDE SIGHT DISTANCE VISIBILITY.
3. SEE SHEETS P5.1–P5.3 FOR TREE INVENTORY.
4. PRESERVED TREES WILL REQUIRE PRUNING TO IMPROVE CROWN STRUCTURE AND REMOVE DEAD BRANCHES, AND/OR REMOVAL OF SURROUNDING BLACKBERRY AND OTHER SPECIES TO INCREASE TREE HEALTH. RETAIN NATIVE VEGETATION WITHIN TREE PROTECTION AREAS. SEE TREE PROTECTION NOTES, THIS SHEET, FOR GENERAL PRUNING GUIDELINES.
5. FOLLOWING CLEARING AND GRADING ACTIVITIES, A CERTIFIED ARBORIST SHALL INSPECT RETAINED TREES FOR POTENTIALLY HAZARDOUS TREE CONDITIONS. COORDINATION WITH THE CITY SHALL OCCUR PRIOR TO ANY ADDITIONAL TREE REMOVALS FOR HAZARD ABATEMENT.
6. NOT ALL TREES WERE SURVEYED AND/OR INSPECTED WITHIN TRACT G, A CRITICAL AREA TRACT. ONLY TREES ADJACENT TO THE PROPOSED DEVELOPMENT ACTIVITIES WERE INSPECTED AND INCLUDED IN THE TREE SURVEY. THEREFORE, TRACT F IS EXCLUDED FROM THE SITE AREA FOR TREE DENSITY CALCULATIONS.
7. TREE PROTECTION AREAS MAY BE REVIEWED AGAIN PRIOR TO HOME CONSTRUCTION AND MODIFIED.

TREE PLAN

GROSS AREA:	10.03 AC
SITE AREA EXCLUDING ROW AND TRACT G:	5.63 AC
TOTAL TREE UNITS REQUIRED (5.63 X 20):	113
EXISTING TREES RETAINED/(TREE UNITS):	56/(190)
PROPOSED SITE TREES/(TREE UNITS):	52/(52)

NOTE: SEE LANDSCAPING PLAN (P9.0) FOR PROPOSED TREE PLANTING PLAN

KEYED NOTES (#)

1. REMOVE THE FOLLOWING TREES: 11025, 11026, 11028, 11031, 11034, 11036, 11406, 20129, 20134, 20135, 20138, 20145, 20150, 20155, 20157, 20176, 20180, 20181, 20366, 20531, 21001, 21006. DO NOT PULL STUMPS WITHIN TREE PROTECTION FENCING. STUMP MAY BE GROUND AND COVERED WITH SOIL.
2. IMPACTS TO OFF–SITE ROW OF TREES EXCEEDS RECOMMENDED CRITICAL ROOT AREA IMPACTS. A CERTIFIED ARBORIST IS TO BE PRESENT DURING EXCAVATION ACTIVITIES IN THIS AREA. COORDINATION WITH ADJACENT PARCEL OWNER SHOULD BE COMPLETED PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES. ADDITIONAL ROOT EXPLORATION MAY BE NECESSARY TO DETERMINE ROOT IMPACTS FOR EACH TREE. IF IMPACTS ARE TOO SEVERE, TREE REMOVAL MAY BE NECESSARY WITH OWNER'S PERMISSION. IF TREE REMOVAL IS NECESSARY AND THE OWNER DOES NOT APPROVE, CONSTRUCTION OF NW CASCADE STREET SHALL OCCUR WITH DEVELOPMENT OF PARCEL 127400-000.

LEGEND

	DECIDUOUS / CONIFEROUS
EXISTING TREE TO REMAIN	
EXISTING TREE TO BE REMOVED	
TREE ROOT PROTECTION ZONE (1 FOOT RADIUS PER INCH DBH)	
TREE PROTECTION/CONSTRUCTION FENCE	

CERTIFIED ARBORIST ISA®
PRELIMINARY NOT FOR CONSTRUCTION
BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

TREE PRESERVATION AND REMOVAL PLAN

DESIGNED BY:	ELN
DRAWN BY:	ELN
MANAGED BY:	JMM
CHECKED BY:	BDH
DATE: 3/26/2019	

REVISIONS

JOB NUMBER 5638

SHEET P5.0

AKS DRAWING FILE: 5638 P5.0.DWG | LAYOUT: P5.0

Detailed Tree Inventory for Hancock Springs

AKS JOB NO. 5638 Site Area = 5.63 acres

AKS Reference #	Total DBH (In)	Tree Species Common Name (Scientific name)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
10334	6	Norway Maple (Acer platanoides)	0	Off site, growing up against fence along property line, healthy	C		0
10336	6	Norway Maple (Acer platanoides)	0	Off site, growing up against fence along property line, healthy	C		0
10341	9,5	Paper Birch (Betula papyrifera)	2	Slight lean, crown clean recommended	C		2
10350	27	Noble Fir (Abies procera)	10	Stem forks into codominant stems at 30' & 45', dead branches in crown, crown clean recommended	C		10
10353	23	Douglas-fir (Pseudotsuga menziesii)	8	Stem forks into codominant stems at 40', dead branches in crown, crown clean recommended	C		8
10360	9	Western Redcedar (Thuja plicata)	0	Off site	C		0
10361	6	Western Redcedar (Thuja plicata)	0	Off site	C		0
10363	16	Douglas-fir (Pseudotsuga menziesii)	0	Off site	C		0
10394	32	Norway Maple (Acer platanoides)	12	Full crown, healthy	C	Located within proposed road grading	0
10411	8	Western Redcedar (Thuja plicata)	2	Growing against side of existing structure, surrounded by blackberry	C	Located within proposed road grading	0
10513	13	Red Alder (Alnus rubra)	3	Healthy	C	Located within proposed road grading	0
10514	11	Red Alder (Alnus rubra)	2	Moderate lean	B	Located within proposed road grading	0
10515	15	Red Alder (Alnus rubra)	4	Slight lean, topped	B	Located within proposed road grading	0
10516	9	Red Alder (Alnus rubra)	2	Slight lean, topped	B	Located within proposed road grading	0
10517	11	Red Alder (Alnus rubra)	2	Slight lean, stem forks at 15', topped	B	Located within proposed road grading	0
10518	8	Red Alder (Alnus rubra)	2	Stem forks at 10'	B	Located within proposed road grading	0
10519	9	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
10520	8	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10521	12	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
10522	9	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10523	9	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10524	8	Red Alder (Alnus rubra)	2	Healthy	C	Lot grading greatly impacts root zone	0
10525	9	Paper Birch (Betula papyrifera)	2	Healthy	C	Lot grading greatly impacts root zone	0
10526	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown, minor scarring on stem	C	Lot grading greatly impacts root zone	0
10529	12	Red Alder (Alnus rubra)	2	Slight lean	B	Lot grading greatly impacts root zone	0
10530	14	Red Alder (Alnus rubra)	3	Moderate lean	B	Lot grading greatly impacts root zone	0
10531	10	Red Alder (Alnus rubra)	2	Topped, significant lean	B	Lot grading greatly impacts root zone	0
10532	72	Bigleaf Maple (Acer macrophyllum)	31	Three codominant stem begin above breast height, large dead branches in crown, large cavities in base	B	Located in center of proposed lot grading, poor tree health	0
10537	6	Red Alder (Alnus rubra)	2	Moderate lean	B	Located within proposed road grading	0
10539	8,4,5,3,2	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown with dead branches, slight lean, stem forks at 20', 2" & 3" stems are dead	B	Located within proposed road grading	0
10542	21	Bigleaf Maple (Acer macrophyllum)	7	Slight lean, dead branches in crown	C	Located within proposed road grading	0
10543	23	Bigleaf Maple (Acer macrophyllum)	8	Unbalanced crown with dead branches, slight lean, stem forks at 20'	B	Located within proposed road grading	0
10544	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown with dead branches	B	Located within proposed road grading	0
10545	37	Bigleaf Maple (Acer macrophyllum)	15	Has co-dominant stems, some dead branches, decay present	B	Located within proposed road grading	0
10546	9	Red Alder (Alnus rubra)	2	Slight lean, dead top, poor health	B	Located within proposed road grading	0
10547	6	Red Alder (Alnus rubra)	2	Moderate lean	B	Located within proposed road grading	0
10552	27	Bigleaf Maple (Acer macrophyllum)	0	Off site, unbalanced crown, codominant stems, decay in old branch collars, slight lean, scarring in stem	B		0
10553	25,6,6	Bigleaf Maple (Acer macrophyllum)	0	Off site, codominant stems, slight lean, scarring at 12'	B		0
10554	25	Bigleaf Maple (Acer macrophyllum)	0	Off site, codominant stems, included bark	C		0
10563	13	Bigleaf Maple (Acer macrophyllum)	3	Healthy	C	Lot grading greatly impacts root zone	0
10564	13	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 30', decay in cavity at base, slightly crooked	B	Lot grading greatly impacts root zone	0
10569	6	Red Alder (Alnus rubra)	2	Exhibits very poor health	B	Located within proposed road grading	0
10570	7	Red Alder (Alnus rubra)	2	Healthy	C	Located within proposed road grading	0
10572	7,7,4,4,4	Bigleaf Maple (Acer macrophyllum)	2	One 4" stem is dead, one 7" stem is topped	A	Located within proposed road grading	0
10578	6	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 15'	B	Located within proposed road grading	0
10579	9	Honey Locust (Gleditsia triacanthos)	2	Stem forks at 40', slightly crooked, slight lean	B	Located within proposed road grading	0
10580	9	Red Alder (Alnus rubra)	2	Signs of decay in stem, topped, declining health	B	Located within proposed road grading	0
10581	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean, topped	B	Located within proposed road grading	0
10584	23	Bigleaf Maple (Acer macrophyllum)	8	Unbalanced crown, some included bark, scarring in stem	B	Located within proposed road grading	0
10586	20	Bigleaf Maple (Acer macrophyllum)	6	Unbalanced crown, large dead branches in crown, crooked stem	B	Located within proposed road grading	0
10587	20	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10589	12	Bigleaf Maple (Acer macrophyllum)	2	Decay present at base, topped, slight lean, declining health	B	Lot grading greatly impacts root zone	0
10590	8	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean, crooked stem	B	Lot grading greatly impacts root zone	0
10591	12	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10592	17	Bigleaf Maple (Acer macrophyllum)	5	Codominant stems begin at 20', large dead branches in crown, scarring in stem	C	Lot grading greatly impacts root zone	0
10593	12	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10594	11	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 30', slight lean	B	Lot grading greatly impacts root zone	0
10595	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
10596	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 40', dead branches in crown	C	Lot grading greatly impacts root zone	0
10597	6	Bigleaf Maple (Acer macrophyllum)	2	Dead top	B	Lot grading greatly impacts root zone	0
10598	17	Bigleaf Maple (Acer macrophyllum)	5	Stem forks at 25' and 45', one stem is topped with large branch breakage near top	B	Lot grading greatly impacts root zone	0
10599	14	Bigleaf Maple (Acer macrophyllum)	3	Dead top	B	Lot grading greatly impacts root zone	0
10600	6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10601	8	Bigleaf Maple (Acer macrophyllum)	2	Slightly crooked, sweep in stem	B	Lot grading greatly impacts root zone	0
10602	15	Bigleaf Maple (Acer macrophyllum)	4	Dead top	B	Lot grading greatly impacts root zone	0
10603	16	Bigleaf Maple (Acer macrophyllum)	4	Crooked stem	C	Lot grading greatly impacts root zone	0
10604	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10605	13	Bigleaf Maple (Acer macrophyllum)	3	Dead top, slight lean	B	Lot grading greatly impacts root zone	0
10606	12,10	Bigleaf Maple (Acer macrophyllum)	4	Codominant stems above breast height, dead branches in crown	B	Lot grading greatly impacts root zone	0
10607	7,6,5,4	Bigleaf Maple (Acer macrophyllum)	2	Codominant stems above breast height, dead top, declining health	B	Lot grading greatly impacts root zone	0
10608	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
10610	7	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
10614	8	Red Alder (Alnus rubra)	2	Crooked stem, slight lean	B		2
10615	17,36	Bigleaf Maple (Acer macrophyllum)	16	Breakage and dead branches in crown, splits into three codominant stems above breast height, one stem topped	B		16
10619	12	Bigleaf Maple (Acer macrophyllum)	2	Decay in cavity at base	B	Lot grading greatly impacts root zone	0
10620	8	Red Alder (Alnus rubra)	2	Dead branches, top is dying	B	Lot grading greatly impacts root zone	0
10621	8	Bigleaf Maple (Acer macrophyllum)	2	Topped, decay in stem, moderate lean, crooked stem, declining health	A	Lot grading greatly impacts root zone	0
10622	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, dead top	B	Lot grading greatly impacts root zone	0
10623	9,9	Bigleaf Maple (Acer macrophyllum)	3	One stem forks near top, other stem is topped, decay present	B	Lot grading greatly impacts root zone	0
10624	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, crooked stem	B	Lot grading greatly impacts root zone	0
10625	17	Bigleaf Maple (Acer macrophyllum)	5	Unbalanced, codominant stems above breast height, one stem topped	B	Lot grading greatly impacts root zone	0
10626	10	Bigleaf Maple (Acer macrophyllum)	2	Large dead branches at top	C	Lot grading greatly impacts root zone	0
10627	15	Bigleaf Maple (Acer macrophyllum)	4	Stem forks at 45', decay in stem, crooked, scarring present, large dead branches in crown	B	Lot grading greatly impacts root zone	0
10628	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10629	12	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 40', one branch at fork dead	B	Lot grading greatly impacts root zone	0
10630	12	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
10631	6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10632	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10633	16	Bigleaf Maple (Acer macrophyllum)	4	Healthy	C	Lot grading greatly impacts root zone	0
10634	12	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, crooked	B	Lot grading greatly impacts root zone	0
10635	12,4	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
10637	8	Bigleaf Maple (Acer macrophyllum)	2	Topped, dead bark near break, declining health	B	Lot grading greatly impacts root zone	0
10638	14	Bigleaf Maple (Acer macrophyllum)	3	Slightly crooked	B	Lot grading greatly impacts root zone	0
10639	8,8	Bigleaf Maple (Acer macrophyllum)	2	Slightly crooked, one 8" stem dead	B	Lot grading greatly impacts root zone	0
10640	14	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10641	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10642	9	Bigleaf Maple (Acer macrophyllum)	2	Crooked stem, dead branches in crown	B	Lot grading greatly impacts root zone	0
10643	9	Bigleaf Maple (Acer macrophyllum)	2	Topped, no obvious dominant branches	B	Lot grading greatly impacts root zone	0
10644	13	Bigleaf Maple (Acer macrophyllum)	0	Dead, stem split in half	A	Tree is dead	0
10645	17	Bigleaf Maple (Acer macrophyllum)	5	Unbalanced crown, dead branches in crown, cavity in stem at eye height, decay present	B	Lot grading greatly impacts root zone	0
10646	9	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10647	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10648	7	Bigleaf Maple (Acer macrophyllum)	2	Topped, no obvious dominant branches	B	Lot grading greatly impacts root zone	0
10649	12	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, stem forks at 20', dead branches in crown	B	Lot grading greatly impacts root zone	0
10650	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, stem forks at 20'	B	Lot grading greatly impacts root zone	0
10651	9	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, stem forks at 20'	B	Lot grading greatly impacts root zone	0
10652	15	Bigleaf Maple (Acer macrophyllum)	4	Stem forks at 15'	B	Lot grading greatly impacts root zone	0
10653	13	Bigleaf Maple (Acer macrophyllum)	3	Dead branches in crown, one large branch contains almost all crown growth	B	Lot grading greatly impacts root zone	0
10654	17,15,13,14	Bigleaf Maple (Acer macrophyllum)	11	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10657	12,7	Bigleaf Maple (Acer macrophyllum)	3	Dead top, 7" stem shows declining health, unbalaced crown, 12" stem has sweep at base	B	Lot grading greatly impacts root zone	0
10660	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10661	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10662	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, dead top, stem forks near top	B	Located within proposed road grading	0
10663	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced, dead branches in crown, stem forks near top	B	Located within proposed road grading	0
10664	14	Bigleaf Maple (Acer macrophyllum)	3	Sparse crown, unbalanced	B	Located within proposed road grading	0
10665	12	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Located within proposed road grading	0
10666	8	Bigleaf Maple (Acer macrophyllum)	2	Topped, unbalanced crown, declining health	B	Located within proposed road grading	0
10667	9	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10668	25	Douglas-fir (Pseudotsuga menziesii)	9	Dead branches in crown	C	Located within proposed road grading	0
10669	14	Bigleaf Maple (Acer macrophyllum)	3	Large dead branches in crown, slight lean	B	Lot grading greatly impacts root zone	0
10670	7,7,7,6,4	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced, dead branches in crown, slight lean	B	Lot grading greatly impacts root zone	0
10674	9,7,7,6,4,4	Bigleaf Maple (Acer macrophyllum)	4	Unbalanced, dead branches in crown	B	Lot grading greatly impacts root zone	0
10675	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slightly crooked	B	Located within proposed road grading	0
10676	11,7	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10677	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 40', dead branches in crown	C	Located within proposed road grading	0
10678	11	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 35', unbalanced crown, dead top, slight lean, branches extend horizontally after fork	B	Located within proposed road grading	0
10679	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 40', unbalanced crown	B	Located within proposed road grading	0
10682	17	Bigleaf Maple (Acer macrophyllum)	5	Stem forks at 50', dead top, slight lean, slightly crooked	B	Located within proposed road grading	0
10683	12	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 45', slightly crooked	B	Located within proposed road grading	0
10684	14	Bigleaf Maple (Acer macrophyllum)	3	Stem forks at 20', topped	B	Located within proposed road grading	0
10691	20	Bigleaf Maple (Acer macrophyllum)	6	Codominant stems begin at 10', crooked stem	B	Lot grading greatly impacts root zone	0
10693	11	Bigleaf Maple (Acer macrophyllum)	2	Significant decay in stem, almost dead	A	Located within proposed road grading	0
10695	7	Bigleaf Maple (Acer macrophyllum)	2	Dead top, declining health	B	Located within proposed road grading	0
10696	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown	B	Located within proposed road grading	0
10697	7,4	Bigleaf Maple (Acer macrophyllum)	2	Dead top, slight lean	B	Located within proposed road grading	0
10698	6,7,8	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B	Located within proposed road grading	0
10702	13	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown, stem forks near top, dead branches in crown	B	Located within proposed road grading	0
10705	13,7	Bigleaf Maple (Acer macrophyllum)	4	7" stem unbalanced, slight lean, dead branches in crown	B	Located within proposed road grading	0
10707	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10708	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
10709	13,14,6	Bigleaf Maple (Acer macrophyllum)	6	14" & 6" stems unbalanced, 14" stem has dead top, dead branches in crown	B	Lot grading greatly impacts root zone	0
10710	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced, scarring in stem	B	Lot grading greatly impacts root zone	0
10711	7,7	Bigleaf Maple (Acer macrophyllum)	2	One stem broken, unbalanced, significant lean	A	Lot grading greatly impacts root zone	0
10712	11	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
10713	17,19	Bigleaf Maple (Acer macrophyllum)	9	17" stem splits into codominant stems with one having a dead top, 19" stem unbalanced, decay in dead stem and branch sections	A	Lot grading greatly impacts root zone	0
10715	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10716	14	Bigleaf Maple (Acer macrophyllum)	3	Codominant stems begin above breast height, one stem dead	B	Located within proposed road grading	0
10717	14	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced crown, dead branches in crown	B	Located within proposed road grading	0
10718	14	Bigleaf Maple (Acer macrophyllum)	3	Slightly crooked	C	Located within proposed road grading	0
10719	13	Unknown Deciduous	3	Significant decay in stem, almost dead	A	Located within proposed road grading	0
10720	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10721	14	Bigleaf Maple (Acer macrophyllum)	3	Topped, large dead branch stubs	B	Located within proposed road grading	0
10723	20	Bigleaf Maple (Acer macrophyllum)	6	Large dead branches in crown, branches extend out far	C	Lot grading greatly impacts root zone	0
10724	22	Bigleaf Maple (Acer macrophyllum)	7	Large dead branches in crown, branches extend out far	C	Lot grading greatly impacts root zone	0
10725	6	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean	B	Located within proposed road grading	0

CERTIFIED ARBORIST

ISA

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CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 08/30/19

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY TREE INVENTORY

DESIGNED BY: ELN
DRAWN BY: ELN
MANAGED BY: JMM
CHECKED BY: BDH
DATE: 3/26/2019

REVISIONS

JOB NUMBER
5638

SHEET
P5.1

Detailed Tree Inventory for Hancock Springs

AKS JOB NO. 5638 Site Area = 5.63 acres

AKS Reference #	Total DBH (In)	Tree Species Common Name (Scientific name)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
10726	14	Bigleaf Maple (Acer macrophyllum)	3	Scarring in stem	C	Located within proposed road grading	0
10727	12	Bigleaf Maple (Acer macrophyllum)	2	Topped, no obvious dominant branches	B	Located within proposed road grading	0
10728	6,7	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10729	10	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, topped, branch extends horizontally at top	B	Located within proposed road grading	0
10730	7	Red Alder (Alnus rubra)	2	Severely unbalanced and leaning	B	Located within proposed road grading	0
10731	19	Bigleaf Maple (Acer macrophyllum)	6	Dead branches in crown	C	Located within proposed road grading	0
10732	13	Bigleaf Maple (Acer macrophyllum)	3	Fair health	C	Located within proposed road grading	0
10733	30	Bigleaf Maple (Acer macrophyllum)	11	Codominant stems begin above breast height, one stem crooked	C	Lot grading greatly impacts root zone	0
10734	18	Bigleaf Maple (Acer macrophyllum)	5	Very unbalanced crown, possible dead top	B	Lot grading greatly impacts root zone	0
10737	8	Bigleaf Maple (Acer macrophyllum)	2	Stem forks at 20'	B	Lot grading greatly impacts root zone	0
10738	9	Bigleaf Maple (Acer macrophyllum)	2	Scarring at base	C	Located within proposed road grading	0
10739	26	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
10740	13	Bigleaf Maple (Acer macrophyllum)	3	Large dead branches in crown, declining health	B	Located within proposed road grading	0
10741	15	Bigleaf Maple (Acer macrophyllum)	4	Unbalanced crown, stems forks near top, one branch of fork dead	B	Lot grading greatly impacts root zone	0
10743	36	Bigleaf Maple (Acer macrophyllum)	14	Two codominant stems begin above breast height, dead third stem	B		14
10744	28	Bigleaf Maple (Acer macrophyllum)	10	Previous codominant stem broke off, significant decay in leftover wood, unbalanced crown, crooked stem, forks at 20', dead branches in crown	B	Poor tree health	0
11024	14	Douglas-fir (Pseudotsuga menziesii)	3	Large branch over existing access road	C	Located within proposed road grading	0
11025	11,11,10	Lodgepole Pine (Pinus contorta)	5	Codominant stems above breast height	B	Located within proposed road grading	0
11026	13	Western Redcedar (Thuja plicata)	3	Codominant stems above breast height, brown rot decay at base	B	Poor tree health	0
11027	7,6,6,3	Western Redcedar (Thuja plicata)	2	Codominant stems above breast height, crown clean recommended	B		2
11028	12	Lodgepole Pine (Pinus contorta)	2	Healthy	C	Located within proposed road grading	0
11029	11,12	Western Redcedar (Thuja plicata)	4	Codominant stems above breast height, crown clean recommended	B		4
11030	12	Western Redcedar (Thuja plicata)	2	Crown clean recommended, healthy	C		2
11031	10	Lodgepole Pine (Pinus contorta)	0	Dead	A	Tree is dead	0
11032	11	Western Redcedar (Thuja plicata)	2	Crown clean recommended, healthy	C		2
11033	16	Western Redcedar (Thuja plicata)	4	Crown clean recommended, healthy	C		4
11034	11	Lodgepole Pine (Pinus contorta)	2	Crooked stem	B	Located within proposed road grading	0
11035	24	Douglas-fir (Pseudotsuga menziesii)	8	Crown clean recommended, healthy	C		8
11036	14	Lodgepole Pine (Pinus contorta)	3	Unbalanced crown, large branch over driveway, scarring in stem, crooked	B	Located within proposed road grading	0
11037	8	Western Redcedar (Thuja plicata)	2	Growing in shade of adjacent Douglas-fir, exhibits slow growth in branches	B		2
11040	16	Douglas-fir (Pseudotsuga menziesii)	4	Healthy	C	Located within proposed road grading	0
11041	19	Douglas-fir (Pseudotsuga menziesii)	6	Healthy	C	Located within proposed road grading	0
11042	21	Douglas-fir (Pseudotsuga menziesii)	7	Healthy	C	Located within proposed road grading	0
11043	7	Honey Locust (Gleditsia triacanthos)	2	Unbalanced crown	B	Located within proposed road grading	0
11082	10	Honey Locust (Gleditsia triacanthos)	0	Off site	C		0
11085	10	Honey Locust (Gleditsia triacanthos)	0	Off site, dead branches in crown	C		0
11086	7	Honey Locust (Gleditsia triacanthos)	0	Off site, exhibits healthy growth in response to topping	C		0
11090	6,2,2	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11298	6 stems of 4"	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended, one stem extends outside of crown	C		0
11316	6 stems of 4"	Hawthorn (Crataegus spp.)	2	Healthy	C	Within stormwater facility grading	0
11323	4 stems of 4"	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended	C		0
11324	6,8	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended	C		0
11325	15,13	Port Orford Cedar (Chamaecyparis lawsoniana)	0	Dead	A	Tree is dead	0
11331	12,6,8	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11332	7	Honey Locust (Gleditsia triacanthos)	0	Off site, small 2" stem attached leaning over road requries pruning or removal	C		0
11333	6,6	Honey Locust (Gleditsia triacanthos)	0	Off site	C		0
11336	16	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11337	20	Honey Locust (Gleditsia triacanthos)	0	Off site, healthy	C		0
11343	9	Honey Locust (Gleditsia triacanthos)	2	Codominant stems above breast height	B	Located within proposed road grading	0
11347	17,17,15,12,12, 12,10,6,6	Canyon Live Oak (Quercus chrysolepis)	15	Large stems branch off in all directions, one stem split in half, old scars with decay present in multiple stems, stems are crooked and unbalanced, moderate to severe leaning	A	Sidewalk to be constructed 7' from tree, poor tree health	0
11402	10 stems of 6"	Hawthorn (Crataegus spp.)	0	Heavy crown clean recommended	C		0
11403	7,7,6	Aspen (Populus spp.)	2	Less than 10' in height, yellow leaves, dead branches in crown, crown clean recommended	C		2
11405	12,14	Holly (Ilex spp.)	5	Heavy crown clean recommended, scars on stem	C		5
11406	33	Aspen (Populus spp.)	13	Surrounded by heavy blackberry, many dead branches in crown, severe lean, decay present in old branch collars	B	Trunk leans over proposed storm trenching	0
20000	6,4	Black Walnut (Juglans nigra)	2	Healthy	C	Located within proposed road grading	0
20015	8	Western Redcedar (Thuja plicata)	2	Growing against side of existing structure, surrounded by blackberry	C	Located within proposed road grading	0
20016	7	Red Alder (Alnus rubra)	2	Sweep at base, growing against side of existing structure, surrounded by blackberry	B	Located within proposed road grading	0
20023	53	Cherry (Prunus spp.)	22.5	Almost dead	B	Located within proposed road grading	0
20097	27,33	Bigleaf Maple (Acer macrophyllum)	0	Off site, decay in stem cavity, pitch seeps	B		0
20099	35	Bigleaf Maple (Acer macrophyllum)	0	Off site, topped, large branch containing all foliage extends 20' into site, scarring on branch, decay present	B		0
20100	7	Sycamore (Platanus spp.)	0	Off site, moderate lean	C		0
20103	14	Sycamore (Platanus spp.)	0	Off site	C		0
20105	18	Sycamore (Platanus spp.)	0	Off site, some branches extend over site	C		0
20106	9,7	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20107	10	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20108	6	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B		2
20109	8	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B		2
20110	7	Red Alder (Alnus rubra)	2	Surrounded by blackberry, slight lean	B		2
20111	6	Red Alder (Alnus rubra)	2	Surrounded by blackberry, slight lean, crooked stem	B		2
20112	10	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20114	6	Red Alder (Alnus rubra)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20115	7	Red Alder (Alnus rubra)	2	Healthy	C	Lot grading greatly impacts root zone	0
20116	8	Red Alder (Alnus rubra)	2	Healthy	C	Lot grading greatly impacts root zone	0
20117	6	Red Alder (Alnus rubra)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20118	6	Red Alder (Alnus rubra)	2	Topped, slight lean, declining health	B	Lot grading greatly impacts root zone	0
20129	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20130	9	Red Alder (Alnus rubra)	2	Slightly crooked stem, dead branches in crown	B		2
20131	10	Red Alder (Alnus rubra)	2	Slight lean	B		2
20132	9	Red Alder (Alnus rubra)	2	Healthy	B		2
20133	6	Red Alder (Alnus rubra)	2	Sweep at base	B		2
20134	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20135	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20138	8	Red Alder (Alnus rubra)	2	Dead top	B	Poor tree health	0
20141	6	Red Alder (Alnus rubra)	2	Slight lean	B		2
20144	9,10,14	Bigleaf Maple (Acer macrophyllum)	6	Large dead branches in crown	B		6
20145	7	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20146	12,6	Bigleaf Maple (Acer macrophyllum)	3	6" stem dead, large dead branches in crown	B		3
20147	11	Bigleaf Maple (Acer macrophyllum)	2	Moderate lean	B		2
20148	6,7,8,9,11,4	Bigleaf Maple (Acer macrophyllum)	6	Large dead branches in crown, moderate lean	B		6
20149	7,8,8,11,12,4,4	Bigleaf Maple (Acer macrophyllum)	7	Large dead branches in crown	C		7
20150	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20151	9,10,13,13	Unknown Deciduous	8	Large dead branches in crown, crown clean recommended	B		8
20153	6	Red Alder (Alnus rubra)	2	Healthy	C		2
20155	6	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B	High risk of falling after development	0
20156	8	Red Alder (Alnus rubra)	2	Healthy	C		2
20157	8	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20158	8	Red Alder (Alnus rubra)	2	Dead branches in crown	B		2
20159	9	Red Alder (Alnus rubra)	2	Dead branches in crown, codominant stems above breast height	B		2
20160	6	Red Alder (Alnus rubra)	2	Healthy	C		2
20175	8	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C		2
20176	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20180	13	Bigleaf Maple (Acer macrophyllum)	3	Healthy	C	Lot grading greatly impacts root zone	0
20181	21	Bigleaf Maple (Acer macrophyllum)	7	Large dead branches in crown, scarring in stem	C	Lot grading greatly impacts root zone	0
20185	18	Bigleaf Maple (Acer macrophyllum)	5	Dead hanging branches in crown	C		5
20192	6	Red Alder (Alnus rubra)	2	Crooked stem, moderate lean	B		2
20193	9	Red Alder (Alnus rubra)	2	Significant lean	A		2
20194	10,7	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C		2
20195	7	Bigleaf Maple (Acer macrophyllum)	2	Scarring in stem	B		2
20196	8	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B		2
20199	6	Red Alder (Alnus rubra)	2	Crooked stem	B		2
20202	6,12	Red Alder (Alnus rubra)	3	Dead branches in crown, sweep at base	B	Lot grading greatly impacts root zone	0
20203	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20204	16	Red Alder (Alnus rubra)	4	Dead branches in crown	C		4
20205	13	Red Alder (Alnus rubra)	3	Topped, dead branches in crown, declining health	B	Poor tree health	0
20216	6	Red Alder (Alnus rubra)	2	Slight lean, crooked stem	B		2
20218	7	Red Alder (Alnus rubra)	2	Slight lean	B		2
20220	9	Red Alder (Alnus rubra)	2	Dead branches in crown, crooked stem	B		2
20221	9	Red Alder (Alnus rubra)	2	Unbalanced crown, severe lean	B	High risk of falling after development	0
20222	7	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20223	14	Bigleaf Maple (Acer macrophyllum)	3	Unbalanced, dead branches in crown	B	Lot grading greatly impacts root zone	0
20224	6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20226	7,4	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20228	6	Honey Locust (Gleditsia triacanthos)	2	Dead branches in crown, crooked stem	B	Lot grading greatly impacts root zone	0
20231	32	Bigleaf Maple (Acer macrophyllum)	12	Dead top, forks at 50', declining health	B	Lot grading greatly impacts root zone	0
20234	8	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
20235	10	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20236	10	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20237	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20238	8	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20240	11	Unknown Deciduous	2	Healthy	C	Lot grading greatly impacts root zone	0
20241	11	Unknown Deciduous	2	Unbalanced, decay present in stem	B	Lot grading greatly impacts root zone	0
20242	12	Unknown Deciduous	2	Unbalanced crown, sweep at base, severe lean	B	Lot grading greatly impacts root zone	0
20243	12	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20244	7	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20245	8	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20246	7	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20247	10	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20248	8	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20249	9	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20250	10	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown	C	Lot grading greatly impacts root zone	0
20252	6,4	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20253	6,6	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Tree is dead	0
20254	37	Douglas-fir (Pseudotsuga menziesii)	15	Dead branches in crown	C	Located in center of proposed lot grading	0
20263	8	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown	B	Lot grading greatly impacts root zone	0
20265	9	Red Alder (Alnus rubra)	2	Few leaves on branches, declining health	B	Lot grading greatly impacts root zone	0
20267	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, slight lean, crooked stem	B	Lot grading greatly impacts root zone	0
20268	6	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, moderate lean, crooked stem	B	Lot grading greatly impacts root zone	0
20274	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	B	Lot grading greatly impacts root zone	0
20275	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	B	Lot grading greatly impacts root zone	0
20276	6	Bigleaf Maple (Acer macrophyllum)	2	Crooked stem	B	Lot grading greatly impacts root zone	0
20277	20	Bigleaf Maple (Acer macrophyllum)	6	Dead branches in crown, crooked stem	C	Lot grading greatly impacts root zone	0
20278	7,7	Bigleaf Maple (Acer macrophyllum)	2	Dead branches in crown, crooked stem	B	Lot grading greatly impacts root zone	0
20283	7	Red Alder (Alnus rubra)	2	Crooked stem	B		2
20284	6,5	Red Alder (Alnus rubra)	2	Slight lean	B		2
20285	9	Red Alder (Alnus rubra)	2	Slight lean	B		2

CERTIFIED ARBORIST
ISA
BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY TREE INVENTORY

DESIGNED BY: ELN
DRAWN BY: ELN
MANAGED BY: JMM
CHECKED BY: BDH
DATE: 3/26/2019

REVISIONS

JOB NUMBER 5638

SHEET P5.2

AKS DRAWING FILE: 5638 P5.0.DWG | LAYOUT: P5.2

Detailed Tree Inventory for Hancock Springs

AKS JOB NO. 5638 **Site Area = 5.63 acres**

AKS Reference #	Total DBH (In)	Tree Species Common Name (Scientific name)	Tree Units Initial	Condition/Comments	Windthrow Rating	Reason for Removal	Tree Units Retained
20288	24,20,12	Bigleaf Maple (Acer macrophyllum)	0	Off site, dead branches in crown, decay in stem, large branches extend over site	B		0
20302	13,12	Bigleaf Maple (Acer macrophyllum)	0	12" stem extends off site & dead, decay in stem cavity at base, unbalanced, dead branches in crown	B	Poor tree health	0
20322	7	Paper Birch (Betula papyrifera)	2	Moderate lean	B		2
20323	7	Paper Birch (Betula papyrifera)	2	Unbalanced crown, slight lean, crooked stem	B		2
20324	11	Cottonwood (Populus spp.)	2	Healthy	C		2
20335	7	Unknown Deciduous	2	Decay in stem cavity	B	Lot grading greatly impacts root zone	0
20340	15	Unknown Deciduous	4	Decay in stem cavity, dead branches in crown, declining health	B	Lot grading greatly impacts root zone	0
20341	10	Unknown Deciduous	2	Dead top, cavity in stem, decay in cavity, declining health	B	Lot grading greatly impacts root zone	0
20343	21	Paper Birch (Betula papyrifera)	7	Large dead branches with breakage	C	Lot grading greatly impacts root zone	0
20345	8,8,6,6,4,4	Bigleaf Maple (Acer macrophyllum)	4	Both 4" stems are dead, dead branches in crown	B	Lot grading greatly impacts root zone	0
20366	6,6,7,7	Unknown Deciduous	3	Dead top, crown clean recommended	B	Final lot grading will greatly affect root zone	0
20404	15,10,6	Elderberry (Sambucus spp.)	6	Surrounded by heavy blackberry, significant decay in stem, scarring in stem	A	Lot grading greatly impacts root zone	0
20438	19	Norway Maple (Acer platanoides)	6	25' crown radius, stem splits into 7-8 large branches at 7'	B	Lot grading greatly impacts root zone	0
20443	31	Western Redcedar (Thuja plicata)	12	Surrounded by blackberry, healthy	C	Final lot grading will result in fills of over 4' in depth across entire root zone	0
20448	7,5	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B	Lot grading greatly impacts root zone	0
20449	6	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20450	8	Bigleaf Maple (Acer macrophyllum)	2	Healthy	C	Lot grading greatly impacts root zone	0
20451	7	Bigleaf Maple (Acer macrophyllum)	2	Slight lean	B	Lot grading greatly impacts root zone	0
20453	7	Bigleaf Maple (Acer macrophyllum)	2	Dead top	B	Lot grading greatly impacts root zone	0
20454	7	Bigleaf Maple (Acer macrophyllum)	2	Unbalanced crown, dead branches in crown	B	Lot grading greatly impacts root zone	0
20496	9	Hawthorn (Crataegus spp.)	2	Many dead branches	C	Storm access road grading	0
20497	3,4,17,23	Hawthorn (Crataegus spp.)	11	Many dead branches	C	Storm access road grading	0
20531	11	Red Alder (Alnus rubra)	2	Moderate lean	B	Within stormwater facility grading	0
20549	26	Bigleaf Maple (Acer macrophyllum)	9	Scar at 15', dead branches in crown	C	Within stormwater facility grading	0
20551	12	Red Alder (Alnus rubra)	2	Sparse crown	B	Lot grading greatly impacts root zone	0
20552	6,10	Bigleaf Maple (Acer macrophyllum)	2	6" stem is topped and has decay, broken branches in crown	B	Within stormwater facility grading	0
20560	10	Red Alder (Alnus rubra)	2	Dead top	B	Within stormwater facility grading	0
20561	9	Red Alder (Alnus rubra)	2	Unbalanced crown, Dead top	B	Within stormwater facility grading	0
20562	6	Red Alder (Alnus rubra)	2	Many dead branches, slight lean, surrounded by blackberry, declining health	B	Within stormwater facility grading	0
20563	11	Red Alder (Alnus rubra)	2	Many dead branches, slight lean, surrounded by blackberry, declining health	B	Within stormwater facility grading	0
20564	7	Red Alder (Alnus rubra)	2	Significant decay in stem, moderate lean, stem forks at 10', surrounded by blackberry, almost dead	A	Within stormwater facility grading	0
20565	12	Red Alder (Alnus rubra)	2	Slight lean, stem forks near top	B	Within stormwater facility grading	0
20566	12	Red Alder (Alnus rubra)	2	Topped, scars from breakage at top and 20'	B	Within stormwater facility grading	0
20568	16	Red Alder (Alnus rubra)	4	Surrounded by blackberry, poor crown structure	B	Within stormwater facility grading	0
20571	9	Red Alder (Alnus rubra)	2	Moderate lean	B	Within stormwater facility grading	0
20572	6	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20573	36	Bigleaf Maple (Acer macrophyllum)	14	Codominant stems above breast height, decay in stem, many large dead branches	B	Within stormwater facility grading	0
20576	17	Bigleaf Maple (Acer macrophyllum)	0	Large dead branches, corrected sweep	C	Within stormwater facility grading	0
20577	8	Red Alder (Alnus rubra)	0	Dead	A	Retained within critical area	0
20578	7	Red Alder (Alnus rubra)	0	Off site, slight lean	B		0
20583	10	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20589	6	Bigleaf Maple (Acer macrophyllum)	0	Off site, slight lean	B		0
20590	12	Red Alder (Alnus rubra)	0	Dead	A	Retained within critical area	0
20591	6	Red Alder (Alnus rubra)	0	Off site, dead	A		0
20593	10	Red Alder (Alnus rubra)	0	Dead branches in crown	C	Within stormwater facility grading	0
20595	33	Bigleaf Maple (Acer macrophyllum)	0	3 codominant stems above breast height, large dead branches, unbalanced, slight lean	B	Within stormwater facility grading	0
20596	10	Bigleaf Maple (Acer macrophyllum)	0	2 codominant stems above breast height, one stem topped, dead branches in crown	B	Within stormwater facility grading	0
20597	23	Bigleaf Maple (Acer macrophyllum)	0	2 codominant stems above breast height, one stem dead, decay present in scar on stem	B	Within stormwater facility grading	0
20598	10	Bigleaf Maple (Acer macrophyllum)	0	Dead top, moderate lean, scarring on stem, crooked stem	B	Within stormwater facility grading	0
20604	14	Red Alder (Alnus rubra)	3	Dead top	B	Within stormwater facility grading	0
20608	14	Red Alder (Alnus rubra)	0	Dead	A	Tree is dead	0
20611	15,15	Bigleaf Maple (Acer macrophyllum)	0	Slight lean, crooked stem	B		0
20612	10	Bigleaf Maple (Acer macrophyllum)	0	Dead	A	Retained within critical area	0
20613	10,6	Bigleaf Maple (Acer macrophyllum)	0	6" stem dead, sweep near base	B		0
20626	12	Red Alder (Alnus rubra)	2	Slight lean, one large dead branch	C	Within stormwater facility grading	0
20672	8	Vine Maple (Acer circimatum)	0	Dead	A	Tree is dead	0
20673	6,6,6,6	Vine Maple (Acer circimatum)	0	Dead	A	Tree is dead	0
20676	26	Red Alder (Alnus rubra)	0	Codominant stems begin at 8', decay in cavity at base, slight lean, scarring in stem, pitch leaking from scar, declining health, surrounded by heavy blackberry	B	Within stormwater facility grading	0
20677	15,12	Apple (Malus, spp.)	0	Many large dead branches, decay throughout tree, severe lean, very crooked, declining health	A	Within stormwater facility grading	0
20683	15,9	Red Alder (Alnus rubra)	0	Dead top, 9" stem spreads out horizontally 25', surrounded by heavy blackberry	B	Within stormwater facility grading	0
20684	22	Red Alder (Alnus rubra)	0	Dead branches in crown	C	Within stormwater facility grading	0
20687	10	Red Alder (Alnus rubra)	0	Dead branches in crown	C	Within stormwater facility grading	0
21000	35	Bigleaf Maple (Acer macrophyllum)	0	Off site	C		0
21001	10	Black Cottonwood (Populus trichocarpa)	2	Decay in stem cavity	B	Poor tree health	0
21002	6	Unknown Deciduous	2	Dead branches in crown, decay in stem, severe lean, declining health	B	Lot grading greatly impacts root zone	0
21003	13	Unknown Deciduous	3	Unbalanced crown, decay in stem	B	Lot grading greatly impacts root zone	0
21004	10	Unknown Deciduous	2	Unbalanced crown, significant decay in stem, severe lean	B	Lot grading greatly impacts root zone	0
21005	6	Black Cottonwood (Populus trichocarpa)	2	Healthy	C	Lot grading greatly impacts root zone	0
21006	4 stems of 4"	Hawthorn (Crataegus spp.)	2	Healthy	C	Lot grading greatly impacts root zone	0
21007	8	Red Alder (Alnus rubra)	0	Off site, dead	A		0
21008	16	Bigleaf Maple (Acer macrophyllum)	0	Slight lean, scarring on stem, crooked stem, dead branches in crown	B		0

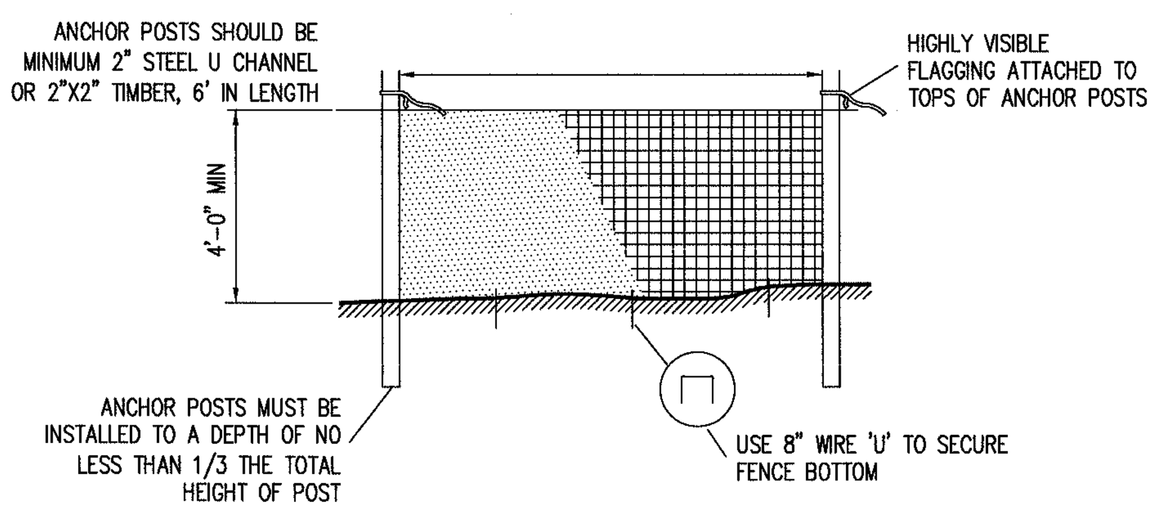
NOTE: Onsite trees existed during the site visits performed on 09/19/2018 - 09/21/2018.

Total # of On Site Existing Trees= 294
Total On Site Existing Tree Units = 1027.5
Total # of On Site Trees Retained= 56
Total # of Tree Units Retained= 190.0
Minimum Tree Units Required per City Code = 113
(5.63 acres * 20 trees/acre)
Minimum # Trees to replant= 0

Total # of Existing Trees Removed= 238
Total Existing Tree Units Removed= 837.5

Windthrow Rating:
A=Least windthrow resistant
B=Moderate windthrow resistant
C=Most windthrow resistant

Hazard assessment was not performed for each tree during the arborist site assessment. If hazards were identified, they are described within the table above. See arborist report for more information.



TREE PROTECTION NOTES:

1. BLAZE ORANGE OR BLUE PLASTIC MESH FENCE FOR TREE PROTECTION DEVICE, ONLY.
2. BOUNDARIES OF PROTECTION AREA WILL BE ESTABLISHED IN THE FIELD BY THE ARBORIST PRIOR TO CONSTRUCTION
3. BOUNDARIES OF PROTECTION AREA SHOULD BE STAKED AND FLAGGED BY THE ARBORIST, OR UNDER THE SUPERVISION OF THE ARBORIST, PRIOR TO INSTALLING DEVICES.
4. AVOID DAMAGE TO CRITICAL ROOT ZONE. DO NOT DAMAGE OR SEVER LARGE ROOTS WHEN INSTALLING POSTS.
5. TREE PROTECTION TO BE INSTALLED PRIOR TO CONSTRUCTION AND REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETED.

PLASTIC MESH TREE PROTECTION FENCE

NOT TO SCALE

ARBORIST DISCLOSURE STATEMENT

ARBORISTS ARE TREE SPECIALISTS WHO USE THEIR EDUCATION, KNOWLEDGE, TRAINING, AND EXPERIENCE TO EXAMINE TREES, RECOMMEND MEASURES TO ENHANCE THE HEALTH OF TREES, AND ATTEMPT TO REDUCE THE RISK OF LIVING NEAR TREES. THE CLIENT AND JURISDICTION MAY CHOOSE TO ACCEPT OR DISREGARD THE RECOMMENDATIONS OF THE ARBORIST, OR SEEK ADDITIONAL ADVICE.

ARBORISTS CANNOT DETECT EVERY CONDITION THAT COULD POSSIBLY LEAD TO THE STRUCTURAL FAILURE OF A TREE. TREES ARE LIVING ORGANISMS THAT FAIL IN WAYS WE DO NOT FULLY UNDERSTAND. CONDITIONS ARE OFTEN HIDDEN WITHIN TREES AND BELOW GROUND. ARBORISTS CANNOT GUARANTEE THAT A TREE WILL BE HEALTHY OR SAFE UNDER ALL CIRCUMSTANCES, OR FOR A SPECIFIED PERIOD OF TIME. LIKEWISE, REMEDIAL TREATMENTS, LIKE MEDICINE, CANNOT BE GUARANTEED.

TREES CAN BE MANAGED, BUT THEY CANNOT BE CONTROLLED. TO LIVE NEAR TREES IS TO ACCEPT SOME DEGREE OF RISK. THE ONLY WAY TO ELIMINATE ALL RISK ASSOCIATED WITH TREES IS TO ELIMINATE ALL TREES.

AT THE COMPLETION OF CONSTRUCTION, ALL TREES MUST ONCE AGAIN BE REVIEWED TO EVALUATE THEIR HAZARD RATING. LAND CLEARING AND REMOVAL OF ADJACENT TREES CAN EXPOSE PREVIOUSLY UNSEEN DEFECTS AND OTHERWISE HEALTHY TREES CAN BE DAMAGED DURING CONSTRUCTION.

TREE INFORMATION GATHERED UNDER THE SUPERVISION OF BRYCE HANSON, CERTIFIED ARBORIST, WITH AKS ENGINEERING AND FORESTRY, LLC.

TREES SHOWN TO BE SAVED WILL BE EVALUATED BY THE PROJECT ARBORIST PRIOR TO, DURING, AND AFTER CONSTRUCTION. TREES ADVERSELY AFFECTED BY CONSTRUCTION AND/OR DETERMINED TO BE A SAFETY HAZARD WILL BE REMOVED.

CERTIFIED ARBORIST
ISA
PRELIMINARY NOT FOR CONSTRUCTION
BRYCE D. HANSON
CERTIFICATE NUMBER: PN 7554A
EXPIRATION DATE: 06/30/19

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HANCOCK SPRINGS SUBDIVISION
CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

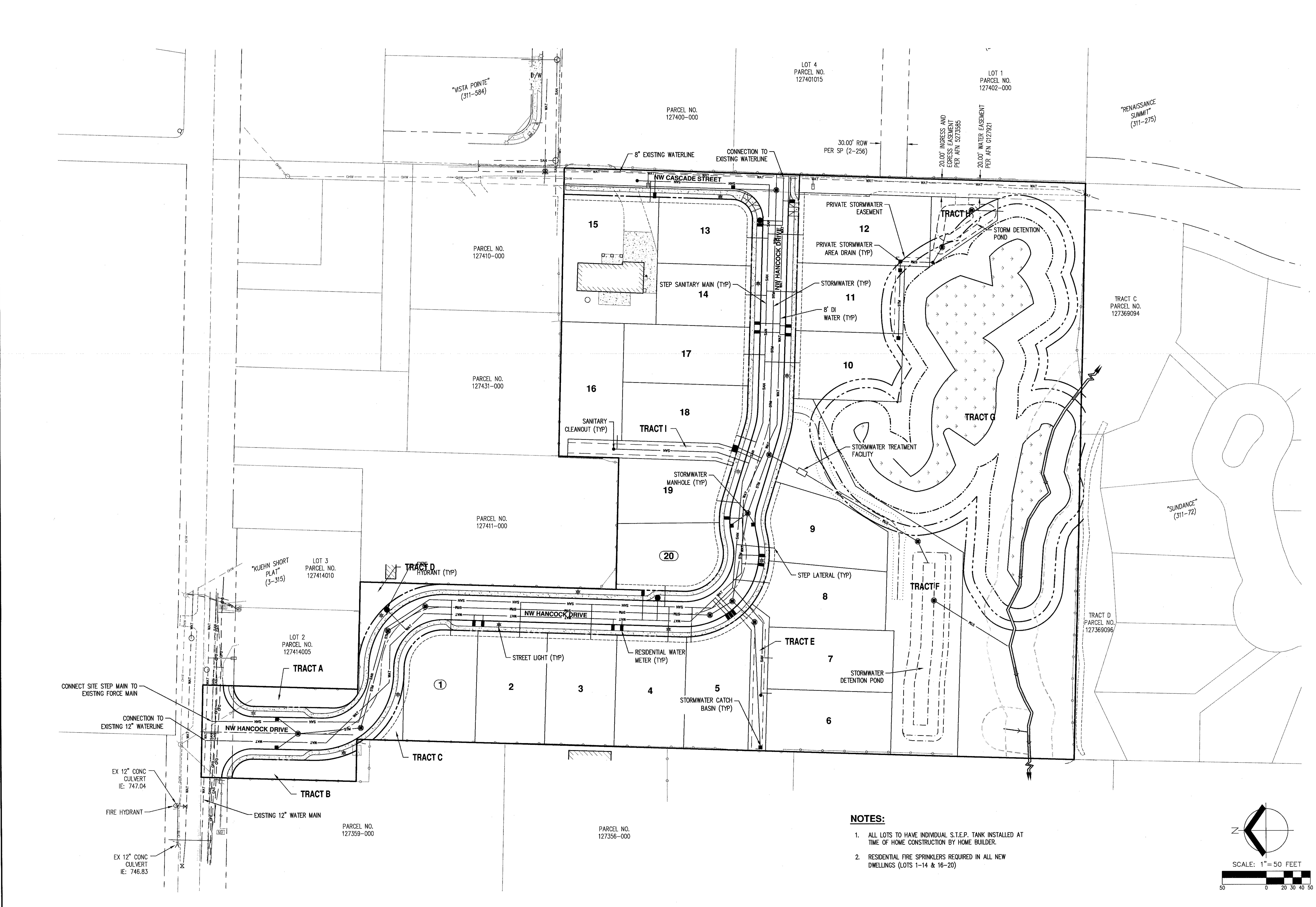
PRELIMINARY TREE INVENTORY

DESIGNED BY: ELN
DRAWN BY: ELN
MANAGED BY: JMM
CHECKED BY: BDH
DATE: 3/26/2019

REVISIONS

JOB NUMBER 5638
SHEET **P5.3**

AKS DRAWING FILE: 5638 P5.0.DWG | LAYOUT: P5.3



NOTES:

1. ALL LOTS TO HAVE INDIVIDUAL S.T.E.P. TANK INSTALLED AT TIME OF HOME CONSTRUCTION BY HOME BUILDER.
2. RESIDENTIAL FIRE SPRINKLERS REQUIRED IN ALL NEW DWELLINGS (LOTS 1-14 & 16-20)

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HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON
APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

COMPOSITE UTILITY PLAN

DESIGNED BY: CJS
DRAWN BY: NAL
MANAGED BY: JMM
CHECKED BY: JMM
DATE: 3/26/2019

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER 5638

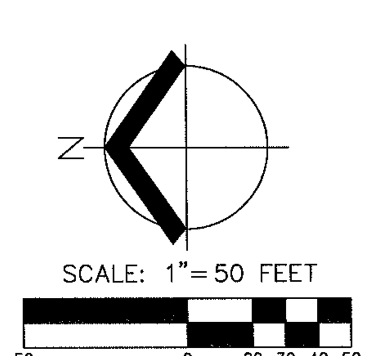
SHEET P6.0

AKS DRAWING FILE: 5638 P6.0.DWG | LAYOUT: P6.0

GENERAL NOTES

1. THE PROPOSED STORMWATER CONVEYANCE SYSTEM WITHIN THE REAR OF LOTS 10, 11 AND 12 SHALL BE PRIVATELY OWNED AND MAINTAINED BY THOSE LOTS. A COVENANT DEDICATED TO THE CITY OF CAMAS FOR ACCESS AND INSPECTION SHALL BE PROVIDED PRIOR TO FINAL PLAT RECORDING.
2. TRACT F AND H ARE STORMWATER DETENTION PONDS THAT WILL BE OWNED BY THE HOME OWNER'S ASSOCIATION AND MAINTAINED BY THE CITY OF CAMAS.
3. ACCORDING TO CLARK COUNTY GIS, THE SITE IS NOT WITHIN OR ADJACENT TO A 100-YEAR FLOODPLAIN OR SHORELINE MANAGEMENT AREA.
4. THERE ARE NO KNOWN ON-SITE STORMWATER FACILITIES.
5. NATIVE VEGETATION WITHIN TRACT G AND THE CRITICAL AREAS WILL BE RETAINED AND ENHANCED, AS NEEDED, PER THE WETLAND MITIGATION PLAN.
6. SOME OFF-SITE FLOW OCCURS FROM ADJACENT PARCELS. ANALYSIS OF OFF-SITE FLOW WAS NOT DONE AT THIS TIME AND WILL BE INCLUDED WITH THE FINAL STORMWATER PLAN.
7. THE WATER QUALITY TREATMENT FACILITY FOR TREATMENT OF ON-SITE POLLUTION GENERATING STORMWATER IS LOCATED WITHIN TRACT F. PRELIMINARY FEATURES INCLUDE:

   FACILITY TYPE: 6'X11' MECHANICAL FILTER VAULT
   CARTRIDGE COUNT AND SIZE: 10-12" STACKED
   OFF-LINE FLOW RATE PROVIDED: 0.53 CFS
   OFF-LINE FLOW RATE REQUIRED: 0.529 CFS



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CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY STORMWATER PLAN

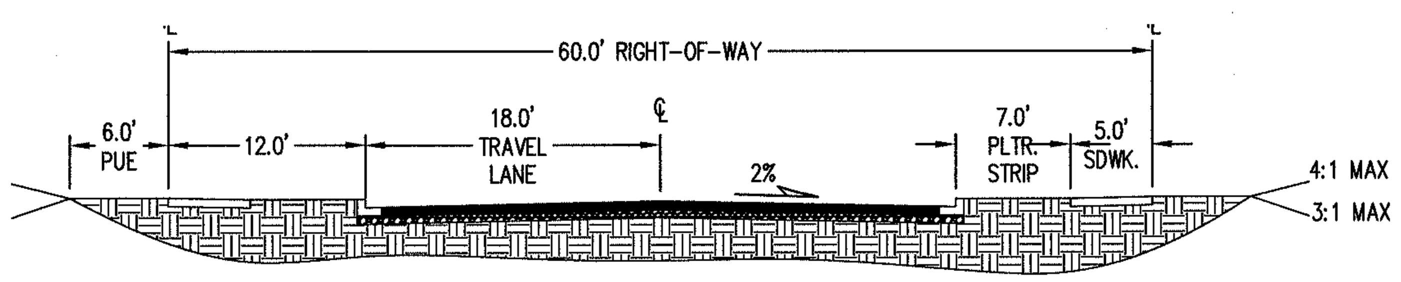
DESIGNED BY: CJS
DRAWN BY: NAL
MANAGED BY: JMM
CHECKED BY: JMM
DATE: 3/26/2019

JOHN M. ME... STATE OF WASHINGTON 42614 REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

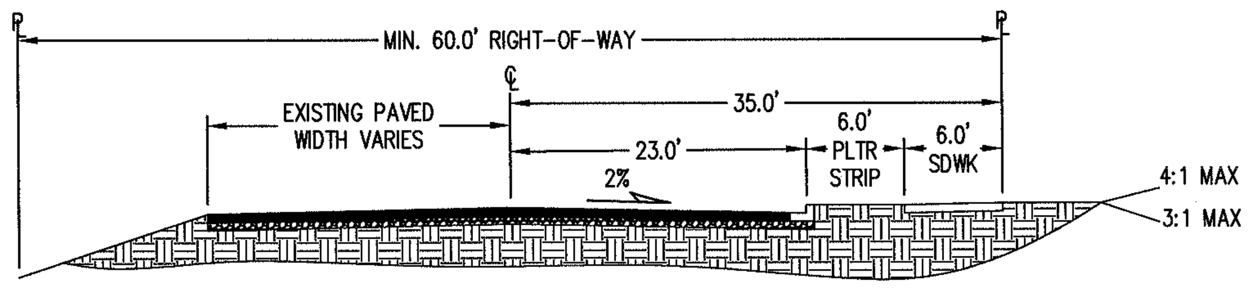
JOB NUMBER
5638

SHEET
P7.0

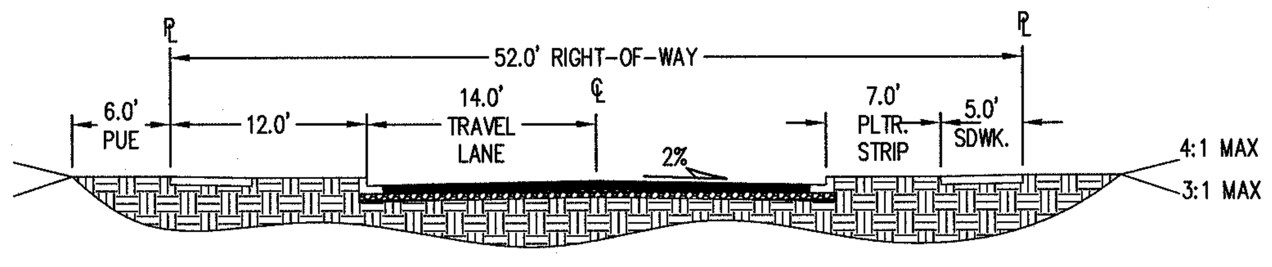


NW CASCADE ST & NW HANCOCK DRIVE (ST2)

STA: 10+00.00 – 11+32.00 (NW HANCOCK DRIVE)

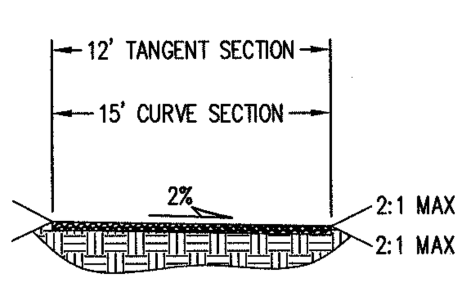


NW 18TH AVE (ST4)



NW HANCOCK DRIVE (ST3)

STA: 12+41.95 – 21+79.74

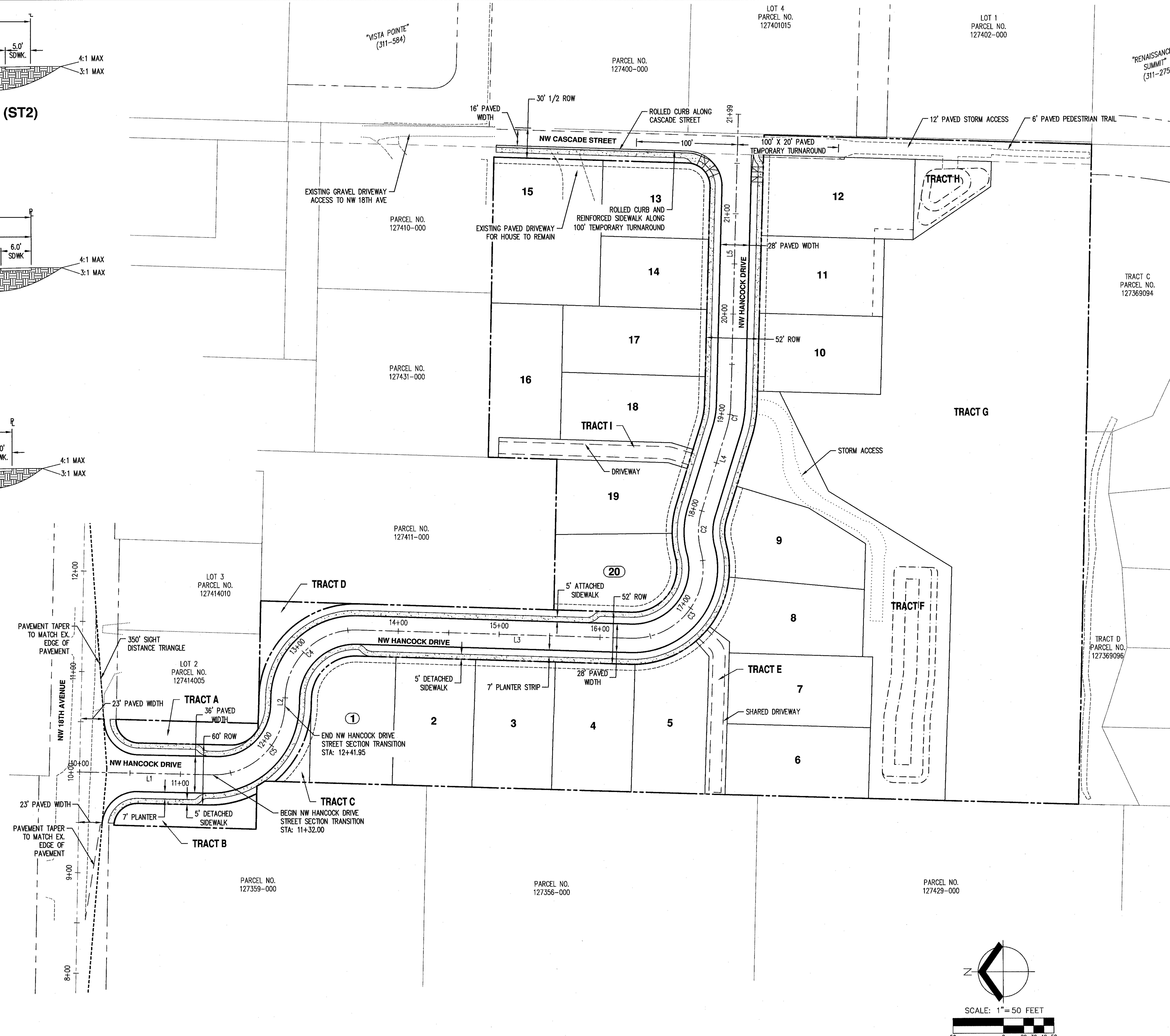


STORM ACCESS

MAX SLOPE: 15%

CURVE TABLE				
CURVE	RADIUS	DELTA	LENGTH	CHORD
C1	100.00'	15°16'42"	26.67'	S80°35'52"E 26.59'
C2	70.00'	31°41'34"	38.72'	S88°48'18"E 38.23'
C3	70.00'	106°24'51"	130.01'	S51°26'39"E 112.11'
C4	70.00'	90°25'50"	110.48'	S43°27'09"E 99.37'
C5	70.00'	90°00'00"	109.96'	S43°40'04"E 98.99'

TANGENT TABLE		
LINE #	LENGTH	DIRECTION
L1	132.01	S1° 19' 56.08"W
L2	7.38	S88° 40' 03.92"E
L3	270.54	S1° 45' 46.42"W
L4	84.81	S72° 57' 31.03"E
L5	269.19	S88° 14' 13.58"E



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CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY STREET PLAN

DESIGNED BY:	CJS
DRAWN BY:	NAL
MANAGED BY:	JMM
CHECKED BY:	JMM
DATE:	2/26/2019

JOHN M. ... STATE OF WASHINGTON 42614 REGISTERED PROFESSIONAL ENGINEER

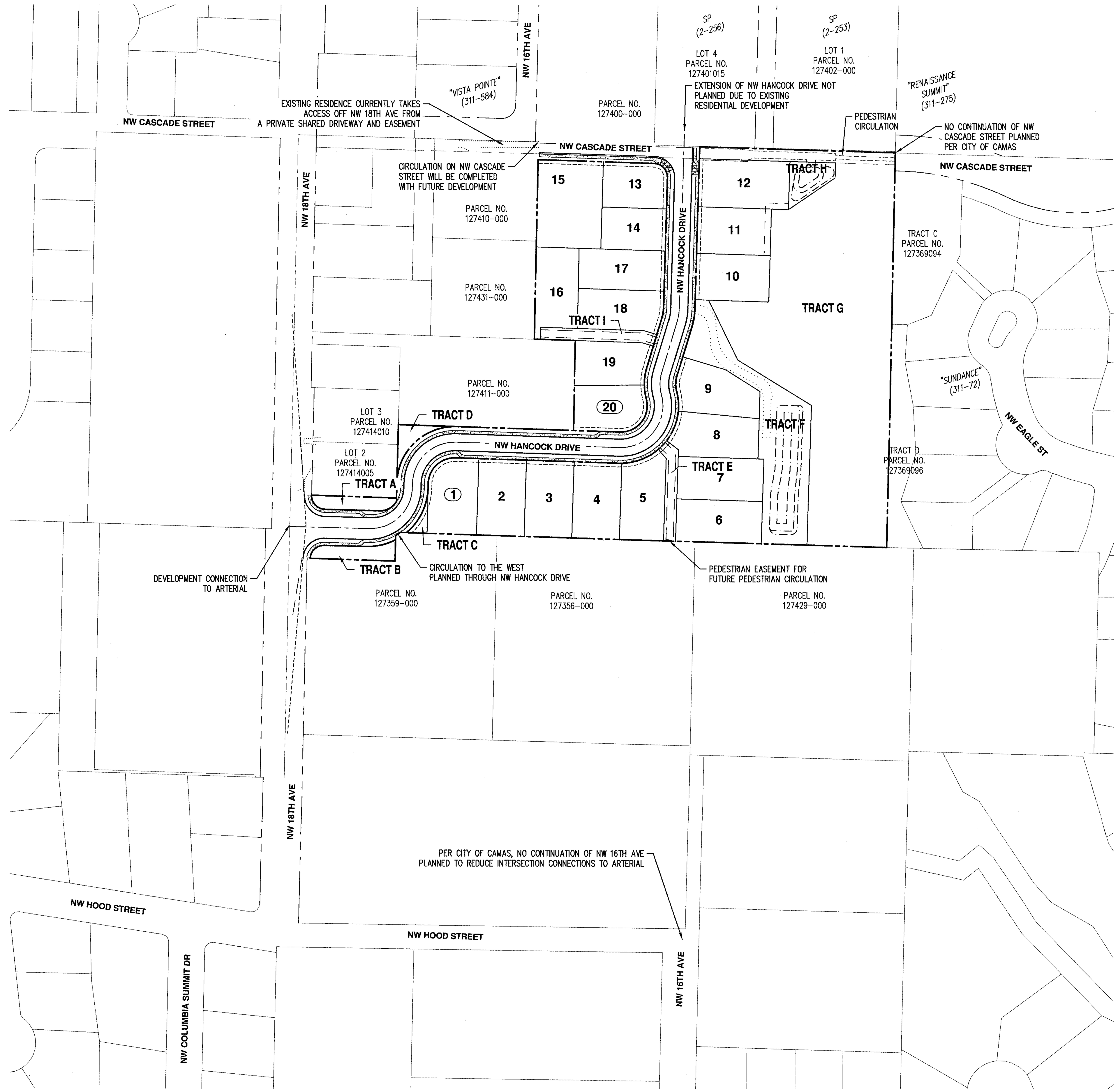
PRELIMINARY NOT FOR CONSTRUCTION

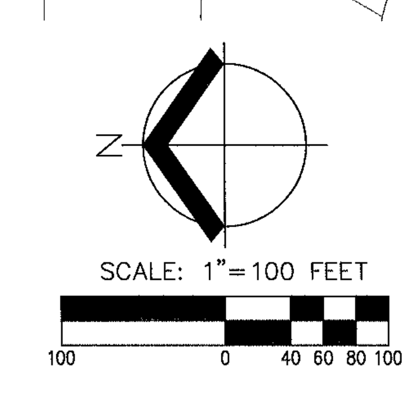
REVISIONS

JOB NUMBER 5638

SHEET P8.0

AKS DRAWING FILE: 5638 P8.0.DWG | LAYOUT: P8.0





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CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E, W.M.

PRELIMINARY CIRCULATION PLAN

DESIGNED BY: CJS
DRAWN BY: NAL
MANAGED BY: JMM
CHECKED BY: JMM
DATE: 3/26/2019

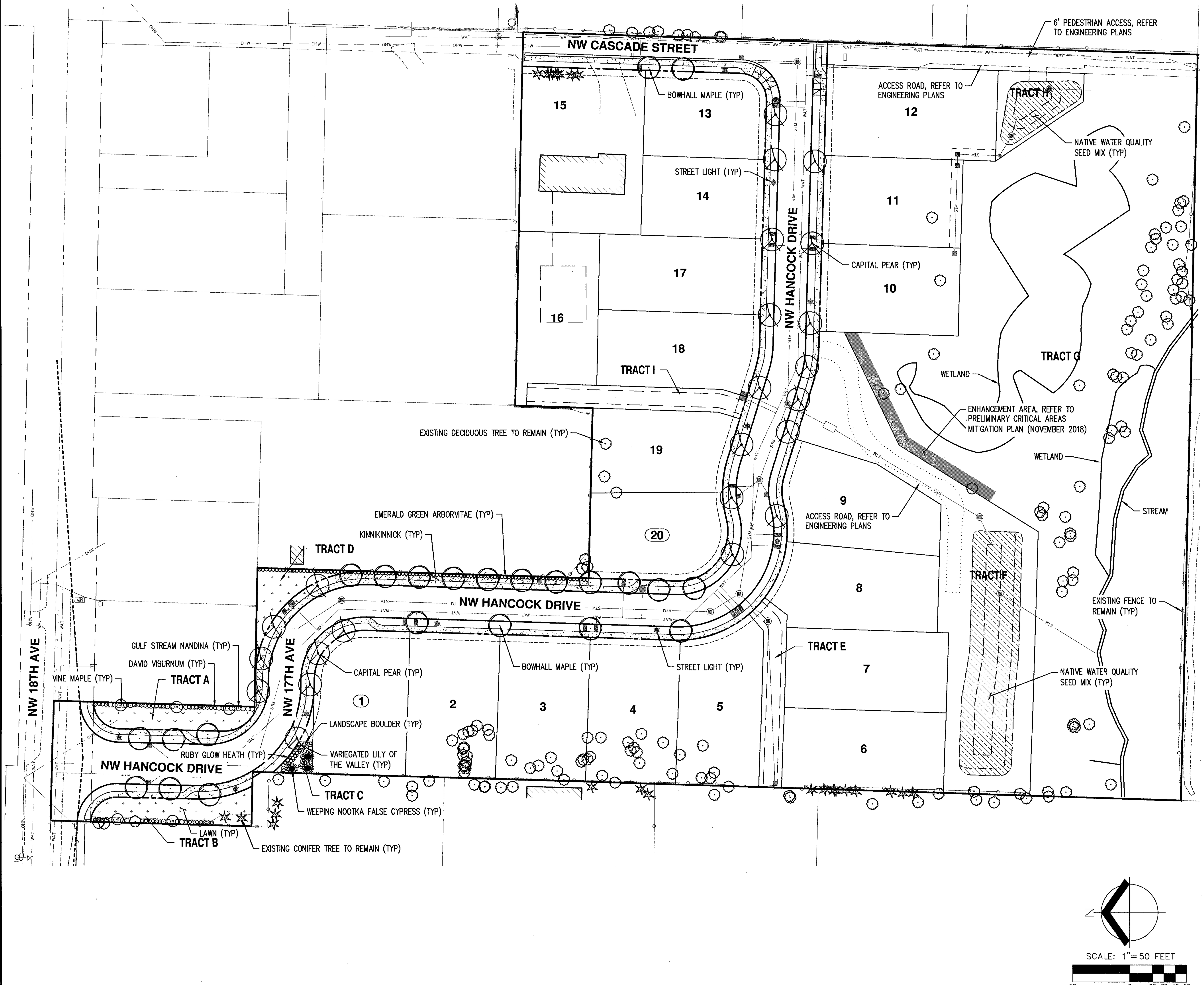
PRELIMINARY NOT FOR CONSTRUCTION
JOHN M. MEIER STATE OF WASHINGTON 42614 REGISTERED PROFESSIONAL ENGINEER

REVISIONS

JOB NUMBER
5638

SHEET
P8.1

AKS DRAWING FILE: 5638 P8.0.DWG | LAYOUT: P8.1



CONCEPTUAL PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE/CONTAINER	SPACING
	5	ACER CIRCINATUM	VINE MAPLE	5'-6' HT. B&B	AS SHOWN
	23	ACER RUBRUM 'BOWHALL'	BOWHALL MAPLE	2" CAL. B&B	AS SHOWN
	3	CHAMAECYPARIS NOOTKATENSIS 'PENDULA'	WEEPING NOOTKA FALSE CYPRESS	6' HT. B&B	AS SHOWN
	23	PYRUS CALLERYANA 'CAPITAL'	CAPITAL PEAR	2" CAL. B&B	AS SHOWN
SHRUBS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE/CONTAINER**	**SPACING**
	16	ERICA CARNEA 'RUBY GLOW'	RUBY GLOW HEATHER	1 GAL CONT.	36" o.c.
	23	NANDINA DOMESTICA 'GULF STREAM'	GULF STREAM NANDINA	3 GAL. CONT.	48" o.c.
	5	PIERIS JAPONICA 'VARIEGATA'	VARIEGATED LILY OF THE VALLEY	3 GAL CONT.	48" o.c.
	97	THUJA OCCIDENTALIS 'SMARAGD'	EMERALD GREEN ARBORVITAE	4-5' HT. CONT.	36" o.c.
	38	VIBURNUM DAVIDII	DAVID VIBURNUM	3 GAL CONT.	36" o.c.
GROUND COVERS	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**SIZE/CONTAINER**	**SPACING**
	135	ARCTOSTAPHYLOS UVA-URSI	KINNIKINNICK	1 GAL CONT	36" o.c.

APPROX. 8,624 SF — LAWN – NORTHWEST SUPREME LAWN SEED MIX – SUNMARK SEEDS (OR APPROVED EQUAL)
- LOLIUM PERENNE VAR DASHER 3 (DASHER 3 PERENNIAL RYEGRASS) 35%
- LOLIUM PERENNE VAR CUTTER II (CUTTER II PERENNIAL RYEGRASS) 35%
- FESTUCA RUBRA VAR GARNET (GARNET CREEPING RED FESCUE) 15%
- FESTUCA RUBRA SPP FALLAX VAR WINDWARD (WINDWARDS CHEWINGS FESCUE) 15%

APPROX. 11,916 SF — NATIVE WATER QUALITY SEED MIX – SUNMARK SEEDS (OR APPROVED EQUAL)
- ELYMUS GLAUCUS (BLUE WILDRYE) 46%
- FESTUCA RUBRA RUBRA (NATIVE RED FESCUE) 38%
- DESCHAMPSIA CESPITOSA (TUFTED HAIRGRASS) 12%
- GLYCERIA OCCIDENTALIS (NORTHWESTERN MANNAGRASS) 2%
- BECKMANIA SYZIGACHNE (AMERICAN SLOUGHGRASS) 2%

APPLY AT A RATE OF 1 LB. PER 1,000 SF OR AS RECOMMENDED BY SUPPLIER.

GENERAL LANDSCAPE NOTES:

1. LANDSCAPE PLAN IS PRELIMINARY AND INTENDED TO SHOW DESIGN INTENT ONLY. REVISIONS OR SUBSTITUTIONS, INCLUDING CHANGES TO PLANT LOCATION, QUANTITIES, TYPES, AND SIZES MAY BE NECESSARY PRIOR TO FINAL APPROVAL BASED ON PLANT AVAILABILITY, SITE CONDITIONS, UTILITY CONFLICTS, ETC. ALL SUBSTITUTIONS SHALL CONFORM TO CITY OF CAMAS LANDSCAPE DESIGN STANDARDS.
2. ALL PLANTS AND PLANTINGS SHALL CONFORM TO CITY OF CAMAS DESIGN STANDARDS AND TO AMERICAN NURSERY STANDARDS ANSI Z60.1. PLANT IN ACCORDANCE WITH ACCEPTED BEST-PRACTICE INDUSTRY STANDARDS SUCH AS THOSE ADOPTED BY THE WASHINGTON ASSOCIATION OF LANDSCAPE PROFESSIONALS (WALP).
3. CENTER TREES IN PLANTER STRIPS AND LANDSCAPE PLANTING BEDS WHERE POSSIBLE. KEEP OTHER TREE TRUNKS 3' O.C. MINIMUM FROM CURBS, SIDEWALKS, AND OTHER PAVING OR CENTERED IN PLANTING ISLAND. KEEP SHRUBS AND GROUNDCOVER A MINIMUM OF 24" O.C. FROM PAVING AND 3' O.C. FROM TREES. ADJUST PLANTINGS AS NECESSARY ON SITE TO AVOID CONFLICT WITH UTILITIES, HYDRANTS, LIGHT POLES, METERS, ETC..
4. HATCHED AREAS ARE MEANT TO CONVEY GENERAL PLANT LOCATION. PLANT COVERAGE, SPACING, AND LAYOUT SHALL BE CONSISTENT WITH THE SPACING LISTED IN THE PLANT LEGEND FOR FULL COVERAGE.
5. MULCH: APPLY 3" DEEP WELL-AGED MEDIUM GRIND OR SHREDDED DARK HEMLOCK BARK MULCH UNDER AND AROUND ALL TREES AND SHRUBS IN PLANTER STRIP AREAS NOT INCLUDED AS STORMWATER FACILITIES OR LAWN. WHERE TREES ARE IN LAWN AREAS, A MINIMUM 3' DIAMETER MULCH RING SHALL BE USED AROUND THE TREE TO PROTECT THE TRUNK FROM MOWER DAMAGE. CARE SHALL BE TAKEN TO AVOID COVERING FOLIAGE OR ROOT CROWNS OF PLANTS. PLANTS SHALL BE PLANTED AT A DEPTH TO ACCOMMODATE BARK MULCH APPLICATION.
6. IRRIGATION FOR HEALTHY PLANT ESTABLISHMENT AND SURVIVAL IS RECOMMENDED AND SHALL BE 'DESIGN-BUILD' BY LANDSCAPE CONTRACTOR.
7. REFER TO SHEET P5.0 FOR PRELIMINARY TREE PLAN.

AKS ENGINEERING & FORESTRY, LLC
9600 NE 126TH AVE STE 2520
VANCOUVER, WA 98682
P: 360.882.0419
F: 360.882.0426
aks-eng.com
ENGINEERING · SURVEYING · NATURAL RESOURCES
FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

HANCOCK SPRINGS SUBDIVISION

CAMAS WASHINGTON

APN 127371000, 127375000, 127377000, 127379000, 127414000 NE 1/4 S9, T1N, R3E W.M.

PRELIMINARY LANDSCAPE AND LIGHTING PLAN

DESIGNED BY:	TEB
DRAWN BY:	TEB
MANAGED BY:	JMM
CHECKED BY:	KAH

DATE: 3/26/2019

STATE OF WASHINGTON · KIRSTI ANN HAUSER · LICENSED LANDSCAPE ARCHITECT · 1309 EXP.

PRELIMINARY NOT FOR CONSTRUCTION

REVISIONS

JOB NUMBER
5638

SHEET
P9.0

AKS DRAWING FILE: 5638 P9.0.DWG | LAYOUT: P9.0

Exhibit 19
SUB18-05

Charles Lawrence
3010 NW 18th Avenue
Camas, WA 98607

March 23, 2019

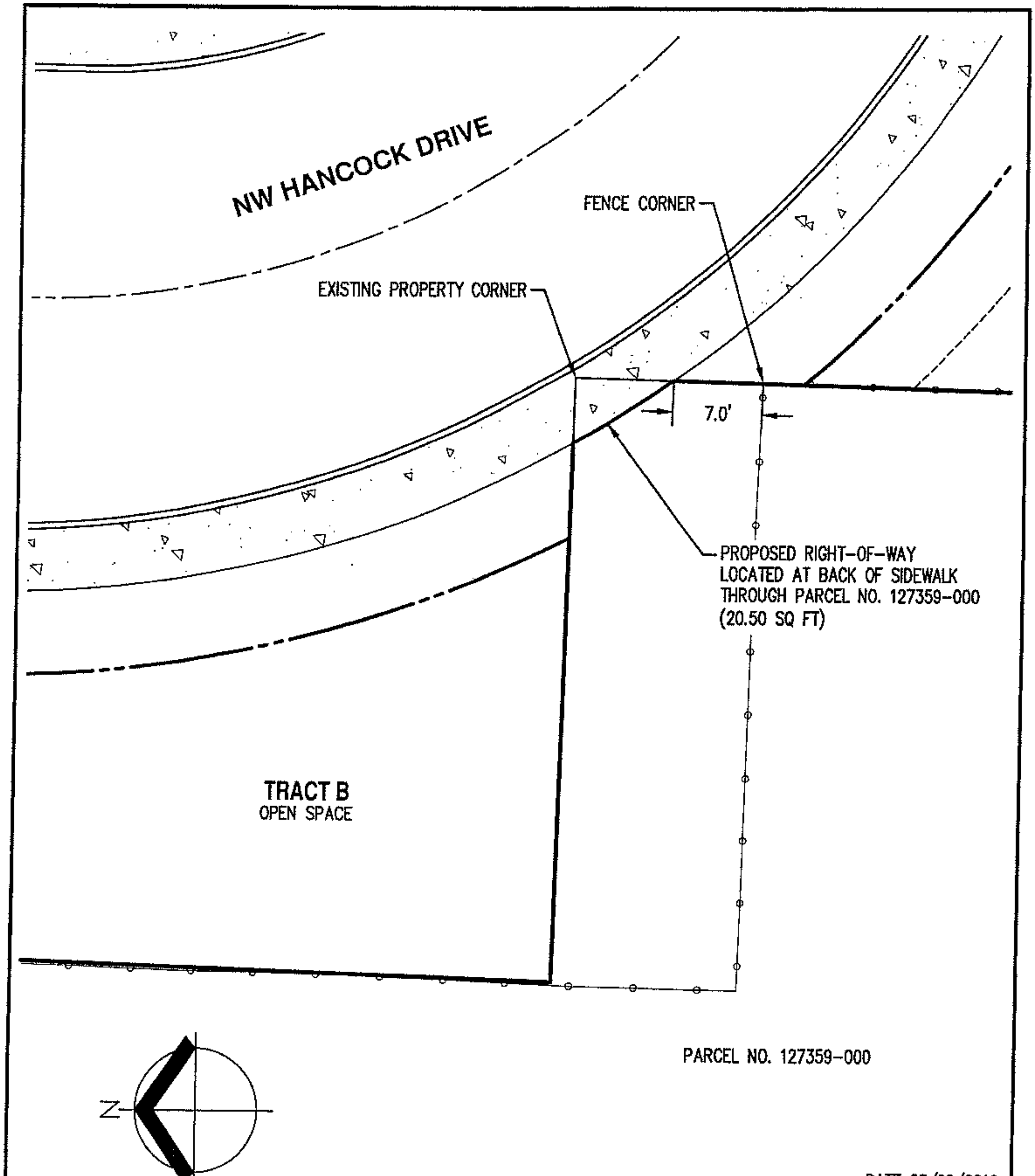
City of Camas
Building Division
616 NE 4th Avenue
Camas, WA 98607

To Whom it May Concern:

I agree to dedicate 20.50 square feet of right-of-way to the City of Camas from parcel 127359-000 as shown in Exhibit A (attached).

Sincerely,

Charles Lawrence
503-806-7873



SCALE: 1"=10 FEET

10 0 4 6 8 10

DATE: 03/06/2019

RIGHT-OF-WAY DEDICATION EXHIBIT	EXHIBIT A
AKS ENGINEERING & FORESTRY, LLC 9600 NE 126TH AVE, STE 2520 VANCOUVER, WA 98682 P: 360.882.0419 F: 360.882.0426 aks-eng.com	DRWN: CJS CHKD: JMM AKS JOB: 5638

DWG: 5638CMPL | LAYOUT2

City of Camas WASHINGTON

Notice of Application and Public Hearing

Hancock Springs Subdivision

File No. SUB18-05

NOTICE IS HEREBY GIVEN that an application for "Hancock Springs" a 20-lot single family residential subdivision development requesting preliminary plat approval was received on November 21, 2018 by Northeast Classic Homes, LLC, and deemed technically complete on January 4, 2019.

LOCATION: The 9.95 acre site is located 2926 NW 18th Ave, Camas, Washington, and is zoned Residential-10,000 and Residential-15 (R-10, R-15). The location of tax parcels: 127414-000, 127377-000, 127371-000, 127379-000, and 127375-000 are also described as the SE ¼ Sections 09 and 28, Township 1 North, Range 3 East of the Willamette Meridian (E.W.M.).

SCHEDULED PUBLIC HEARING: The Hancock Springs Subdivision (SUB18-05) will be considered at a public hearing on **April 18, 2019, at 4:00 p.m.**, before the Hearings Examiner in the City Council Chambers, 616 NE 4th Avenue, Camas, WA.

APPLICATION MATERIALS: The Hancock Springs preliminary plat (subdivision) application included the following: project narrative; SEPA checklist, proposed development plans, critical areas report, critical area mitigation plan, preliminary tree report, traffic study, geotechnical report, archaeological predetermination*, and other required submittal documents. These documents are available for review at the Community Development Department (616 NE 4th Ave., Camas, WA) during regular business hours Monday – Friday 8am-5pm.

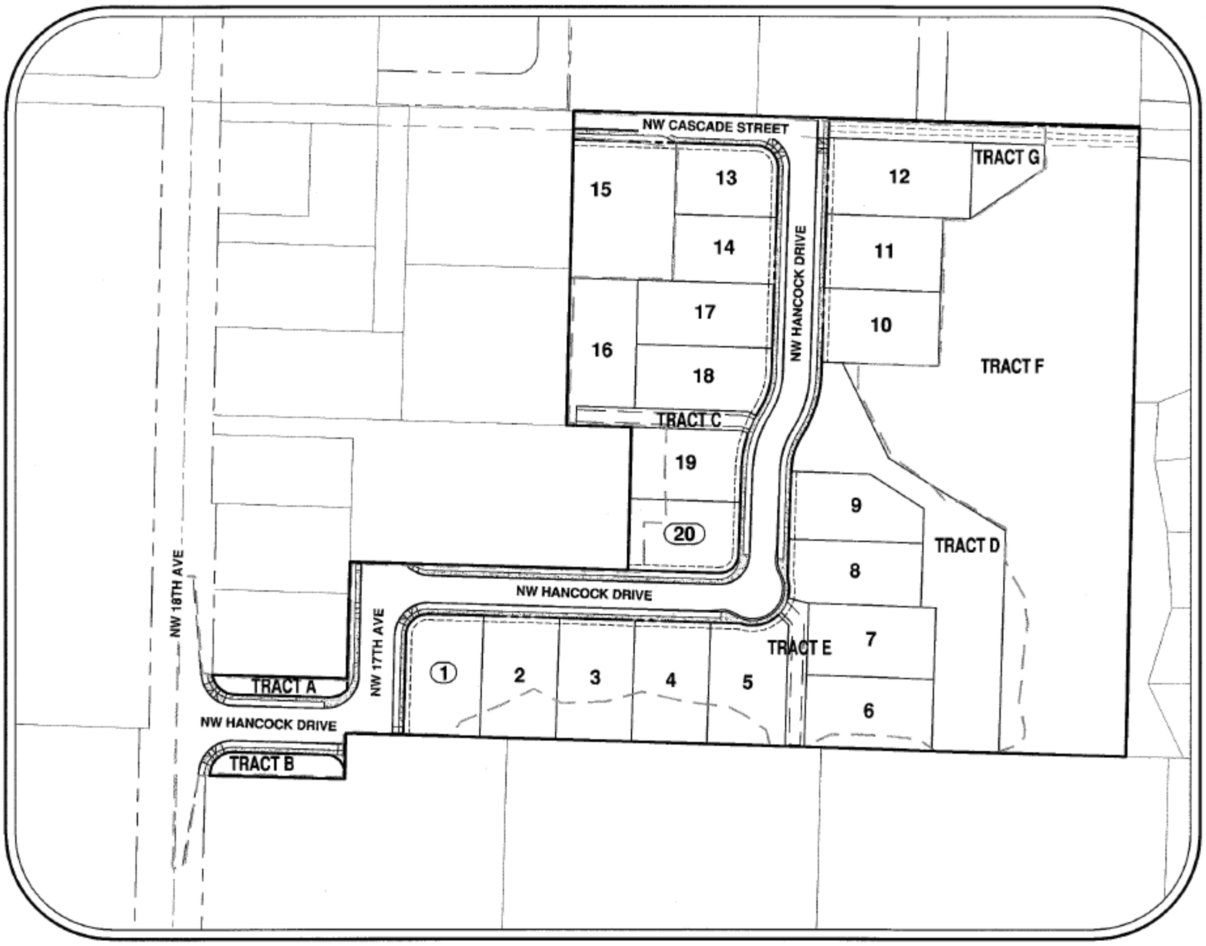
PARTICIPATE: All citizens are entitled to have equal access to the services, benefits and programs of the City of Camas. Please contact the City Clerk at (360) 834-6864 for special accommodations if needed. The City will provide translators for non-English speaking persons who request assistance at least three working days prior to a public meeting.

Public comments and questions are encouraged, and there are several opportunities available to interested citizens*. It is preferable that written comments be received five days prior to the public hearing, in order to be available with the online agenda and materials.* With that said, comments can also be accepted during the public hearing. The public hearing will follow the quasi-judicial process described within Camas Municipal Code §18.55.180. Comments related to this development may be submitted as follows: (1) In person by testifying at the public hearing; (2) by regular mail to Planning Division staff, Robert Maul, Planning Manager, at the Camas City Hall, 616 NE 4th Avenue, Camas, WA 98607; (3) by email to: communitydevelopment@cityofcamas.us; or (4) by phone (360) 817-7255. **For questions related to this application, please contact Robert Maul, Planning Manager, at (360) 817-7255 or communitydevelopment@cityofcamas.us.**

Published in the Post Record on April 4, 2019 Legal Publication # 170130
Posted at Camas City Hall, Camas Library, City of Camas web site at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on **April 3, 2019**

*consistent with RCW 42.56.300, Archaeological information is exempt from public disclosure.

Excerpt from Preliminary Plat Application
Hancock Springs Subdivision (File #SUB18-05)



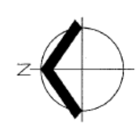


Exhibit 21
SUB18-05

City of Camas WASHINGTON

State Environmental Policy Act
Determination of Non-Significance

CASE NO: SEPA18-28 Hancock Spring Subdivision

APPLICANT: Northwest Classic Homes, LLC
Attn: Craig Moody
10100 NE 116th Cr.
Vancouver, WA 98662

REQUEST: The applicant is proposing to develop 9.95 acres into a 20 lot subdivision, with critical area preservation, stormwater facilities, open space tracts along with utilities and road improvements.

LOCATION: 2926 NW 18TH AVENUE, CAMAS, WA 98607. PARCEL NUMBERS 127371-000, 127375-000, 127377-000, AND 127414-000.

LEGAL DESCRIPTION: NE ¼, S09, T1N, R3E WILLAMETTE MERIDIAN

SEPA DETERMINATION: DETERMINATION OF NON-SIGNIFICANCE (DNS)

COMMENT DEADLINE: APRIL 18TH, 2019 AT 5:00 P.M.

As lead agency under the State Environmental Policy Act (SEPA) Rules [Chapter 197-11, Washington Administrative Code (WAC)], the City of Camas must determine if there are possible significant adverse environmental impacts associated with this proposal. The options include the following:

- DS = Determination of Significance (The impacts cannot be mitigated through conditions of approval and, therefore, requiring the preparation of an Environmental Impact Statement (EIS).
- MDNS = Mitigated Determination of Non-Significance (The impacts can be addressed through conditions of approval), or;
- DNS = Determination of Non-Significance (The impacts can be addressed by applying the Camas Municipal Code).

Published in the Post Record on April 4, 2019 Legal Publication # 169820
Posted at Camas City Hall, Camas Library, City of Camas web site at: http://www.cityofcamas.us
Mailed to property owners within 300-feet on **April 3, 2019**

Determination:

Determination of Non-Significance (DNS). The City of Camas, as lead agency for review of this proposal, has determined that this proposal does not have a probable significant adverse impact on the environment. An Environmental Impact Statement (EIS) is not required under RCW 43.21C.030(2)(e). This decision was made after review of a completed environmental checklist, and other information on file with the City of Camas.

Date of Publication & Comment Period:

Publication date of this DNS is **April 4th, 2019**, and is issued under WAC 197-11-340. The lead agency will not act on this proposal until the close of the 14-day comment period which ends on **April 18th, 2019**. Comments may be sent by email to communitydevelopment@cityofcamas.us or regular mail to:

City of Camas SEPA Official
Community Development Department
616 NE Fourth Avenue
Camas, Washington 98607

Responsible Official: Robert Maul (360) 817-1568

Robert Maul, Planning Manager and Responsible Official	**April 4th, 2019** **Date of publication**

Hancock Springs Subdivision
(City File No. SUB18-05)
Index of Exhibits

Number	Title	Date
-	Hancock Springs Subdivison Staff Report	4/11/2019
1	Applicant's Application	11/18/2018
2	Project Narrative	10/1/2018
3	State Environmental Review Application	11/21/2018
4	Proposed Development Plans	11/20/2018
5	Critical Area Report	11/20/2018
6	Preliminary Tree Report	11/20/2018
7	Traffic Study	9/20/2018
8	Geotechnicial Report	9/28/2018
9	Preliminary Stormwater Technical Information Report	11/16/2018
10	Stormwater Early Issues Memorandum	3/26/2019
11	Incompleteness Review Letter	12/18/2018
12	Completeness Review Letter	1/4/2019
13	Proof of Sending Report to Tribes	11/21/2018
14	Waiver of New Pre-Application Meeting	11/20/2018
15	Boundary Line Adjustment Narrative	1/29/2019
16	Boundary Line Adjustment Plot Plan	1/17/2019
17	Proof of Sign Posting on Site	3/26/2019
18	Revised Plan Sets	12/21/2018
19	Right of Way Dedication Letter	3/23/2019
20	Notice of Application and Public Hearing	4/4/2019
21	Environmental Determination of Non-Sigificance (SEPA18-28)	4/4/2019