



# City of Sandy

## Agenda

### Planning Commission Meeting

**Meeting Location:** City Hall- Council Chambers, 39250 Pioneer Blvd., Sandy, Oregon 97055

**Meeting Date:** Monday, February 25, 2019

**Meeting Time:** 7:00 PM

Page

#### 1. ROLL CALL

#### 2. REQUESTS FROM THE FLOOR - CITIZEN COMMUNICATION ON NON- AGENDA ITEMS

#### 3. NEW BUSINESS

3.1. Public Hearing

3.2. Jacoby Heights Subdivision

3 - 405

Staff recommends the Planning Commission hold a public hearing to take public testimony regarding the proposal. Staff recommends the Planning Commission **approve** the subdivision application with modifications as recommended in this report. The staff recommendation includes approval of the following three variances:

- Variance to Section 17.82.20 to have the front door for the houses along Jacoby Road face the interior local street network instead of Jacoby Road, which is designated as a transit street;
- Variance to Section 17.100.120(A) to provide a one-tiered lot configuration rather than a two-tiered lot configuration along Jacoby Road;
- Variance to Section 17.100.120(B) to increase the maximum block length beyond 400 feet for the north side of the proposed Woodstock Street between Camden Court and the east property boundary.

Staff recommends that the Planning Commission interpret the code such that Chapter 17.92, Landscaping and Screening, continue to apply to all zones, including subdivisions.

[Jacoby Heights Subdivision - Pdf](#)

#### 4. ITEMS FROM COMMISSION AND STAFF

**5. ADJOURN**



## Staff Report

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**Meeting Date:** February 25, 2019  
**From** Emily Meharg, Associate Planner  
**SUBJECT:** Jacoby Heights Subdivision

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### **Background:**

All County Surveyors & Planners submitted an application on behalf of Cory Knight to subdivide 9.68 acres at 19124 Jacoby Road into a 32 lot subdivision. The 32 lots range in size from 7,500 square feet to 21,183 square feet. The subdivision proposal includes the extension of Newton Street into the site and three proposed local streets: Camden Court, Woodstock Street, and Middlebury Avenue. The applicant is requesting three (3) variances: a variance to Section 17.82.20 to allow future homes to not orient to Jacoby Road, a variance to Section 17.100.120(A) to allow a one-tiered lot configuration between Jacoby Road and Camden Court, and a variance to Section 17.100.120(B) to exceed a 400 foot block length on the north side of Woodstock Street between Camden Court and the east property line. In addition, the applicant is requesting a code interpretation related to the tree protection standards of Chapter 17.92, Landscaping and Screening General Standards – All Zones, and Chapter 17.102, Urban Forestry.

### **Recommendation:**

Staff recommends the Planning Commission hold a public hearing to take public testimony regarding the proposal. Staff recommends the Planning Commission **approve** the subdivision application with modifications as recommended in this report.

The staff recommendation includes approval of the following three variances:

- Variance to Section 17.82.20 to have the front door for the houses along Jacoby Road face the interior local street network instead of Jacoby Road, which is designated as a transit street;
- Variance to Section 17.100.120(A) to provide a one-tiered lot configuration rather than a two-tiered lot configuration along Jacoby Road;
- Variance to Section 17.100.120(B) to increase the maximum block length beyond 400 feet for the north side of the proposed Woodstock Street between Camden Court and the east property boundary.

Staff recommends that the Planning Commission interpret the code such that Chapter 17.92, Landscaping and Screening, continue to apply to all zones, including subdivisions.

### **Code Analysis:**

See attached staff report and list of conditions

**Budgetary Impact:**  
None

**SUBJECT:** File No. 18-025 SUB/VAR/FSH/TREE/INT Jacoby Heights Subdivision

**AGENDA DATE:** February 25, 2019

**Application Submitted:** June 25, 2018  
**Additional Submittal Items:** December 5, 2018  
**Application Complete:** December 27, 2018  
**120-Day Deadline:** April 27, 2019

**DEPARTMENT:** Planning Division

**STAFF CONTACT:** Emily Meharg, Associate Planner

**EXHIBITS:**

**Applicant's Submittals**

- A. Land Use Application Form
- B. Narrative
- C. Project Plan Set
  - Sheet 1: Cover Sheet and Preliminary Plat Map
  - Sheet 2: Existing Conditions and Tree Retention Inventory
  - Sheet 3: Existing Trees with Building Setbacks Map
  - Sheet 4: FSH and Slopes Map
  - Sheet 5: Preliminary Street and Utility Plan
  - Sheet 6: Preliminary Street Tree Plan
  - Sheet 7: Preliminary Parking Plan
  - Sheet 8: Future Street and Pedestrian Trail Plan
  - Sheet 9: Grading and Erosion Control Plan
  - Sheet 10: Cut and Fill Evaluation
- D. Code Interpretation Request
- E. Storm Drainage Design and Calculations for the Jacoby Heights Subdivision
- F. Traffic Impact Analysis
- G. Geotechnical Report
- H. Wetland Determination
- I. Easement between Cory Knight and Ian Bird and Kelly Bird
- J. Letter from Public Works Director Re: Pump Station Capacity
- K. Arborist Report

**Agency Comments**

- L. City Engineer (January 15, 2019)
- M. Transportation Engineer (January 18, 2019)
- N. PGE (January 23, 2019)
- O. Public Works Director (January 26, 2019)
- P. Transit Director (January 28, 2019)

**Public Comments**

- Q. Annette Giltner, 35000 SE Colorado Road (February 6, 2019)
- R. Shawn Lorenzen, 39343 Stratford Street (February 11, 2019)
- S. Tim and Cherri Anders, 19098 Jacoby Road (February 12, 2019)

**Additional Documents Submitted by Staff**

- T. Chapter 17.102 of the City of Sandy Development Code

## **I. BACKGROUND**

### **A. PROCEEDING**

Type III Subdivision, Type III Code Interpretation, Type III FSH review, Type III Variance for not orienting towards a transit street, Type III Variance for not providing two tiered lot configuration, Type III Variance to Block Length, and Type II Tree Removal Permit. Note: the proposal includes a newly mapped FSH overlay area. The zone change associated with the new FSH overlay will be processed separately by the City.

### **B. FACTUAL INFORMATION**

1. APPLICANT/OWNER: Cory Knight
2. PROJECT NAME: Jacoby Heights Subdivision
3. LEGAL DESCRIPTION: T2S R4E Section 24A Tax Lot 2300
4. SITUS ADDRESS: 19124 Jacoby Road
5. PROPERTY LOCATION: East of Jacoby Road, west of Langensand Road, and south of Cascadia Village Drive
6. PROPERTY SIZE: 9.68 acres
7. PROPOSAL: All County Surveyors & Planners submitted an application on behalf of Cory Knight to subdivide 9.68 acres at 19124 Jacoby Road into a 32 lot subdivision. The 32 lots range in size from 7,500 square feet to 21,183 square feet. The subdivision proposal includes the extension of Newton Street into the site and three proposed local streets: Camden Court, Woodstock Street, and Middlebury Avenue. The applicant is requesting three (3) variances: a variance to Section 17.82.20 to allow future homes to not orient to Jacoby Road, a variance to Section 17.100.120(A) to allow a one-tiered lot configuration between Jacoby Road and Camden Court, and a variance to Section 17.100.120(B) to exceed a 400 foot block length on the north side of Woodstock Street between Camden Court and the east property line. In addition, the applicant is requesting a code interpretation related to the tree protection standards of Chapter 17.92, Landscaping and Screening General Standards – All Zones, and Chapter 17.102, Urban Forestry.
8. COMPREHENSIVE PLAN DESIGNATION: Low Density Residential
9. ZONING DISTRICT DESIGNATION: SFR, Single Family Residential
10. SERVICE CONSIDERATIONS: The applicant proposes to extend the existing sanitary sewer in Jacoby Road to service the entire subdivision. Water service will be provided from a connection to the existing 8-inch water main at the intersection of Cascadia Village Drive and Jacoby Road. The stormwater for the subdivision would be collected and conveyed to a proposed detention pond located in Tract A at the northwest corner of the site.

11. RESPONSE FROM GOVERNMENTAL AGENCIES, UTILITY PROVIDERS, AND CITY DEPARTMENTS:

- a. City Manager – No comments received
- b. City Engineer– Exhibit L
- c. Transportation Engineer – Exhibit M
- d. Public Works Director – Exhibit O
- e. Transit Director – Exhibit P
- f. PGE – Exhibit N
- g. ODOT – No comments received
- h. SandyNet Manager – No comments received
- i. Police Department – No comments received
- j. Fire District No. 72 – No comments received
- k. US Postal Service – No comments received

**C. PUBLIC COMMENTS**

Three written comments were received as follows:

- Annette Giltner at 35000 SE Colorado Road (Exhibit Q) does not want to see more development in Sandy.
- Shawn Lorenzen at 39343 Stratford Street (Exhibit R) does not want to see more residential units built in Sandy without first strengthening the City’s infrastructure to support existing residents.
- Tim and Cherri Anders at 19098 Jacoby Road (Exhibit S) expressed concerns about the effect of the proposed subdivision on their property, which is directly adjacent to the north.

**D. APPLICABLE CRITERIA:**

Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.14 Request for Interpretation; 17.18 Processing Applications; 17.22 Notices; 17.30 Zoning Districts; 17.34 Single Family Residential (SFR); 17.56 Hillside Development; 17.60 Flood and Slope Hazard Overlay District; 17.66 Adjustments and Variances; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.82 Special Setbacks on Transit Streets; 17.84 Improvements Required with Development; 17.86 Parkland and Open Space; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access; 17.100 Land Division; 17.102 Urban Forestry; 15.30 Dark Sky Ordinance; and 15.44 Erosion Control.

**E. BACKGROUND INFORMATION/HISTORY**

There is one existing house at 19124 Jacoby Road. **The applicant shall obtain a demolition permit from the City of Sandy Building Department prior to demolition of the existing structure(s) on-site.** Per the City Engineer (Exhibit L), the preliminary plans don’t identify any existing domestic or irrigation wells on site. **Any existing domestic or irrigation wells on site shall be located, identified, capped, disconnected or abandoned in conformance with OAR 690-220-0030. A copy of the Oregon Water Resources Department (OWRD) abandonment certificate shall be submitted to the City Planning Division.** Per the City Engineer (Exhibit L), the preliminary plans don’t identify any septic tanks on site. **Any on-site sewage disposal system shall be abandoned in conformance with Clackamas County Water Environmental**

**Services (WES) regulations. A copy of the septic tank removal certificate shall be submitted to the City Planning Division.**

**F. PROCEDURAL CONSIDERATIONS**

This request is being processed as a Type III Subdivision, Type III FSH Review, three Type III Variances, Type III Code Interpretation, and Type II Tree Removal Permit. Notification of the proposal was mailed to property owners within 300 feet of the subject property and to affected agencies on January 29, 2019. A legal notice was published in the Sandy Post on February 6, 2019.

**II. ANALYSIS OF CODE COMPLIANCE**

**CHAPTER 17.14 – REQUEST FOR INTERPRETATION**

*Request: The applicant is requesting an interpretation regarding whether Chapter 17.92, Landscaping and Screening, applies to subdivisions.*

***RESPONSE:** Staff reviewed the Development Code and relevant ordinances and consulted with the City Attorney and found nothing indicating that Chapter 17.92 does not apply to subdivisions. In fact, the full title of Chapter 17.92 is Landscaping and Screening General Standards – All Zones. Staff interprets this as meaning that Chapter 17.92 applies to all zones, including Single Family Residential. The specific general provision that the applicant is questioning (Section 17.92.10(C)) states that significant trees should be integrated into the design of a development and that trees to be retained shall be protected from damage during construction. Staff finds that a subdivision qualifies as a development and as construction. Furthermore, there is nothing contained in Chapter 17.92 or Chapter 17.102 that restricts using Chapter 17.92 during subdivision review. There is also nothing in the ordinance (Ordinance No. 2002-10) that adopted Chapter 17.102 that speaks on this matter. In addition, there are several Comprehensive Plan Goal 5 policies that support retaining significant trees, most notably, the following:*

- *Policy 7: Employ development regulations to preserve and protect open space and environmentally sensitive lands, integrate the natural environment of Sandy into project designs, minimize the creation of impervious surface, and discourage the unnecessary clearing of trees and other natural vegetation.*
- *Policy 16: Require development and construction projects to minimize disturbance of significant indigenous growth and to enhance the cohesive quality of tree stands through sensitive site design and construction methods.*
- *Policy 17: Promote innovative site and building designs which reduce the adverse impacts of development on native tree stands and other areas of significant vegetation.*
- *Policy 30: The City of Sandy shall consider incentives to encourage the preservation of significant trees.*
- *Policy 31: The City of Sandy shall undertake a study to designate “significant/heritage” trees or areas of second growth that exist within the City’s urban growth boundary. Designated trees shall be protected and preserved where possible.*

**Recommendation: Staff recommends that the Planning Commission continue to apply Chapter 17.92 to all zones, including during subdivision review.**



**CHAPTER 17.30 – ZONING DISTRICT**

The Single Family Residential (SFR) zoning on the site allows a minimum of 3 units per acre and a maximum of 5.8 units per acre. The number of dwelling units permitted on a parcel of land is calculated after determining the amount of restricted development area in accordance with Section 17.60, the Flood and Slope Hazard Overlay District. Density transfer is permitted from restricted development areas consistent with the provisions of Section 17.60.90, although no density transfer is proposed.

**RESPONSE:** *The total gross acreage for the entire property is 9.68 acres. The proposal contains 2.08 acres of area dedicated for public right-of-way and 0.47 acres dedicated for public tracts (Tract A). After removal of the right-of-way and public tracts the net site area for the subject property is reduced to 7.13 acres of net site area (NSA). The subject property also contains 1.20 acres of restricted development area; therefore, the unrestricted site area (USA) is 5.93 acres. Based on required density, the SFR land requires a minimum of 18 dwelling units (5.93 USA x 3). The maximum allowed dwelling units is 41 (calculated as the lesser of (a) 7.13 NSA x 5.8 = 41 and (b) 5.93 USA x 5.8 x 1.5 = 52). The proposed 32 dwelling units are within the allowable density range and therefore meet the density requirement.*

**CHAPTER 17.34 – SINGLE FAMILY RESIDENTIAL (SFR)**

The applicant proposes 32 single family detached dwellings in conformance with minimum and maximum density requirements, as detailed above in Chapter 17.30.

**17.34.10 PERMITTED USES**

**RESPONSE:** *Section 17.34.10 lists single family detached dwellings as a permitted use. The proposed subdivision includes 32 lots for single family detached dwellings. All homes shall provide building design features in compliance with the standards in Section 17.90.150 and Chapter 17.54.*

**17.34.30 DEVELOPMENT STANDARDS**

Type	Standard
A. Minimum Lot Area - Single detached dwelling - Other permitted uses	7,500 square ft. No minimum
A. Minimum Average Lot Width - Single detached dwelling	60 ft.
C. Minimum Lot Frontage	20 ft. except as allowed by Section 17.100.160
D. Minimum Average Lot Depth	No minimum
E. Setbacks (Main Building) Front yard Rear yard Side yard (interior) Corner Lot	10 ft. minimum 20 ft. minimum 7.5 ft. minimum 10 ft. minimum on side abutting the street <sup>1</sup>
F. Setbacks (Garage/Carport)	22 ft. minimum for front vehicle access

<sup>1</sup> Must comply with clear vision requirements of Chapter 17.74.

	15 ft. minimum if entrance is perpendicular to street (subject to Section 17.90.220) 5 ft. minimum for alley or rear access
G. Projections into Required Setbacks	See Chapter 17.74
H. Accessory Structures in Required Setbacks	See Chapter 17.74
I. Structure Height	35 ft. maximum
J. Building Site Coverage	No minimum
K. Off-Street Parking	See Chapter 17.98

**RESPONSE:** *The proposed lots range in size from 7,500 square feet to 21,183 square feet. All homes shall meet the development standards of Section 17.34.30.*

#### **17.34.40 MINIMUM REQUIREMENTS**

- A. Must connect to municipal water.
- B. Must connect to municipal sewer if service is currently within 200 hundred feet of the site. Sites more than 200 feet from municipal sewer, may be approved to connect to an alternative disposal system provided all of the following are satisfied:
  - 1. A county septic permit is to be secured and a copy is provided to the city.
  - 2. The property owner executes a waiver of remonstrance to a local improvement district and/or signs a deed restriction agreeing to complete improvements.
  - 3. The minimum size of the property is one acre or is a pre-existing buildable lot, as determined by the city.
  - 4. Site consists of a buildable parcel(s) created through dividing property in the city, which is less than five acres in size.
- C. The location of any real improvements to the property must provide for a future street network to be developed.
- D. Must have frontage or approved access to public streets.

**RESPONSE:** *All lots will be required to connect to City services. The applicant is also required to extend utilities to the furthest extent of the subject property.*

### **CHAPTER 17.56 – HILLSIDE DEVELOPMENT**

#### **17.56.10 APPLICABILITY**

These regulations shall apply to any parcel with slopes greater than twenty-five percent (25%) as-shown on the Hillside Development Overlay District Map or with slope hazards mapped by the Department of Geology and Mineral Industries (DOGAMI). This chapter shall apply only to activities and uses that require a building, grading, tree removal and/or land use permit.

- A. General. No person shall develop property in areas designated by SDC 17.56.10, without first demonstrating compliance with this chapter.
  - 1. As a condition of permit issuance or land use approval, the applicant shall agree to implement the recommendations of approved studies and to allow all inspections to be conducted.
  - 2. Where a bond, letter of credit or other guarantee is required, the permit shall not be issued until the bond or guarantee has been obtained and approved.

B. Exemptions:

1. An activity or use that avoids slopes of 25% or greater, DOGAMI slope hazard areas, natural drainageways and potentially hazardous analysis areas as defined in Section 17.56.30.A.
2. The following activities, regardless of location:
  - a. An excavation that is less than three feet in depth, or which involves less than fifty cubic yards of volume;
  - b. A fill that does not exceed three feet in depth or 50 cubic yards of volume;
  - c. New construction or expansion of a structure resulting in a net increase in ground floor area of less than 1,000 square feet that does not involve grading;
  - d. Emergency actions required to prevent an imminent threat to public health or safety, or prevent imminent danger to public or private property, as determined by the Director; or
  - e. Any land use or activity that does not require a building, grading permit, or land use approval.

***RESPONSE:*** *The applicant submitted an FSH and Slopes Map (Exhibit C, Sheet 4) that shows areas of land that exceed 25 percent slope. A majority of the 25 percent or greater slope areas are located in the northeast corner of the property, adjacent to the Tickle Creek basin. The applicant submitted a Geotechnical Report (Exhibit G) by Rapid Soil Solutions LLC that includes construction recommendations related to site preparation, excavation, structural fills, and drainage considerations, which was reviewed by the City Engineer. Per the City Engineer (Exhibit L), **the applicant shall retain appropriate professional geotechnical services for observation of construction of earthwork and grading activities. The grading setbacks, drainage, and terracing shall comply with the Oregon Structural Specialty Code (OSSC) requirements and the geotechnical report recommendations and conclusions as indicated in the report. When the grading is completed, the applicant shall submit a final report by the Geotechnical Engineer to the City stating that adequate inspections and testing have been performed on all lots (Lots 1-32) and all of the work is in compliance with the above noted report and OSSC. The submitted Cut and Fill Evaluation (Exhibit C, Sheet 10) shows proposed cut and fill within the tree protection area south of Trees #419, #523, and #526. The applicant shall update the cut and fill evaluation to include the location of the tree protection fencing as depicted on the existing conditions and tree retention inventory (Exhibit C, Sheet 2). The applicant shall not cut or fill within the proposed tree protection area.***

**17.56.30 REQUIRED MAP AND STUDIES**

- A. Topographic Map Required. To determine the location of potentially hazardous areas, the applicant shall submit a scaled topographic map at two-foot contour intervals for the subject property (site) and for land within 25 feet of the site perimeter. In addition to DOGAMI slide hazard areas and slopes of 25% or greater, potentially hazardous “analysis areas” include land within 25 feet of the top or toe of slopes of 25% or greater and the area 25 feet on either side of drainageways that drain 20 acres or more. This map shall be prepared by a registered engineer or land surveyor and shall show:
1. Slopes of 25-34%;
  2. Slopes of 35% and greater;
  3. The analysis that is within 25’ of slopes that are 25% or greater parallel to and within 25 feet of the top of the 25% slope break;
  4. Mapped DOGAMI slide hazard areas;
  5. The analysis area within 25 feet of the centerline of drainageways that drain at least 20 acres; and

6. The area (in square feet) for each category listed above for the subject property.
- B. **Types of Required Studies.** There are three types of geological and engineering studies that may be required by this chapter. See Table 1 under Section 17.56.40, below.
1. **Geological Assessments** are prepared and stamped by a Certified Engineering Geologist and describe the surface and subsurface conditions of a site, delineate areas of a property that may be subject to specific geologic hazards, and assess the suitability of the site for development. Geotechnical Reports shall be conducted according to the requirements of Appendix A (*Geological Assessments*), shall make recommendations as to whether further studies are required, and may be incorporated into or included as an appendix to the geotechnical report.
  2. **Engineering Geology Reports** are prepared and stamped by a Certified Engineering Geologist and provide detailed descriptions of the geology of the site, professional conclusions and recommendations regarding the effect of geological conditions on the proposed development, and opinions and recommendations covering the adequacy of the site to be developed. Engineering Geology Reports shall be prepared in accordance with the requirements of Appendix B (*Guidelines for Preparing Engineering Geology Reports in Oregon* adopted by the Oregon State Board of Geologist Examiners) and may be incorporated into or included as an appendix to the geotechnical report.
  3. **Geotechnical Reports** are prepared and stamped by a Geotechnical Engineer, evaluate site conditions, and recommend design measures necessary to reduce the development risks and facilitate safe and stable development. Geotechnical Reports shall be conducted according to the requirements of Appendix C (*Geotechnical Reports*), and may be incorporated into or included as an appendix to the Engineering Geology Report.

**RESPONSE:** *Rapid Soil Solutions LLC completed a Geotechnical Report (Exhibit G) dated February 23, 2018 for the subject site. The applicant shall follow the recommendations outlined in the Geotechnical Report.*

**17.56.40 WHERE STUDIES REQUIRED**

Additional geological or engineering studies shall be required, or not required, under the following circumstances:

**TABLE 1: WHERE STUDIES ARE REQUIRED OR NOT REQUIRED**

Situation	Type I Development Applications; Single Family Homes, Duplexes and Accessory Uses	NON-EXEMPT Grading; Type II or III Development Applications
A. Proposed development avoids slopes of 25% or greater, drainageways, DOGAMI slope hazard areas and all analysis areas:	1. No further requirements	2. No further requirements
B. Development proposed on slopes of 25-35% or analysis areas, but avoids drainageways, DOGAMI hazard areas and slopes of	1. Geological Assessment required; Engineering Geology or Geotechnical Reports may be required*	2. Engineering Geology Report required; Geotechnical Report may be required*

35% or greater:		
C. Development proposed on DOGAMI hazard areas, slopes of 35% or greater, or drainageway areas:	1. Engineering Geology Report required; Geotechnical Report may be required*	2. Engineering Geology Report and Geotechnical Report required

\* Whether additional studies are necessary depends on recommendations of base required study.

**RESPONSE:** *The applicant shall submit a geological assessment specific to each lot proposed to be developed with a single family house on 25 percent or greater slopes that fall outside the mapped FSH overlay. This includes Lots 19, 20, 21, 27, 28, and 29. Additional reports may be required depending on the recommendations of the geological assessment. Once the subdivision is platted and building permits are filed for individual home construction the property owner/contractor shall submit Type I Hillside applications with studies as detailed in Table 1 in Section 17.56.40.*

**17.56.50 COMPLIANCE WITH STUDY CONCLUSIONS AND RECOMMENDATIONS REQUIRED**

- A. Professional Standards. The director shall determine whether Geological Assessments, Engineering Geology Reports, or Geotechnical Reports have been prepared in accordance with Section 17.56.30. The director may require additional information or analysis necessary to meet study requirements.
- B. Peer Review. The director may require peer review of any required report, in which case regulated activities and uses shall be reviewed and accepted through the peer review process before any regulated activity will be allowed.
  - 1. A professional or professional firm of the city’s choice that meets the qualifications listed in this chapter shall perform the review.
  - 2. The review shall be at the applicant's expense.
  - 3. Review of report submittals shall determine whether required elements are completed, geologic report procedures and assumptions are accepted, and all conclusions and recommendations are supported and reasonable.
- C. Review Criteria. The approval authority shall rely on the conclusions and recommendations of required reports, as modified by peer review, to determine compliance with this chapter.
- D. Conditions of Approval. Conclusions and recommendations stated in approved reports shall be directly incorporated as permit conditions or provide the basis for conditions of approval for the regulated activity or use.
- E. Expiration. Where an approved assessment or report as defined and required by this chapter has been prepared within the last five years for a specific site, and where the proposed land use activity and surrounding site conditions are unchanged, that report may be utilized and a new report is not required. Should environmental conditions associated with the site or surrounding the site change, or if the proposed land use activity or development has materially changed, the applicant shall submit an amendment to the required assessment or report, which may be reviewed and approved through the peer review process.

**RESPONSE:** *The Geotechnical Report includes construction recommendations related to site preparation, excavation, structural fills, and drainage considerations. The applicant shall retain*

*appropriate professional geotechnical services for observation of construction of earthwork and grading activities. The grading setbacks, drainage, and terracing shall comply with the Oregon Structural Specialty Code (OSSC) requirements and the geotechnical report recommendations and conclusions as indicated in the report. When the grading is completed, the applicant shall submit a final report by the Geotechnical Engineer to the City stating that adequate inspections and testing have been performed on all lots (Lots 1-32) and all of the work is in compliance with the above noted report and OSSC.*

## **CHAPTER 17.60 – FLOOD AND SLOPE HAZARD OVERLAY DISTRICT**

### **17.60.00 INTENT**

This chapter is intended to promote the public health, safety and general welfare by minimizing public and private adverse impacts from flooding, erosion, landslides or degradation of water quality consistent with Statewide Planning Goals 6 (Air, Land and Water Resources Quality) and 7 (Areas Subject to Natural Disasters and Hazards) and the Sandy Comprehensive Plan (SCP).

***RESPONSE:*** *The applicant is not proposing any development within the Flood and Slope Hazard (FSH) overlay district. However, the proposal includes 6 lots that that are proposed to be platted within the FSH overlay. The applicant shall place the FSH analysis area in a separate tract and shall dedicate the FSH tract to the City. Staff brought the subject subdivision proposal to the January 30, 2019 Parks and Trails Advisory Board meeting. The Parks and Trails Advisory Board recommends that a tract is created and dedicated to the City and cited three primary reasons that they would like to see the land dedicated: 1) increased protection of the trees located within the FSH buffer area; 2) a larger area through which a connector trail to Tickle Creek Trail could meander; and, 3) to provide a wider riparian buffer that would not only better protect Tickle Creek, but would also enhance the natural beauty along the future extension of the Tickle Creek Trail. The Public Works Director expressed some maintenance concerns about the City taking on ownership of the FSH tract without knowing the existing condition of that area. The applicant shall submit a Phase I environmental assessment and a native vegetation report for the FSH area to be dedicated in the tract. The applicant shall remove all invasive plants and re-plant any areas of exposed soil with native plants. The applicant shall dedicate the FSH tract to the City and shall submit a maintenance bond for two full growing seasons (May 1 – October 31) to ensure 80 percent plant survival or replacement and that the tract remains in good condition. The proposal also contains two trees that are proposed for removal and appear to be on the FSH boundary line: Trees #510 and #516. The applicant shall update the plan set to retain Trees #510 and #516 to avoid tree removal in the FSH overlay.*

### **17.60.30 REQUIRED SETBACK AREAS**

Setback areas shall be required to protect water quality and maintain slope stability near stream corridors and locally significant wetlands. Setbacks are measured horizontally from, parallel to and upland from the protected feature.

- A. **Required Setbacks.** The required special setback(s) shall be:
1. 70 feet from the top of bank of Tickle Creek;
  2. 50 feet from top of bank along other perennial streams, except for “No Name Creek” east of Towle Drive, as provided in Section 17.60.30.C.2 below.
  3. 25 feet around the edge of any mapped locally significant wetland; and

4. 25 feet from the top of any 25% slope break where the slope break occurs within the FSH overlay district as mapped by the city.

**RESPONSE:** *The applicant submitted a Wetland Determination (Exhibit H) by Environmental Science & Assessment, LLC dated May 30, 2018. The wetland determination concluded there is no evidence of intermittent or perennial flow on the site. Per the City Engineer (Exhibit L), a Wetlands Report outlining the delineated wetlands/high water level appears to be necessary based on the National Wetland Inventory (NWI) or the Local Wetland Inventory (LWI). **The wetland report/delineation shall be concurred with by the State of Oregon Division of State Lands (ODSL) and the US Army Corps of Engineers (COE) and the Oregon Department of Fish and Wildlife.** The City Engineer also recommends that the City of Sandy Planning Division review the FSH Overlay District line at the northeast corner of the site.*

#### **17.60.50 SPECIAL REPORTS**

Where development is proposed on restricted development areas within the FSH overlay district as defined in Section 17.60.20.A, the Director shall require submission of the following special reports. These reports shall be in addition to other information required for specific types of development, and shall be prepared by professionals in their respective fields.

The Director may require one or more of these reports where necessary to address potential adverse impacts from development on buildable land within the FSH overlay district. The Director may exempt Type II permit applications from one or more of these reports where impacts are minimal and the exemption is consistent with the purpose of the FSH overlay zone as stated in Section 17.60.00.

- A. Hydrology and Soils Report. This report shall include information on the hydrological conditions on the site, the effect of hydrologic conditions on the proposed development, the proposed development's impact on surface and groundwater flows to wetlands and streams, and any hydrological or erosion hazards. This report shall also include soils characteristics of the site, their suitability for development, carrying capacity, and erosion or slumping characteristics that might present a hazard to life and property, or adversely affect the use or stability of a public facility or utility. Finally, this report shall include information on the nature, distribution and strength of existing soils; the adequacy of the site for development purposes; and an assessment of grading procedures required to impose the minimum disturbance to the natural state. A licensed professional engineer registered in Oregon shall prepare the hydrology and soils report.
- B. Grading Plan. The grading plan shall be specific to a proposed physical structure or use and shall include information on terrain (two-foot intervals of property), drainage, direction of drainage flow, location of proposed structures and existing structures which may be affected by the proposed grading operations, water quality facilities, finished contours or elevations, including all cut and fill slopes and proposed drainage channels. Project designs including but not limited to locations of surface and subsurface devices, walls, dams, sediment basins, storage reservoirs, and other protective devices shall form part of the submission. The grading plan shall also include: 1) construction phase erosion control plan consistent with the provisions of Chapter 15.44; and 2) schedule of operations. A licensed professional engineer registered in Oregon shall prepare the grading and erosion control plan.

- C. **Native Vegetation Report.** This report shall consist of a survey of existing vegetative cover, whether it is native or introduced, and how it will be altered by the proposed development. Measures for re-vegetation with native plant species will be clearly stated, as well as methods for immediate and long-term stabilization of slopes and control of soil erosion. A landscape architect, landscape designer, botanist or arborist with specific knowledge of native plant species, planting and maintenance methods, survival rates, and their ability to control erosion and sedimentation shall prepare the vegetation report. The applicant shall be responsible for replacing any native plant species that do not survive the first two years after planting, and for ensuring the survival of any replacement plants for an additional two years after their replacement.

**RESPONSE:** *Per the City Engineer (Exhibit L), a Wetlands Report outlining the delineated wetlands/high water level appears to be necessary based on the National Wetland Inventory (NWI) or the Local Wetland Inventory (LWI). The wetland report/delineation shall be concurred with by the State of Oregon Division of State Lands (ODSL) and the US Army Corps of Engineers (COE) and the Oregon Department of Fish and Wildlife.*

#### **17.60.80 WATER QUALITY TREATMENT FACILITIES**

Tickle Creek, the Sandy River and associated natural drainage ways are vital to Sandy's recreationally based economy and to the quality of life of Sandy residents. Placement of water quality facilities shall be limited as follows:

- A. The water quality facility shall not be constructed in restricted development areas, except where necessary to serve approved development within restricted development areas (e.g., a road) and where no reasonable alternative exists in buildable areas of the site.
- B. Where the approval authority determines that a more efficient and effective regional site exists within the sub-basin, the water quality facility may be constructed off-site.

**RESPONSE:** *The proposed detention pond (Tract A) is located in the northwest corner of the site and is not within the mapped FSH overlay area.*

#### **17.60.90 DENSITY TRANSFER PROVISIONS**

Residential density transfer may be approved subject to the following:

- A. **Required Setback Areas.** Density may be transferred from restricted development areas (i.e., steep slopes, protected water features and required setbacks) to buildable portions of the site.
- B. **Density Maximum.** The maximum gross density for the buildable area of the site shall not exceed 150% of the maximum density allowed by the underlying zoning district for that buildable area.
- C. **Housing Types Not Permitted in Underlying Zoning District.** Housing types not permitted in the underlying zoning district may only be approved through the PD (planned development) or SAP (specific area plan) process.
- D. **Transfer Area.** Transfer of density may only occur within the same property and/or to properties contiguous to the primary property. The terms "primary property" identify the legal lot from which density is to be transferred to "secondary property(s)". Further development or land use action on the primary or secondary properties shall be reviewed together in the same application.



**RESPONSE:** Since no development is proposed within the FSH area, a density transfer per Section 17.60.90 is allowed for the buildable area of the site. There are 1.20 acres of restricted development area. See Chapter 17.30 for density analysis.

## **CHAPTER 17.80 – ADDITIONAL SETBACKS ON COLLECTOR AND ARTERIAL STREETS**

### **17.80.10 APPLICABILITY**

Collector: Jacoby Road

**RESPONSE:** Four lots (Lots 9, 10, 30 and 32) are proposed to contain frontage on Jacoby Road, which is classified as a collector street. **All structures on lots along Jacoby Road shall be constructed to comply with the standards of Section 17.80.20.**

### **17.80.20 SPECIFIC SETBACKS**

Any structure located on streets listed above or identified in the Transportation System Plan as arterials or collectors shall have a minimum setback of 20 feet measured from the property line. This applies to applicable front, rear and side yards.

**RESPONSE:** All structures shall maintain a minimum 20-foot setback from the Jacoby Road public right-of-way. The Preliminary Plat (Exhibit C, Sheet 1) depicts building envelopes at 20 feet from the Jacoby Road right-of-way.

## **CHAPTER 17.82 – SPECIAL SETBACKS ON TRANSIT STREETS**

### **17.82.20 BUILDING ORIENTATION**

- A. All buildings shall have their primary entrances oriented toward a transit street rather than a parking area, or if not adjacent to a transit street, toward a public right-of-way or private walkway which leads to a transit street.
- B. Buildings shall have a primary entrance connecting directly between the street and building interior. This entrance shall be open to the public during all business hours and shall comply with the accessibility standards of the Uniform Building Code.
- C. In lieu of a building entrance oriented to a transit street, a building's entrance may be enhanced and identified in the following manner:
  - 1. An entrance plaza of at least 150 square feet, at least 100 square feet of which shall be visible from the transit street. The entrance plaza shall be at least 10 feet wide at the narrowest dimension; and
  - 2. A permanent building feature (e.g. a portico, porch or awning) shall be visible from the transit street, signifying an entrance; and
  - 3. Pedestrian-scale lighting shall be required at the entrance; and
  - 4. A clearly marked, convenient, safe and lighted pedestrian route shall be provided to the entrance, from the transit street.

- D. Primary building entrances shall be architecturally emphasized and visible from the street. Building entrances shall incorporate arcades, roofs, porches, alcoves, porticoes, and awnings that protect pedestrians from the rain and sun. Continuous arcades are strongly encouraged.
- E. All building entrances and exits shall be well lit. Lighting shall be a pedestrian scale (3'-12') and the source light shall be shielded to reduce glare.
- F. For commercial buildings with facades over 300 feet in length on a transit street, two or more building entrances on the street must be provided.
- G. If the site has frontage on more than one transit street, the building shall provide one main entrance oriented to a transit street or to a corner where two transit streets intersect.

**RESPONSE:** *Jacoby Road is a designated transit street. Lots 9, 10, 30, and 32 have frontage on Jacoby Road. As part of the Jacoby Heights subdivision proposal, the applicant has requested a variance to the requirements of Section 17.82.20 to allow the front door for the houses on Lots 9, 10, 30, and 32 to face the internal street network instead of Jacoby Road, which is a designated transit street. The variance request is discussed in detail in the analysis of Chapter 17.66 in this staff report.*

#### **CHAPTER 17.84 - IMPROVEMENTS REQUIRED WITH DEVELOPMENT**

This chapter provides general information regarding improvements required in association with development, and it clarifies the timing, extent, and standards for public and private improvements.

##### **17.84.20 TIMING OF IMPROVEMENTS**

- A. All improvements required by the standards in this chapter shall be installed concurrently with development, as follows:
  1. Where a land division is proposed, each proposed lot shall have required public and franchise utility improvements installed or financially guaranteed in accordance with the provisions of Chapter 17 prior to approval of the final plat.
  2. Where a land division is not proposed, the site shall have required public and franchise utility improvements installed or financially guaranteed in accordance with the provisions of Chapter 17 prior to temporary or final occupancy of structures.

**RESPONSE:** *Submission of preliminary street and utility plans during the land use review process is solely for compliance with the data requirements of Section 17.100.60 (D). **Public improvement plans are subject to a separate review and approval process. Preliminary plat approval does not connote approval of public improvement construction plans.***

- B. Where specific approval for a phasing plan has been granted for a planned development and/or subdivision, improvements may similarly be phased in accordance with that plan.

**RESPONSE:** *The applicant did not propose a phasing plan with this application.*

##### **17.84.30 PEDESTRIAN AND BICYCLIST IMPROVEMENTS**

- A. Sidewalks shall be required along both sides of all arterial, collector, and local streets, as follows:

1. Sidewalks shall be a minimum of 5 ft. wide on local streets. The sidewalks shall be separated from curbs by a tree planting area that provides separation between sidewalk and curb, unless modified in accordance with Subsection 3 below.
2. Sidewalks along arterial and collector streets shall be separated from curbs with a planting area, except as necessary to continue an existing curb-tight sidewalk. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of 6 ft. wide.
3. Sidewalk improvements shall be made according to city standards, unless the city determines that the public benefit in the particular case does not warrant imposing a severe adverse impact to a natural or other significant feature such as requiring removal of a mature tree, requiring undue grading, or requiring modification to an existing building. Any exceptions to the standards shall generally be in the following order.
  - a) Narrow landscape strips
  - b) Narrow sidewalk or portion of sidewalk to no less than 4 feet in width
  - c) Eliminate landscape strips
  - d) Narrow on-street improvements by eliminating on-street parking
  - e) Eliminate sidewalks
4. The timing of the installation of sidewalks shall be as follows:
  - a) Sidewalks and planted areas along arterial and collector streets shall be installed with street improvements, or with development of the site if street improvements are deferred.
  - b) Sidewalks along local streets shall be installed in conjunction with development of the site, generally with building permits, except as noted in (c) below.
  - c) Where sidewalks on local streets abut common areas, drainageways, or other publicly owned or semi-publicly owned areas, the sidewalks and planted areas shall be installed with street improvements.

***RESPONSE:*** *The Preliminary Plat (Exhibit C, Sheet 1) depicts an 8-foot-wide public utility easement along the frontage of all proposed lots to facilitate future installation of utilities. Sidewalks abutting the proposed lots shall be constructed in association with development of the lots. The applicant shall construct sidewalks along Tract A both on Jacoby Road and Camden Court, prior to final plat approval. The sidewalks on Camden Court, Woodstock Street, Newton Street, and Middlebury Avenue shall be five feet in width and separated by a planter strip or swale (six feet in width) in areas not transverse by driveways. The sidewalks on Jacoby Road shall be six feet in width and separated by a five foot planter strip.*

*The submitted Street Tree Plan (Exhibit C, Sheet 6) identifies street trees along all streets. The section of Newton Street on the east side of the property adjacent to Lots 1 and 2 is proposed to be constructed with half street improvements. This proposed design places the utilities underneath the planter strip; thus, the proposal does not show street trees in front of Lots 1 and 2. Per the Public Works Director (Exhibit O), the applicant shall eliminate the proposed curve at the east end of Newton and continue the three-quarter street improvement to the east boundary of the site. The applicant shall update the plan set to show street trees in the planter strip adjacent to Lots 1 and 2. Street trees shall be installed approximately 30 feet on center in conjunction with issuance of building permits. Street trees are required to be a minimum caliper of 1.5-inches measured 6 inches from grade. Trees shall be planted and staked per the City of Sandy standard planting detail; trees shall be tied to the stakes with loosely tied twine. The planter strip shall be graded and backfilled as necessary, and bark mulch, vegetation, or other approved material installed prior to occupancy. Tree ties shall be removed within one year of installation.*

- B. Safe and convenient pedestrian and bicyclist facilities that strive to minimize travel distance to the extent practicable shall be provided in conjunction with new development within and between new subdivisions, planned developments, commercial developments, industrial areas, residential areas, public transit stops, school transit stops, and neighborhood activity centers such as schools and parks, as follows:
1. For the purposes of this section, “safe and convenient” means pedestrian and bicyclist facilities that: are reasonably free from hazards which would interfere with or discourage travel for short trips; provide a direct route of travel between destinations; and meet the travel needs of pedestrians and bicyclists considering destination and length of trip.
  2. To meet the intent of “B” above, right-of-ways connecting cul-de-sacs or passing through unusually long or oddly shaped blocks shall be a minimum of 15 ft. wide with 8 feet of pavement.
  3. 12 feet wide pathways shall be provided in areas with high bicycle volumes or multiple use by bicyclists, pedestrians, and joggers.
  4. Pathways and sidewalks shall be encouraged in new developments by clustering buildings or constructing convenient pedestrian ways. Pedestrian walkways shall be provided in accordance with the following standards:
    - a) The pedestrian circulation system shall be at least five feet in width and shall connect the sidewalk on each abutting street to the main entrance of the primary structure on the site to minimize out of direction pedestrian travel.
    - b) Walkways at least five feet in width shall be provided to connect the pedestrian circulation system with existing or planned pedestrian facilities which abut the site but are not adjacent to the streets abutting the site.
    - c) Walkways shall be as direct as possible and avoid unnecessary meandering.
    - d) Walkway/driveway crossings shall be minimized. Internal parking lot design shall maintain ease of access for pedestrians from abutting streets, pedestrian facilities, and transit stops.
    - e) With the exception of walkway/driveway crossings, walkways shall be separated from vehicle parking or vehicle maneuvering areas by grade, different paving material, painted crosshatching or landscaping. They shall be constructed in accordance with the sidewalk standards adopted by the City. (This provision does not require a separated walkway system to collect drivers and passengers from cars that have parked on site unless an unusual parking lot hazard exists).
    - f) Pedestrian amenities such as covered walk-ways, awnings, visual corridors and benches will be encouraged. For every two benches provided, the minimum parking requirements will be reduced by one, up to a maximum of four benches per site. Benches shall have direct access to the circulation system.

***RESPONSE:*** Five foot wide sidewalks are proposed on local streets and six foot wide sidewalks are proposed along Jacoby Road adjacent to the proposed subdivision. These sidewalks provide safe and convenient pedestrian access within the subdivision and connect the site to neighboring properties. To improve pedestrian connectivity, ***the applicant shall construct a mid-block ADA ramp on the west side of Jacoby Road opposite Woodstock Street to provide ADA access to the existing sidewalk on the west side of Jacoby Road and the neighborhood to the west.***

- C. Where a development site is traversed by or adjacent to a future trail linkage identified within the Transportation System Plan, improvement of the trail linkage shall occur concurrent with development. Dedication of the trail to the City shall be provided in accordance with 17.84.80.

**RESPONSE:** *The City's current TSP maps were created with the former UGB boundaries (pre-June 2017) and did not include the subject property that was brought into the revised UGB boundaries. Therefore, there are no trail linkages identified in the TSP for this property.*

- E. To ensure improved access between a development site and an existing developed facility such as a commercial center, school, park, or trail system, the Planning Commission or Director may require off-site pedestrian facility improvements concurrent with development.

**RESPONSE:** *Tickle Creek crosses the northeast corner of the subject property and the future extension of the Tickle Creek Trail is planned to extend along the length of Tickle Creek. At the pre-application meeting, staff informed the applicant that staff would like to see a connection from the proposed subdivision to the future Tickle Creek Trail. Staff recommended the trail connection extend north from the intersection of Middlebury Avenue and Woodstock Street. The submitted Future Street and Pedestrian Trail Plan (Exhibit C, Sheet 8) details the future pedestrian trail connection to the future Tickle Creek Trail on the adjacent property to the east (tax lot 800). Staff brought this proposal to the January 30, 2019 Parks and Trails Advisory Board meeting. The Parks and Trails Advisory Board also recommends that the connector trail be constructed as part of this development. Staff recommends the Planning Commission require a pedestrian trail connection to the future extension of the Tickle Creek Trail as part of this development. Staff recommends that the trail connection be located in alignment with Middlebury Avenue. Alternatively, staff recommends that Lot 19 be included in the FSH tract and that the trail connection be located on the proposed location of Lot 19. Preserving Lot 19 as a tract would preserve trees, further enhance the Tickle Creek basin, and provide a wide trail connection for switch backs or stairs. If the applicant wants to pursue locating the pedestrian trail connection off-site, the applicant shall provide justification as to why a connection on tax lot 800 makes more sense than a connection developed as part of this proposal. Based on an initial review of topography (using Lidar data), it appears that the applicant's proposed trail connection on tax lot 800 is located on steeper slopes than staff's recommendation so staff is unsure what the justification is for the applicant's proposed trail connection location on tax lot 800. After review of the Lidar data the Parks and Trails Advisory Board was also unsure about the justification for moving the trail connection to tax lot 800.*

#### **17.84.40 TRANSIT AND SCHOOL BUS TRANSIT REQUIREMENTS**

- A. Development sites located along existing or planned transit routes shall, where appropriate, incorporate bus pull-outs and/or shelters into the site design. These improvements shall be installed in accordance with the guidelines and standards of the transit agency. School bus pull-outs and/or shelters may also be required, where appropriate, as a condition of approval for a residential development of greater than 50 dwelling units where a school bus pick-up point is anticipated to serve a large number of children.
- B. New developments at or near existing or planned transit or school bus transit stops shall design development sites to provide safe, convenient access to the transit system, as follows:
1. Commercial and civic use developments shall provide a prominent entrance oriented towards arterial and collector streets, with front setbacks reduced as much as possible to provide access for pedestrians, bicycles, and transit.
  2. All developments shall provide safe, convenient pedestrian walkways between the buildings and the transit stop, in accordance with the provisions of 17.84.30 B.

**RESPONSE:** *The Transit Director (Exhibit P) states that the proposed development will require construction of one transit amenity at the northwest corner of the subject property adjacent to Tract A and as close to Cascadia Village Drive as possible. The amenity required is a 7 foot by 9.5 foot concrete pad to accommodate a 5 foot by 7.5 foot bus shelter, equipped with one 6 foot long green metal bench. **The applicant shall install one bench (Fairweather model PL-3, powder-coated RAL6028) with a concrete pad to City specifications. The applicant shall contact the Transit Director for specific location, amenity information, and pad engineering specifications.***

#### **17.84.50 STREET REQUIREMENTS**

- A. Traffic evaluations may be required of all development proposals in accordance with the following:
1. A proposal establishing the scope of the traffic evaluation shall be submitted for review to the City Engineer. The evaluation requirements shall reflect the magnitude of the project in accordance with accepted traffic engineering practices. Large projects should assess all nearby key intersections. Once the scope of the traffic evaluation has been approved, the applicant shall present the results with and an overall site development proposal. If required by the City Engineer, such evaluations shall be signed by a Licensed Professional Civil Engineer or Licensed Professional Traffic Engineer licensed in the State of Oregon.
  2. If the traffic evaluation identifies level-of-service conditions less than the minimum standard established in the Transportation System Plan, improvements and funding strategies mitigating the problem shall be considered concurrent with a development proposal.

**RESPONSE:** *The submitted Traffic Impact Analysis (Exhibit F) was completed by Lancaster Engineering and is dated June 15, 2018. The traffic assumptions are based on the 10<sup>th</sup> Edition Trip Generation handbook. The analysis is based on the construction of 32 single-family homes and the removal of one existing house, for a net increase of 31 units. The trip rates indicate that upon full occupancy the subdivision will generate about 23 trips during the morning peak hour and 31 trips during the evening peak hour, with a weekday total of 292 trips. The study found that adequate sight distances can be made available on Jacoby Road at the site access intersections of both Woodstock Street and Newton Street. The study also found that all study intersections are operating acceptably per City of Sandy and ODOT standards and are projected to continue to operate acceptably upon build-out of the proposed development through year 2020. The Traffic Impact analysis concludes that no operational mitigation is necessary or recommended, no safety mitigation is recommended, no sight distance mitigations are necessary or recommended, and no turn lane or signal mitigations are recommended as part of this development.*

*The City Engineer (Exhibit L) reviewed the Traffic Impact Analysis and noted the following: “There are no reported crashes at the intersection of Jacoby [Road] and Dubarko Road, or at any of the intersections adjacent to the development. However, the crash rate at the intersection of Dubarko Road and Highway 211 exceeds the 90th percentile criteria and meets the warrants for the addition of left turn lanes as identified in the TSP. This intersection should be addressed by ODOT as soon as possible, but not as a component of this proposed development.”*

*The City Transportation Engineer (Exhibit M) reviewed the Traffic Impact Analysis and does not recommend any modifications to the TIA as the analysis demonstrates that the development can be accommodated without requiring mitigation to meet adopted operational standards. The City Transportation Engineer states the following: “The intersections that will provide access from the*

*subdivision to Jacoby Road are appropriately located and provide adequate sight distance. The existence of a higher than average crash rate at the intersection of OR 211 and Dubarko Road and traffic volumes that suggest left-turn lanes are warranted on OR 211 at this location are indicators that the city should continue to work with ODOT for implementation of enhancements at this intersection. This analysis indicates that a traffic signal is not yet warranted but left-turn lanes on both the northbound and southbound approaches on OR 211 are warranted. The need for these improvements is justified based on regional growth of which this development is only a minor component.”*

- B. Location of new arterial streets shall conform to the Transportation System Plan in accordance with the following:
1. Arterial streets should generally be spaced in one-mile intervals.
  2. Traffic signals should generally not be spaced closer than 1500 ft. for reasonable traffic progression.

**RESPONSE:** *The proposal does not include any new arterial or collector streets.*

- C. Local streets shall be designed to discourage through traffic. NOTE: for the purposes of this section, “through traffic” means the traffic traveling through an area that does not have a local origination or destination. To discourage through traffic and excessive vehicle speeds the following street design characteristics shall be considered, as well as other designs intended to discourage traffic:
1. Straight segments of local streets should be kept to less than a quarter mile in length. As practical, local streets should include traffic calming features, and design features such as curves and “T” intersections while maintaining pedestrian connectivity.
  2. Local streets should typically intersect in “T” configurations rather than 4-way intersections to minimize conflicts and discourage through traffic. Adjacent “T” intersections shall maintain a minimum of 150 ft. between the nearest edges of the 2 rights-of-way.
  3. Cul-de-sacs should generally not exceed 400 ft. in length nor serve more than 20 dwelling units, except in cases where existing topography, wetlands, or drainage systems or other existing features necessitate a longer cul-de-sac in order to provide adequate access to an area. Cul-de-sacs longer than 400 feet or developments with only one access point may be required to provide an alternative access for emergency vehicle use only, install fire prevention sprinklers, or provide other mitigating measures, determined by the City.

**RESPONSE:** *The proposal includes a cul-de-sac (Camden Court) that does not exceed 400 feet in length. Five lots and Tract A are proposed to gain access from the cul-de-sac.*

- D. Development sites shall be provided with access from a public street improved to City standards in accordance with the following:
1. Where a development site abuts an existing public street not improved to City standards, the abutting street shall be improved to City standards along the full frontage of the property concurrent with development.
  2. Half-street improvements are considered the minimum required improvement. Three-quarter-street or full-street improvements shall be required where traffic volumes generated by the development are such that a half-street improvement would cause safety and/or capacity problems. Such a determination shall be made by the City Engineer.
  3. To ensure improved access to a development site consistent with policies on orderly urbanization and extension of public facilities the Planning Commission or Director may require off-site

- improvements concurrent with development. Off-site improvement requirements upon the site developer shall be reasonably related to the anticipated impacts of the development.
4. Reimbursement agreements for  $\frac{3}{4}$  street improvements (i.e., curb face to curb face) may be requested by the developer per Chapter 12 of the SMC.
  5. A  $\frac{1}{2}$  street improvement includes curb and pavement 2 feet beyond the center line of the right-of-way. A  $\frac{3}{4}$  street improvement includes curbs on both sides of the side and full pavement between curb faces.

**RESPONSE:** *The proposed street network and improvements generally comply with City standards, with the exception of one block variance. There are five streets inside or adjacent to the proposed subdivision requiring the following improvements:*

***Jacoby Road:*** *Half-street construction of Jacoby Road is required within the subject property boundary to collector street standards, including curb, 6-foot wide concrete sidewalks, street lighting, landscaping strip, street trees, and public utilities. Per the City Engineer (Exhibit L) and Public Works Director (Exhibit O), the improvements on Jacoby Road shall include an additional 10 feet of right-of-way dedication (60' ROW).*

***Woodstock Street:*** *Woodstock Street requires full-street construction to local street standards including concrete curbs, 5-foot wide concrete sidewalks, street lighting, 5-foot wide planter strip, street trees, ADA ramps, and public utilities. The applicant has applied for one variance to exceed the maximum block length for the north side of Woodstock Street from Camden Court to the east property boundary. The Preliminary Street and Utility Plan (Exhibit C, Sheet 5) shows the street improvements on Woodstock Street ending approximately 7 feet from the development site boundary. Section 17.84.50(E) requires extension of street improvements "to the edge of adjacent properties." **The applicant shall extend the street improvements on Woodstock Street to the east line of the development site and obtain slope easements or construct retaining walls as necessary to comply with this section of the development code. The developer shall improve the street section adjacent to the recommended trail connection tract on Woodstock Street prior to final plat approval.***

***Middlebury Avenue:*** *Middlebury Avenue requires full-street improvements to local street standards including concrete curbs, 5-foot wide concrete sidewalks, street lighting, 5-foot wide planter strip, street trees, ADA ramps, and public utilities.*

***Newton Street:*** *Newton Street is proposed to align with the existing alignment of Newton Street west of Jacoby Road and to then shift to the south such that it aligns with the southern property boundary. The extension of Newton Street requires full-street improvements to local standards including concrete curbs, 5-foot wide concrete sidewalks, street lighting, street trees, ADA ramps, and public utilities adjacent to Lot 9, tapering to three-quarter street improvements adjacent to the remaining lots along Newton Street. The applicant is proposing a three-quarter street improvement for Newton Street through the site transitioning to a half-street section at the west line of proposed Lot 2. Per the Public Works Director (Exhibit O), the proposed Newton Street alignment coincides with an existing access easement serving at least two and possibly as many as four existing dwellings to the east. No more than two dwellings may be served by a half-street improvement. As proposed this narrowed section of Newton Street would serve at least four dwellings and perhaps as many as six. **The applicant shall eliminate the proposed curve at the east end of Newton and continue the three-quarter street improvement to the east boundary of the site. Per the City Engineer (Exhibit L), the three-quarter street improvements on Newton Street shall include a 28-foot wide paved***



*surface, curbs on both sides, 5-foot planter strips and 5-foot sidewalks on the north side of the roadway. The preliminary street and utility plan (Exhibit C, Sheet 5) shows the sidewalk and planter strip improvements on the south side of Newton Street across from Lot 9 ending before the development site boundary. Section 17.84.50(E) requires extension of street improvements “to the edge of adjacent properties.” **The applicant shall extend the street improvements on Newton Street across from Lot 9 to the south line of the development site and obtain slope easements or construct retaining walls as necessary to comply with this section of the development code. Improvements shall include extension of the Newton Street sidewalk and planter strip, one additional street tree, and landscaping the additional 17.70 feet of right-of-way dedication at the southeast corner of Newton Street and Jacoby Road.***

*Camden Court: Camden Court requires full-street improvements to local street standards including concrete curbs, 5-foot wide concrete sidewalks, street lighting, 5-foot wide planter strip, street trees, ADA ramps, and public utilities.*

- E. As necessary to provide for orderly development of adjacent properties, public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property(ies) in accordance with the following:
1. Temporary dead-ends created by this requirement to extend street improvements to the edge of adjacent properties may be installed without turn-arounds, subject to the approval of the Fire Marshal.
  2. In order to assure the eventual continuation or completion of the street, reserve strips may be required.

***RESPONSE:** The applicant is not proposing any permanent dead-end streets. The applicant proposes that Newton Street, Woodstock Street, and Middlebury Avenue be temporary dead-end streets with construction of this subdivision until such a time as these streets are extended onto the adjoining properties to the east and south. **The applicant shall plat a vehicle non-access reserve (VNAR) strip along the south side of the right-of-way of Newton Street and at the east end of Woodstock Street.** The dead-ends on Woodstock Street and Newton Street would be approximately 190 feet. **The applicant shall work with the Fire Marshall to determine if a temporary turn-around is needed on Woodstock Street and/or Newton Street, or if houses on particular lots need to be sprinkled.** The Preliminary Street and Utility Plan (Exhibit C, Sheet 5) shows the street improvements on Woodstock Street ending approximately 7 feet from the development site boundary. Section 17.84.50(E) requires extension of street improvements “to the edge of adjacent properties.” **The applicant shall extend the street improvements on Woodstock Street to the east line of the development site and obtain slope easements or construct retaining walls as necessary to comply with this section of the development code.***

- F. Where required by the Planning Commission or Director, public street improvements may be required through a development site to provide for the logical extension of an existing street network or to connect a site with a nearby neighborhood activity center, such as a school or park. Where this creates a land division incidental to the development, a land partition shall be completed concurrent with the development.

***RESPONSE:** The proposal includes the extension of Newton Street from the Cascadia Village subdivision.*

- G. Except for extensions of existing streets, no street names shall be used that will duplicate or be confused with names of existing streets. Street names and numbers shall conform to the established pattern in the surrounding area and be subject to approval of the Director.

**RESPONSE:** *The applicant is proposing the following new street names: Camden Court, Woodstock Street, and Middlebury Avenue. The City of Sandy reserves the right to name streets.*

- H. Location, grades, alignment, and widths for all public streets shall be considered in relation to existing and planned streets, topographical conditions, public convenience and safety, and proposed land use. Where topographical conditions present special circumstances, exceptions to these standards may be granted by the City Engineer provided the safety and capacity of the street network is not adversely affected. The following standards shall apply:
1. Location of streets in a development shall not preclude development of adjacent properties. Streets shall conform to planned street extensions identified in the Transportation Plan and/or provide for continuation of the existing street network in the surrounding area.
  2. Grades shall not exceed 6 percent on arterial streets, 10 percent on collector streets, and 15 percent on local streets.
  3. As far as practical, arterial streets and collector streets shall be extended in alignment with existing streets by continuation of the street centerline. When staggered street alignments resulting in “T” intersections are unavoidable, they shall leave a minimum of 150 ft. between the nearest edges of the two rights-of-way.
  4. Centerline radii of curves shall not be less than 500 ft. on arterial streets, 300 ft. on collector streets, and 100 ft. on local streets.
  5. Streets shall be designed to intersect at angles as near as practicable to right angles and shall comply with the following:
    - a) The intersection of an arterial or collector street with another arterial or collector street shall have a minimum of 100 ft. of straight (tangent) alignment perpendicular to the intersection.
    - b) The intersection of a local street with another street shall have a minimum of 50 ft. of straight (tangent) alignment perpendicular to the intersection.
    - c) Where right angle intersections are not possible, exceptions can be granted by the City Engineer provided that intersections not at right angles have a minimum corner radius of 20 ft. along the right-of-way lines of the acute angle.
    - d) Intersections with arterial streets shall have a minimum curb corner radius of 20 ft. All other intersections shall have a minimum curb corner radius of 10 ft.
  6. Right-of-way and improvement widths shall be as specified by the Transportation System Plan. Exceptions to those specifications may be approved by the City Engineer to deal with specific unique physical constraints of the site.

**RESPONSE:** *The Preliminary Plat (Exhibit C, Sheet 1) does not show the correct measurement of 50 feet of tangent alignment at the intersection of Jacoby Road and Newton Street as required by 17.84.50(H.5.b). The applicant measured the 50 feet of tangent alignment from the centerline of Jacoby Road rather than from the curb line extended. The applicant shall revise the alignment of Newton Street to conform to the 50 feet of tangent alignment standard.*

#### **17.84.60 PUBLIC UTILITY EXTENSIONS**

- A. All development sites shall be provided with public water, sanitary sewer, and storm drainage.

- B. Where necessary to serve property as specified in “A” above, required public utility installations shall be constructed concurrent with development.
- C. Off-site public utility extensions necessary to fully serve a development site and adjacent properties shall be constructed concurrent with development.
- D. As necessary to provide for orderly development of adjacent properties, public utilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).
- E. All public utility installations required with development shall conform to the City’s facilities master plans.
- F. Private on-site sanitary sewer and storm drainage facilities may be considered provided all the following conditions exist:
  1. Extension of a public facility through the site is not necessary for the future orderly development of adjacent properties;
  2. The development site remains in one ownership and land division does not occur (with the exception of land divisions that may occur under the provisions of 17.84.50 F above);
  3. The facilities are designed and constructed in accordance with the Uniform Plumbing Code and other applicable codes, and permits and/or authorization to proceed with construction is issued prior to commencement of work.

***RESPONSE:*** *The applicant’s Preliminary Street and Utility Plan (Exhibit C, Sheet 5) depicts the location and type of proposed public utilities including water, sanitary sewer and stormwater. All public utility installations shall conform to the City’s facilities master plans. Staff recommends the applicant revise the utility plan to include broadband fiber locations as detailed by the SandyNet Manager. Per the City Engineer (Exhibit L), all public sanitary sewer and waterline mains shall be a minimum of 8 inches in diameter and all stormwater drains shall be a minimum of 12 inches in diameter and shall be extended to the plat boundaries where practical to provide future connections to adjoining properties. No building permits will be issued until all public utilities including sanitary sewer are available to serve the development. The applicant shall pay plan review, inspection, and permit fees as determined by the Public Works Director. The utility improvements proposal and requirements for the Jacoby Heights subdivision are further detailed in Sections 17.100.230, 17.100.240, and 17.100.250 below.*

#### **17.84.80 FRANCHISE UTILITY INSTALLATIONS**

These standards are intended to supplement, not replace or supersede, requirements contained within individual franchise agreements the City has with providers of electrical power, telephone, cable television, and natural gas services (hereinafter referred to as “franchise utilities”).

***RESPONSE:*** *Private utility services will be submitted for review and approval by service providers and City staff in association with construction plans, and all utility lines will be extended to the perimeter of the site. All franchise utilities shall be installed underground and in conformance with City standards. PGE submitted a comment (Exhibit N) stating they did not find any conflicts related to the project. Per PGE’s request, the applicant shall call the PGE Service Coordinators at 503-323-6700 when the developer is ready to start the project.*

## 17.84.90 LAND FOR PUBLIC PURPOSES

- A. Easements for public sanitary sewer, water, storm drain, pedestrian and bicycle facilities shall be provided whenever these facilities are located outside a public right-of-way in accordance with the following:
  - 1. When located between adjacent lots, easements shall be provided on one side of a lot line.
  - 2. The minimum easement width for a single utility is 15 ft. The minimum easement width for two adjacent utilities is 20 ft. The easement width shall be centered on the utility to the greatest extent practicable. Wider easements may be required for unusually deep facilities.
- B. Public utility easements with a minimum width of 5 feet shall be provided adjacent to all street rights-of-way for franchise utility installations.
- C. Where a development site is traversed by a drainage way or water course, a drainage way dedication shall be provided to the City.
- D. Where a development is traversed by, or adjacent to, a future trail linkage identified within the Transportation System Plan, dedications of suitable width to accommodate the trail linkage shall be provided. This width shall be determined by the City Engineer, considering the type of trail facility involved.
- E. Where existing rights-of-way and/or easements within or adjacent to development sites are nonexistent or of insufficient width, dedications may be required. The need for and widths of those dedications shall be determined by the City Engineer.
- F. Where easement or dedications are required in conjunction with land divisions, they shall be recorded on the plat. Where a development does not include a land division, easements and/or dedications shall be recorded on standard document forms provided by the City Engineer.
- G. If the City has an interest in acquiring any portion of a proposed subdivision or planned development site for a public purpose, other than for those purposes listed above, or if the City has been advised of such interest by a school district or other public agency, and there is a reasonable assurance that steps will be taken to acquire the land, the Planning Commission may require those portions of the land be reserved for public acquisition for a period not to exceed 1 year.
- H. Environmental assessments for all lands to be dedicated to the public or City may be required to be provided by the developer. An environmental assessment shall include information necessary for the City to evaluate potential liability for environmental hazards, contamination, or required waste cleanups related to the dedicated land. An environmental assessment shall be completed prior to the acceptance of dedicated lands in accordance with the following:
  - 1. The initial environmental assessment shall detail the history of ownership and general use of the land by past owners. Upon review of the information provided by the grantor, as well as any site investigation by the City, the Director will determine if the risks of potential contamination warrant further investigation. When further site investigation is warranted, a Level I Environmental Assessment shall be provided by the grantor.

***RESPONSE:*** *The applicant proposes a 20,283 square foot public stormwater detention pond (Tract A). Rather than include the FSH overlay area as part of Lots 19, 20, 21, 26, 27, and 28, the applicant shall designate the FSH area as a separate tract on the plat and dedicate the tract to the City. In addition, staff recommends the Planning Commission require a pedestrian trail connection to the future extension of the Tickle Creek Trail as part of this development. Staff recommends that the trail connection be located in alignment with Middlebury Avenue. Alternatively, staff recommends that Lot 19 be included in the FSH tract and that the trail connection be located on the proposed location of Lot 19. The applicant shall include the trail connector tract as part of the FSH tract and shall dedicate the entire tract to the City.*

*The Plat shall detail the following easements:*

- *An eight-foot wide public utility easement (PUE) along the frontage of all proposed lots;*
- *Crossover easements along the common parcel line recorded between pairs of lots that share driveways (Lots 26 and 27, and Lots 28 and 29);*
- *20 foot easement along the west boundary of Lots 9 and 10 for public sanitary sewer and public storm line. Per the Public Works Director (Exhibit O), the City reserves the right to widen this easement depending on the final design depth of the sanitary sewer and storm lines per Section 17.84.90(A.2);*
- *A 15 foot easement between Lot 30 and Tract A for public sanitary sewer;*
- *A 10 foot private storm drain easement at the rear of Lots 1-18, 22-25, 28, 29, 31, and 32 and a 10 foot private storm drain easement across Lots 19-21 just south of the FSH boundary;*
- *A vehicle non-access reserve (VNAR) strip in the following locations:*
  - *Jacoby Road frontage of Lots 9, 10, 30 and 32 and Tract A; and,*
  - *South side of the right-of-way of Newton Street; and,*
  - *East end of the right-of-way of Woodstock Street.*

#### **17.84.100 MAIL DELIVERY FACILITIES**

***RESPONSE:*** *The applicant will need to coordinate with the United States Postal Service (USPS) to locate mail facilities and these will be approved by the City and USPS. Mail delivery facilities shall be provided by the applicant in conformance with Section 17.84.100 and the standards of the USPS. The applicant shall submit a mail delivery plan, featuring grouped lockable mail facilities, to the City and USPS for review and approval prior to installation of mailboxes.*

#### **CHAPTER 17.86 – PARKLAND AND OPEN SPACE**

##### **17.86.10 MINIMUM PARKLAND DEDICATION REQUIREMENTS**

Parkland Dedication: New residential subdivisions, planned developments, multi-family or manufactured home park developments shall be required to provide parkland to serve existing and future residents of those developments. Multi-family developments which provide some "congregate" services and/or facilities, such as group transportation, dining halls, emergency monitoring systems, etc., but which have individual dwelling units rather than sleeping quarters only, are considered to be multi-family developments for the purpose of parkland dedication. Licensed adult congregate living facilities, nursing homes, and all other similar facilities which provide their clients with individual beds and sleeping quarters, but in which all other care and services are communal and provided by facility employees, are specifically exempt from parkland dedication and system development fee requirements.

1. The required parkland shall be dedicated as a condition of approval for the following:
  - a. Tentative plat for a subdivision or partition;

- b. Planned Development conceptual or detailed development plan;
  - c. Design review for a multi-family development or manufactured home park; and
  - d. Replat or amendment of any site plan for multi-family development or manufactured home park where dedication has not previously been made or where the density of the development involved will be increased.
2. Calculation of Required Dedication: The required parkland acreage to be dedicated is based on a calculation of the following formula rounded to the nearest 1/100 (0.00) of an acre:

*Required parkland dedication (acres) = (proposed units) x (persons/unit) x 0.0043 (per person park land dedication factor)*

- a. Population Formula: The following table shall be used to determine the number of persons per unit to be used in calculating required parkland dedication:

<b>Type of Unit</b>	<b>Total Persons Per Unit</b>
Single family residential	3.0
Standard multi-family unit	2.0
Manufactured dwelling park	2.0
Congregate multi-family unit	1.5

Persons per unit, age distribution, and local conditions change with time. The specific formula for the dedication of land will, therefore, be subject to periodic review and amendment.

- b. Per Person Parkland Dedication Factor: The total parkland dedication requirement shall be 0.0043 of an acre per person based on the adopted standard of 4.3 acres of land per one thousand of ultimate population per the Parks Master Plan<sup>1</sup>. This standard represents the citywide land-to-population ratio for city parks, and may be adjusted periodically through amendments to the Parks Master Plan.

**RESPONSE:** *The applicant proposes 32 single-family detached dwellings with this subdivision request. Based upon the calculations adopted by the City and specified within Section 17.86.10, the required dedication area is 0.41 acres of public parkland (32 proposed units x 3 persons per unit x .0043=0.4128 rounded to the nearest 1/100 of an acre = 0.41 acres to be dedicated).*

<sup>1</sup> Parks Master Plan, Implementation Plan section, Pages 4 and 5 indicate a required park acreage total of 64.5 acres. This number, divided by population (2015) of 15,000 equates to 4.3 acres per 1000 population or 0.0043 per person.

#### 17.86.40 CASH IN LIEU OF DEDICATION

At the city's discretion only, the city may accept payment of a fee in lieu of land dedication. The city may require payment in lieu of land when the park land to be dedicated is less than 3 acres. A payment in lieu of land dedication is separate from Park Systems Development Charges, and is not eligible for a credit of Park Systems Development Charges. The amount of the fee in lieu of land dedication (in dollars per acre) shall be set by City Council Resolution, and it shall be based on the typical market value of developed property (finished lots) in Sandy net of related development costs.

1. The following factors shall be used in the choice of whether to accept land or cash in lieu:
  - a. The topography, geology, access to, parcel size, and location of land in the development available for dedication;
  - b. Potential adverse/beneficial effects on environmentally sensitive areas;
  - c. Compatibility with the Parks Master Plan, Public Facilities element of the Comprehensive Plan, and the City of Sandy Capital Improvements Program in effect at the time of dedication;
  - d. Availability of previously acquired property; and
  - e. The feasibility of dedication.
2. A. Cash in lieu of parkland dedication shall be paid prior to approval of the final plat or as specified below:
  - a. 50 percent of the payment shall be paid prior to final plat approval, and
  - b. The remaining 50 percent of the payment pro-rated equally among the lots, plus an administrative surcharge, shall be paid as specified by City Council Resolution.

**RESPONSE:** Based on the calculations specified in Section 17.86.10, the applicant is responsible for dedicating 0.41 acres of public parkland based on 32 dwelling units. No parkland is identified on the subject property in the Parks Master Plan. **For these reasons, the applicant shall pay a fee in lieu for the required parkland dedication per the adopted Fee Resolution.** Per Resolution 2013-14, the required fee in lieu amount is \$241,000 per acre if the entire amount is paid prior to final plat approval. Therefore, **based on the current Fee Resolution, the applicant would be required to pay a fee in lieu of dedication for a total of \$98,810 (0.41 acres of land to be dedicated x \$241,000).** Alternatively, Ordinance 2013-03 allows the applicant to pay a minimum of 50 percent of the fee to receive final plat approval with the remaining balance to be paid as a proportionate amount with each building permit. If a portion of the fee is deferred, Resolution 2013-14 specifies a per acre fee of \$265,000. **Currently, the Fee Resolution requires payment of \$108,650 if a portion of the fee is deferred, a minimum of 50 percent (\$54,325) paid prior to final plat approval and the remaining 50 percent (\$54,325) divided between the 32 lots (\$1,697.66/lot).** If the number of lots is modified from 32, the parks fee in lieu will need to be recalculated.

## **17.86.50 MINIMUM STANDARDS FOR OPEN SPACE DEDICATION**

The applicant through a subdivision or design review process may propose the designation and protection of open space areas as part of that process. This open space will not, however, be counted toward the parkland dedication requirement of Sections 17.86.10 through 17.86.40.

4. Open space areas shall be maintained so that the use and enjoyment thereof is not diminished or destroyed. Open space areas may be owned, preserved, and maintained by any of the following mechanisms or combinations thereof:
  - a. Dedication to the City of Sandy or an appropriate public agency approved by the City, if there is a public agency willing to accept the dedication. Prior to acceptance of proposed open space, the City may require the developer to submit a Phase I Environmental Site Assessment completed by a qualified professional according to American Society of Testing and Materials (ASTM) standards (ASTM E 1527). The results of this study shall indicate a clean environmental record.
  - b. Common ownership by a homeowner's association that assumes full responsibility for its maintenance;
  - c. Dedication of development rights to an appropriate public agency with ownership remaining with the developer or homeowner's association. Maintenance responsibility will remain with the property owner; and/or
  - d. Deed-restricted private ownership preventing development and/or subsequent subdivision and providing for maintenance responsibilities.

***RESPONSE:*** *The applicant is not proposing any dedication of open space. However, the Parks Board recommends that the FSH analysis tract be dedicated to the City. The Public Works Director expressed some maintenance concerns about the City taking on ownership of the tract without knowing the condition that it is in. The applicant shall submit a Phase I environmental assessment and a native vegetation report for the FSH area. The applicant shall remove all invasive plants and re-plant any areas of exposed soil with native plants. The applicant shall dedicate the FSH tract to the City and shall submit a maintenance bond for two full growing seasons (May 1 – October 31) to ensure 80 percent plant survival or replacement and that the tract remains in good condition. Although parkland dedication is separate from open space dedication, staff recommends that the Planning Commission grant the applicant a parks fee-in-lieu credit for dedication of the open space FSH analysis area. The applicant shall obtain an appraisal for the FSH analysis area and, with City approval of the appraised value, shall receive a parks fee-in-lieu credit for dedicating the open space FSH analysis area. To be considered for a parks fee in-lieu credit the appraisal will need to account for the limited development potential of the land to be dedicated.*

## **CHAPTER 17.92 – LANDSCAPING AND SCREENING**

### **17.92.10 GENERAL PROVISIONS**

- C. Significant plant and tree specimens should be preserved to the greatest extent practicable and integrated into the design of a development. Trees of 25-inches or greater circumference measured at



a height of 4-½ ft. above grade are considered significant. Plants to be saved and methods of protection shall be indicated on the detailed planting plan submitted for approval. Existing trees may be considered preserved if no cutting, filling, or compaction of the soil takes place between the trunk of the tree and the area 5-ft. outside the tree’s drip line. Trees to be retained shall be protected from damage during construction by a construction fence located 5 ft. outside the dripline.

- L. All landscaping shall be continually maintained, including necessary watering, weeding, pruning and replacing.

**RESPONSE:** *Per Section 17.92.10 (C), trees over 25-inches circumference measured at a height of 4-½ feet above grade are considered significant and should be preserved to the greatest extent practicable and integrated into the design of a development. A 25-inch circumference tree measured at 4-½ feet above grade has roughly an eight-inch diameter at breast height (DBH). The applicant shall preserve significant trees (25-inches or greater circumference, or 8-inches or greater DBH) to the greatest extent practicable. The applicant shall install protective fencing located at least 5 feet outside of the dripline around all trees to be retained on the subject property and for trees on adjacent property. Tree retention will be discussed in more detail under Chapter 17.102 in this document. Per Section 17.92.10(L), all landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing.*

**Note:** *the applicant is requesting a code interpretation to determine if Section 17.92.10(C) applies to subdivisions.*

**17.92.30 REQUIRED TREE PLANTINGS**

Planting of trees is required for all parking lots with 4 or more parking spaces, public street frontages, and along private drives more than 150 feet long. Trees shall be planted outside the street right-of-way except where there is a designated planting strip or City adopted street tree plan.

The City maintains a list of appropriate trees for street tree and parking lot planting situations. Selection of species should be made from the city-approved list. Alternate selections may be approved by the Director following written request. The type of tree used shall determine frequency of trees in planting areas. Trees in parking areas shall be dispersed throughout the lot to provide a canopy for shade and visual relief.

Area/Type of Planting	Canopy	Spacing
Street Tree	Medium	30 ft. on center
Street Tree	Large	50 ft. on center

Trees may not be planted:

- Within 5 ft. of permanent hard surface paving or walkways, unless specific species, special planting techniques and specifications approved by the Director are used.
- Unless approved otherwise by the City Engineer:
  - \* Within 10 ft. of fire hydrants and utility poles
  - \* Within 20 ft. of street light standards
  - \* Within 5 ft. from an existing curb face

- \* Within 10 ft. of a public sanitary sewer, storm drainage or water line
- Where the Director determines the trees may be a hazard to the public interest or general welfare.
- Trees shall be pruned to provide a minimum clearance of 8 ft. above sidewalks and 12 ft. above street and roadway surfaces.

**RESPONSE:** *As required by Section 17.92.30, the development of the subdivision requires trees spaced 30 feet on center along street frontages. The submitted Street Tree Plan (Exhibit C, Sheet 6) identifies street trees along all of the proposed streets. The proposed plan details 84 street trees. Two (2) of the street trees are proposed to be located in driveways in front of Lots 31 and 32; however, there appears to be sufficient space to relocate at least one of the trees outside of the driveway area. **The applicant shall update the plan set to remove street trees from the driveways in front of Lots 31 and 32; at least one of the street trees shall be relocated outside of the driveway area.** The Preliminary Street and Utility Plan (Exhibit C, Sheet 5) shows the sidewalk and planter strip improvements on the south side of Newton Street across from Lot 9 ending before the development site boundary. Section 17.84.50(E) requires extension of street improvements “to the edge of adjacent properties.” With extension of the sidewalk and planter strip to the southern property boundary, the proposal could accommodate a third street tree on the south side of Newton Street. **The applicant shall extend the street improvements on Newton Street across from Lot 9 to the south line of the development site and obtain slope easements or construct retaining walls as necessary to comply with this section of the development code. Improvements shall include extension of the sidewalk, planter strip, and one additional street tree.** The proposed layout would likely accommodate an additional two (2) street trees on the east end of Newton Street. Per the Public Works Director (Exhibit O), **the applicant shall eliminate the proposed curve at the east end of Newton and continue the three-quarter street improvement to the east boundary of the site. The applicant shall update the plan set to show street trees in the planter strip adjacent to Lots 1 and 2. If the plans change in a way that affects the number of street trees (e.g., driveway locations), the applicant shall submit an updated street tree plan for staff review and approval. Street trees are required to be a minimum caliper of 1.5-inches measured 6 inches from grade. Trees shall be planted, staked, and the planter strip shall be graded and backfilled as necessary, and bark mulch, vegetation, or other approved material installed prior to occupancy. Tree ties shall be removed after one growing season (or a maximum of 1 year).***

#### **17.92.40 IRRIGATION**

Landscaping shall be irrigated, either with a manual or automatic system, to sustain viable plant life.

**RESPONSE:** *Section 17.92.40 requires that all landscaping shall be irrigated, either with a manual or automatic system. As required by Section 17.92.140, the developer and lot owners shall be required to maintain all vegetation planted in the development for two years from the date of completion, and shall replace any dead or dying plants during that period.*

#### **17.92.50 TYPES AND SIZES OF PLANT MATERIALS**

- A. At least 75% of the required landscaping area shall be planted with a suitable combination of trees, shrubs, or evergreen ground cover except as otherwise authorized by Chapter 17.92.10 F.
- B. Plant Materials. Use of native plant materials or plants acclimatized to the Pacific Northwest is encouraged where possible.

- C. Trees shall be species having an average mature spread of crown greater than 15 feet and having trunks which can be maintained in a clear condition with over 5 feet of clear wood (without branches). Trees having a mature spread of crown less than 15 feet may be substituted by grouping the same so as to create the equivalent of a 15-foot crown spread.
- D. Deciduous trees shall be balled and burlapped, be a minimum of 7 feet in overall height or 1 ½ inches in caliper measured 6 inches above the ground, immediately after planting. Bare root trees will be acceptable to plant during their dormant season.
- E. Coniferous trees shall be a minimum five feet in height above ground at time of planting.
- F. Shrubs shall be a minimum of 1 gallon in size or 2 feet in height when measured immediately after planting.
- G. Hedges, where required to screen and buffer off-street parking from adjoining properties shall be planted with an evergreen species maintained so as to form a continuous, solid visual screen within 2 years after planting.
- H. Vines for screening purposes shall be a minimum of 1 gallon in size or 30 inches in height immediate after planting and may be used in conjunction with fences, screens, or walls to meet physical barrier requirements as specified.
- I. Groundcovers shall be fully rooted and shall be well branched or leafed. If used in lieu of turf in whole or in part, ground covers shall be planted in such a manner as to provide complete coverage in one year.
- J. Turf areas shall be planted in species normally grown as permanent lawns in western Oregon. Either sod or seed are acceptable. Acceptable varieties include improved perennial ryegrasses and fescues used within the local landscape industry.
- K. Landscaped areas may include architectural features or artificial ground covers such as sculptures, benches, masonry or stone walls, fences, rock groupings, bark dust, decorative hard paving and gravel areas, interspersed with planted areas. The exposed area developed with such features shall not exceed 25% of the required landscaped area. Artificial plants are prohibited in any required landscape area.

**RESPONSE:** *Street trees are typically required to be a minimum caliper of 1.5-inches measured 6 inches from grade. In the past, staff has recommended a larger caliper street tree (2-inches) for subdivision proposals where a substantial number of existing trees were proposed for removal. However, staff has received feedback that fewer species are available at the 2-inch caliper size. To provide species diversity, staff recommends requiring 1.5-inch caliper street trees. All street trees shall be a minimum of 1.5-inches in caliper measured 6 inches above the ground and shall be planted per the City of Sandy standard planting detail. The applicant proposes six distinct street tree species with one tree species per block face. Staff would like to see more diversity in street tree species in general and within each block. The applicant shall update the plan set to detail a minimum of two (2) different tree species per block face for staff review and approval. The proposed street tree list includes paperbark maple and Patmore ash. Due to concerns with Asian Longhorn Beetle and Emerald Ash Borer, staff do not recommend planting new maples or ashes at this time. The applicant shall update the proposed street tree list with at least two additional species from the City of Sandy Street Tree List that aren't maples or ashes. Staff recommends two (or more) species from the following list: cascara (*Rhamnus purshiana*), kobus magnolia (*Magnolia kobus*), Skyrocket oak (*Quercus robur* 'Skyrocket'), Japanese stewartia (*Stewartia pseudocamellia*), Japanese snowbell (*Styrax japonica*), or eastern redbud (*Cercis canadensis*). Providing species diversity adds visual interest and provides additional resistance against disease in conformance with City of Sandy Comprehensive Goal 5 Policy 28. The applicant also proposed Halka ginkgo. Technically, the only ginkgo on the City of Sandy street tree list is Saratoga ginkgo (*Ginkgo biloba**

'Saratoga'); however, staff recommends that Halka ginkgo be approved as a street tree with this application.

#### **17.92.60 REVEGETATION IN UNLANDSCAPED OR NATURAL AREAS**

- A. Areas where natural vegetation has been removed or damaged through grading or construction activity in areas not affected by the landscaping requirements and that are not to be occupied by structures or other improvements shall be replanted.
- B. Plant material shall be watered at intervals sufficient to assure survival and growth.
- C. The use of native plant materials or plants acclimatized to the Pacific Northwest is encouraged to reduce irrigation and maintenance demands.

**RESPONSE:** *The applicant did not submit any plans for re-vegetation of areas damaged through grading/construction, although most of the areas affected by grading will be improved. The applicant shall maintain all unlandscaped and/or revegetated areas for a period of two years following the date of recording of the final plat associated with those improvements.*

#### **17.92.130 PERFORMANCE BOND**

If weather conditions or other circumstances beyond the control of the developer or owner make completion of the landscaping impossible prior to desired occupancy, an extension of up to 6 months may be applied for by posting "security" equal to 120% of the cost of the landscaping, assuring installation within 6 months. "Security" may consist of a performance bond payable to the city, cash, certified check, time certificates of deposit, assignment of a saving account, letter of credit, or other such assurance of access to funds necessary for completion as shall meet the approval of the City Attorney. Upon acceptance of the security, the developer or owner may be allowed occupancy for a period of up to 180 days. If the installation of the landscaping improvement is not completed within 180 days, the City shall have access to the security to complete the installation and/or revoke occupancy. Upon completion of the installation by the city, any portion of the remaining security minus administrative charges of 30% shall be returned to the owner. Costs in excess of the posted security shall be assessed against the property and the City shall thereupon have a valid lien against the property, which will come due, and payable.

**RESPONSE:** *The applicant has the option to defer the installation of street trees and/or landscaping for weather-related reasons. Staff recommends the applicant utilize this option rather than install trees and landscaping during the dry summer months. If the applicant chooses to postpone street tree and/or landscaping installation, the applicant shall post a performance bond equal to 120 percent of the cost of the street trees/landscaping, assuring installation within 6 months. The cost of street trees shall be based on the street tree plan and at least \$500 per tree fee, including a three-year maintenance and warranty period. The cost of landscaping shall be based on the average of three estimates from three landscaping contractors; the estimates shall include as separate items all materials, labor, and other costs of the required action, including a two-year maintenance and warranty period.*

### **CHAPTER 17.98 – PARKING, LOADING, AND ACCESS REQUIREMENTS**

### **17.98.20 OFF-STREET PARKING REQUIREMENTS**

**RESPONSE:** Section 17.98.20 requires two off-street parking spaces per single family detached dwelling unit. The 32 dwelling units proposed in this subdivision requires 64 off-street parking spaces. Each lot will have a driveway and the ability to construct a double car garage.

### **17.98.50 SETBACKS**

- A. Parking areas, which abut a residential zoning district, shall meet the setback of the most restrictive adjoining residential zoning district.
- B. Required parking shall not be located in a required front or side yard setback area abutting a public street except in industrial districts. For single family and two-family dwellings, required off-street parking may be located in a driveway.
- C. Parking areas shall be setback from a lot line adjoining a street the same distance as the required building setbacks. Regardless of other provisions, a minimum setback of 5 feet shall be provided along the property fronting on a public street. The setback area shall be landscaped as provided in this code.

**RESPONSE:** Garages are required to be at least 22 feet setback from the front property line to meet setback requirements in the SFR zoning district. The Preliminary Plat (Exhibit C, Sheet 1) details a typical 22 foot garage setback.

### **17.98.60 DESIGN, SIZE AND ACCESS**

All off-street parking facilities, vehicular maneuvering areas, driveways, loading facilities, accessways, and private streets shall conform to the standards set forth in this section.

- A. Parking Lot Design. All areas for required parking and maneuvering of vehicles shall have a durable hard surface such as concrete or asphalt.
- B. Size of Space.
  - 1. A standard parking space shall be 9 feet by 18 feet.
  - 2. A compact parking space shall be 8 feet by 16 feet.
  - 3. Handicapped parking spaces shall be 13 feet by 18 feet. Accessible parking shall be provided for all uses in compliance with the requirements of the State of Oregon (ORS 447.233) and the Americans with Disabilities Act.
  - 4. Parallel parking spaces shall be a length of 22 feet.  
No more than 35 percent of the parking stalls shall be compact spaces

**RESPONSE:** The applicant shall comply with the parking standards in Section 17.98.60. The parking areas in front of the proposed garages for all lots need to be at least 10 feet in width by 20 feet in length. Driveways for single family homes are required to be at least 10 feet wide as detailed in Section 17.98.100 below. The garages shall be adequate depth to park a vehicle and the on-street parking spaces shall be at least 22 feet in length.

### **17.98.80 ACCESS TO ARTERIAL AND COLLECTOR STREETS**

- A. Location and design of all accesses to and/or from arterials and collectors (as designated in the Transportation System Plan) are subject to review and approval by the City Engineer. Where practical, access from a lower functional order street may be required. Accesses to arterials or collectors shall be located a minimum of 150 ft. from any other access or street intersection. Exceptions may be granted by the City Engineer. Evaluations of exceptions shall consider posted speed of the street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.
- B. No development site shall be allowed more than one access point to any arterial or collector street (as designated in the Transportation System Plan) except as approved by the City Engineer. Evaluations of exceptions shall consider posted speed of street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.
- C. When developed property is to be expanded or altered in a manner that significantly affects on-site parking or circulation, both existing and proposed accesses shall be reviewed under the standards in A and B above. As a part of an expansion or alteration approval, the City may require relocation and/or reconstruction of existing accesses not meeting those standards.

**RESPONSE:** *Jacoby Heights Subdivision is proposed to create two intersections with Jacoby Road, a designated collector street: Woodstock Street and Newton Street. All lots are required to have driveway access from the internal local street network with a vehicle non-access reserve strip (VNAR) detailed on the face of plat along Jacoby Road.*

#### **17.98.100 DRIVEWAYS**

- A. A driveway to an off-street parking area shall be improved from the public roadway to the parking area a minimum width of 20 feet for a two-way drive or 12 feet for a one-way drive but in either case not less than the full width of the standard approach for the first 20 feet of the driveway.
- B. A driveway for a single-family dwelling shall have a minimum width of 10 feet.
- C. A driveway for a two-family dwelling shall have a minimum width of 20 feet. A driveway approach must be constructed in accordance with applicable city standards and the entire driveway must be paved with asphalt or concrete.
- D. Driveways, aisles, turnaround areas and ramps shall have a minimum vertical clearance of twelve feet for their entire length and width but such clearance may be reduced in parking structures.
- E. No driveway shall traverse a slope in excess of 15 percent at any point along the driveway length.
- F. The location and design of the driveway shall provide for unobstructed sight per the vision clearance requirements. Requests for exceptions to these requirements will be evaluated by the City Engineer considering the physical limitations of the lot and safety impacts to vehicular, bicycle, and pedestrian traffic.

**RESPONSE:** *The minimum driveway width for a single-family dwelling is 10 feet. The Public Works driveway approach standard detail specifies a maximum of 24 feet wide for a residential driveway*

*approach. The Preliminary Parking Plan (Exhibit C, Sheet 7) details driveway curb cuts for all lots. With the exception of a few lots on the cul-de-sac, all driveways are detailed at approximately 20 feet. The applicant is proposing a shared driveway between Lot 29 and Tract A at approximately 36 feet and a shared driveway between Lot 27 and 28 at approximately 26 feet. In order to maximize street tree planting areas and prevent conflicts with streetlights, water meters and dry utility facilities, shared driveway approaches may be required in cul-de-sac bulbs. Per the Public Works Director (Exhibit O), Lot 28 and 29 shall share a driveway approach maximum 24 feet in width. Lot 26 and 27 shall share a driveway approach maximum 24 feet in width. The applicant shall grant crossover easements along the common parcel line to lots with shared driveway approaches. The applicant shall realign the access drive proposed to serve the stormwater facility in Tract A or revise the west line of Lot 29 to eliminate remnant of Tract A between the access drive and Lot 29. The driveway approach for Tract A shall be a maximum of 12 feet in width. Per the City Engineer (Exhibit L), the access to the detention pond shall be paved or all-weather surface.*

#### **17.98.130 PAVING**

- A. Parking areas, driveways, aisles and turnarounds shall be paved with concrete, asphalt or comparable surfacing, constructed to city standards for off-street vehicle areas.
- B. Gravel surfacing shall be permitted only for areas designated for non-motorized trailer or equipment storage, propane or electrically powered vehicles, or storage of tracked vehicles.

**RESPONSE:** *As required by Section 17.98.130, all parking, driveway and maneuvering areas shall be constructed of asphalt, concrete, or other approved material.*

#### **17.98.140 DRAINAGE**

Parking areas, aisles and turnarounds shall have adequate provisions made for the on-site collection of drainage waters to eliminate sheet flow of such waters onto sidewalks, public rights-of-way and abutting private property.

**RESPONSE:** *Section 17.98.140 contains requirements for drainage. Other sections of this order detail the stormwater requirements.*

#### **17.98.200 RESIDENTIAL ON-STREET PARKING REQUIREMENTS**

- A. Residential On-Street Parking Requirements. Residential on-street parking shall conform to the following standards:
  - 1. In addition to required off-street parking, all new residential planned developments, subdivisions and partitions shall provide one (1) on-street parking space within 200 feet of each dwelling except as provided in Section 17.98.200(A)(6) below.
  - 2. The location of residential on-street parking shall be reviewed for compliance with this section through submittal of a Residential Parking Analysis Plan as required in Section 17.98.10(M).
  - 3. Residential on-street parking shall not obstruct required clear vision areas and shall not violate any local or state laws.
  - 4. Parallel residential on-street parking spaces shall be 22 feet minimum in length.

5. Residential on-street parking shall be measured along the curb from the outside edge of a driveway wing or curb cut. Parking spaces must be set back a minimum of 15 feet from an intersection and may not be located within 10 feet of a fire hydrant.
6. Portions of residential on-street parking required by this section may be provided in parking courts that are interspersed throughout a development when the following standards are met:
  - a. No more than eight (8) parking spaces shall be provided in a parking court;
  - b. Parking spaces within a parking court shall be nine (9) feet wide and 18 feet in depth;
  - c. Notwithstanding Section 17.98.70, vehicles parked in a parking court are permitted to back onto the public right-of-way from the parking court;
  - d. A parking court shall be located within 200 feet of the dwellings requiring parking in accordance with the requirements of Section 17.98.10(M);
  - e. No more than two (2) parking courts shall be provided within a block, with only one (1) parking court provided along a block face;
  - f. A parking court shall be paved in compliance with the standards of this chapter and the latest adopted grading and drainage standards;
  - g. If a parking court is adjacent to a public right-of-way, it shall be publicly owned and maintained;
  - h. If a parking court is adjacent to a private drive, it shall be privately owned and maintained. For each parking court there shall be a legal recorded document which includes:
    - i. A legal description of the parking court;
    - ii. Ownership of the parking court;
    - iii. Use rights; and
    - iv. A maintenance agreement and the allocation and/or method of determining liability for maintenance of the parking court;
  - i. A parking court shall be used solely for the parking of operable passenger vehicles.

**RESPONSE:** *The Preliminary Parking Plan (Exhibit C, Sheet 7) identifies a total of 62 on-street parking spaces with at least one (1) on-street parking space within 200 feet of each of the 32 lots. The proposed parking plan shows 21 parking spaces on the south side of Newton Street, including parking spaces for Lots 1-4. These on-street parking spaces should not be counted toward meeting the on-street parking requirement since the south side of the street will eventually develop with driveways and/or streets that will eliminate these spaces or prevent the developer of the site to the south from counting these spaces toward their on-street parking requirement. Per the Public Works Director (Exhibit O), **the applicant shall revise and resubmit the on-street parking plan for staff review and approval prior to final plat approval. No parking courts are proposed. The location of fire hydrants will be reviewed by the Sandy Fire Department in more detail with Construction Plans. The applicant shall revise the Parking Analysis if required fire hydrants affect on-street parking spaces.***

## **CHAPTER 17.100 – LAND DIVISION**



Chapter 17.100 presents review procedures, design standards, and improvement requirements for land division. Section 17.100.60 is the subsection relevant to the division of subdivisions.

### **17.100.60 SUBDIVISIONS**

Approval of a subdivision is required for a land division of 4 or more parcels in a calendar year. A two-step procedure is required for subdivision approval: (1) tentative plat review and approval; and (2) final plat review and approval.

**RESPONSE:** *Submittal of preliminary utility plans is solely to satisfy the requirements of Section 17.100.60. Preliminary plat approval does not connote utility or public improvement plan approval which will be reviewed and approved separately upon submittal of public improvement construction plans.*

E. Approval Criteria. The Director or Planning Commission shall review the tentative plat for the subdivision based on the classification procedure (Type II or III) set forth in Section 17.12 and the following approval criteria:

1. The proposed subdivision is consistent with the density, setback and dimensional standards of the base zoning district, unless modified by a Planned Development approval.

**RESPONSE:** *The applicant requests subdivision approval for a subdivision that is in compliance with most of the applicable development standards. The applicant requests one variance to increase block length beyond the maximum block length standard, one variance to allow houses to not face a transit street, and one variance to allow single-tiered lots. As a result, the application for the subdivision and variances is being processed concurrently through a Type III procedure. The proposal is consistent with density and other dimensional standards of the base zoning district.*

2. The proposed subdivision is consistent with the design standards set forth in this chapter.

**RESPONSE:** *Consistency with design standards in this chapter are discussed under each subsection below. Conditions of approval can be adopted where necessary to bring the proposal into compliance with applicable standards.*

3. The proposed street pattern is connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy.

**RESPONSE:** *The proposed subdivision includes the extension of Newton Street to the east of Jacoby Road and three new proposed local streets, including one cul-de-sac. The subject property was not included in the City's current Transportation System Plan (TSP) because it was outside of the Urban Growth Boundary (UGB) when the TSP was adopted in 2011.*

4. Adequate public facilities are available or can be provided to serve the proposed subdivision.

**RESPONSE:** *All public facilities including water, sanitary sewer and stormwater are available or will be constructed by the applicant to serve the Jacoby Heights Subdivision.*

5. All proposed improvements meet City standards.

**RESPONSE:** *The detailed review of proposed improvements is contained in this report. Staff has identified a few aspects of the proposed subdivision improvements requiring additional information or modification by the applicant, but conditions of approval can be adopted to bring the proposal into compliance with all standards.*

6. The phasing plan, if requested, can be carried out in a manner that meets the objectives of the above criteria and provides necessary public improvements for each phase as it develops.

**RESPONSE:** *The applicant did not submit a phasing plan. This subdivision request is for a 32 lot subdivision in one development phase.*

#### **17.100.70 LAND DIVISION DESIGN STANDARDS**

All land divisions shall be in conformance with the requirements of the applicable base zoning district and this chapter, as well as with other applicable provisions of this Code. Modifications to these requirements may be accomplished through a Planned Development. The design standards in this section shall be used in conjunction with street design standards included in the City of Sandy Transportation System Plan and standards and construction specifications for public improvements as set forth in adopted Public Facilities Plans and the Sandy Municipal Code.

**RESPONSE:** *The applicant requested the following three Type III variances:*

- *Variance to Section 17.82.20 to have the front door for the houses along Jacoby Road face the interior local street network instead of Jacoby Road, which is designated as a transit street;*
- *Variance to Section 17.100.120(A) to provide a one-tiered lot configuration rather than a two-tiered lot configuration along Jacoby Road;*
- *Variance to Section 17.100.120(B) to increase the maximum block length beyond 400 feet for the north side of the proposed Woodstock Street between Camden Court and the east property boundary.*

*Staff supports the variance to front door orientation, the variance to allow a single-tiered lot configuration along Jacoby Road, and the variance to allow the block length to exceed 400 feet on the north side of Woodstock Street between Camden Court and the east property boundary. The tentative plat shall otherwise be designed to comply with all standards of the City of Sandy Development Code, Transportation System Plan, Facilities Master Plans and Sandy Municipal Code.*

#### **17.100.100 STREETS GENERALLY**

No subdivision or partition shall be approved unless the development has frontage or approved access to an existing public street. In addition, all streets shall be graded and improved in conformance with the City's construction standards, approved by the City Engineer, in accordance with the construction plans.

- A. Street Connectivity Principle. The pattern of streets established through land divisions should be connected to: (a) provide safe and convenient options for cars, bikes and pedestrians; (b) create a logical, recognizable pattern of circulation; and (c) spread traffic over many streets so that key streets (particularly U.S. 26) are not overburdened.

**RESPONSE:** *The proposed development is moderately conducive to walking and biking while accommodating motor vehicles. Due to topography and the location of Tickle Creek, it does not make sense to extend the north-south streets (Camden Court and Middlebury Avenue) to the north.*

- B. Transportation Impact Studies. Transportation impact studies may be required by the city engineer to assist the city to evaluate the impact of development proposals, determine reasonable and prudent

transportation facility improvements and justify modifications to the design standards. Such studies will be prepared in accordance with the following:

1. A proposal established with the scope of the transportation impact study shall be coordinated with, and agreed to, by the city engineer. The study requirements shall reflect the magnitude of the project in accordance with accepted transportation planning and engineering practices. A professional civil or traffic engineer registered in the State of Oregon shall prepare such studies.
2. If the study identifies level-of-service conditions less than the minimum standards established in the Sandy Transportation System Plan, improvements and funding strategies mitigating the problem shall be considered as part of the land use decision for the proposal.

**RESPONSE:** *The submitted Transportation Impact Analysis (Exhibit F) was completed by Lancaster Engineering and is dated June 15, 2018. The traffic assumptions are based on the 10<sup>th</sup> Edition Trip Generation handbook. The analysis is based on the construction of 32 single-family homes and the removal of one existing house, for a net increase of 31 units. The trip rates indicate that upon full occupancy the subdivision will generate about 23 trips during the morning peak hour and 31 trips during the evening peak hour, with a weekday total of 292 trips. The study found that adequate sight distances can be made available on Jacoby Road at the site access intersections of both Woodstock Street and Newton Street. The study also found that all study intersections are operating acceptably per City of Sandy and ODOT standards and are projected to continue to operate acceptably upon build-out of the proposed development through year 2020. The Traffic Impact analysis concludes that no operational mitigation is necessary or recommended, no safety mitigation is recommended, no sight distance mitigations are necessary or recommended, and no turn lane or signal mitigations are recommended as part of this development. The City Transportation Engineer (Exhibit M) reviewed the Traffic Impact Analysis and concurred that the analysis demonstrates that the development can be accommodated without requiring mitigation to meet adopted operational standards.*

- C. Topography and Arrangement. All streets shall be properly related to special traffic generators such as industries, business districts, schools, and shopping centers and to the pattern of existing and proposed land uses.

**RESPONSE:** *Considering the site's topography, the proposed street layout is acceptable given the topography and residential use of this site, and the topography and use of adjacent properties.*

- D. Street Spacing. Street layout shall generally use a rectangular grid pattern with modifications as appropriate to adapt to topography or natural conditions.

**RESPONSE:** *The applicant proposes a rectangular pattern of streets with an offset grid. Due to topography and the location of Tickle Creek, it does not make sense to extend the north-south streets (Camden Court and Middlebury Avenue) to the north. However, future development to the south will be required to align with the proposed intersections in order to maintain a rectangular grid pattern and maximize pedestrian, bicycle, and vehicular connectivity. An offset grid with "T" intersections is not warranted due to the lack of through traffic.*

- E. Future Street Plan. Future street plans are conceptual plans, street extensions and connections on acreage adjacent to land divisions. They assure access for future development and promote a logical, connected pattern of streets. It is in the interest of the city to promote a logical, connected pattern of streets. All applications for land divisions shall provide a future street plan that shows the pattern of

existing and proposed future streets within the boundaries of the proposed land divisions, proposed connections to abutting properties, and extension of streets to adjacent parcels within a 400 foot radius of the study area where development may practically occur.

***RESPONSE:*** *The proposed local street plan has been designed to facilitate the traffic needs of this development while ensuring there are no intersection conflicts with future development. Per the City Engineer (Exhibit L), the applicant shall provide a profile design for a minimum of 200 feet for all future street extensions beyond the project boundary to ensure future street grades can be met.*

- F. Connections. Except as permitted under Exemptions, all streets, alleys and pedestrian walkways shall connect to other streets within the development and to existing and planned streets outside the development and to undeveloped properties which have no future street plan. Streets shall terminate at other streets or at parks, schools or other public land within a neighborhood.
1. Where practicable, local roads shall align and connect with other roads when crossing collectors and arterials.
  2. Proposed streets or street extensions shall be located to provide direct access to existing or planned transit stops, and existing or planned neighborhood activity centers, such as schools, shopping areas and parks.
  3. Exemptions.
    - a. A future street plan is not required for partitions of residentially zoned land when none of the parcels may be redivided under existing minimum density standards.
    - b. Standards for street connections do not apply to freeways and other highways with full access control.
    - c. When street connection standards are inconsistent with an adopted street spacing standard for arterials or collectors, a right turn in/right turn out only design including median control may be approved. Where compliance with the standards would result in unacceptable sight distances, an accessway may be approved in place of a street connection.

***RESPONSE:*** *The proposed design extends Newton Street east across Jacoby Road into the site. All proposed streets will allow connection with future development to the south and east, with the exception of Camden Court, which is a cul-de-sac. Due to topography and the location of Tickle Creek, it is not practicable to connect Camden Court to the north.*

#### **17.100.110 STREET STANDARDS AND CLASSIFICATION**

Street standards are illustrated in the figures included at the end of this chapter. Functional definitions of each street type are described in the Transportation System Plan as summarized below.

- A. Major arterials are designed to carry high volumes of through traffic, mixed with some unavoidable local traffic, through or around the city. Major arterials should generally be spaced at 1-mile intervals.
- B. Minor arterials are designed to collect and distribute traffic from major and minor arterials to neighborhood collectors and local streets, or directly to traffic destinations. Minor arterials should generally be spaced at 1-mile intervals.
- C. Residential minor arterials are a hybrid between minor arterial and collector type streets that allow for moderate to high traffic volumes on streets where over 90% of the fronting lots are residential.

- D. Collector streets are designed to collect and distribute traffic from higher type arterial streets to local streets or directly to traffic destinations. Collector streets should generally be spaced at 1/2-mile intervals.
- E. Local streets are designed to provide direct access to abutting property and connect to collector streets. A general spacing of 8-10 local streets per mile is recommended.
- F. Cul-de-sacs and dead end streets are discouraged. If deemed necessary, cul-de-sacs shall be as short as possible and shall not exceed 400 feet in length.
- G. Public access lanes are designed to provide primary access to a limited number of dwellings when the construction of a local street is unnecessary.
- H. Alleys are designed to provide access to multiple dwellings in areas where lot frontages are narrow and driveway spacing requirements cannot be met.

**RESPONSE:** *Jacoby Road is an existing collector street. All proposed streets in the subdivision are local streets, including the extension of the existing Newton Street, which is proposed to extend east of Jacoby Road into the site. Camden Court is a proposed cul-de-sac and does not exceed 400 feet. Per the City Engineer (Exhibit L), the plans don't clearly indicate the radius for the proposed cul-de-sac. **The minimum paved cul-de-sac radius shall be 48 feet as per the Oregon Fire Code and Metro Code Committee. A review by the Fire Department to confirm cul-de-sac size compliance shall be required.***

#### **17.100.120 BLOCKS AND ACCESSWAYS**

- A. Blocks. Blocks shall have sufficient width to provide for two tiers of lots at appropriate depths. However, exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features.
- B. Residential Blocks. Blocks fronting local streets shall not exceed 400 feet in length, unless topographic, natural resource, or other similar physical conditions justify longer blocks. Blocks may exceed 400 feet if approved as part of a Planned Development, Specific Area Plan, adjustment or variance.

**RESPONSE:** *The applicant is requesting variances to Sections 17.100.120(A) and (B). The proposal includes one lot (Lot 30) that will be a single-tiered lot and one block (north side of Woodstock Street between Camden Court and the eastern property boundary) that exceeds 400 feet.*

- D. Pedestrian and Bicycle Access Way Requirements. In any block in a residential or commercial district over 600 feet in length, a pedestrian and bicycle accessway with a minimum improved surface of 10 feet within a 15-foot right-of-way or tract shall be provided through the middle of the block. To enhance public convenience and mobility, such accessways may be required to connect to cul-de-sacs, or between streets and other public or semipublic lands or through greenway systems.

**RESPONSE:** *None of the proposed blocks exceed 600 feet in length. At the pre-application meeting, staff informed the applicant that staff would like to see a connection from the proposed subdivision to the future Tickle Creek Trail. Staff recommended the trail connection extend north from the intersection of Middlebury Avenue and Woodstock Street. The submitted Future Street and Pedestrian Trail Plan (Exhibit C, Sheet 8) details the future pedestrian trail connection to the future Tickle Creek Trail on the adjacent property to the east (tax lot 800). Staff brought this proposal to the January 30, 2019 Parks and Trails Advisory Board meeting. The Parks and Trails Advisory*

*Board also recommends that the connector trail be constructed as part of this development. Staff recommends the Planning Commission require a pedestrian trail connection to the future extension of the Tickle Creek Trail as part of this development. Staff recommends that the trail connection be located in alignment with Middlebury Avenue. Alternatively, staff recommends that Lot 19 be included in the FSH tract and that the trail connection be located on the proposed location of Lot 19. If the applicant wants to pursue locating the pedestrian trail connection off-site, the applicant shall provide justification as to why a connection on tax lot 800 makes more sense than a connection developed as part of this proposal.*

#### **17.100.130 EASEMENTS**

A minimum eight (8) foot public utility easement shall be required along property lines abutting a right-of-way for all lots within a partition or subdivision. Where a partition or subdivision is traversed by a watercourse, drainage way, channel or stream, the land division shall provide a stormwater easement or drainage right-of-way conforming substantially with the lines of such watercourse, and such further width as determined needed for water quality and quantity protection.

***RESPONSE:** The Preliminary Plat (Exhibit C, Sheet 1) details an 8 foot wide public utility easement along all street frontages. The plat shall detail all proposed easements as detailed in Section 17.84.90 above.*

#### **17.100.180 INTERSECTIONS**

- A. Intersections. Streets shall be laid out so as to intersect as nearly as possible at right angles. A proposed intersection of two new streets at an angle of less than 75 degrees shall not be acceptable. No more than two streets shall intersect at any one point unless specifically approved by the City Engineer. The city engineer may require left turn lanes, signals, special crosswalks, curb extensions and other intersection design elements justified by a traffic study or necessary to comply with the Development Code.
- B. Curve Radius. All local and neighborhood collector streets shall have a minimum curve radius (at intersections of rights-of-way) of 20 feet, unless otherwise approved by the City Engineer. When a local or neighborhood collector enters on to a collector or arterial street, the curve radius shall be a minimum of 30 feet, unless otherwise approved by the City Engineer.

***RESPONSE:** The proposed intersections are all right angles and meet the required minimum spacing standard of 150 feet as required in Section 17.84.50(C)(2).*

#### **17.100.190 STREET SIGNS**

***RESPONSE:** The applicant will be required to pay for the cost of all street signs and the City will install the street signs.*

#### **17.100.210 STREET LIGHTING**

***RESPONSE:** Chapter 15.30 contains the City of Sandy's Dark Sky Ordinance. The applicant will need to install street lights along all street frontages wherever street lighting is determined*

*insufficient. The locations of street light fixtures shall be reviewed in detail with construction plans.*

#### **17.100.220 LOT DESIGN**

- A. The lot arrangement shall be such that there will be no foreseeable difficulties, for reason of topography or other conditions, in securing building permits to build on all lots in compliance with the Development Code.
- B. The lot dimensions shall comply with the minimum standards of the Development Code. When lots are more than double the minimum lot size required for the zoning district, the subdivider may be required to arrange such lots to allow further subdivision and the opening of future streets to serve such potential lots.
- C. The lot or parcel width at the front building line shall meet the requirements of the Development Code and shall abut a public street other than an alley for a width of at least 20 feet. A street frontage of not less than 15 feet is acceptable in the case of a flag lot division resulting from the division of an unusually deep land parcel which is of a size to warrant division into not more than two parcels.
- D. Double frontage lots shall be avoided except where necessary to provide separation of residential developments from arterial streets or to overcome specific disadvantages of topography or orientation.
- E. Lots shall avoid deriving access from major or minor arterials. When driveway access from major or minor arterials may be necessary for several adjoining lots, the Director or the Planning Commission may require that such lots be served by a common access drive in order to limit possible traffic hazards on such streets. Where possible, driveways should be designed and arranged to avoid requiring vehicles to back into traffic on minor or major arterials.

***RESPONSE:*** *The Single Family Residential (SFR) zoning district requires lots at least 7,500 square feet in area. The proposed lots range in size from 7,500 square feet to 21,183 square feet. All homes are required to comply with setback standards and maximum building height limitations as required in Chapter 17.34. Lot 30 is a double frontage lots that will take access from Camden Court but also abut Jacoby Road. Lots 19-21 and 27 contain more than double the minimum lot size; however, a large portion of each lot's area is within the FSH and, therefore, cannot be divided into a separate buildable lot. To avoid potential conflict between private property owners and the FSH overlay area in the future, **the applicant shall designate the FSH analysis area as a separate tract and dedicate the tract to the City of Sandy.** No lots are proposed to be accessed from a major or minor arterial. All lots are required to comply with clear vision requirements at all intersections.*

#### **17.100.230 WATER FACILITIES**

Water lines and fire hydrants serving the subdivision or partition, and connecting the development to City mains, shall be installed to provide adequate water pressure to serve present and future consumer demand. The materials, sizes, and locations of water mains, valves, service laterals, meter boxes and other required appurtenances shall be in accordance with the standards of the Fire District, the City, and the State.

If the city requires the subdivider to install water lines in excess of eight inches, the city may participate in the oversizing costs. Any oversizing agreements shall be approved by the city manager based upon council policy and dependent on budget constraints. If required water mains will directly serve property

outside the subdivision, the city may enter into an agreement with the subdivider setting forth methods for reimbursement for the proportionate share of the cost.

**RESPONSE:** *City facilities have adequate capacity to serve the proposed development. The specific details of water facilities will be reviewed with construction plans. Water service will be provided from a connection to the existing 8-inch water main at the intersection of Cascadia Village Drive and Jacoby Road. There is no other proposed connection to the water distribution system. Per the Public Works Director (Exhibit O), the applicant shall demonstrate that adequate fire and domestic flow will be available with a single point of connection to the water distribution system or connect to the existing 8-inch water line at the intersection of Newton Street and Amherst Street. Per the City Engineer (Exhibit L), all new waterline mains shall be a minimum of 8-inches in diameter and shall be extended to the plat boundaries where practical to provide future connections to adjoining properties. The applicant's proposed Utility Plan (Exhibit C, Sheet 5) depicts new hydrants. The location of fire hydrants will be reviewed by the Sandy Fire Department in more detail with construction plans.*

#### **17.100.240 SANITARY SEWERS**

Sanitary sewers shall be installed to serve the subdivision and to connect the subdivision to existing mains. Design of sanitary sewers shall take into account the capacity and grade to allow for desirable extension beyond the subdivision.

If required sewer facilities will directly serve property outside the subdivision, the city may enter into an agreement with the subdivider setting forth methods for reimbursement by nonparticipating landowners for the proportionate share of the cost of construction.

**RESPONSE:** *City facilities have adequate capacity to serve the proposed development. The specific details of sanitary sewer facilities will be reviewed with construction plans. Per the City Engineer (Exhibit L), all new public sanitary sewer lines shall be a minimum of 8-inches in diameter and shall be extended to the plat boundaries where practical to provide future connections to adjoining properties. The proposed utility plan shows an 8-inch sanitary sewer line extended south from the existing sewer line in Jacoby Road approximately 490 feet to the site. The site will drain to the existing SE sewer pump station located on Jacoby Road south of Trillium Avenue. Per the Public Works Director (Exhibit O), the applicant shall provide a sanitary sewer lateral serving Tax Lot 6100 (located directly north of the subject property) with the sanitary sewer main line extension.*

#### **17.100.250 SURFACE DRAINAGE AND STORM SEWER SYSTEM**

- A. Drainage facilities shall be provided within the subdivision and to connect with off-site drainage ways or storm sewers. Capacity, grade and materials shall be by a design approved by the city engineer. Design of drainage within the subdivision shall take into account the location, capacity and grade necessary to maintain unrestricted flow from areas draining through the subdivision and to allow extension of the system to serve such areas.
- B. In addition to normal drainage design and construction, provisions shall be taken to handle any drainage from preexisting subsurface drain tile. It shall be the design engineer's duty to investigate the location of drain tile and its relation to public improvements and building construction.
- C. The roof and site drainage from each lot shall be discharged to either curb face outlets (if minor quantity), to a public storm drain or to a natural acceptable drainage way if adjacent to the lot.



**RESPONSE:** The applicant proposes a 20,283 square foot public stormwater detention pond (Tract A) to be dedicated to the City of Sandy. Detained and treated discharge from the detention pond is proposed to be discharged to the adjacent property to the north. Per the Public Works Director (Exhibit O), the applicant shall demonstrate that the proposed subdivision does not exceed pre-development site runoff discharges to this same point and provide information on the dimensions and slope of the existing drainage way. Per the City Engineer (Exhibit L), the detention pond shall meet the requirements of the 2016 City of Portland Stormwater Management Manual (SWMM) for landscaping, Section 2.4.1, and escape route, Section 2.30. All new public storm drains shall be a minimum of 12-inches in diameter and shall be extended to the plat boundaries where practical to provide future connections to adjoining properties. The City Engineer (Exhibit L) states the submitted preliminary stormwater calculations meet the water quality and water quantity criteria as stated in the City of Sandy Municipal Code Chapter 13.18 Standards and the City of Portland current Stormwater Management Manual (SWMM) Standards that were adopted by reference into the Sandy Development Code. Per the City Engineer, the applicant shall submit a detailed final stormwater report stamped by a licensed professional to the City for review and approval with the final construction plans.

#### **17.100.260 UNDERGROUND UTILITIES**

All subdivisions or major partitions shall be required to install underground utilities (including, but not limited to, electrical and telephone wiring). The utilities shall be installed pursuant to the requirements of the utility company.

**RESPONSE:** All utilities shall be placed underground.

#### **17.100.270 SIDEWALKS**

Sidewalks shall be installed on both sides of a public street and in any special pedestrian way within the subdivision.

**RESPONSE:** The applicant proposes constructing sidewalks along all public street frontages, with the exception of the proposed three-quarter street section and one-half street section of Newton Street.

#### **17.100.290 STREET TREES**

Where planting strips are provided in the public right-of-way, a master street tree plan shall be submitted and approved by the Director. The street tree plan shall provide street trees approximately every 30' on center for all lots.

**RESPONSE:** As required by Section 17.92.30, the development of the subdivision requires installation of trees along all street frontages. Street trees are discussed in Section 17.92.30 of this staff report.

#### **17.100.300 EROSION CONTROL**

Grass seed planting shall take place prior to September 30th on all lots upon which a dwelling has not been started but the ground cover has been disturbed. The seeds shall be of an annual rye grass variety and shall be sown at not less than four pounds to each 1000 square feet of land area.

***RESPONSE: The applicant shall submit a grading and erosion control permit and request an inspection of installed devices prior to any additional grading onsite. The grading and erosion control plan shall include a re-vegetation plan for all areas disturbed during construction of the subdivision. All erosion control and grading shall comply with Section 15.44 of the Municipal Code and as detailed below. The proposed subdivision is greater than one acre which typically requires approval of a DEQ 1200-C Permit. The applicant shall submit confirmation from DEQ if a 1200-C Permit will not be required.***

### **17.100.310 REQUIRED IMPROVEMENTS**

The following improvements shall be installed at no expense to the city, consistent with the design standards of Chapter 17.84, except as otherwise provided in relation to oversizing.

- A. Drainage facilities
- B. Lot, street and perimeter monumentation
- C. Mailbox delivery units
- D. Sanitary sewers
- E. Sidewalks
- F. Street lights
- G. Street name signs
- H. Street trees
- I. Streets
- J. Traffic signs
- K. Underground communication lines, including broadband (fiber), telephone, and cable. Franchise agreements will dictate whether telephone and cable lines are required.
- L. Underground power lines
- M. Water distribution lines and fire hydrants

***RESPONSE: The applicant shall be responsible for the installation of all improvements detailed in Section 17.100.310, including fiber facilities. SandyNet requires the developer to work with the City to ensure that broadband infrastructure meets the design standards and adopted procedures as described in Section 17.84.70. Entry monument signs shall be located entirely outside the public right-of-way and clear vision areas as required by Section 17.74.30. If entry signs are desired, staff recommends the applicant submit a detailed plan showing the location of such signage.***

## **CHAPTER 17.102 – URBAN FORESTRY**

### **17.102.20 APPLICABILITY**

This chapter applies only to properties within the Sandy Urban Growth Boundary that are greater than one acre including contiguous parcels under the same ownership.

- A. General: No person shall cut, harvest, or remove trees 11 inches DBH or greater without first obtaining a permit and demonstrating compliance with this chapter.
  - 1. As a condition of permit issuance, the applicant shall agree to implement required provisions of this chapter and to allow all inspections to be conducted.
  - 2. Tree removal is subject to the provisions of Chapter 15.44, Erosion Control, Chapter 17.56, Hillside Development, and Chapter 17.60 Flood and Slope Hazard.

- B. Exceptions: The following tree removals are exempt from the requirements of this chapter.
1. Tree removal as required by the city or public utility for the installation or maintenance or repair of roads, utilities, or other structures.
  2. Tree removal to prevent an imminent threat to public health or safety, or prevent imminent threat to public or private property, or prevent an imminent threat of serious environmental degradation. In these circumstances, a Type I tree removal permit shall be applied for within seven days following the date of tree removal.

**RESPONSE:** *Section 17.00.10 states the overall purpose of the Development Code, which is to ensure that development is consistent with the goals and policies of the Sandy Comprehensive Plan. Goal 5 of the Comprehensive Plan addresses natural resources, with a stated intention of establishing policies for conservation of open space and protection of natural and scenic resources in compliance with Statewide Planning Goal 5. The Comprehensive Plan states, "In keeping with the mandate of Statewide Planning Goal 5, Oregon communities are required to provide programs that will 'conserve open space and protect natural and scenic resources.' Additionally, the City of Sandy has the goal of providing parks, open space, and recreational opportunities for its citizens, as well as promoting healthy and visually attractive environments that are in harmony with the natural landscape character of the area." Goal 5 of the Comprehensive Plan includes policies related to natural resources, open space, stream corridor protection, indigenous growth protection, historic and cultural resource protection, and environmental and cultural resource protection. The most relevant policies related to tree retention and mitigation include the following:*

- *Policy 4: The City promotes development practices which maintain or enhance the environmental quality enjoyed by the residents of the community.*
- *Policy 7: Employ development regulations to preserve and protect open space and environmentally sensitive lands, integrate the natural environment of Sandy into project designs, minimize the creation of impervious surface, and discourage the unnecessary clearing of trees and other natural vegetation.*
- *Policy 16: Require development and construction projects to minimize disturbance of significant indigenous growth and to enhance the cohesive quality of tree stands through sensitive site design and construction methods.*
- *Policy 17: Promote innovative site and building designs which reduce the adverse impacts of development on native tree stands and other areas of significant vegetation.*
- *Policy 18: Where feasible, preserve natural vegetation resource sites through public acquisition, conservation easements or other available methods to permanently limit development.*
- *Policy 19: Encourage and, if necessary, require reforestation in open space areas to help mitigate the adverse impacts of development.*
- *Policy 27: The City of Sandy shall promote the planting of trees throughout the community on both public and private properties.*
- *Policy 28: The City of Sandy shall consider the establishment of a street tree plan that identifies particular trees within different areas of the City but that provide species diversity to add visual interest throughout the community, create individual neighborhood identity, and provide additional resistance through species diversity against disease.*
- *Policy 29: The City of Sandy shall review existing development standards, including street standards, to assure that the standards support and encourage the maintenance of a sustainable urban forest.*

- *Policy 30: The City of Sandy shall consider incentives to encourage the preservation of significant trees.*

*As discussed in further detail below, the 9.68 acre site requires retention of a minimum of 29 trees that are in good condition and are 11-inches DBH or greater. Of the 521 trees inventoried on the site, the applicant is proposing to remove 457. Per Section 17.92.10(C), significant trees (8-inches or greater DBH) should be preserved to the greatest extent practicable. In addition, the City of Sandy Comprehensive Plan encourages development that minimizes disturbance of native tree stands, preserves natural open space, and promotes innovative site and building design to minimize the adverse impacts of development on native tree stands.*

#### **17.102.50 TREE RETENTION AND PROTECTION REQUIREMENTS**

- A. **Tree Retention:** The landowner is responsible for retention and protection of trees required to be retained as specified below:
1. At least three trees 11 inches DBH or greater are to be retained for every one-acre of contiguous ownership.
  2. Retained trees can be located anywhere on the site at the landowner's discretion before the harvest begins. Clusters of trees are encouraged.
  3. Trees proposed for retention shall be healthy and likely to grow to maturity, and be located to minimize the potential for blow-down following the harvest.
  4. If possible, at least two of the required trees per acre must be of conifer species.
  5. Trees within the required protected setback areas may be counted towards the tree retention standard if they meet these requirements.
- B. **Tree Protection Area:** Except as otherwise determined by the Planning Director, all tree protection measures set forth in this section shall be instituted prior to any development activities and removed only after completion of all construction activity. Tree protection measures are required for land disturbing activities including but not limited to tree removal, clearing, grading, excavation, or demolition work.
1. Trees identified for retention shall be marked with yellow flagging tape and protected by protective barrier fencing placed no less than 10 horizontal feet from the outside edge of the trunk.
  2. Required fencing shall be a minimum of six feet tall supported with metal posts placed no farther than ten feet apart installed flush with the initial undisturbed grade.
  3. No construction activity shall occur within the tree protection zone, including, but not limited to dumping or storage of materials such as building supplies, soil, waste items, equipment, or parked vehicles.
- C. **Inspection.** The applicant shall not proceed with any tree removal or construction activity, except erosion control measures, until the City has inspected and approved the installation of tree protection measures. Within 15 days of the date of accepting an application for a Type I permit, the city shall complete an onsite inspection of proposed activities and issue or deny the permit. Within 15 days of issuing a Type II or Type III permit, the city shall complete an onsite inspection of proposed activities.

For ongoing forest operations, the permit holder shall notify the city by phone or in writing 24 hours prior to subsequent tree removal. The city may conduct an onsite re-inspection of permit conditions at this time.

**RESPONSE:** *The subject property is 9.68 acres, which requires a minimum of 29 retention trees that are 11-inches or greater DBH and in good health. Per the submitted Tree Retention Inventory (Exhibit C, Sheet 2), the applicant proposes to retain all trees within the FSH overlay (64 total), including 33 trees that are viable and 11-inches or greater DBH. It appears that there are two trees that are proposed for removal located on the FSH boundary line: Tree #510 and Tree #516. **The applicant shall update the plan set to retain Trees #510 and #516 to avoid tree removal in the FSH overlay.** Of the 33 viable trees identified for retention, six (6) appear to be on or very close to the eastern property boundary (Trees # 527, 528, 530, 549, 550, and 3006), and an additional four (4) include notes such as “poor trunk taper,” “windthrow potential,” “wound on trunk,” or “some trunk decay” (Trees # 520, 531, 534, and 560). Without those nine (9) trees, the proposal would only include 24 retention trees. Therefore, staff recommends that the applicant retain additional trees. In addition, Section 17.92.10(C) of the Development Code states that significant trees (defined as 8-inches or greater DBH) should be preserved to the greatest extent practicable and integrated into the design of a development. This is also in line with the Comprehensive Plan, particularly Policies 16 and 17. **The applicant shall update the plan set to include a minimum of an additional 10 retention trees 8-inches or greater DBH and in good health. Staff recommends retaining all trees on Lot 19 and including the area as part of the FSH tract dedicated to the City of Sandy.** Alternatively, staff recommends the applicant consider directional boring in the utility easements to retain Trees #109, 110, 120, 122, 336, 340, 366, 380, 383 and 392, and/or reducing the square footage of Lots 9 and 10 and creating an approximately 20 foot wide tree preservation buffer tract along Jacoby Road, which shall also be placed in a conservation easement. A tree buffer along Jacoby Road would also support the applicant’s request to have the houses on Lots 9 and 10 face the internal street network rather than Jacoby Road.*

*Section 17.102.50(B.1) requires tree protection fencing be placed no less than 10 horizontal feet from the outside edge of the trunk. Per the Pacific Northwest International Society of Arboriculture (ISA), the ISA defines the critical root zone (CRZ) as “an area equal to a 1-foot radius from the base of the tree’s trunk for each 1 inch of the tree’s diameter at 4.5 feet above grade (referred to as diameter at breast height).” Often the drip-line is used to estimate a tree’s CRZ; however, it should be noted that a tree’s roots typically extend well beyond its drip-line. Section 17.92.10(C) requires tree protection fencing located 5 feet beyond the drip-line of a tree, taking into account that there are many roots beyond the drip-line and that trees continue to grow. **Tree protection fencing shall be located at least 5 feet beyond the dripline of all retention trees. Tree protection fencing shall be a minimum of six feet tall supported with metal posts placed no farther than ten feet apart installed flush with the initial undisturbed grade. No construction activity shall occur within the tree protection zone, including, but not limited to dumping or storage of materials such as building supplies, soil, waste items, equipment, or parked vehicles. The applicant shall request an inspection of tree protection measures prior to any tree removal, grading, or other construction activity on the site.***

**OTHER CONSIDERATIONS FOR TREES:**

*To ensure protection of the required retention trees, the applicant shall record a tree protection covenant specifying protection of these trees and limiting removal without submittal of an Arborist’s Report and City approval. This document shall include a sketch identifying the required retention trees. All trees marked for retention shall be retained and protected during construction regardless of desired or proposed building plans; plans for future houses on the*

***proposed lots within the subdivision shall be modified to not encroach on retention trees and associated tree protection fencing.***

*The properties directly north and east of the subject site (tax lots 6100 and 800) contain a number of existing trees, some of which are located close to the shared property line and have canopies that extend onto the subject property. **The applicant shall update the plan set to detail tree protection fencing on the subject property located 5 feet beyond the dripline of all trees located on the properties to the north and east.***

## **CHAPTER 17.66 – ADJUSTMENTS AND VARIANCES**

### **17.66.60 VARIANCES**

Variations are a means of requesting a complete waiver or major adjustment to certain development standards. They may be requested for a specific lot or as part of a land division application. The Type II variance process is generally reserved for major adjustments on individual lots, while variations to development standards proposed as part of a land division are processed as a Type III application (requiring a public hearing).

**RESPONSE:** *The applicant proposes the following three Type III variations:*

- *Variance to Section 17.82.20 to have the front door for the houses along Jacoby Road face the interior local street network instead of Jacoby Road, which is designated as a transit street;*
- *Variance to Section 17.100.120(A) to provide a one-tiered lot configuration rather than a two-tiered lot configuration along Jacoby Road;*
- *Variance to Section 17.100.120(B) to increase the maximum block length beyond 400 feet for the north side of the proposed Woodstock Street between Camden Court and the east property boundary.*

### **17.66.70 TYPE II AND TYPE III VARIANCE CRITERIA**

The authority to grant a variance does not include authority to approve a development that is designed, arranged or intended for a use not otherwise approvable in the location. The criteria are as follows:

- A. The circumstances necessitating the variance are not of the applicant's making.
- B. The hardship does not arise from a violation of this Code, and approval will not allow otherwise prohibited uses in the district in which the property is located.
- C. Granting of the variance will not adversely affect implementation of the Comprehensive Plan.
- D. The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.
- E. The development will be the same as development permitted under this code and City standards to the greatest extent that is reasonably possible while permitting some economic use of the land.

- F. Special circumstances or conditions apply to the property which do not apply generally to other properties in the same zone or vicinity, and result from lot size or shape (legally existing prior to the effective date of this Code), topography, or other circumstances over which the applicant has no control.

**BLOCK LENGTH VARIANCE**

17.100.120 (B) Residential Blocks. *“Blocks fronting local streets shall not exceed 400 feet in length, unless topographic, natural resource, or other similar physical conditions justify longer blocks. Blocks may exceed 400 feet if approved as part of a Planned Development, Specific Area Plan, adjustment or variance.”*

Request: *The applicant requests approval to exceed the 400 foot block length standard for the north side of Woodstock Street between Camden Court and the eastern property boundary (approximately 426 feet).*

Criteria A. of Section 17.66.70 states “The circumstances necessitating the variance are not of the applicant’s making.” **RESPONSE:** *The topography of the site is such that there cannot be a north-south street north of Woodstock Street without encroaching in the FSH. By not creating an intersection along the north side of Woodstock Street, the design better protects the FSH area and Tickle Creek basin. The City Engineer reviewed the future street plan (Exhibit C, Sheet 8) and states “given the wetlands/Tickle Creek is [sic] located to the north, a stubbed street is not feasible. Extending the block length for approximately 100 feet appears to be reasonable and is compatible with the location of the existing house on the adjacent property to the east.”*

Criteria B. of Section 17.66.70 states “The hardship does not arise from a violation of this Code, and approval will not allow otherwise prohibited uses in the district in which the property is located.” **RESPONSE:** *The applicant has not violated the Development Code and the uses allowed on the lots will be the same with or without approval of this variance. Granting a block length variance will better protect the natural resources on the site.*

Criteria C. of Section 17.66.70 states “Granting of the variance will not adversely affect implementation of the Comprehensive Plan.” **RESPONSE:** *Approval of the variance will not have an impact on any of the policies or goals of the Comprehensive Plan or any other applicable policies and standards adopted by the City. The applicant’s narrative (Exhibit B) states: “Granting this variance will further the City’s goal of protecting natural resources and will not adversely affect implementation of the Comprehensive Plan.”*

Criteria D. of Section 17.66.70 states “The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.” **RESPONSE:** *Approval of the variance will not be materially detrimental or injurious to other property owners in the vicinity.*

Criteria E. of Section 17.66.70 states “The development will be the same as development permitted under this code and City standards to the greatest extent that is reasonably possible while permitting some economic use of the land.” **RESPONSE:** *The proposed development will not be significantly different than if Woodstock Street was limited to 400 feet in length. Inclusion of a connector trail to the future Tickle Creek Trail on the subject property north of Woodstock Street will break up the block length and provide additional pedestrian connectivity.*

Criteria F. of Section 17.66.70 states “Special circumstances or conditions apply to the property which do not apply generally to other properties in the same zone or vicinity, and result from lot size or shape (legally existing prior to the effective date of this Code), topography, or other circumstances over which the applicant has no control.” **RESPONSE:** *The topography of the site is such that there cannot be a north-south street north of Woodstock Street without encroaching in the FSH. By not creating an intersection along the north side of Woodstock Street, the design better protects the FSH area and Tickle Creek basin.*

**Recommendation:** *Staff recommends the Planning Commission approve a variance to allow the north side of Woodstock Street between Camden Court and the eastern property boundary to exceed 400 feet as proposed in the submitted plan set. Staff’s recommendation to include the connector trail to the future Tickle Creek trail on the subject property will effectively reduce the block length for pedestrians and will improve pedestrian connectivity in the future.*

**BUILDING ORIENTATION VARIANCES**

*The requirement of building entrances oriented to transit streets, such as Jacoby Road, is to provide a pleasant and enjoyable pedestrian experience by connecting activities within a structure to the adjacent sidewalk where transit amenities are located.*

**Request:** *The applicant requests a Type III variance to Chapter 17.82.20 to allow the front door of the future homes constructed on Lots 9, 10, 30 and 32 to face the internal local street network instead of Jacoby Road, a designated transit street.*

Criteria A. of Section 17.66.70 states “The circumstances necessitating the variance are not of the applicant’s making.” **RESPONSE:** *The Development Code does not allow driveway access to higher classification streets such as Jacoby Road, a collector street. The front door could be oriented to Jacoby Road with a rear or side loaded garage oriented to the internal street network; however, staff recognizes that the front doors on Jacoby Road would essentially be false front doors, which is not the intent of the code.*

Criteria B. of Section 17.66.70 states “The hardship does not arise from a violation of this Code, and approval will not allow otherwise prohibited uses in the district in which the property is located.” **RESPONSE:** *The applicant has not violated the Development Code and the uses allowed on the lots will be the same with or without approval of this variance.*

Criteria C. of Section 17.66.70 states “Granting of the variance will not adversely affect implementation of the Comprehensive Plan.” **RESPONSE:** *The variance will not have an impact on any of the policies or goals of the Comprehensive Plan.*

Criteria D. of Section 17.66.70 states “The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.” **RESPONSE:** *Approval of the variance will not be materially detrimental or injurious to other property owners in the vicinity. Orientation of the houses on Lots 9, 10, 30, and 32 to the internal street network will have no negative effect on surrounding properties. Per the applicant’s narrative (Exhibit B), “Homes directly across Jacoby Road from the subject property have a similar configuration to what is being proposed.”*

Criteria E. of Section 17.66.70 states “The development will be the same as development permitted under this code and City standards to the greatest extent that is reasonably possible while permitting



some economic use of the land.” **RESPONSE:** *Orienting the houses on Lots 9, 10, 30, and 32 to the local street will allow construction of a traditional structure containing a garage and front door on the same street elevation, which will create a consistent look in the neighborhood. However, the requirement of building entrances oriented to transit streets, such as Jacoby Road, is to provide a pleasant and enjoyable pedestrian experience by connecting activities within a structure to the adjacent sidewalk where transit amenities are located. If Planning Commission approves this variance, **staff recommends the applicant add additional design elements and decorative fencing along the Jacoby Road facing sides of Lots 9, 10, 30 and 32 per the following:***

- *Builders of individual lots shall construct a decorative fence on the Jacoby Road facing side of Lots 9, 10, 30, and 32 to enhance the visual appeal of these lots from Jacoby Road. The fence shall include the following design details:*
  - *Constructed of vertical black metal or faux metal fencing material.*
  - *No greater than 3-inch gap between vertical pickets.*
  - *4-feet to 6-feet in height.*
  
- *The rear elevations of Lot 30 and the side elevation of Lots 9, 10, and 32 shall incorporate all of the following design details where applicable:*
  - *Decorative gables – including two or more of the following:*
    - *A window with grids.*
    - *A trimmed vent. The trim must match the trim on the windows and the vent must be at least 4 square feet in area.*
    - *Cross or diagonal bracing, shingles, trim, corbels, exposed rafter ends, or brackets.*
    - *Decorative ‘belly-band’ with an alternative paint color to the siding color, between building floors.*
  - *Mixture of siding materials, including shake or horizontal lap siding with an alternative paint color to the primary siding color.*
  - *Recessed or covered rear entries (rear elevation only).*
    - *The covered area must be at least 48 square feet and a minimum of 8 feet wide.*
    - *The recessed entry must feature vertical support posts.*
  - *Minimum four-inch wide trim or 12-inch wide shutters around all windows.*

***Builders shall submit proposed decorative fence and elevation designs for staff review and approval.***

Criteria F. of Section 17.66.70 states “Special circumstances or conditions apply to the property which do not apply generally to other properties in the same zone or vicinity, and result from lot size or shape (legally existing prior to the effective date of this Code), topography, or other circumstances over which the applicant has no control.” **RESPONSE:** *It would create an unconventional design to have the rear of the houses on Lots 30 and 32 facing the proposed Camden Court cul-de-sac. While the front doors of the houses on Lots 9 and 10 could face Jacoby Road, the garages would not be able to gain access from Jacoby Road. A more traditional orientation would be to have both the front door and garage face the local street as requested by the applicant.*

***Recommendation: Staff recommends the Planning Commission approve a variance to allow the front door of the future homes constructed on Lots 9, 10, 30, and 32 to not face Jacoby Road. Staff further***

***recommends the applicant add additional design elements and decorative fencing along the Jacoby Road facing sides of Lots 9, 10, 30, and 32.***

**TWO-TIERED LOT VARIANCE**

17.100.120 (A) Blocks. “Blocks shall have sufficient width to provide for two tiers of lots at appropriate depths. However, exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features.”

Request: *The applicant requests approval to provide a one-tier lot configuration for Lot 30 between Jacoby Road and Camden Court, instead of the required two-tier configuration.*

Criteria A. of Section 17.66.70 states “The circumstances necessitating the variance are not of the applicant’s making.” **RESPONSE:** *The applicant’s narrative (Exhibit B) states that the design of the proposed subdivision, including the single-tiered lot on the cul-de-sac, is due to “topographic and natural resource constraints of the property associated with the location of Tickle Creek and steep slopes.” The proposal only includes one single-tiered lot. In addition, the Development Code allows an exception for blocks that are adjacent to arterial streets or natural features. Though Jacoby Road is a collector street, staff believes approving the applicant’s request to allow one-tiered lot configuration would be in line with the intent of Section 17.100.120(A), which states: “Blocks shall have sufficient width to provide for two tiers of lots at appropriate depths. However, exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features.”*

Criteria B. of Section 17.66.70 states “The hardship does not arise from a violation of this Code, and approval will not allow otherwise prohibited uses in the district in which the property is located.” **RESPONSE:** *The applicant has not violated the Development Code and the uses allowed on the lots will be the same with or without approval of this variance.*

Criteria C. of Section 17.66.70 states “Granting of the variance will not adversely affect implementation of the Comprehensive Plan.” **RESPONSE:** *The variance will not have an impact on any of the policies or goals of the Comprehensive Plan.*

Criteria D. of Section 17.66.70 states “The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.” **RESPONSE:** *Approval of the variance will not be materially detrimental or injurious to other property owners in the vicinity.*

Criteria E. of Section 17.66.70 states “The development will be the same as development permitted under this code and City standards to the greatest extent that is reasonably possible while permitting some economic use of the land.” **RESPONSE:** *The proposal contains one single-tiered lot (Lot 30) and the proposed development will not be significantly different than if the applicant proposed a two-tiered lot configuration so that Lot 30 was somehow not oriented as a single tiered lot.*

Criteria F. of Section 17.66.70 states “Special circumstances or conditions apply to the property which do not apply generally to other properties in the same zone or vicinity, and result from lot size or shape (legally existing prior to the effective date of this Code), topography, or other circumstances over which the applicant has no control.” **RESPONSE:** *The applicant’s narrative states “the subject property contains unique circumstances (collector street, steep slopes, and creek) that warrant approval of an alternative design.” The Code allows an exception for blocks that are adjacent to arterial streets or natural features. Though Jacoby Road is a collector street, staff believes approving the applicant’s*

request to allow one-tiered lot configuration would be in line with the intent of Section 17.100.120(A) as explained in Criteria A.

Recommendation: **Staff recommends the Planning Commission approve the applicant's request to allow one-tiered lot configuration for Lot 30 between Jacoby Road and Camden Court.**

#### **CHAPTER 15.30 – DARK SKY ORDINANCE**

All exterior lighting is required to conform to the requirements of this chapter.

**RESPONSE:** Chapter 15.30 contains the City of Sandy's Dark Sky Ordinance. The applicant will need to install street lights along all street frontages wherever street lighting is determined insufficient. **The locations of these fixtures shall be reviewed in detail with construction plans. Full cut-off lighting shall be required.**

#### **CHAPTER 15.44 – EROSION CONTROL**

##### **15.44.20 AREA OF APPLICATION**

This chapter applies to all ground disturbing activities within the city limits whether or not a permit is required, unless such activities are otherwise exempted by the Sandy Development Code. All non-permitted ground disturbing activities that are permanent or temporary in nature shall comply with this chapter unless otherwise noted.

**RESPONSE:** All on-site earthwork activities including any retaining wall construction should follow the requirements of the current edition of the Oregon Structural Specialty Code (OSSC). If the proposal includes a retaining wall, the applicant shall submit additional details on the proposed retaining wall for staff review and approval. All on-site earthwork activities should follow the Geotechnical Report (Exhibit G) prepared by Rapid Soil Solutions LLC, dated February 23, 2018. Any deviations from the initial design parameters shall be reviewed by Rapid Soil Solutions for applicability. The City Engineer (Exhibit L) reviewed the Geotechnical Report and recommends that **the applicant shall retain appropriate professional geotechnical services for observation of construction of earthwork and grading activities. The grading setbacks, drainage, and terracing shall comply with the Oregon Structural Specialty Code (OSSC) requirements and the geotechnical report recommendations and conclusions as indicated in the report. When the grading is completed, the applicant shall submit a final report by the Geotechnical Engineer to the City stating that adequate inspections and testing have been performed on the lots and all of the work is in compliance with the above noted report and OSSC. Site grading should not in any way impede, impound or inundate the adjoining properties. All the work within the public right-of-way and within the paved area should comply with American Public Works Association (APWA) and City requirements as amended. The applicant shall submit a grading and erosion control permit and request an inspection of installed devices prior to any additional grading onsite. The grading and erosion control plan shall include a re-vegetation plan for all areas disturbed during construction of the subdivision. All erosion control and grading shall comply with Section 15.44 of the Municipal Code. The proposed subdivision is greater than one acre which typically requires approval of a DEQ 1200-C Permit. The applicant shall submit confirmation from DEQ if a 1200-C Permit will not be required.**

#### **15.44.50 APPLICANT'S RESPONSIBILITY**

The developer, subsequent developers or property owners shall bear responsibility for the installation, construction, protection of all stockpiles on the site, materials transported from the site, maintenance including re-vegetation of all graded areas, inspection and disposition of erosion control measures. In order to meet the purpose of this chapter, the developer shall:

- C. Apply permanent or temporary soil stabilization to denuded development site areas in conformance with the following schedule:
  1. Between October 1 and April 30, all denuded sites shall immediately be provided with either temporary or permanent soil stabilization.
  2. Between May 1 and September 30, temporary erosion and sediment control measures to reduce dust and sediment transport shall be applied as soon as practicable, but in no case more than seven days after ground disturbing activity occurs.
  3. Ground cover shall be installed on any portion of a site that is denuded for more than six months. Sports fields or playgrounds surrounded by vegetative cover or permanently installed curbing are exempt from this requirement.
  4. Temporary measures shall be maintained until permanent measures are established.
  5. Plant replacement vegetative cover that does not include plants listed as nuisance or prohibited plants on the City of Portland Plant List (available in the Planning & Development office) or the City's Native Plant List. Agriculture, timber production or residential crop growing activities are exempted from this requirement.
  6. Secure or protect soil stockpiles throughout the project with temporary or permanent soil stabilization measures. Depositions of soil may be subject to additional regulations requiring permit, review or erosion and sediment control.
  7. Select BMPs from the *Erosion Control Manual*.

***RESPONSE:*** Section 15.44.50 contains requirements for maintenance of a site including re-vegetation of all graded areas. ***The applicant's Erosion Control Plan shall be designed in accordance with the standards of Section 15.44.50.***

### **III. SUMMARY AND CONCLUSION**

All County Surveyors & Planners submitted an application on behalf of Cory Knight to subdivide 9.68 acres at 19124 Jacoby Road into a 32 lot subdivision. The 32 lots range in size from 7,500 square feet to 21,183 square feet. The subdivision proposal includes the extension of Newton Street into the site and three proposed local streets: Camden Court, Woodstock Street, and Middlebury Avenue. The applicant is requesting three (3) variances: a variance to Section 17.82.20 to allow future homes to not orient to Jacoby Road, a variance to Section 17.100.120(A) to allow a one-tiered lot configuration between Jacoby Road and Camden Court, and a variance to Section 17.100.120(B) to exceed a 400 foot block length on the north side of Woodstock Street between Camden Court and the east property line. In addition, the applicant is requesting a code interpretation related to the tree protection standards of Chapter 17.92, Landscaping and Screening General Standards – All Zones, and Chapter 17.102, Urban Forestry.

As detailed in this report, the proposed subdivision generally complies with most Development Code requirements.

Biggest Issues/Staff Recommendations:

- Add pedestrian connector trail, or provide justification as to why a connection on tax lot 800 makes more sense than a connection developed as part of this proposal.
- Create separate FSH tract and dedicate it to the City.
- Add additional decorative fence and building features on Jacoby Road for Lots 9, 10, 30, and 32.
- Provide a geological assessment specific to each lot proposed to be developed with a single family house on 25 percent or greater slopes that fall outside the mapped FSH overlay.
- Design Newton Street with a three-quarter street section to the eastern property boundary.
- Identify a minimum of 10 additional retention trees.

#### IV. RECOMMENDATION

Staff recommends the Planning Commission hold a public hearing to take public testimony regarding the proposal. Staff recommends the Planning Commission **approve** the subdivision application with modifications as recommended in this report. The staff recommendation includes approval of the following three variances:

- Variance to Section 17.82.20 to have the front door for the houses along Jacoby Road face the interior local street network instead of Jacoby Road, which is designated as a transit street;
- Variance to Section 17.100.120(A) to provide a one-tiered lot configuration rather than a two-tiered lot configuration along Jacoby Road;
- Variance to Section 17.100.120(B) to increase the maximum block length beyond 400 feet for the north side of the proposed Woodstock Street between Camden Court and the east property boundary.

Staff recommends that the Planning Commission interpret the code such that Chapter 17.92, Landscaping and Screening, continue to apply to all zones, including subdivisions.

## **18-025 SUB/VAR/FSH/TREE/INT Jacoby Heights Subdivision**

### **List of Conditions/Recommendations**

#### FSH/Trees/Landscaping

1. Staff recommends that the Planning Commission continue to apply Chapter 17.92 to all zones, including during subdivision review.
2. The applicant shall update the plan set to retain Trees #510 and #516 to avoid tree removal in the FSH overlay.
3. The wetland report/delineation shall be concurred with by the State of Oregon Division of State Lands (ODSL) and the US Army Corps of Engineers (COE) and the Oregon Department of Fish and Wildlife.
4. The applicant shall designate the FSH area as a separate tract on the plat and dedicate the tract to the City. In addition, staff recommends the Planning Commission require a pedestrian trail connection to the future extension of the Tickle Creek Trail as part of this development. Staff recommends that the trail connection be located in alignment with Middlebury Avenue. Alternatively, staff recommends that Lot 19 be included in the FSH tract and that the trail connection be located on the proposed location of Lot 19. The applicant shall include the trail connector tract as part of the FSH tract and shall dedicate the entire tract to the City.
5. The applicant shall submit a Phase I environmental assessment and a native vegetation report for the FSH area. The applicant shall remove all invasive plants and re-plant any areas of exposed soil with native plants. The applicant shall dedicate the FSH tract to the City and shall submit a maintenance bond for two full growing seasons (May 1 – October 31) to ensure 80 percent plant survival or replacement and that the tract remains in good condition. Although parkland dedication is separate from open space dedication, staff recommends that the Planning Commission grant the applicant a parks fee-in-lieu credit for dedication of the open space FSH analysis area. The applicant shall obtain an appraisal for the FSH analysis area and, with City approval of the appraised value, shall receive a parks fee-in-lieu credit for dedicating the open space FSH analysis area.
6. All landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing.
7. The applicant shall update the plan set to remove street trees from the driveways in front of Lots 31 and 32; at least one of the street trees shall be relocated outside of the driveway area.
8. As required by Section 17.92.140, the developer and lot owners shall be required to maintain all vegetation planted in the development for two years from the date of completion, and shall replace any dead or dying plants during that period.
9. All street trees shall be a minimum of 1.5-inches in caliper measured 6 inches above the ground and shall be planted per the City of Sandy standard planting detail.

10. The applicant shall update the plan set to detail a minimum of two (2) different tree species per block face for staff review and approval.
11. The applicant shall update the proposed street tree list with at least two additional species from the City of Sandy Street Tree List that aren't maples or ashes.
12. The applicant shall maintain all unlandscaped and/or revegetated areas for a period of two years following the date of recording of the final plat associated with those improvements.
13. If the applicant chooses to postpone street tree and/or landscaping installation, the applicant shall post a performance bond equal to 120 percent of the cost of the street trees/landscaping, assuring installation within 6 months. The cost of street trees shall be based on the street tree plan and at least \$500 per tree fee, including a three-year maintenance and warranty period. The cost of landscaping shall be based on the average of three estimates from three landscaping contractors; the estimates shall include as separate items all materials, labor, and other costs of the required action, including a two-year maintenance and warranty period.
14. The applicant shall update the plan set to retain Trees #510 and #516 to avoid tree removal in the FSH overlay.
15. The applicant shall update the plan set to include a minimum of an additional 10 retention trees 8-inches or greater DBH and in good health. Staff recommends retaining all trees on Lot 19 and including the area as part of the FSH tract dedicated to the City of Sandy. Alternatively, staff recommends the applicant consider directional boring in the utility easements to retain Trees #109, 110, 120, 122, 336, 340, 366, 380, 383 and 392, and/or reducing the square footage of Lots 9 and 10 and creating an approximately 20 foot wide tree preservation buffer tract along Jacoby Road, which shall also be placed in a conservation easement.
16. The applicant shall preserve significant trees (25-inches or greater circumference, or 8-inches or greater DBH) to the greatest extent practicable.
17. The applicant shall install protective fencing located at least 5 feet outside of the dripline around all trees to be retained on the subject property and for trees located on adjacent properties to the north and east. Tree protection fencing shall be a minimum of six feet tall supported with metal posts placed no farther than ten feet apart installed flush with the initial undisturbed grade. No construction activity shall occur within the tree protection zone, including, but not limited to dumping or storage of materials such as building supplies, soil, waste items, equipment, or parked vehicles. The applicant shall request an inspection of tree protection measures prior to any tree removal, grading, or other construction activity on the site.
18. To ensure protection of the required retention trees, the applicant shall record a tree protection covenant specifying protection of these trees and limiting removal without submittal of an Arborist's Report and City approval. This document shall include a sketch identifying the required retention trees. All trees marked for retention shall be retained and protected during construction regardless of desired or proposed building plans; plans

for future houses on the proposed lots within the subdivision shall be modified to not encroach on retention trees and associated tree protection fencing.

19. Staff recommends the Planning Commission require a pedestrian trail connection to the future extension of the Tickle Creek Trail as part of this development. Staff recommends that the trail connection be located in alignment with Middlebury Avenue. Alternatively, staff recommends that Lot 19 be included in the FSH tract and that the trail connection be located on the proposed location of Lot 19. If the applicant wants to pursue locating the pedestrian trail connection off-site, the applicant shall provide justification as to why a connection on tax lot 800 makes more sense than a connection developed as part of this proposal.

#### Individual House Conditions

20. All structures on lots along Jacoby Road shall be constructed to comply with the standards of Section 17.80.20.
21. All homes shall meet the development standards of Section 17.34.30.
22. Lot 28 and 29 shall share a driveway approach maximum 24 feet in width. Lot 26 and 27 shall share a driveway approach maximum 24 feet in width. The applicant shall grant crossover easements along the common parcel line to lots with shared driveway approaches. The applicant shall realign the access drive proposed to serve the stormwater facility in Tract A or revise the west line of Lot 29 to eliminate remnant of Tract A between the access drive and Lot 29. The driveway approach for Tract A shall be a maximum of 12 feet in width.
23. Staff recommends the applicant add additional design elements and decorative fencing along the Jacoby Road facing sides of Lots 9, 10, 30 and 32 per the following:
  - Builders of individual lots shall construct a decorative fence on the Jacoby Road facing side of Lots 9, 10, 30, and 32 to enhance the visual appeal of these lots from Jacoby Road. The fence shall include the following design details:
    - Constructed of vertical black metal or faux metal fencing material.
    - No greater than 3-inch gap between vertical pickets.
    - 4-feet to 6-feet in height.
  - The rear elevations of Lot 30 and the side elevation of Lots 9, 10, and 32 shall incorporate all of the following design details where applicable:
    - Decorative gables – including two or more of the following:
      - A window with grids.
      - A trimmed vent. The trim must match the trim on the windows and the vent must be at least 4 square feet in area.
      - Cross or diagonal bracing, shingles, trim, corbels, exposed rafter ends, or brackets.



- Decorative ‘belly-band’ with an alternative paint color to the siding color, between building floors.
    - Mixture of siding materials, including shake or horizontal lap siding with an alternative paint color to the primary siding color.
    - Recessed or covered rear entries (rear elevation only).
      - The covered area must be at least 48 square feet and a minimum of 8 feet wide.
      - The recessed entry must feature vertical support posts.
    - Minimum four-inch wide trim or 12-inch wide shutters around all windows.
24. Builders shall submit proposed decorative fence and elevation designs for staff review and approval.
25. Staff recommends the Planning Commission approve a variance to allow the front door of the future homes constructed on Lots 9, 10, 30, and 32 to not face Jacoby Road. Staff further recommends the applicant add additional design elements and decorative fencing along the Jacoby Road facing sides of Lots 9, 10, 30, and 32.
26. Staff recommends the Planning Commission approve the applicant’s request to allow one-tiered lot configuration for Lot 30 between Jacoby Road and Camden Court.

Transportation/Streets

27. The applicant shall construct sidewalks along Tract A both on Jacoby Road and Camden Court, prior to final plat approval. The sidewalks on Camden Court, Woodstock Street, Newton Street, and Middlebury Avenue shall be five feet in width and separated by a planter strip or swale (six feet in width) in areas not transverse by driveways. The sidewalks on Jacoby Road shall be six feet in width and separated by a five foot planter strip.
28. The applicant shall eliminate the proposed curve at the east end of Newton and continue the three-quarter street improvement to the east boundary of the site. The three-quarter street improvements on Newton Street shall include a 28-foot wide paved surface, curbs on both sides, 5-foot planter strips and 5-foot sidewalks on the north side of the roadway.
29. The applicant shall revise the alignment of Newton Street to conform to the 50 feet of tangent alignment standard.
30. The applicant shall extend the street improvements on Newton Street across from Lot 9 to the south line of the development site and obtain slope easements or construct retaining walls as necessary to comply with this section of the development code. Improvements shall include extension of the Newton Street sidewalk and planter strip, one additional street tree, and landscaping the additional 17.70 feet of right-of-way dedication at the southeast corner of Newton Street and Jacoby Road.

31. The applicant shall extend the street improvements on Woodstock Street to the east line of the development site and obtain slope easements or construct retaining walls as necessary to comply with this section of the development code. The developer shall improve the street section adjacent to the recommended trail connection tract on Woodstock Street prior to final plat approval.
32. The improvements on Jacoby Road shall include an additional 10 feet of right-of-way dedication (60' ROW).
33. The applicant shall provide a profile design for a minimum of 200 feet for all future street extensions beyond the project boundary to ensure future street grades can be met.
34. The minimum paved cul-de-sac radius shall be 48 feet as per the Oregon Fire Code and Metro Code Committee. A review by the Fire Department to confirm cul-de-sac size compliance shall be required.
35. Staff recommends the Planning Commission approve a variance to allow the north side of Woodstock Street between Camden Court and the eastern property boundary to exceed 400 feet as proposed in the submitted plan set. Staff's recommendation to include the connector trail to the future Tickle Creek trail on the subject property will effectively reduce the block length for pedestrians and will improve pedestrian connectivity in the future.
36. The applicant shall update the plan set to show street trees in the planter strip adjacent to Lots 1 and 2. If the plans change in a way that affects the number of street trees (e.g., driveway locations), the applicant shall submit an updated street tree plan for staff review and approval.
37. Street trees shall be installed approximately 30 feet on center in conjunction with issuance of building permits. Street trees are required to be a minimum caliper of 1.5-inches measured 6 inches from grade. Trees shall be planted and staked per the City of Sandy standard planting detail; trees shall be tied to the stakes with loosely tied twine. The planter strip shall be graded and backfilled as necessary, and bark mulch, vegetation, or other approved material installed prior to occupancy. Tree ties shall be removed after one growing season (or a maximum of 1 year).
38. The applicant shall construct a mid-block ADA ramp on the west side of Jacoby Road opposite Woodstock Street to provide ADA access to the existing sidewalk on the west side of Jacoby Road and the neighborhood to the west.
39. The applicant shall install one bench (Fairweather model PL-3, powder-coated RAL6028) with a concrete pad to City specifications. The applicant shall contact the Transit Director for specific location, amenity information, and pad engineering specifications.
40. The applicant shall plat a vehicle non-access reserve (VNAR) strip along the south side of the right-of-way of Newton Street and at the east end of Woodstock Street.

41. The applicant shall work with the Fire Marshall to determine if a temporary turn-around is needed on Woodstock Street and/or Newton Street, or if houses on particular lots need to be sprinkled.
42. The City of Sandy reserves the right to name streets.
43. The access to the detention pond shall be paved or all-weather surface.

#### Utilities

44. All public utility installations shall conform to the City's facilities master plans. Staff recommends the applicant revise the utility plan to include broadband fiber locations as detailed by the SandyNet Manager.
45. All public sanitary sewer and waterline mains shall be a minimum of 8 inches in diameter and all stormwater drains shall be a minimum of 12 inches in diameter and shall be extended to the plat boundaries where practical to provide future connections to adjoining properties. No building permits will be issued until all public utilities including sanitary sewer are available to serve the development. The applicant shall pay plan review, inspection, and permit fees as determined by the Public Works Director.
46. Any existing domestic or irrigation wells on site shall be located, identified, capped, disconnected or abandoned in conformance with OAR 690-220-0030. A copy of the Oregon Water Resources Department (OWRD) abandonment certificate shall be submitted to the City Planning Division.
47. Any on-site sewage disposal system shall be abandoned in conformance with Clackamas County Water Environmental Services (WES) regulations. A copy of the septic tank removal certificate shall be submitted to the City Planning Division.
48. All new public sanitary sewer lines shall be a minimum of 8-inches in diameter and shall be extended to the plat boundaries where practical to provide future connections to adjoining properties.
49. The applicant shall provide a sanitary sewer lateral serving Tax Lot 6100 (located directly north of the subject property) with the sanitary sewer main line extension.
50. The applicant shall demonstrate that the proposed subdivision does not exceed pre-development site runoff discharges to this same point and provide information on the dimensions and slope of the existing drainage way.
51. The detention pond shall meet the requirements of the 2016 City of Portland Stormwater Management Manual (SWMM) for landscaping, Section 2.4.1, and escape route, Section 2.30.
52. All new public storm drains shall be a minimum of 12-inches in diameter and shall be extended to the plat boundaries where practical to provide future connections to adjoining properties.

53. The applicant shall submit a detailed final stormwater report stamped by a licensed professional to the City for review and approval with the final construction plans.
54. All utilities shall be placed underground.
55. All franchise utilities shall be installed underground and in conformance with City standards.
56. The applicant shall call the PGE Service Coordinators at 503-323-6700 when the developer is ready to start the project.
57. The applicant shall demonstrate that adequate fire and domestic flow will be available with a single point of connection to the water distribution system or connect to the existing 8-inch water line at the intersection of Newton Street and Amherst Street.
58. The location of fire hydrants will be reviewed by the Sandy Fire Department in more detail with construction plans.
59. All new waterline mains shall be a minimum of 8-inches in diameter and shall be extended to the plat boundaries where practical to provide future connections to adjoining properties.
60. The applicant shall be responsible for the installation of all improvements detailed in Section 17.100.310, including fiber facilities. SandyNet requires the developer to work with the City to ensure that broadband infrastructure meets the design standards and adopted procedures as described in Section 17.84.70.
61. The locations of street light fixtures shall be reviewed in detail with construction plans.

#### Parking

62. The applicant shall comply with the parking standards in Section 17.98.60.
63. All parking, driveway and maneuvering areas shall be constructed of asphalt, concrete, or other approved material.
64. The applicant shall revise and resubmit the on-street parking plan for staff review and approval prior to final plat approval. The applicant shall revise the Parking Analysis if required fire hydrants affect on-street parking spaces.

#### Geotech/Grading/Erosion

65. The applicant shall submit a grading and erosion control permit and request an inspection of installed devices prior to any additional grading onsite. The grading and erosion control plan shall include a re-vegetation plan for all areas disturbed during construction of the subdivision. All erosion control and grading shall comply with Section 15.44 of the Municipal Code and as detailed below. The proposed subdivision is greater than one acre

which typically requires approval of a DEQ 1200-C Permit. The applicant shall submit confirmation from DEQ if a 1200-C Permit will not be required.

66. The applicant shall retain appropriate professional geotechnical services for observation of construction of earthwork and grading activities. The grading setbacks, drainage, and terracing shall comply with the Oregon Structural Specialty Code (OSSC) requirements and the geotechnical report recommendations and conclusions as indicated in the report. When the grading is completed, the applicant shall submit a final report by the Geotechnical Engineer to the City stating that adequate inspections and testing have been performed on all lots (Lots 1-32) and all of the work is in compliance with the above noted report and OSSC.
67. The applicant shall update the cut and fill evaluation to include the location of the tree protection fencing as depicted on the existing conditions and tree retention inventory (Exhibit C, Sheet 2). The applicant shall not cut or fill within the proposed tree protection area.
68. The applicant shall follow the recommendations outlined in the Geotechnical Report.
69. The applicant shall submit a geological assessment specific to each lot proposed to be developed with a single family house on 25 percent or greater slopes that fall outside the mapped FSH overlay. This includes Lots 19, 20, 21, 27, 28, and 29. Additional reports may be required depending on the recommendations of the geological assessment. Once the subdivision is platted and building permits are filed for individual home construction the property owner/contractor shall submit Type I Hillside applications with studies as detailed in Table 1 in Section 17.56.40.
70. All on-site earthwork activities including any retaining wall construction should follow the requirements of the current edition of the Oregon Structural Specialty Code (OSSC). If the proposal includes a retaining wall, the applicant shall submit additional details on the proposed retaining wall for staff review and approval.
71. The applicant shall retain appropriate professional geotechnical services for observation of construction of earthwork and grading activities. The grading setbacks, drainage, and terracing shall comply with the Oregon Structural Specialty Code (OSSC) requirements and the geotechnical report recommendations and conclusions as indicated in the report. When the grading is completed, the applicant shall submit a final report by the Geotechnical Engineer to the City stating that adequate inspections and testing have been performed on the lots and all of the work is in compliance with the above noted report and OSSC. Site grading should not in any way impede, impound or inundate the adjoining properties. All the work within the public right-of-way and within the paved area should comply with American Public Works Association (APWA) and City requirements as amended. The applicant shall submit a grading and erosion control permit and request an inspection of installed devices prior to any additional grading onsite.
72. All erosion control and grading shall comply with Section 15.44 of the Municipal Code. The proposed subdivision is greater than one acre which typically requires approval of

a DEQ 1200-C Permit. The applicant shall submit confirmation from DEQ if a 1200-C Permit will not be required.

73. The applicant's Erosion Control Plan shall be designed in accordance with the standards of Section 15.44.50.

#### Miscellaneous

74. If entry signs are desired, staff recommends the applicant submit a detailed plan showing the location of such signage.
75. Public improvement plans are subject to a separate review and approval process. Preliminary plat approval does not connote utility or public improvement plan approval which will be reviewed and approved separately upon submittal of public improvement construction plans.
76. The applicant shall obtain a demolition permit from the City of Sandy Building Department prior to demolition of the existing structure(s) on-site.
77. Mail delivery facilities shall be provided by the applicant in conformance with Section 17.84.100 and the standards of the USPS. The applicant shall submit a mail delivery plan, featuring grouped lockable mail facilities, to the City and USPS for review and approval prior to installation of mailboxes.
78. The applicant shall pay a fee in lieu for the required parkland dedication per the adopted Fee Resolution. Based on the current Fee Resolution, the applicant would be required to pay a fee in lieu of dedication for a total of \$98,810 (0.41 acres of land to be dedicated x \$241,000). Currently, the Fee Resolution requires payment of \$108,650 if a portion of the fee is deferred, a minimum of 50 percent (\$54,325) paid prior to final plat approval and the remaining 50 percent (\$54,325) divided between the 32 lots (\$1,697.66/lot).
79. The Plat shall detail the following easements:
- An eight-foot wide public utility easement (PUE) along the frontage of all proposed lots;
  - Crossover easements along the common parcel line recorded between pairs of lots that share driveways (Lots 26 and 27, and Lots 28 and 29);
  - 20 foot easement along the west boundary of Lots 9 and 10 for public sanitary sewer and public storm line. Per the Public Works Director (Exhibit O), the City reserves the right to widen this easement depending on the final design depth of the sanitary sewer and storm lines per Section 17.84.90(A.2);
  - A 15 foot easement between Lot 30 and Tract A for public sanitary sewer;

- A 10 foot private storm drain easement at the rear of Lots 1-18, 22-25, 28, 29, 31, and 32 and a 10 foot private storm drain easement across Lots 19-21 just south of the FSH boundary;
- A vehicle non-access reserve (VNAR) strip in the following locations:
  - Jacoby Road frontage of Lots 9, 10, 30 and 32 and Tract A; and,
  - South side of the right-of-way of Newton Street; and,
  - East end of the right-of-way of Woodstock Street.

**EXHIBIT A**



**LAND USE APPLICATION FORM**

(Please print or type the information below)

**Planning Department  
39250 Pioneer Blvd.  
Sandy OR 97055  
503-668-4886**

Name of Project Jacoby Heights Subdivision

Location or Address 19124 SE Jacoby Road, Sandy, OR

Map & Tax Lot Number T 2S , R 4E , Section 24A ; Tax Lot(s) 2300

Plan Designation SFR Zoning Designation LDR Acres 9.64

Request:

Type III, 31 lot residential subdivision, including two Type III Variances and a Type II Tree Removal Permit.

I am the (check one)  owner  lessee of the property listed above and the statements and information contained herein are in all respects true, complete and correct to the best of my knowledge and belief.

Applicant Cory Knight	Owner Cory Knight
Address 16513 SE Orchard View Lane	Address
City/State/Zip Damascus, OR 97089	City/State/Zip
Phone 503-481-7789	Phone
Email cory@taylorgroupprealty.com	Email
Signature	Signature

If signed by Agent, owner's written authorization must be attached.

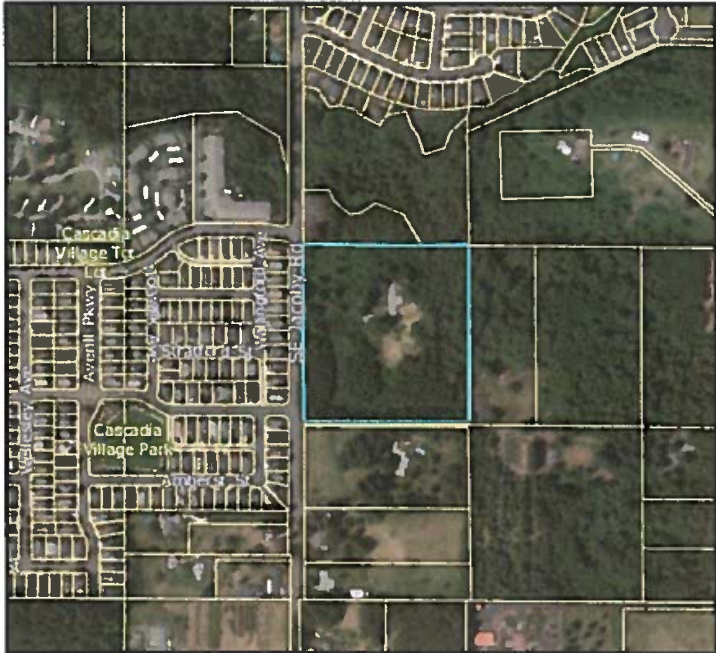
File No. <u>180255081</u>	Date <u>6/19/18</u>	Rec. No.	Fee \$ <u>9676.00</u>
Type of Review (circle one): Type I    Type II    Type III <u>Type IV</u>			

24E 24A 02300



**EXHIBIT B**

**PROJECT NARRATIVE  
FOR  
JACOBY ESTATES SUBDIVISION  
19124 SE JACOBY ROAD  
SANDY, OREGON 97055**



**Revised  
December 2018**

## Project Details

Project Location: 19124 SE Jacoby Road, East side of Jacoby Road; south and east of Cascadia Village Drive

Legal Description: Map 24E 24A, Tax Lot 2300

Zoning District SFR, Single Family Residential

Site Size: 9.68 ac. (421,661 sf)

### Owner / Applicant

Cory Knight  
16513 SE Orchard View Lane  
Damascus, Or 97089  
cory@taylorgrouprealty.com  
503-481-7789

### Representative:

Civil Engineer / Surveyor  
All County Surveyors & Planners, Inc.  
Ray Moore, P.E., P.L.S.  
P.O. Box 955  
Sandy, OR 97055  
Phone: 503-668-3151  
Fax: 503-668-4730  
Email: ray@allcountysurveyors.com

**Consultant Team:**

**Planning**

Tracy Brown  
Tracy Brown Planning Consultants, LLC  
17075 Fir Drive  
Sandy, OR 97055  
Phone: 503-781-0453  
tbrownplan@gmail.com

**Geotechnical Engineer**

Mia Mahedy-Sexton, PE, GE  
Rapid Soil Solutions  
3915 SW Plum Street  
Portland, Or 97219  
Mia@rapidsoilsolutions.com  
503-816-3689

**Traffic Engineer**

William Farley  
Lancaster Engineering  
321 SW 4th Ave., Suite 400  
Portland, OR 97204  
Phone: 503-248-0313  
todd@lancasterengineering.com

**Wetland Consultant**

Jack Dalton  
Environmental Science & Assessment LLC  
107 SE Washington Street Suite 249  
Portland, Or 97214  
Jack@esapdx.com  
Office: 503-478-0424  
Cell: 971-413-6738

**Arborist**

Peter Torres  
Multnomah Tree Experts, Ltd  
8325 SW 42nd Ave  
Portland, Or 97219  
Peter@multnomahtree.com  
503-452-8160

## **I. General Project Description**

The project site consists of one parcel located at Township 2 South, Range 4 East, Section 24A, tax lot 2300 of the Willamette Meridian. The property contains approximately 9.64 acres and an existing single family dwelling. A tributary of Tickle Creek flows through the northeast corner of the property.

The site is zoned SFR, Single Family Residential. The applicant proposes constructing a 32 lot subdivision in a single phase and intends to remove the existing residence with construction of the subdivision. All of the lots are proposed to be accessed by a new street system constructed off Jacoby Road that can be extended to adjacent parcels in the future. The subject property gradually slopes to the west and north with the northeast corner of the property containing steeper slopes sloping to the northeast. This area of the property contains a small stretch of Tickle Creek.

The applicant proposes platting lots within the FSH Overlay identified on the property but no development is proposed within this area. A 20,283 square foot tract (Tract A) is also proposed to be dedicated to the city of Sandy to be used for stormwater detention and water quality purposes.

A pre-application conference was held with the City to review the project on January 3, 2018. Based on input received at this meeting modifications were made to the subdivision layout. Application materials were initially submitted to the City on June 25, 2018. On July 12, 2018, the City sent the applicant a letter deeming the application incomplete. The revised narrative addresses the items in this letter.

With this application the applicant is requesting a Code Interpretation per the requirements of Chapter 17.14. The applicant requests the Planning Commission make a determination regarding pertinent regulations applicable to retaining trees within the proposed subdivision. Staff has recently been applying the language in Section 17.92.10(C) in addition to Chapter 17.102 to regulating trees. The applicant believes only the requirements of Chapter 17.102 are applicable for this purpose.

## **II. Application Approval Requests**

The applicant requests the following approvals with this application:

- Type III Code Interpretation regarding tree protection regulations applicable to the proposed subdivision;
- Type III Subdivision including a Type II Tree Removal Permit;
- Type III, Variance to Section 17.82.20 to allow all homes adjacent to Jacoby Road to be constructed with their front doors facing the internal local street rather than Jacoby Road;
- Type III Variance to Section 17.100.120(A) to allow creation of a single tier of lots (Lot 30) adjacent to Jacoby Road, a collector street; and

- Type III Variance to Section 17.100.120(B) to exceed the 400 foot block length maximum for the north side of Woodstock St., from Camden Ct. to the eastern property line.

### III. Items Submitted With This Application

- Land Use Application
- Notification List and Mailing Labels
- Exhibit A - Project Narrative (revised)
- Exhibit B - Code Interpretation Request
- Exhibit C - Civil Plans
  - Sheet 1 - Cover Sheet and Preliminary Plat Map
  - Sheet 2 - Existing Conditions and Tree Inventory
  - Sheet 3 - Existing Trees with Building Setbacks
  - Sheet 4 - FSH and Slopes Map
  - Sheet 5 - Preliminary Street and Utility Plan
  - Sheet 6 - Preliminary Street Tree Plan
  - Sheet 7 - Preliminary Parking Plan
  - Sheet 8 - Future Street and Pedestrian Trail Plan
  - Sheet 9 - Grading and Erosion Control Plan
  - Sheet 10 - Cut and Fill Evaluation
- Exhibit D - Storm Drainage Report
- Exhibit E - Traffic Impact Analysis
- Exhibit F - Geotechnical Report
- Exhibit G - Wetland Determination Memo
- Exhibit H - Existing Easement (Document 2008-012774)
- Exhibit I - Public Works Correspondence RE: Sewer Pump Station
- Exhibit J - Tree Inventory
- Exhibit K - Incompleteness Letter dated July 12, 2018

### IV. Review of Applicable Approval Criteria

Development applications are required to meet development standards set forth in the City of Sandy Development Code. This section addresses all applicable review criteria. Pertinent code provisions are cited below in regular text followed by a response describing how the proposal complies with this standard in *italics*. The following code chapters have been reviewed in this narrative:

<u>Chapter</u>	<u>Title</u>
17.30	Zoning District
17.34	Single Family Residential (SFR)
17.60	Flood and Slope Hazard Overlay
17.80	Additional Setbacks on Collector and Arterial Streets
17.82	Special Setbacks on Transit Streets
17.84	Improvements Required with Development
17.86	Parkland and Open Space

17.90	Design Standards
17.92	Landscaping and Screening
17.98	Parking, Loading, and Access Requirements
17.100	Land Division
17.102	Urban Forestry
15.30	Dark Sky Ordinance

## **CHAPTER 17.30 - ZONING DISTRICTS**

### **17.30.20 RESIDENTIAL DENSITY CALCULATION PROCEDURE**

The number of dwelling units permitted on a parcel of land is calculated after the determination of the net site area and the acreage of any restricted development areas (as defined by Chapter 17.60). Limited density transfers are permitted from restricted development areas to unrestricted areas consistent with the provisions of the Flood and Slope Hazard Area Overlay District, Chapter 17.60.

*Response: The applicant proposes a 32 lot subdivision with a single tract to be dedicated to the city (Tract A) for stormwater drainage purposes. The subject property contains a gross site area of 9.68 acres. After deducting public rights-of-way and the proposed stormwater tract, the net site area (NSA) is 7.09 acres. Because the subject property contains restricted development areas (RDA) as defined by Chapter 17.60 these areas are also deducted from the net site area to determine the unrestricted site area (USA). The formula used in this calculation is: NSA - RDA = USA.*

*The subject property contains 52,444 square feet (1.20 acres) of restricted development area (RDA) as shown on Sheet 4. Subtracting this area from the 7.09 net site area (NSA) results in an unrestricted site area (USA) containing 5.89 acres.*

*The SFR zone allows a minimum of 3 and a maximum of 5.8 units per net acre. The minimum density is calculated by multiplying the USA x the required minimum density (5.89 acres x 3 = 17.67 units round up to 18 units)*

*The maximum density is determined by these two formulas and using the lesser number of units.*

*a. NSA (in acres) x Maximum Density of Zoning District (units/acre).*

*(7.09 acres x 5.8 units/acre = 41.122 (rounded to 41 units)).*

*b. USA (in acres) x Maximum Density of Zoning District (units/acre) x 1.5 (maximum allowable density transfer based on Chapter 17.60)*

*(5.89 x acres x 5.8 units/acre x 1.5 density transfer = 51.243 (rounded to 51 units))*

*As a result of these calculations the density range for the subject property is a minimum of 18 units and a maximum of 41 units.*

## CHAPTER 17.34 - SINGLE-FAMILY RESIDENTIAL (SFR)

### 17.34.00 - INTENT

The district is intended to implement the Low Density Residential Comprehensive Plan designation by providing for low-density residential development in specific areas of the city. The purpose of this district is to allow limited development of property while not precluding more dense future development, as urban services become available. Density shall not be less than 3 or more than 5.8 units per net acre.

*Response: As detailed above, the proposed 32 lots complies with the density range in the SFR zoning district of 18 to 41 units for the subject property.*

### 17.34.10 - PERMITTED USES

#### A. Primary Uses Permitted Outright:

1. Single detached dwelling subject to design standards in Chapter 17.90;

*Response: The applicant proposes constructing single family detached dwellings as permitted in this zoning district.*

### 17.34.30 - DEVELOPMENT STANDARDS

Type	Standard
A. Minimum Lot Area - Single detached dwelling - Other permitted uses	7,500 square ft. No minimum
B. Minimum Average Lot Width - Single detached dwelling	60 ft.
C. Minimum Lot Frontage	20 ft. except as allowed by Section 17.100.160
D. Minimum Average Lot Depth	No minimum
E. Setbacks (Main Building) Front yard Rear yard Side yard (interior) Corner Lot	10 ft. minimum 20 ft. minimum 7.5 ft. minimum 10 ft. minimum on side abutting the street
F. Setbacks (Garage/Carport)	22 ft. minimum for front vehicle access 15 ft. minimum if entrance is perpendicular to street (subject to Section 17.90.220) 5 ft. minimum for alley or rear access
G. Projections into Required Setbacks	See Chapter 17.74
H. Accessory Structures in Required Setbacks	See Chapter 17.74
I. Structure Height	35 ft. maximum
J. Building Site Coverage	No minimum
K. Off-Street Parking	See Chapter 17.98

**Response:** As shown on Sheet 1 of the plan set, all lots in the proposed subdivision contain at least 7,500 square feet, have at least 20 feet of street frontage, contain an average lot width of at least 60 feet as required. The proposed building footprints shown on this sheet indicates that all lots are capable of complying with applicable setbacks in the zone. The details of these development standards will be reviewed with submittal of building permits. Compliance with required off-street parking as shown on Sheet 7 is reviewed in Chapter 17.98 below.

#### **17.34.40 - MINIMUM REQUIREMENTS**

A. Must connect to municipal water.

**Response:** The applicant proposes extending water service to serve all dwellings in the new subdivision.

B. Must connect to municipal sewer if service is currently within 200 feet of the site. Sites more than 200 feet from municipal sewer, may be approved to connect to an alternative disposal system provided all of the following are satisfied:

1. A county septic permit is secured and a copy is provided to the city;
2. The property owner executes a waiver of remonstrance to a local improvement district and/or signs a deed restriction agreeing to complete improvements, including but not limited, to curbs, sidewalks, sanitary sewer, water, storm sewer or other improvements which directly benefit the property;
3. The minimum size of the property is one acre or is a pre-existing buildable lot, as determined by the city;
4. Site consists of a buildable parcel(s) created through dividing property in the city, which is less than five acres in size.

**Response:** The existing dwelling is currently served by a septic system. This system will be decommissioned in accordance with applicable regulations and the applicant will provide proof of the decommissioned system with construction documents.

C. The location of any real improvements to the property must provide for a future street network to be developed.

**Response:** A new street network will be constructed to serve each dwelling as required.

D. Must have frontage or approved access to public streets.

**Response:** Each new residence constructed in the subdivision will gain access from a public street.

#### **17.34.50 - ADDITIONAL REQUIREMENTS**

A. Design review as specified in Chapter 17.90 is required for all uses.



*Response: Only Section 17.90.150, Residential Design Standards of Chapter 17.90 is applicable to residential developments. This section is reviewed below.*

- B. Lots with 40 feet or less of street frontage shall be accessed by a rear alley or a shared private driveway.

*Response: Lots 27/28 contain less than 40 feet of street frontage but comply with the 20 foot minimum street frontage standard. Due to slopes it is not feasible to access these lots by a rear alley, however a shared curb cut/ driveway is a possibility if required.*

## **CHAPTER 17.60 - FLOOD AND SLOPE HAZARD (FSH) OVERLAY**

### **17.60.10 - INTERPRETATION AND MAPPING**

The Director has the ultimate responsibility for maintaining the FSH Overlay District on the City of Sandy Zoning Map, determining on-site measuring methods, and otherwise interpreting the provisions of this chapter. Technical terms used in this chapter are defined in Chapter 17.10, Definitions. This chapter does not regulate development on lots or parcels entirely outside the FSH Overlay District.

- A. FSH Overlay District. The only areas subject to the restrictions and prohibitions of the FSH overlay district are those indicated on the City of Sandy Zoning Map on file in the Planning Department. This chapter does not regulate lots or parcels entirely outside the FSH Overlay District.

*Response: The city's Zoning Map dated May 18, 2018 shows that only the northeast corner of the subject property is affected by the FSH Overlay and the city's FSH Overlay Analysis map dated December 11, 2012 does not identify any restricted areas on the subject property. The applicant hired a wetland expert to evaluate the property to determine if any wetlands or waters of the state exist on the subject property. As detailed in Exhibit G submitted with this application, this memo indicates "there is no evidence of intermittent or perennial flow on the site" and no wetlands are present.*

*As part of the completeness items, the City requested the applicant map the FSH Overlay on the site (including 25% slopes and setbacks, 200 feet from the top of bank of Tickle Creek, 100 ft. from the top of bank of other streams, wetlands with setback, etc.) and pay a Type III FSH review fee. The applicant is confused by this request since this code section clearly states the "only areas subject to the restrictions and prohibitions of the FSH overlay district are this indicated on the City of Sandy Zoning Map on file in the Planning Department".*

*Regardless, as requested the applicant's Engineer completed the FSH overlay mapping as shown on Sheet 4.*

- B. Development Approval Required. No development shall occur within the FSH overlay district without first obtaining City approval under the provisions of this chapter. The Director shall notify the Oregon Division of State Lands whenever any inventoried wetland is proposed for development, in accordance with ORS 227.350. In riverine situations, the Director shall notify adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse, and submit copies of such notification to the administrator.

*Response: As shown on the Preliminary Plat Map, lots are proposed to be platted within the FSH overlay district, but no development will occur in this area.*

- C. Applicant Responsibilities. The applicant for alteration or development within the FSH overlay district shall be responsible for preparing a survey of the entire site, based on site specific field surveys or Corps of Engineers data that precisely maps and delineates the following areas:

1. The name, location and dimensions of affected streams or rivers, and the tops of their respective banks.

*Response: As noted in the section above, no development is proposed within the FSH overlay district on the subject property.*

2. 100-year floodplain and floodway boundaries and elevations as determined by the June 17, 2008 FIS for Clackamas County and Incorporated Areas.

*Response: The 100-year floodplain or floodway boundaries have not been identified for this portion of Tickle Creek and does not affect the subject property.*

3. The City of Sandy FSH overlay district boundary as depicted on the City of Sandy FSH Map.
4. The water quality and slope setback area(s) as defined in Section 17.60.30.
5. The size and location of locally significant wetlands shall be determined based on the City of Sandy Locally Significant Wetland Inventory (2002) unless modified by a wetland delineation approved by the Oregon Division of State Lands and submitted to the City. Wetland delineations that have formal concurrence from the Division of State Lands shall be valid for the period specified in that agency's administrative rules.
6. Steep slope areas where the slope of the land is 25% or greater within the FSH overlay district boundary.
7. The area enclosed by a continuous line, measured 25 feet horizontally, parallel to and upland from the top of a steep slope area, where the top of the steep slope is within the FSH overlay district boundary.
8. Existing public rights-of-way, structures, roads and utilities.
9. Natural vegetation, including trees or tree clusters and understory within the FSH Overlay District boundary.
10. Existing and proposed contours at 2-foot intervals.

*Response: The applicant has shown the FSH Overlay on Sheet 4. This boundary is included on all plan sheets.*

#### **17.60.20 - PERMITTED USES AND ACTIVITIES**

A. Restricted Development Areas. Restricted development areas within the FSH overlay district as shown on the City of Sandy Zoning Map include:

1. Slopes of 25% or greater that (a) encompass at least 1,000 square feet and (b) have an elevation differential of at least 10 feet.
2. Protected water features, including locally significant wetlands, wetland mitigation areas approved by the Division of State Lands, and perennial streams.
3. Required setback areas as defined in section 17.60.30.

*Response: No development is proposed within the FSH overlay as identified on either the city's official Zoning Map or the applicant's mapped boundary.*

B. Permitted Uses. Permitted uses within restricted development areas are limited to the following:

*Response: None of the uses identified in this section are proposed within the FSH overlay on the subject property.*

C. Platting of New Lots. No new lot shall be platted or approved for development that is exclusively in restricted development areas as defined in subsection 17.60.20.A.

*Response: As shown on the Preliminary Plat several of the lots are proposed to be platted within the FSH overlay. All of these lots have sufficient area to ensure development can occur outside the FSH overlay.*

#### **17.60.30 - REQUIRED SETBACK AREAS**

A. Required Setbacks. The required special setback(s) shall be:

1. 70 feet from the top of bank of Tickle Creek;
3. 25 feet around the edge of any mapped locally significant wetland; and
4. 25 feet from the top of any 25% slope break where the slope break occurs within the FSH overlay district as mapped by the city.

*Response: These boundaries are identified as applicable on the applicant's FSH mapping included on Sheet 4.*

B. Minimize Impacts. Natural vegetation shall be preserved and enhanced and excavation minimized within required water quality setback areas.

*Response: No disturbance or development is proposed within water quality setback areas on the subject property.*

#### **17.60.40 - REVIEW PROCEDURES**

Review of development requests within the FSH Overlay District shall occur subject to the following procedures. Unless otherwise indicated below, the

Director may approve Type I permits over the counter or following a field check. Type II and III development applications shall be reviewed to ensure consistency with Section 17.60.60-70. Section 17.60.50 special reports shall also be required, unless specifically exempted by the Director.

*Response: As noted above, no development is proposed within the FSH Overlay District.*

#### **17.60.80 - WATER QUALITY TREATMENT FACILITIES**

Tickle Creek, the Sandy River and associated natural drainage ways are vital to Sandy's recreationally based economy and to the quality of life of Sandy residents. Placement of water quality facilities shall be limited as follows:

- A. The water quality facility shall not be constructed in restricted development areas, except where necessary to serve approved development within restricted development areas (e.g., a road) and where no reasonable alternative exists in buildable areas of the site.
- B. Where the approval authority determines that a more efficient and effective regional site exists within the sub-basin, the water quality facility may be constructed off-site.

*Response: The proposed water quality (Tract A) is located outside the FSH overlay.*

#### **CHAPTER 17.66 - ADJUSTMENTS AND VARIANCES**

Adjustments and variances are procedures to vary development standards normally applied to a particular district.

*Response: The applicant is requesting three variances with this application as follows:*

- *Variance No. 1 - Type III Special Variance to Section 17.82.20 to allow homes on lots adjacent to Jacoby Road to face the internal local street rather than Jacoby Road;*
- *Variance No. 2 - Type III Variance to Section 17.100.120(A) regarding two tiers of lots.*
- *Variance No. 3 - Type III Variance to Section 17.100.120(B) regarding block length standard.*

**VARIANCE NO. 1** - The applicant is requesting a Type III variance to Section 17.82.20 to allow homes constructed on lots adjacent to Jacoby Road to have their front doors face the internal local street rather than Jacoby Road. The City's Transit Master Plan identifies the portion of Jacoby Road from Dubarko Road to Cascadia Village Drive as a future transit route. Section 17.82.10 indicates that the requirements of Chapter 17.82 are only applicable to properties within 400 feet of an existing or future transit route. Only Lot 30 is considered a double frontage lot with access proposed from Camden Court.

- A. The circumstances necessitating the variance are not of the applicant's making.

*Response: The applicant is requesting a variance to orient the homes adjacent to Jacoby Road towards the internal local street. The location and roadway classification of Jacoby Road is not of the applicant's making and these lots are restricted from gaining access Jacoby Road by Section 17.100.220(E). In addition, a grade differential exists between the elevation of the sidewalk along Jacoby Road and the future homes located on some of these lots making construction of a pedestrian connection more challenging. The applicant also wants to ensure that these lots are provided with a large private backyard which is desirable selling feature for a large lot, and is concerned construction of a pedestrian connection through this yard will limit the desirability of this feature. In addition, Chapter 17.84 requires Camden Court to be spaced at least 150 feet from the intersection of Woodstock Street with Jacoby Road. As a result, Lot 30 is considerably deeper than it would otherwise be and the backyard on this lot will be roughly 40 deep. This added depth will separate this home from Jacoby Road and ensure a spacious backyard. To require construction of a pedestrian connection through this yard would defeat the benefit of this configuration. All other lots (Lots 9, 10, and 32) that may be subject to these section are corner lots and are best suited to be oriented to the internal local street as the lots next to them will be.*

- B. The hardship does not arise from a violation of this Code, and approval will not allow otherwise prohibited uses in the district in which the property is located.

*Response: Approval of this variance would allow the property to be developed with large lots featuring a relatively large private backyard. This configuration is similar to all other lots in the subdivision and the majority of similarly sized lots in the City of Sandy. Approval of a variance to this standard will allow homes to be constructed on these lots similar to homes constructed directly across Jacoby Road from the subject property. Approval of this variance will not allow otherwise prohibited uses.*

- C. Granting of the variance will not adversely affect implementation of the Comprehensive Plan.

*Response: The Sandy Comprehensive Plan contains limited language specifically related to the proposed code requirement. Goal 12, Transportation however does include the following policies:*

*Pedestrian Friendly Street and Streetscape Design*

- 8. Encourage the planting of street trees in tree-deficient area of the city.*
- 10. Encourage the development of sidewalks on both sides of all streets, especially in high pedestrian activity areas such as near schools and in the downtown area.*
- 11. Develop street, bicycle, and pedestrian facilities that encourage pedestrian- friendly streetscapes.*

*If the requested variance is approved, all homes constructed in the subdivision will be provided with a street and sidewalk in front of the home that will connect to the sidewalk along Jacoby Road. This streetscape will include the planting of street trees as required by code. It would hard to imagine how approval of this variance would adversely affect implementation of policies of the Comprehensive Plan.*

- D. The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.  
*Response: Approval of this variance to allow homes on lots adjacent to Jacoby Road to face the internal street rather than Jacoby Road will have no effect on the public welfare or other property in the vicinity. Homes directly across Jacoby Road from the subject property have a similar configuration to what is being proposed.*
- E. The development will be the same as development permitted under this code and City standards to the greatest extent that is reasonably possible while permitting some economic use of the land.  
*Response: Approval of this variance will allow homes to be constructed in a manner that is similar to the majority of homes in the city. Some examples of homes constructed under similar circumstances include:*
- *Cascadia Village - between Wallingford Ave. and Jacoby Road (across Jacoby from the proposed subdivision);*
  - *Timberline Trails Subdivision - between Dubarko and Wall St;*
  - *Sandy Bluff Subdivision - south side of Coralburst St;*
  - *Sandy Bluff Annex - west side of Penny Ave;*
  - *Hamilton Ridge - southern section of Hamilton Ridge Drive;*
  - *Sleepy Hollow Subdivision - between Van Tassel and Sandy Heights;*
  - *Deer Pointe - west side of Antler Ave.; and*
  - *Deer Pointe - between Highway 26 and Meadow Ave.*
- F. Special circumstances or conditions apply to the property which do not apply generally to other properties in the same zone or vicinity, and result from lot size or shape (legally existing prior to the effective date of this Code), topography, or other circumstances over which the applicant has no control.  
*Response: The applicant is requesting approval of this variance because of topographic considerations and the physical characteristics of the subject lots. Lot 30 proposed to be accessed from and face Camden Court is approximately 130 feet. This added depth will allow a large home to be constructed on this lots with a substantial backyard. These characteristics are somewhat unique and very desirable in the City of Sandy. The other lots that may be subject to this standard are corner lots.*
- VARIANCE NO. 2** - The applicant is requesting a variance to Section 17.100.120(A) for the block containing Lot 30. Section 17.100.120(A) Blocks, contains the following language: “Blocks shall have sufficient width to provide for two tiers of

lots at appropriate depths. However, exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features.”

**Response:** Based on input received at the pre-application conference, City staff indicated the applicant will need to apply for a variance to Section 17.100.120(A) for Lot 30. As shown on submitted plans the separation between Jacoby Road and Camden Court contains only a single tier of lots. This design is due to topographic and natural resource constraints of the property associated with the location of Tickle Creek and steep slopes. The language in this section specifies that, “exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features”. The language in this section suggests that granting an exception without requiring a variance is the preferred method to resolve conflicts with this section. There are numerous examples in the city of subdivisions that have been approved without requiring a variance to this standard. These include the following:

- Cascadia Village - between Wallingford Ave. and Jacoby Road (across Jacoby from the proposed subdivision);
- Timberline Trails Subdivision - between Dubarko and Wall St;
- Sandy Bluff Subdivision - south side of Coralburst St;
- Sandy Bluff Annex - west side of Penny Ave;
- Hamilton Ridge - southern section of Hamilton Ridge Drive;
- Salmon Creek Estates - north side of Chinook St;
- Sleepy Hollow Subdivision - between Van Tassel and Sandy Heights;
- Deer Pointe - west side of Antler Ave.; and
- Deer Pointe - between Highway 26 and Meadow Ave.

The variance criteria regarding the requested variance are addressed below as requested.

- A. The circumstances necessitating the variance are not of the applicant’s making.

**Response:** Tickle Creek flows through the northeast corner of the subject property and moderately steep slopes descend from the upper parts of the property down towards the creek. The location of these features limit the creation of a typical two tier lot development pattern. In addition, Jacoby Road is classified as a collector street and direct access to lots from a local street (proposed cul-de-sac) is preferred. A cul-de-sac is proposed to provide access to the five lots in this area. Due to unique site constraints, the circumstances necessitating the variance are not of the applicant’s making.

- B. The hardship does not arise from a violation of this Code, and approval will not allow otherwise prohibited uses in the district in which the property is located.

*Response: The requested variance is necessary to allow an efficient development pattern on the subject property. The hardship created by requiring compliance with the two tier standard in this section does not arise from a violation of the Code and approval of this variance will not allow otherwise prohibited uses in the SFR zoning district in which the property is located. Without approval of this variance development of this portion of the property would be severely limited.*

- C. Granting of the variance will not adversely affect implementation of the Comprehensive Plan.

*Response: As noted above, a similar design has been approved and constructed in a number of other places through-out the community. The proposed request is not unique and to allow a single tier of lots in this portion of the development will not set a precedence or adversely affect implementation of the Comprehensive Plan. A review of the Comprehensive Plan does not reveal any policies specifically addressing this standard.*

- D. The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.

*Response: The requested variance will provide the developer with increased flexibility in the development of the lots affected by this request. The location and conditions of the variance will have no effect on adjacent or surrounding properties. Approval of the variance will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.*

- E. The development will be the same as development permitted under this code and City standards to the greatest extent that is reasonably possible while permitting some economic use of the land.

*Response: The proposed design is due to the unique topographic and natural resource constraints of the property associated with the location of Tickle Creek and steep slopes. The language in this section specifies that certain conditions warrant an exception to this standard: "blocks adjacent to arterial streets or natural features". The language in this section suggests that granting an exception without requiring a variance is the preferred method to resolve conflicts with this section. As noted above, numerous examples exist in the city of subdivisions that have been approved without requiring a variance to this standard. These include the following:*

- *Cascadia Village - between Wallingford Ave. and Jacoby Road (across Jacoby from the proposed subdivision);*
- *Timberline Trails Subdivision - between Dubarko and Wall St;*
- *Sandy Bluff Subdivision - south side of Coralburst St;*
- *Sandy Bluff Annex - west side of Penny Ave;*
- *Hamilton Ridge - southern section of Hamilton Ridge Drive;*
- *Salmon Creek Estates - north side of Chinook St;*



- *Sleepy Hollow Subdivision - between Van Tassel and Sandy Heights;*
- *Deer Pointe - west side of Antler Ave.; and*
- *Deer Pointe - between Highway 26 and Meadow Ave.*

*Because of physical limitations associated with the classification of Jacoby Road, steep slopes and the location of Tickle Creek, development of this portion of the property is challenging. Approval of an exception to this standard or variance will allow the property to be developed to the greatest extent that is reasonably possible.*

- F. Special circumstances or conditions apply to the property which do not apply generally to other properties in the same zone or vicinity, and result from lot size or shape (legally existing prior to the effective date of this Code), topography, or other circumstances over which the applicant has no control.  
*Response: As discussed above, the subject property contains unique circumstances (collector street, steep slopes, and creek) that warrant approval of an alternative design. The applicant does not have any control over these circumstances. Approval of this variance will result in a similar lot configuration as a number of previously approved subdivisions located in the city.*

**VARIANCE NO. 3** - The applicant requests a variance to Section 17.100.120(B) block length standard for the north side of Woodstock Street from Camden Court (cul-de-sac) to the end of this street on the subject property.

This standard states: **Residential Blocks**. Blocks fronting local streets shall not exceed 400 feet in length, unless topographic, natural resource, or other similar physical conditions justify longer blocks. Blocks may exceed 400 feet if approved as part of a Planned Development, Specific Area Plan, adjustment or variance.  
*Response: The submitted plan features a block on the north side of Woodstock St. from Camden Court to the eastern property line of 420 feet, approximately 20 feet longer than allowed by this section. This design is due the unique topographic conditions of the property and the location of Tickle Creek prohibiting another street to be constructed north of Woodstock Street. As shown on Sheet 8, Future Street Plan, the extension of Woodstock Street to the east of the subject property provides opportunities to provide public access to the creek corridor if it desired in the future. This section clearly identifies an adjustment or variance*

- A. The circumstances necessitating the variance are not of the applicant's making.  
*Response: The location of steep slopes and Tickle Creek limit construction of a north-south street north of Woodstock Street. The location of these natural features are not of the applicant's making.*

- B. The hardship does not arise from a violation of this Code, and approval will not allow otherwise prohibited uses in the district in which the property is located.

*Response: The proposed block exceeds the 400 foot maximum block length standard by approximately 20 feet. Because of the physical constraints discussed above, the construction of a north-south street in this location is also not desirable as this street is extended to the east. Granting a variance to allow construction of the street as proposed would not allow otherwise prohibited uses in the SFR zoning district.*

- C. Granting of the variance will not adversely affect implementation of the Comprehensive Plan.

*Response: Due to the unique physical constraints and the location of Tickle Creek, it is not practicable to construct a street north of Woodstock Street. No street is shown in this location on the city's Transportation System Plan or any other long range planning document. Granting this variance will further the City's goal of protecting natural resources and will not adversely affect implementation of the Comprehensive Plan.*

- D. The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.

*Response: The extension of Woodstock Street to the east will provide an opportunity for the adjacent property to gain access to this street and extend utilities for future development. Property to the north of Tickle Creek in the Timberline Trails Subdivision has already been provided access. Construction of a new street north of Woodstock Street would be significantly more injurious to properties north of the subject property than not constructing this street. Granting this variance will not adversely affect the public welfare or be materially injurious to other property in the vicinity.*

- E. The development will be the same as development permitted under this code and City standards to the greatest extent that is reasonably possible while permitting some economic use of the land.

*Response: Approving this requested variance will allow the property to be developed with a subdivision of large lots for future residential home construction. The applicant proposes establishing a pedestrian access to the Tickle Creek corridor from the north end of Camden Court. Approval of the variance will be similar to development permitted in compliance with this standard.*

- F. Special circumstances or conditions apply to the property which do not apply generally to other properties in the same zone or vicinity, and result from lot size or shape (legally existing prior to the effective date of this Code), topography, or other circumstances over which the applicant has no control.

*Response: As noted above, the location of Tickle Creek and topographic constraints make construction of a street north of Woodstock Street, east of*

*Camden Court impracticable and undesirable. These conditions are generally unique to the subject property and result from physical limitations of the property.*

## **CHAPTER 17.80 - ADDITIONAL SETBACKS ON COLLECTOR AND ARTERIAL STREETS**

### **17.80.10 - APPLICABILITY**

These regulations apply to all property abutting the following streets:

#### **A. Minor Arterials.**

- SE 362nd Avenue (Duncan Road)
- Bluff Road
- Kelso Road
- Ten Eyck Road
- Langensand Road
- Bornstedt Road
- Bell Street

#### **B. CollectorStreets.**

- Industrial Way
- Sandy Heights (Wewer Road) Street
- Tupper Road
- Meinig Road (south of Proctor)
- Meinig Road (First Avenue)
- McCormick
- Van Fleet Street
- Gary Street
- Pleasant Street
- Sunset Street

#### **C. Residential Minor Arterial**

- Dubarko Road

*Response: The subject property is not located adjacent to any of the streets listed in this section.*

### **17.80.20 - SPECIFIC SETBACKS**

Any structure located on streets listed above or identified in the Transportation System Plan as arterials or collectors shall have a minimum setback of 20 feet measured from the property line. This applies to applicable front, rear and side yards.

*Response: The City's Transportation System Plan identifies Jacoby Road adjacent to the subject property as a "Collector" street. The Preliminary Plat shows the proposed building envelopes for all lots adjacent to this road will maintain a minimum 20 foot setback to this road.*

## **CHAPTER 17.82 - SPECIAL SETBACKS ON TRANSIT STREETS**

### **17.82.00 INTENT**

The intent is to provide for convenient, direct, and accessible pedestrian access to and from public sidewalks and transit facilities, provide a safe, pleasant and enjoyable pedestrian experience by connecting activities within a structure to the adjacent sidewalk and/or transit street; and promote the use of pedestrian, bicycle, and transit modes of transportation to retail and commercial activities.

*Response: The applicant has submitted a variance request to the requirements of this section as detailed in Chapter 17.66 above to allow homes along Jacoby Road to face the adjacent internal local street.*

## **CHAPTER 17.84 - IMPROVEMENTS REQUIRED WITH DEVELOPMENT**

### **17.84.20 - TIMING OF IMPROVEMENTS**

A. All improvements required by the standards in this chapter shall be installed concurrently with development, as follows:

1. Where a land division is proposed, each proposed lot shall have required public and franchise utility improvements installed or financially guaranteed in accordance with the provisions of Chapter 17 prior to approval of the final plat.

*Response: All lots in the proposed subdivision will be required to install public and franchise utility improvements or financially guaranteed these improvements prior to final plat approval.*

2. Where a land division is not proposed, the site shall have required public and franchise utility improvements installed or financially guaranteed in accordance with the provisions of Chapter 17 prior to temporary or final occupancy of structures.

*Response: This section is not applicable because a land division is proposed.*

B. Where specific approval for a phasing plan has been granted for a planned development and/or subdivision, improvements may similarly be phased in accordance with that plan.

*Response: The applicant does not intend constructing the proposed subdivision in phases.*

### **17.84.30 - PEDESTRIAN AND BICYCLIST REQUIREMENTS**

A. Sidewalks shall be required along both sides of all arterial, collector, and local streets, as follows:

1. Sidewalks shall be a minimum of 5 ft. wide on local streets. The sidewalks shall be separated from curbs by a tree planting area that provides separation between sidewalk and curb, unless modified in accordance with Subsection 3 below.

*Response: All proposed sidewalks on the internal (local) streets will be five feet wide as required and separated from curbs by a tree planting area.*

2. Sidewalks along arterial and collector streets shall be separated from curbs with a planting area, except as necessary to continue an existing curb-tight sidewalk. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of 6 ft. wide.

*Response: A six foot sidewalk is proposed to be constructed along Jacoby Road and will include a planter strip as required.*

3. Sidewalk improvements shall be made according to city standards, unless the city determines that the public benefit in the particular case does not warrant imposing a severe adverse impact to a natural or other significant feature such as requiring removal of a mature tree, requiring undue grading, or requiring modification to an existing building. Any exceptions to the standards shall generally be in the following order.
  - a) Narrow landscape strips
  - b) Narrow sidewalk or portion of sidewalk to no less than 4 feet in width
  - c) Eliminate landscape strips
  - d) Narrow on-street improvements by eliminating on-street parking
  - e) Eliminate sidewalks

*Response: No exceptions or modifications to the sidewalk standards of this section are requested with this application.*

4. The timing of the installation of sidewalks shall be as follows:
  - a) Sidewalks and planted areas along arterial and collector streets shall be installed with street improvements, or with development of the site if street improvements are deferred.
  - b) Sidewalks along local streets shall be installed in conjunction with development of the site, generally with building permits, except as noted in (c) below.
  - c) Where sidewalks on local streets abut common areas, drainageways, or other publicly owned or semi-publicly owned areas, the sidewalks and planted areas shall be installed with street improvements.

*Response: The applicant intends to construct all sidewalk improvements as required by this section. The sidewalk along Jacoby Road will be constructed prior to final plat approval, or at the time of home construction whichever the city prefers. Sidewalks along the local streets will be constructed at the time of home construction.*

- B. Safe and convenient pedestrian and bicyclist facilities that strive to minimize travel distance to the extent practicable shall be provided in conjunction with new development within and between new subdivisions, planned developments, commercial developments, industrial areas, residential areas, public transit stops, school transit stops, and neighborhood activity centers such as schools and parks, as follows:

1. For the purposes of this section, “safe and convenient” means pedestrian and bicyclist facilities that: are reasonably free from hazards which would interfere with or discourage travel for short trips; provide a direct route of travel between destinations; and meet the travel needs of pedestrians and bicyclists considering destination and length of trip.

*Response: No pedestrian or bicycle facilities other than sidewalks are proposed. The applicant had originally identified a pedestrian access from the end of Camden Court to connect with a future trail along Tickle Creek. After reviewing the location and details of facility further, the applicant’s Engineer has identified the preferred location for this facility to be on the adjacent property to the east of the subject property. The reasons this facility should not be located on the subject property is due to steep slopes. As shown on Sheet 8, a future Tickle Creek Trail is likely to be located on the north side of the creek. The location of a connector/access trail will need to accommodate construction of bridge to cross the creek from the vicinity of the subject property in order to reach the trail. The applicant does not favor constructing this facility on the subject property due to steep grades and resulting construction challenges (stairs with handrail) associated with constructing the facility on steep slopes.*

2. To meet the intent of “B” above, right-of-ways connecting cul-de-sacs or passing through unusually long or oddly shaped blocks shall be a minimum of 15 ft. wide with 8 feet of pavement.

*Response: As noted above, no facilities are proposed.*

3. 12 feet wide pathways shall be provided in areas with high bicycle volumes or multiple use by bicyclists, pedestrians, and joggers.

*Response: The details of the Tickle Creek detail have not been determined in the vicinity of the subject property. No facility is proposed with the subdivision.*

4. Pathways and sidewalks shall be encouraged in new developments by clustering buildings or constructing convenient pedestrian ways. Pedestrian walkways shall be provided in accordance with the following standards:

- a) The pedestrian circulation system shall be at least five feet in width and shall connect the sidewalk on each abutting street to the main entrance of the primary structure on the site to minimize out of direction pedestrian travel.
- b) Walkways at least five feet in width shall be provided to connect the pedestrian circulation system with existing or planned pedestrian facilities which abut the site but are not adjacent to the streets abutting the site.
- c) Walkways shall be as direct as possible and avoid unnecessary meandering.

*Response: No pedestrian pathways are proposed, only sidewalks adjacent to public streets.*

- d) Walkway/driveway crossings shall be minimized. Internal parking lot design shall maintain ease of access for pedestrians from abutting streets, pedestrian facilities, and transit stops.
- e) With the exception of walkway/driveway crossings, walkways shall be separated from vehicle parking or vehicle maneuvering areas by grade, different paving material, painted crosshatching or landscaping. They shall be constructed in accordance with the sidewalk standards adopted by the City. (This provision does not require a separated walkway system to collect drivers and passengers from cars that have parked on site unless an unusual parking lot hazard exists).
- f) Pedestrian amenities such as covered walkways, awnings, visual corridors and benches will be encouraged. For every two benches provided, the minimum parking requirements will be reduced by one, up to a maximum of four benches per site. Benches shall have direct access to the circulation system.

*Response: The requirements of these sections are not applicable to the proposed subdivision.*

- C. Where a development site is traversed by or adjacent to a future trail linkage identified within the Transportation System Plan, improvement of the trail linkage shall occur concurrent with development. Dedication of the trail to the City shall be provided in accordance with 17.84.80.

*Response: No trails are identified in the City's Transportation System Plan or Parks Master Plan on the subject property.*

- D. To provide for orderly development of an effective pedestrian network, pedestrian facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).

*Response: No pedestrian facilities, except sidewalks are proposed.*

- E. To ensure improved access between a development site and an existing developed facility such as a commercial center, school, park, or trail system, the Planning Commission or Director may require off-site pedestrian facility improvements concurrent with development.

*Response: No off-site pedestrian improvements have been identified.*

**17.84.40 - TRANSIT AND SCHOOL BUS TRANSIT REQUIREMENTS**

- A. Development sites located along existing or planned transit routes shall, where appropriate, incorporate bus pull-outs and/or shelters into the site design. These improvements shall be installed in accordance with the guidelines and standards of the transit agency. School bus pull-outs and/or shelters may also be required, where appropriate, as a condition of approval for a residential development of greater than 50 dwelling units where a school bus pick-up point is anticipated to serve a large number of children.

*Response: The subject property is not located along an existing or planned transit route as shown on the city's Transit Master Plan or does it contain greater than 50 dwellings (32 proposed). During the pre-application conference the city Transit Manager identified a required transit amenity at the northwest corner of the property adjacent to Tract A. The location of this facility is shown on the plan set.*

- B. New developments at or near existing or planned transit or school bus transit stops shall design development sites to provide safe, convenient access to the transit system, as follows:
  - 1. Commercial and civic use developments shall provide a prominent entrance oriented towards arterial and collector streets, with front setbacks reduced as much as possible to provide access for pedestrians, bicycles, and transit.
  - 2. All developments shall provide safe, convenient pedestrian walkways between the buildings and the transit stop, in accordance with the provisions of 17.84.30 B.

*Response: The proposed residential subdivision complies with the requirements of this section.*

#### **17.84.50 - STREET REQUIREMENTS**

- A. Traffic evaluations may be required of all development proposals in accordance with the following:
  - 1. A proposal establishing the scope of the traffic evaluation shall be submitted for review to the City Engineer. The evaluation requirements shall reflect the magnitude of the project in accordance with accepted traffic engineering practices. Large projects should assess all nearby key intersections. Once the scope of the traffic evaluation has been approved, the applicant shall present the results with and an overall site development proposal. If required by the City Engineer, such evaluations shall be signed by a Licensed Professional Civil Engineer or Licensed Professional Traffic Engineer licensed in the State of Oregon.
  - 2. If the traffic evaluation identifies level-of-service conditions less than the minimum standard established in the Transportation System Plan, improvements and funding strategies mitigating the problem shall be considered concurrent with a development proposal.

*Response: A Traffic Impact Study has been included with this application as requested by the City. This study does not identify any required mitigation.*
- B. Location of new arterial streets shall conform to the Transportation System Plan in accordance with the following:
  - 1. Arterial streets should generally be spaced in one-mile intervals.
  - 2. Traffic signals should generally not be spaced closer than 1500 ft. for reasonable traffic progression.



*Response: No new arterial streets are required as part of this project.*

C. Local streets shall be designed to discourage through traffic. NOTE: for the purposes of this section, “through traffic” means the traffic traveling through an area that does not have a local origination or destination. To discourage through traffic and excessive vehicle speeds the following street design characteristics shall be considered, as well as other designs intended to discourage traffic:

1. Straight segments of local streets should be kept to less than a quarter mile in length. As practical, local streets should include traffic calming features, and design features such as curves and “T” intersections while maintaining pedestrian connectivity.
2. Local streets should typically intersect in “T” configurations rather than 4-way intersections to minimize conflicts and discourage through traffic. Adjacent “T” intersections shall maintain a minimum of 150 ft. between the nearest edges of the 2 rights-of-way.

*Response: The proposed subdivision does not include any long straight street segments. The distance between the proposed cul-de-sac and Jacoby Road is 150 feet in accordance with this section. All streets have been designed in accordance with the requirements of these sections.*

3. Cul-de-sacs should generally not exceed 400 ft. in length nor serve more than 20 dwelling units, except in cases where existing topography, wetlands, or drainage systems or other existing features necessitate a longer cul-de-sac in order to provide adequate access to an area. Cul-de-sacs longer than 400 feet or developments with only one access point may be required to provide an alternative access for emergency vehicle use only, install fire prevention sprinklers, or provide other mitigating measures, determined by the City.

*Response: Camden Court, a proposed cul-de-sac, is approximately 219 feet long and will serve five lots in compliance with this section. Servicing this area of the subject property is challenging due to topographic and natural resource considerations and this is the reason a cul-de-sac has been proposed.*

D. Development sites shall be provided with access from a public street improved to City standards in accordance with the following:

1. Where a development site abuts an existing public street not improved to City standards, the abutting street shall be improved to City standards along the full frontage of the property concurrent with development.

*Response: All homes will gain access from a public street improved to city standards in compliance with this section.*

2. Half-street improvements are considered the minimum required improvement. Three quarter-street or full-street improvements shall be

required where traffic volumes generated by the development are such that a half-street improvement would cause safety and/or capacity problems. Such a determination shall be made by the City Engineer.

*Response: All new streets are proposed as full street improvements with the exception of the extension of Newton Street on the subject property. This street is proposed as a full street adjacent to Lot 9, a three-quarter street adjacent to Lots 2-8, tapering from a three-quarter street to a half street on Lot 2, and is proposed to be constructed as a half street adjacent to Lot 1. The applicant is proposing tapering this street to a one-half street improvement at the east end of the subdivision in order to allow this street to be extended to the east without impacting the existing home located at 19260 SE Jacoby Road. As proposed this road when extended as a one-half street would be located about 15 feet from the front porch of this home rather than one-foot if this road were extended as a three-quarter street.*

3. To ensure improved access to a development site consistent with policies on orderly urbanization and extension of public facilities the Planning Commission or Director may require off-site improvements concurrent with development. Off-site improvement requirements upon the site developer shall be reasonably related to the anticipated impacts of the development.  
*Response: No off-site improvements have been identified or are warranted with construction of this subdivision.*

4. Reimbursement agreements for 3/4 street improvements (i.e., curb face to curb face) may be requested by the developer per Chapter 12 of the SMC.  
*Response: The applicant may request reimbursement for this street per the requirements of Chapter 12 following construction of this improvement.*

5. A 1/2 street improvement includes curb and pavement 2 feet beyond the center line of the right-of-way. A 3/4 street improvement includes curbs on both sides of the side and full pavement between curb faces.  
*Response: Both the short section of the one-half street section and the three-quarter street section are proposed to be constructed in accordance with these standards.*

- E. As necessary to provide for orderly development of adjacent properties, public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property(ies) in accordance with the following:
  1. Temporary dead-ends created by this requirement to extend street improvements to the edge of adjacent properties may be installed without turn-arounds, subject to the approval of the Fire Marshal.
  2. In order to assure the eventual continuation or completion of the street, reserve strips may be required.

*Response: The proposed street layout results in one temporary dead-end street (Woodstock Street) and one street that will be used to provide access to the two rural dwellings located at 19260 and 19270 Jacoby Road just east of the subject property (Newton Street). The applicant is aware the Fire Marshal will need to review the proposal. In addition, the applicant is aware that reserve strips will likely be required at the end of these streets.*

- F. Where required by the Planning Commission or Director, public street improvements may be required through a development site to provide for the logical extension of an existing street network or to connect a site with a nearby neighborhood activity center, such as a school or park. Where this creates a land division incidental to the development, a land partition shall be completed concurrent with the development.

*Response: The applicant does not anticipate that any public street improvements will be required to be extended beyond the site boundaries. No such improvements were identified at the pre-application conference.*

- G. Except for extensions of existing streets, no street names shall be used that will duplicate or be confused with names of existing streets. Street names and numbers shall conform to the established pattern in the surrounding area and be subject to approval of the Director.

*Response: The southern most proposed street is an extension of Newton Street and will carry the same name. The proposed names for the other streets in the subdivision have been selected to conform to names of New England towns, similar to those used in the Cascade Village Subdivision to the west. These names include: Camden Court, Woodstock Street, and Middlebury Avenue.*

- H. Location, grades, alignment, and widths for all public streets shall be considered in relation to existing and planned streets, topographical conditions, public convenience and safety, and proposed land use. Where topographical conditions present special circumstances, exceptions to these standards may be granted by the City Engineer provided the safety and capacity of the street network is not adversely affected. The following standards shall apply:

1. Location of streets in a development shall not preclude development of adjacent properties. Streets shall conform to planned street extensions identified in the Transportation Plan and/or provide for continuation of the existing street network in the surrounding area.

*Response: A future street plan is submitted with this application as Sheet 8. This plan shows that the proposal will facilitate and not preclude development on adjacent properties. No roads identified on the TSP are shown on the subject property.*

2. Grades shall not exceed 6 percent on arterial streets, 10 percent on collector streets, and 15 percent on local streets.

*Response: All streets in the proposed development are local streets. The maximum grade on these streets is less than the maximum allowed by this section.*

3. As far as practical, arterial streets and collector streets shall be extended in alignment with existing streets by continuation of the street centerline. When staggered street alignments resulting in "T" intersections are unavoidable, they shall leave a minimum of 150 ft. between the nearest edges of the two rights-of-way.

*Response: The alignment of Jacoby Road, a collector street, has already been established. The proposed plan features all street intersections a minimum of 150 feet between each other. The distance between Jacoby Road and the proposed cul-de-sac (Camden Court) is 150 feet and the distance between Camden Court and Middlebury Avenue to the east is approximately 193 feet in compliance with this standard.*

4. Centerline radii of curves shall not be less than 500 ft. on arterial streets, 300 ft. on collector streets, and 100 ft. on local streets.

*Response: All proposed streets in the subdivision with the exception of short segments of the western end of Newton Street are straight. The short segment of this street has a 100 foot centerline radii in compliance with this standard.*

5. Streets shall be designed to intersect at angles as near as practicable to right angles and shall comply with the following:

- a) The intersection of an arterial or collector street with another arterial or collector street shall have a minimum of 100 ft. of straight (tangent) alignment perpendicular to the intersection.
- b) The intersection of a local street with another street shall have a minimum of 50 ft. of straight (tangent) alignment perpendicular to the intersection.
- c) Where right angle intersections are not possible, exceptions can be granted by the City Engineer provided that intersections not at right angles have a minimum corner radius of 20 ft. along the right-of-way lines of the acute angle.
- d) Intersections with arterial streets shall have a minimum curb corner radius of 20 ft. All other intersections shall have a minimum curb corner radius of 10 ft.

*Response: All proposed streets are designed to intersect at right angles with the intersecting street and comply with the requirements of this section. Newton Street constructed on the subject property intersecting with Jacoby Road maintains a 50 foot straight tangent as required as shown on Sheets 1 and 5.*

6. Right-of-way and improvement widths shall be as specified by the Transportation System Plan. Exceptions to those specifications may be approved by the City Engineer to deal with specific unique physical constraints of the site.

*Response: The proposed right-of-way width of all full-width local streets is 50 feet in compliance this standard. The right-of-way width of the extension of Newton Street to be constructed along the southern property line is designed in compliance with the standards for a three-quarter street and a one-half street as applicable.*

- J. Private streets may be considered within a development site provided all the following conditions are met:

*Response: No private streets are proposed.*

#### **17.84.60 - PUBLIC FACILITY EXTENSIONS**

- A. All development sites shall be provided with public water, sanitary sewer, broadband (fiber), and storm drainage.

*Response: The submitted Utility Plan shows the location of proposed public water, sanitary sewer, and stormwater drainage facilities. Broadband fiber service will be detailed in construction plans.*

- B. Where necessary to serve property as specified in "A" above, required public facility installations shall be constructed concurrent with development.

*Response: All of the utilities identified above will be constructed concurrent with the development.*

- C. Off-site public facility extensions necessary to fully serve a development site and adjacent properties shall be constructed concurrent with development.

*Response: The applicant will extend all utilities as necessary to serve the development as required by this section.*

- D. As necessary to provide for orderly development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).

*Response: As shown on the submitted Utility Plan, all public facilities are proposed to be extended through the site to edge of adjacent properties.*

- E. Private on-site sanitary sewer and storm drainage facilities may be considered provided all the following conditions exist:

*Response: No private utilities are proposed.*

#### **17.84.70 - PUBLIC IMPROVEMENT PROCEDURES**

*Response: The applicant is aware of and intends to comply with the requirements of this section.*

#### 17.84.80 - FRANCHISE UTILITY INSTALLATIONS

These standards are intended to supplement, not replace or supersede, requirements contained within individual franchise agreements the City has with providers of electrical power, telephone, cable television, and natural gas services (hereinafter referred to as "franchise utilities").

- A. Where a land division is proposed, the developer shall provide franchise utilities to the development site. Each lot created within a subdivision shall have an individual service available or financially guaranteed prior to approval of the final plat.

*Response: Franchise utilities will be provided to all lots within the proposed subdivision as required. The location of these utilities will be identified on construction plans and installed or guaranteed prior to final plat approval.*

- B. Where necessary, in the judgment of the Director, to provide for orderly development of adjacent properties, franchise utilities shall be extended through the site to the edge of adjacent property(ies), whether or not the development involves a land division.

*Response: The applicant does not anticipate extending franchise utilities beyond the site.*

- C. The developer shall have the option of choosing whether or not to provide natural gas or cable television service to the development site, providing all of the following conditions exist:

1. Extension of franchise utilities through the site is not necessary for the future orderly development of adjacent property(ies);
2. The development site remains in one ownership and land division does not occur (with the exception of land divisions that may occur under the provisions of 17.84.50 F above); and
3. The development is non-residential.

*Response: The applicant anticipates installing natural gas and cable television service will be installed as required.*

- D. Where a land division is not proposed, the site shall have franchise utilities required by this section provided in accordance with the provisions of 17.84.70 prior to occupancy of structures.

*Response: A land division is proposed, as such this section is not applicable.*

- E. All franchise utility distribution facilities installed to serve new development shall be placed underground except as provided below. The following facilities may be installed aboveground:

1. Poles for street lights and traffic signals, pedestals for police and fire system communications and alarms, pad mounted transformers, pedestals, pedestal mounted terminal boxes and meter cabinets, concealed ducts, substations, or facilities used to carry voltage higher than 35,000 volts;

2. Overhead utility distribution lines may be permitted upon approval of the City Engineer when unusual terrain, soil, or other conditions make underground installation impracticable. Location of such overhead utilities shall follow rear or side lot lines wherever feasible.

*Response: All franchise utilities will be installed underground with the exception of street lights as allowed by this section.*

- F. The developer shall be responsible for making necessary arrangements with franchise utility providers for provision of plans, timing of installation, and payment for services installed. Plans for franchise utility installations shall be submitted concurrent with plan submittal for public improvements to facilitate review by the City Engineer.

*Response: The developer will make all necessary arrangements with franchise utility providers as required by this section.*

- G. The developer shall be responsible for installation of underground conduit for street lighting along all public streets improved in conjunction with the development in accordance with the following:

1. The developer shall coordinate with the City Engineer to determine the location of future street light poles. The street light plan shall be designed to provide illumination meeting standards set by the City Engineer.
2. The developer shall make arrangements with the serving electric utility for trenching prior to installation of underground conduit for street lighting.

*Response: The developer will install underground conduit for street lighting in accordance with the requirements of this section.*

#### **17.84.90 - LAND FOR PUBLIC PURPOSES**

- A. Easements for public sanitary sewer, water, storm drain, pedestrian and bicycle facilities shall be provided whenever these facilities are located outside a public right-of-way in accordance with the following:

1. When located between adjacent lots, easements shall be provided on one side of a lot line.
2. The minimum easement width for a single utility is 15 ft. The minimum easement width for two adjacent utilities is 20 ft. The easement width shall be centered on the utility to the greatest extent practicable. Wider easements may be required for unusually deep facilities.

*Response: A 15 foot wide easement is proposed to be centered on Lot 30 and Tract A for sanitary sewer service and a 20 foot wide easement adjacent to Jacoby Road on Lots 9, 10, 30, and 32 is proposed for sanitary sewer and stormwater purpose in compliance with this section. Ten foot private storm easements are located at the back of Lots 1 - 18, 19 - 25, 28, 29, 31, and 32. No other easements are proposed.*

- B. Public utility easements with a minimum width of 5 feet shall be provided adjacent to all street rights-of-way for franchise utility installations.

*Response: Despite the language in this section, eight foot wide public utility easements are provided along all lots adjacent to street rights-of-way for future franchise utility installations.*

- C. Where a development site is traversed by a drainageway or water course, a drainage way dedication shall be provided to the City.

*Response: No dedication along Tickle Creek is proposed at this time.*

- D. Where a development is traversed by, or adjacent to, a future trail linkage identified within the Transportation System Plan, dedications of suitable width to accommodate the trail linkage shall be provided. This width shall be determined by the City Engineer, considering the type of trail facility involved.

*Response: No future trail is identified in the TSP on subject property.*

- E. Where existing rights-of-way and/or easements within or adjacent to development sites are nonexistent or of insufficient width, dedications may be required. The need for and widths of those dedications shall be determined by the City Engineer.

*Response: The only existing right-of-way adjacent to the development is Jacoby Road. A ten foot dedication to accommodate improvements to road is proposed along the entire property adjacent to this road.*

- F. Where easement or dedications are required in conjunction with land divisions, they shall be recorded on the plat. Where a development does not include a land division, easements and/or dedications shall be recorded on standard document forms provided by the City Engineer.

*Response: All easements and dedications will be identified on the plat as required.*

#### **17.84.100 - MAIL DELIVERY FACILITIES**

*Response: The location and type of mail delivery facilities will be coordinated with the City Engineer and the Post Office as part of the construction plan process. The conceptual location of these facilities are shown on Sheet 7, Preliminary Parking Plan.*

### **CHAPTER 17.86 - PARKLAND and OPEN SPACE**

#### **17.86.00 - INTENT**

The availability of parkland and open space is a critical element in maintaining and improving the quality of life in Sandy. Land that features trees, grass and vegetation provides not only an aesthetically pleasing landscape but also buffers incompatible uses, and preserves sensitive environmental features and important resources. Parks and open space, together with support facilities, also help to meet the active and passive recreational needs of the population of Sandy. This chapter implements policies of Goal 8 of the Comprehensive Plan and the Parks Master Plan by outlining provisions for parks and open space in the City of Sandy.



*Response: The city's master plans do not show any parks or trails on the subject property. The subject property contains a small section of Tickle Creek at the northeast corner of the property. The subject property also contains relatively steep slopes behind Lots 19-21 and 26 - 28.*

#### **17.86.10 - MINIMUM PARKLAND DEDICATION REQUIREMENTS**

Parkland Dedication: New residential subdivisions, planned developments, multi-family or manufactured home park developments shall be required to provide parkland to serve existing and future residents of those developments.

*Response: The proposed residential subdivision is subject to the provisions of this chapter.*

1. The required parkland shall be dedicated as a condition of approval for the following:
  - a. Tentative plat for a subdivision or partition;
  - b. Planned Development conceptual or detailed development plan;
  - c. Design review for a multi-family development or manufactured home park; and
  - d. Replat or amendment of any site plan for multi-family development or manufactured home park where dedication has not previously been made or where the density of the development involved will be increased.

*Response: No parkland has been identified on the tentative plat.*

2. Calculation of Required Dedication: The required parkland acreage to be dedicated is based on a calculation of the following formula rounded to the nearest 1/100 (0.00) of an acre:

Required parkland dedication (acres) = (proposed units) x (persons/unit) x 0.0043 (per person park land dedication factor)

*Response: The proposed 32 lot subdivision results in the following formal: 32 (proposed units) x 3 (persons/unit) x 0.0043 (per person park land dedication factor) = 0.4128 rounded to 0.41.*

#### **17.86.40 - CASH IN LIEU OF DEDICATION**

At the city's discretion only, the city may accept payment of a fee in lieu of land dedication. The city may require payment in lieu of land when the park land to be dedicated is less than 3 acres. A payment in lieu of land dedication is separate from Park Systems Development Charges, and is not eligible for a credit of Park Systems Development Charges. The amount of the fee in lieu of land dedication (in dollars per acre) shall be set by City Council Resolution, and it shall be based on the typical market value of developed property (finished lots) in Sandy net of related development costs.

*Response: City staff has indicated they would consider recommending parks fee-in-lieu credit if the applicant dedicates parkland but a formal proposal has not been brought forward. The applicant requests the city consider providing park fee-in-lieu credit for any land dedication. The amount of this fee will be*

*determined based on the City Council Fee Resolution with approval of the subdivision.*

**CHAPTER 17.92 - LANDSCAPING AND SCREENING GENERAL STANDARDS - ALL ZONES**

**Response:** This chapter has limited applicability to subdivisions so only those applicable sections are reviewed in this submittal.

**17.92.10 - GENERAL PROVISIONS**

- A. Where landscaping is required by this Code, detailed planting plans shall be submitted for review with development applications. No development may commence until the Director or Planning Commission has determined the plans comply with the purposes clause and specific standards in this chapter. All required landscaping and related improvements shall be completed or financially guaranteed prior to the issuance of a Certificate of Occupancy.
- B. Appropriate care and maintenance of landscaping onsite and landscaping in the adjacent public right-of-way is the right and responsibility of the property owner, unless City ordinances specify otherwise for general public and safety reasons. If street trees or other plant materials do not survive or are removed, materials shall be replaced in kind within 6 months.
- C. Significant plant and tree specimens should be preserved to the greatest extent practicable and integrated into the design of a development. Trees of 25-inches or greater circumference measured at a height of 4-1/2 ft. above grade are considered significant. Plants to be saved and methods of protection shall be indicated on the detailed planting plan submitted for approval. Existing trees may be considered preserved if no cutting, filling, or compaction of the soil takes place between the trunk of the tree and the area 5-ft. outside the tree's drip line. Trees to be retained shall be protected from damage during construction by a construction fence located 5 ft. outside the dripline.  
*Response: City staff has recently started to use this section to specify tree protection within residential subdivisions. The applicant has submitted an interpretation request per the requirements of Chapter 17.14 with this application. This request asks that the Planning Commission make a formal determination regarding applicable tree protection regulations for residential subdivisions.*

**17.92.20 - MINIMUM IMPROVEMENTS - LANDSCAPING AND SCREENING**

**Response:** *The Single Family Residential zone is not listed in this section requiring minimum landscaping.*

**CHAPTER 17.98 - PARKING, LOADING, AND ACCESS REQUIREMENTS**

**17.98.10 GENERAL PROVISIONS**

- M. **Residential Parking Analysis Plan.** A Residential Parking Analysis Plan shall be required for all new residential planned developments, subdivisions, and partitions to include a site plan depicting all of the following:
- a. Location and dimension of required parking spaces as specified in Section 17.98.200.
  - b. Location of areas where parking is not permitted as specified in Sections 17.98.200(A)(3) and (5).
  - c. Location and design of parking courts (if applicable).
- Response: A Residential Parking Analysis Plan as required by this section is included as Sheet 7 of the plan set.*

**17.98.80 - ACCESS TO ARTERIAL AND COLLECTOR STREETS**

*Response: No lots are proposed to gain access from an arterial or collector street.*

**17.98.90 - ACCESS TO UNIMPROVED STREETS**

*Response: All streets proposed in the subdivision will be improved to city standards.*

**17.98.100 - DRIVEWAYS**

- A. A driveway to an off-street parking area shall be improved from the public roadway to the parking area a minimum width of 20 feet for a two-way drive or 12 feet for a one-way drive but in either case not less than the full width of the standard approach for the first 20 feet of the driveway.  
*Response: All lots will have a standard 24 foot wide curb cut and driveway approach.*
- B. A driveway for a single-family dwelling shall have a minimum width of 10 feet.  
*Response: All lots will have a standard 24 foot wide curb cut and driveway approach. Due to the narrow street frontage of Lots 27/28, these lots will likely be accessed by a joint curb cut serving both lots.*
- C. A driveway for a two-family dwelling shall have a minimum width of 20 feet. A driveway approach must be constructed in accordance with applicable city standards and the entire driveway must be paved with asphalt or concrete.  
*Response: All of the proposed lots will be constructed with a single family dwelling so this section is not applicable.*
- D. Driveways, aisles, turnaround areas and ramps shall have a minimum vertical clearance of twelve feet for their entire length and width but such clearance may be reduced in parking structures.  
*Response: All driveways will be designed in compliance with this standard.*
- E. No driveway shall traverse a slope in excess of 15 percent at any point along the driveway length.

*Response: All driveways will be designed in compliance with this standard.*

- F. The location and design of the driveway shall provide for unobstructed sight per the vision clearance requirements. Requests for exceptions to these requirements will be evaluated by the City Engineer considering the physical limitations of the lot and safety impacts to vehicular, bicycle, and pedestrian traffic.

*Response: All driveways will be designed in compliance with this standard.*

#### **17.98.110 - VISION CLEARANCE**

- A. Except within the Central Business District, vision clearance areas shall be provided at intersections of all streets and at intersections of driveways and alleys with streets to promote pedestrian, bicycle, and vehicular safety. The extent of vision clearance to be provided shall be determined from standards in Chapter 17.74 and taking into account functional classification of the streets involved, type of traffic control present at the intersection, and designated speed for the streets.

*Response: The subject property is located in the SFR zone requiring compliance with this section. The requirements of this section will be considered in placing landscaping in these areas with construction of homes.*

- B. Traffic control devices, streetlights, and utility installations meeting approval by the City Engineer are permitted within vision clearance areas.

*Response: The exceptions contained in this section will be considered in the design and placement of these structures.*

#### **17.98.200 - RESIDENTIAL ON-STREET PARKING REQUIREMENTS**

- A. Residential On-Street Parking Requirements. Residential on-street parking shall conform to the following standards:

1. In addition to required off-street parking, all new residential planned developments, subdivisions and partitions shall provide one (1) on-street parking space within 200 feet of each dwelling except as provided in Section 17.98.200(A)(6) below.
2. The location of residential on-street parking shall be reviewed for compliance with this section through submittal of a Residential Parking Analysis Plan as required in Section 17.98.10(M).
3. Residential on-street parking shall not obstruct required clear vision areas and shall not violate any local or state laws.
4. Parallel residential on-street parking spaces shall be 22 feet minimum in length.

5. Residential on-street parking shall be measured along the curb from the outside edge of a driveway wing or curb cut. Parking spaces must be set back a minimum of 15 feet from an intersection and may not be located within 10 feet of a fire hydrant.

*Response: A Residential On-Street Parking Analysis designed in compliance with the requirements of this section is included as Sheet 7 of the application package. One on-street parking space at least 22 feet in length has been identified within 200 feet of each of the 32 lots. An additional 30 on-street parking spaces have also been identified as shown on the Parking Plan.*

6. Portions of residential on-street parking required by this section may be provided in parking courts that are interspersed throughout a development when the following standards are met:

*Response: No parking courts are proposed.*

#### **CHAPTER 17.100 - LAND DIVISION**

##### **17.100.20 - LAND DIVISION CLASSIFICATION - TYPE I, II OR III PROCEDURES**

- C. Type II Land Division (Major Partition or Subdivision). A major partition or subdivision shall be a Type II procedure when a street is extended, satisfactory street conditions exist and the resulting parcels/lots comply with the standards of the zoning district and this chapter. Satisfactory street conditions exist when the Director determines one of the following:

1. Existing streets are stubbed to the property boundaries and are linked by the land division.
2. An existing street or a new proposed street need not continue beyond the land division in order to complete an appropriate street system or to provide access to adjacent property.
3. The proposed street layout is consistent with a street pattern adopted as part of the Comprehensive Plan or an officially adopted City street plan.

*Response: The proposed subdivision complies with all applicable code requirements to be process as a Type II application with the exception of three items noted above. The applicant is requesting three variances to applicable code standards and as such, the entire application will be processed as a Type III application.*

##### **17.100.60 - SUBDIVISIONS**

Approval of a subdivision is required for a land division of 4 or more parcels in a calendar year. A two-step procedure is required for subdivision approval: (1) tentative plat review and approval; and (2) final plat review and approval.

*Response: As defined by this section the 32 lot land division is a subdivision.*

- A. Preapplication Conference. The applicant for a subdivision shall participate in a preapplication conference with city staff to discuss procedures for approval,

applicable state and local requirements, objectives and policies of the Sandy Comprehensive Plan, and the availability of services.

*Response: A pre-application conference was held with the city on January 3, 2018.*

- B. Application Requirements for a Tentative Plat. Subdivision applications shall be made on forms provided by the planning department and shall be accompanied by:

*Response: All of the items required by this section were included with the submittal.*

- E. Approval Criteria. The Director or Planning Commission shall review the tentative plat for the subdivision based on the classification procedure (Type II or III) set forth in Section 17.12 and the following approval criteria:

1. The proposed subdivision is consistent with the density, setback and dimensional standards of the base zoning district, unless modified by a Planned Development approval.

*Response: As reviewed in the narrative above, the proposed subdivision is designed to be consistent with density, setback, and dimensional standards in the SFR zoning district.*

2. The proposed subdivision is consistent with the design standards set forth in this chapter.

*Response: With the exception of three variances requested with this application, the proposal complies with the design standards in this chapter.*

3. The proposed street pattern is connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy.

*Response: As illustrated on the submitted Future Street Plan (Sheet 8), the proposed street system is consistent with the City's Transportation System Plan and Comprehensive Plan.*

4. Adequate public facilities are available or can be provided to serve the proposed subdivision.

*Response: The City of Sandy has confirmed (Exhibit I) the sanitary sewer pump station constructed with the Timberline Trails Subdivision located along Jacoby Road north of the subject property has sufficient capacity to accommodate the proposed development. The city has indicated that all other public facilities have capacity to serve the proposed subdivision.*

5. All proposed improvements meet City standards.

*Response: With the exception of the three variances requested above, all improvements in the proposed development are designed in compliance with City standards.*

6. The phasing plan, if requested, can be carried out in a manner that meets the objectives of the above criteria and provides necessary public improvements for each phase as it develops.

*Response: The applicant proposes developing the subdivision in a single phase.*

#### **17.100.80 - CHARACTER OF THE LAND**

Land which the Director or the Planning Commission finds to be unsuitable for development due to flooding, improper drainage, steep slopes, rock formations, adverse earth formations or topography, utility easements, or other features which will reasonably be harmful to the safety, health, and general welfare of the present or future inhabitants of the partition or subdivision and the surrounding areas, shall not be developed unless adequate methods are formulated by the subdivider and approved by the Director or the Planning Commission to solve the problems created by the unsuitable land conditions.

*Response: A small area of the subject property is affected by the FSH overlay identified on the City of Sandy Zoning Map. The area of this overlay has been refined by the applicant as shown on Sheet 4 of the plan set. The applicant does not propose any development within this area. A Geotechnical Evaluation for the property is included as part of the application package (Exhibit F).*

#### **17.100.90 - ACCESS CONTROL GUIDELINES AND COORDINATION**

- A. Notice and coordination with ODOT required. The city will coordinate and notify ODOT regarding all proposals for new or modified public and private accesses on to Highways 26 and 211.

*Response: The subject property does not abut Highways 26 and 211.*

#### **17.100.100 - STREETS GENERALLY**

- A. Transportation Impact Studies. Transportation impact studies may be required by the city engineer to assist the city to evaluate the impact of development proposals, determine reasonable and prudent transportation facility improvements and justify modifications to the design standards. Such studies will be prepared in accordance with the following:

1. A proposal established with the scope of the transportation impact study shall be coordinated with, and agreed to, by the city engineer. The study requirements shall reflect the magnitude of the project in accordance with accepted transportation planning and engineering practices. A professional civil or traffic engineer registered in the State of Oregon shall prepare such studies.
2. If the study identifies level-of-service conditions less than the minimum standards established in the Sandy Transportation System Plan, improvements and funding strategies mitigating the problem shall be considered as part of the land use decision for the proposal.

*Response: A traffic impact analysis prepared in compliance with city standards has been submitted with the application (Exhibit E). This study does not identify any issues requiring mitigation by the applicant.*

- B. Topography and Arrangement. All streets shall be properly related to special traffic generators such as industries, business districts, schools, and shopping centers and to the pattern of existing and proposed land uses.

*Response: None of the special traffic generators listed in this section are located near the subject property. All existing and proposed residential uses have been considered in development of the proposed street pattern. A future street plan is submitted with this application (Sheet 8) showing how streets can be extended beyond the subject property in the future.*

- C. Street Spacing. Street layout shall generally use a rectangular grid pattern with modifications as appropriate to adapt to topography or natural conditions.

*Response: The proposed street layout represents a rectangular grid pattern.*

- D. Future Street Plan. Future street plans are conceptual plans, street extensions and connections on acreage adjacent to land divisions. They assure access for future development and promote a logical, connected pattern of streets. It is in the interest of the city to promote a logical, connected pattern of streets. All applications for land divisions shall provide a future street plan that shows the pattern of existing and proposed future streets within the boundaries of the proposed land divisions, proposed connections to abutting properties, and extension of streets to adjacent parcels within a 400 foot radius of the study area where development may practically occur.

*Response: A future street plan in compliance with the requirements of this section was submitted as part of the application package (Sheet 8) . This plan assures that access for future development will promote a logical and connected pattern of streets.*

- E. Connections. Except as permitted under Exemptions, all streets, alleys and pedestrian walkways shall connect to other streets within the development and to existing and planned streets outside the development and to undeveloped properties which have no future street plan. Streets shall terminate at other streets or at parks, schools or other public land within a neighborhood.

Where practicable, local roads shall align and connect with other roads when crossing collectors and arterials.

Proposed streets or street extensions shall be located to provide direct access to existing or planned transit stops, and existing or planned neighborhood activity centers, such as schools, shopping areas and parks.

*Response: All streets proposed in the subdivision will allow connection to other streets with the exception of the proposed cul-de-sac, Camden Court. Due to the location of Tickle Creek and steep slopes on the subject property, it is not practical or desirable to serve this portion of the property with a connected street network.*

#### 17.100.120 - BLOCKS AND ACCESSWAYS



- A. **Blocks.** Blocks shall have sufficient width to provide for two tiers of lots at appropriate depths. However, exceptions to the block width shall be allowed for blocks that are adjacent to arterial streets or natural features.

*Response: All blocks within the proposed subdivision have sufficient width to provide for two tiers of lots within the exception of the block containing Lot 30. Because direct access is not permitted to Jacoby Road a street is required on the east side of this lot to provide access. The applicant is requesting a variance to this section as reviewed in Chapter 17.66 above.*

- B. **Residential Blocks.** Blocks fronting local streets shall not exceed 400 feet in length, unless topographic, natural resource, or other similar physical conditions justify longer blocks. Blocks may exceed 400 feet if approved as part of a Planned Development, Specific Area Plan, adjustment or variance.

*Response: As reviewed in Chapter 17.66 above, the applicant is requesting a Type III Variance to this section for the block on the north side of Woodstock Street between Camden Court and the eastern property line. The length of this block is 420 feet, 20 feet greater than the maximum block length.*

- D. **Pedestrian and Bicycle Access Way Requirements.** In any block in a residential or commercial district over 600 feet in length, a pedestrian and bicycle accessway with a minimum improved surface of 10 feet within a 15-foot right-of-way or tract shall be provided through the middle of the block. To enhance public convenience and mobility, such accessways may be required to connect to cul-de-sacs, or between streets and other public or semipublic lands or through greenway systems.

*Response: None of the blocks within the proposed subdivision exceed 600 feet in length. The applicant is not proposing access to the Tickle Creek corridor in this subdivision but rather as shown on Sheet 8, a pedestrian access trail is identified in a more suitable location on the property directly east of the subject property.*

#### **17.100.130 - EASEMENTS**

A minimum eight (8) foot public utility easement shall be required along property lines abutting a right-of-way for all lots within a partition or subdivision. Where a partition or subdivision is traversed by a watercourse, drainage way, channel or stream, the land division shall provide a stormwater easement or drainage right-of-way conforming substantially with the lines of such watercourse, and such further width as determined needed for water quality and quantity protection.

*Response: Eight foot wide public utility easements are identified along all property lines abutting a public right-of-way. In addition, a 20 foot wide easement to accommodate both sanitary sewer and stormwater facilities is proposed along the western line of Lots 9, 10, 30 and 32 and a 15 foot wide sanitary sewer easement between Lot 30 and Tract A is also proposed. Private stormwater easements are located along the back of Lots 1 - 18, 19 - 25, 28, 29, 31, and 32.*

**17.100.140 - PUBLIC ALLEYS**

*Response: No alleys are proposed in this development.*

**17.100.150 RESIDENTIAL SHARED PRIVATE DRIVES**

*Response: No residential shared private drives are proposed in this development*

**17.100.160 PUBLIC ACCESS LANES**

*Response: No public access lanes are proposed in this development*

**17.100.170 - FLAG LOTS**

Flag lots can be created where it can be shown that no other street access is possible to achieve the requested land division. The flag lot shall have a minimum street frontage of 15 feet for its accessway. The following dimensional requirements shall apply to flag lots:

- A. Setbacks applicable to the underlying zoning district shall apply to the flag lot.
- B. The access strip (pole) may not be counted toward the lot size requirements. *Response: No flag lots are proposed.*

**17.100.180 - INTERSECTIONS**

A. Intersections. Streets shall be laid out so as to intersect as nearly as possible at right angles. A proposed intersection of two new streets at an angle of less than 75 degrees shall not be acceptable. No more than two streets shall intersect at any one point unless specifically approved by the City Engineer. The city engineer may require left turn lanes, signals, special crosswalks, curb extensions and other intersection elements justified by a traffic study or necessary to comply with the Development Code.

*Response: All streets in the proposed subdivision have been designed to intersect at right angles to the opposing street as required.*

B. Curve Radius. All local and neighborhood collector streets shall have a minimum curve radius (at intersections of rights-of-way) of 20 feet, unless otherwise approved by the City Engineer. When a local or neighborhood collector enters on to a collector or arterial street, the curve radius shall be a minimum of 30 feet, unless otherwise approved by the City Engineer.

*Response: All streets in the proposed subdivision have a minimum curve radius as required by this section.*

**17.100.190 - STREET SIGNS**

The subdivider shall pay the cost of street signs prior to the issuance of a Certificate of Substantial Completion. The City shall install all street signs and upon completion will bill the developer for costs associated with installation. In addition, the subdivider may be required to pay for any traffic safety devices related to the development. The City Engineer shall specify the type and location of the street signs and/or traffic safety devices.

*Response: The applicant understands it will be his responsibility to pay the cost of street signs and the city will install these signs.*

#### **17.100.200 - STREET SURFACING**

Public streets, including alleys, within the development shall be improved in accordance with the requirements of the City or the standards of the Oregon State Highway Department. An overlay of asphalt concrete, or material approved by the City Engineer, shall be placed on all streets within the development. Where required, speed humps shall be constructed in conformance with the City's standards and specifications.

*Response: All streets in the proposed subdivision will be improved in accordance with City standards.*

#### **17.100.210 - STREET LIGHTING**

A complete lighting system (including, but not limited to: conduits, wiring, bases, poles, arms, and fixtures) shall be the financial responsibility of the subdivider on all cul-de-sacs, local streets, and neighborhood collector streets. The subdivider will be responsible for providing the arterial street lighting system in those cases where the subdivider is required to improve an arterial street. Standards and specifications for street lighting shall be coordinated with the utility and any lighting district, as appropriate.

*Response: The applicant is aware of the requirements of this section. A lighting plan will be coordinated with PGE and the city prior to installation of any fixtures.*

#### **17.100.220 - LOT DESIGN**

A. The lot arrangement shall be such that there will be no foreseeable difficulties, for reason of topography or other conditions, in securing building permits to build on all lots in compliance with the Development Code.

*Response: All of the lots in the proposed subdivision have been designed so that no foreseeable difficulties due to topography or other conditions will exist in securing building permits on these lots. A Geotechnical Evaluation report has been submitted with this application (Exhibit F) .*

B. The lot dimensions shall comply with the minimum standards of the Development Code. When lots are more than double the minimum lot size required for the zoning district, the subdivider may be required to arrange such lots to allow further subdivision and the opening of future streets to serve such potential lots.

*Response: All lots in the proposed subdivision comply with the minimum standards in the SFR zoning district. As shown on the Preliminary Plat, Lots 19 - 21 and 27 contain more than double the minimum lot size of 7,500 square feet required in this zone. Due to the configuration of these lots and steep slopes, further division of these lots is not possible.*

- C. The lot or parcel width at the front building line shall meet the requirements of the Development Code and shall abut a public street other than an alley for a width of at least 20 feet. A street frontage of not less than 15 feet is acceptable in the case of a flag lot division resulting from the division of an unusually deep land parcel which is of a size to warrant division into not more than two parcels.

*Response: All lots in the proposed subdivision contain at least 20 feet of frontage along a public street. As noted above, no flag lots are proposed.*

- D. Double frontage lots shall be avoided except where necessary to provide separation of residential developments from arterial streets or to overcome specific disadvantages of topography or orientation.

*Response: Only Lot 30 is considered a double frontage lots because it has frontage on both Jacoby Road and Camden Court. Because direct access to this lot from Jacoby Road (a collector street) is discouraged, access is proposed from Camden Court, a local street. The arrangement of this lot represents a logical pattern and due to the specific conditions of the property this arrangement is warranted.*

- E. Lots shall avoid deriving access from major or minor arterials. When driveway access from major or minor arterials may be necessary for several adjoining lots, the Director or the Planning Commission may require that such lots be served by a common access drive in order to limit possible traffic hazards on such streets. Where possible, driveways should be designed and arranged to avoid requiring vehicles to back into traffic on minor or major arterials.

*Response: Jacoby Road is designated as a collector street in the City's Transportation System Plan. The applicant proposes accessing all lots in the subdivision from local streets.*

#### **17.100.230 - WATER FACILITIES**

Water lines and fire hydrants serving the subdivision or partition, and connecting the development to City mains, shall be installed to provide adequate water pressure to serve present and future consumer demand. The materials, sizes, and locations of water mains, valves, service laterals, meter boxes and other required appurtenances shall be in accordance with the standards of the Fire District, the City, and the State.

If the city requires the subdivider to install water lines in excess of eight inches, the city may participate in the oversizing costs. Any oversizing agreements shall be approved by the city manager based upon council policy and dependent on budget constraints. If required water mains will directly serve property outside the subdivision, the city may enter into an agreement with the subdivider setting forth methods for reimbursement for the proportionate share of the cost.

*Response: The applicant intends to install all water lines and fire hydrants in compliance with applicable standards.*

#### **17.100.240 - SANITARY SEWERS**

Sanitary sewers shall be installed to serve the subdivision and to connect the subdivision to existing mains. Design of sanitary sewers shall take into account the capacity and grade to allow for desirable extension beyond the subdivision.

If required sewer facilities will directly serve property outside the subdivision, the city may enter into an agreement with the subdivider setting forth methods for reimbursement by nonparticipating landowners for the proportionate share of the cost of construction.

*Response: The applicant intends to install sanitary sewer lines in compliance with applicable standards. The Public Works Director has indicated the pump station located in the Timberline Trails Subdivision that will serve the subdivision has adequate capacity (Exhibit I). As indicated in this Exhibit an analysis was completed for the contributing basin to the pump station. The pump station, wet well, and force main were all designed to accommodate 525 dwelling units. The basin contains 284 existing dwelling units and as identified by the Public Works Director has sufficient capacity to accommodate the proposed 32 lot subdivision without any required expansion.*

#### **17.100.250 - SURFACE DRAINAGE AND STORM SEWER SYSTEM**

A. Drainage facilities shall be provided within the subdivision and to connect with off-site drainage ways or storm sewers. Capacity, grade and materials shall be by a design approved by the city engineer. Design of drainage within the subdivision shall take into account the location, capacity and grade necessary to maintain unrestricted flow from areas draining through the subdivision and to allow extension of the system to serve such areas.

*Response: A stormwater water quality and detention facility is proposed to be located at the northwest corner of the site (Tract A). This facility has been sized and located to accommodate all public stormwater generated by the subdivision. A stormwater report is included with this application as Exhibit D. In addition, the proposed stormwater system has been designed to capture water entering the site from the south and convey this water through the site as required.*

B. In addition to normal drainage design and construction, provisions shall be taken to handle any drainage from preexisting subsurface drain tile. It shall be the design engineer's duty to investigate the location of drain tile and its relation to public improvements and building construction.

*Response: No subsurface drain tiles are known to exist on the site.*

C. The roof and site drainage from each lot shall be discharged to either curb face outlets (if minor quantity), to a public storm drain or to a natural acceptable drainage way if adjacent to the lot.

*Response: All roof and site drainage will be discharged to curb face outlets or another approved system as required.*

**17.100.260 - UNDERGROUND UTILITIES**

All subdivisions or major partitions shall be required to install underground utilities (including, but not limited to, electrical and telephone wiring). The utilities shall be installed pursuant to the requirements of the utility company.

*Response: The applicant intends to install all utilities underground as required.*

**17.100.270 - SIDEWALKS**

Sidewalks shall be installed on both sides of a public street and in any special pedestrian way within the subdivision.

*Response: Sidewalks will be installed of both sides of all streets with the exception of the three-quarter and one-half street sections of Newton Street extended on the subject property.*

**17.100.280 - BICYCLE ROUTES**

If appropriate to the extension of a system of bicycle routes, existing or planned, the Director or the Planning Commission may require the installation of bicycle lanes within streets. Separate bicycle access ways may be required to reduce walking or cycling distance when no feasible street connection is available.

*Response: No existing, planned, or proposed bicycle routes exist on the subject property. The applicant is aware that street improvements along Jacoby Road may require completion of a bicycle lane as part of these improvements.*

**17.100.290 - STREET TREES**

Where planting strips are provided in the public right-of-way, a master street tree plan shall be submitted and approved by the Director. The street tree plan shall provide street trees approximately every 30' on center for all lots.

*Response: Planter strips will be provided along all frontages as required. Street trees in accordance with City standards will be provided in these areas. A Street Tree Plan is included with the submittal package as Sheet 6.*

**17.100.300 - EROSION CONTROL**

Grass seed planting shall take place prior to September 30th on all lots upon which a dwelling has not been started but the ground cover has been disturbed. The seeds shall be of an annual rye grass variety and shall be sown at not less than four pounds to each 1000 square feet of land area.

*Response: Grass seeding will be completed as required by this section. The submitted erosion control plan (Sheet 9) provides additional details to address erosion control concerns. A separate Grading and Erosion Control Permit will be required prior to any grading on the site.*

**17.100.310 - REQUIRED IMPROVEMENTS**

The following improvements shall be installed at no expense to the city, consistent with the design standards of Chapter 17.84, except as otherwise provided in relation to oversizing.

A. Drainage facilities

- B. Lot, street and perimeter monumentation
  - C. Mailbox delivery units
  - D. Sanitary sewers
  - E. Sidewalks
  - F. Street lights
  - G. Street name signs
  - H. Street trees
  - I. Streets
  - J. Traffic signs
  - K. Underground communication lines, including broadband (fiber), telephone, and cable. Franchise agreements will dictate whether telephone and cable lines are required.
  - L. Underground power lines
  - M. Water distribution lines and fire hydrants
- Response: All of the improvements specified in this section will be installed by the developer at no expense to the City of Sandy consistent with the design standards of Chapter 17.84 and applicable standards.*

## **CHAPTER 17.102 - URBAN FORESTRY**

### **17.102.20 - APPLICABILITY**

This chapter applies only to properties within the Sandy Urban Growth Boundary that are greater than one acre including contiguous parcels under the same ownership.

- A. General: No person shall cut, harvest, or remove trees 11 inches DBH or greater without first obtaining a permit and demonstrating compliance with this chapter.
  1. As a condition of permit issuance, the applicant shall agree to implement required provisions of this chapter and to allow all inspections to be conducted.
  2. Tree removal is subject to the provisions of Chapter 15.44, Erosion Control, Chapter 17.56, Hillside Development, and Chapter 17.60 Flood and Slope Hazard.

*Response: The subject property contains 9.68 and the standards of this chapter are applicable to the proposed subdivision. The applicant intends removing the majority of the trees on the property to accommodate development of a residential subdivision. The proposed tree removal and protection plan have been designed in accordance with the standards of this chapter and the provisions of Chapters 15.44, 17.56, and 17.60 as applicable. As noted in a review of Chapter 17.92, Landscaping above, the applicant has submitted a request for interpretation regarding the applicability of this Chapter to the proposal.*

### **17.102.50 - TREE RETENTION AND PROTECTION REQUIREMENTS**

- A. Tree Retention: The landowner is responsible for retention and protection of trees required to be retained as specified below:

1. At least three trees 11 inches DBH or greater are to be retained for every one-acre of contiguous ownership.
2. Retained trees can be located anywhere on the site at the landowner's discretion before the harvest begins. Clusters of trees are encouraged.
3. Trees proposed for retention shall be healthy and likely to grow to maturity, and be located to minimize the potential for blow-down following the harvest.
4. If possible, at least two of the required trees per acre must be of conifer species.
5. Trees within the required protected setback areas may be counted towards the tree retention standard if they meet these requirements.

*Response: A Tree Inventory was conducted on the site by a professional Arborist who inventoried all trees six-inches and greater DBH within the FSH Overlay and all trees eight-inches and greater on the rest of the site as requested by City staff. This inventory included as Exhibit J lists all trees by number, species, condition, and recommended root protection zone. Sheets 2 and 3 of the plan set shows the location of all trees with trees proposed to be retained colored green. Sheet 2 also includes a portion of the tree inventory listing trees proposed to be retained. Sheet 3 shows these trees with the proposed building envelopes as the City requested.*

*The subject property contains 9.68 acres requiring retention of 29 trees, 11 inches and greater DBH ( $9.68 \times 3 = 28.92$  rounded up to 29.04 trees). The submitted plan indicates that 64 trees are proposed to be retained. Of these trees, 33 trees are 11-inches or greater and in "viable" condition as identified by the Arborist in compliance with the tree retention standards of this Chapter. Of the 33 trees 11-inches or greater, 66 percent (22) are conifer species (Western Red Cedar, Western Hemlock and Douglas fir) with the other 11 trees hardwood species (Red Alder and Bigleaf Maple) as is preferred by subsection (4) above. All of the trees proposed to be retained are located within the FSH Overlay at the back of Lots 19-21, and 27.*

*In addition to the 33 retained trees, 10 mostly conifer trees are proposed to be retained identified a "viable" but are less than 11 inches.*

*As indicated on the tree inventory, the site contains over 500 trees of varying sizes, species, and condition. The primary reason more trees cannot be retained can be understood best by viewing the Cut and Fill Evaluation included as Sheet 10 with this submittal. As shown on this plan, due to topographic variability of the site, the majority of the site, with the exception of the FSH Overlay area, will need to be cut or filled to make it suitable for road, infrastructure, and home construction.*



- B. Tree Protection Area: Except as otherwise determined by the Planning Director, all tree protection measures set forth in this section shall be instituted prior to any development activities and removed only after completion of all construction activity. Tree protection measures are required for land disturbing activities including but not limited to tree removal, clearing, grading, excavation, or demolition work.
1. Trees identified for retention shall be marked with yellow flagging tape and protected by protective barrier fencing placed no less than 10 horizontal feet from the outside edge of the trunk.
  2. Required fencing shall be a minimum of six feet tall supported with metal posts placed no farther than ten feet apart installed flush with the initial undisturbed grade.
  3. No construction activity shall occur within the tree protection zone, including, but not limited to dumping or storage of materials such as building supplies, soil, waste items, equipment, or parked vehicles.  
*Response: The requirements of this section will be complied with prior to any grading or tree removal on the site.*

#### **17.102.60 - TREE REPLANTING REQUIREMENTS**

1. All areas with exposed soils resulting from tree removal shall be replanted with a ground cover of native species within 30 days of harvest during the active growing season, or by June 1st of the following spring.
2. All areas with exposed soils resulting from tree removal occurring between October 1 and March 31 shall also be covered with straw to minimize erosion.
3. Removal of hazard trees as defined shall be replanted with two native trees of quality nursery stock for every tree removed.
4. Tree Removal allowed within the FSH Overlay District shall be replanted with two native trees of quality nursery stock for every tree removed.
5. Tree Removal not associated with a development plan must be replanted following the provisions of OAR Chapter 629, Division 610, Section 020-060  
*Response: No trees are proposed to be replanted at this time.*

#### **17.102.70 - VARIANCES**

*Response: The submitted plan is designed in compliance with the standards in this chapter and a variance to these standards is not requested or required.*

### **CHAPTER 15.30 - DARK SKY ORDINANCE**

#### **15.30.000 - PURPOSE**

The purpose of the Sandy Dark Sky Ordinance is to regulate outdoor lighting in order to reduce or prevent light pollution. This means to the extent reasonably possible the reduction or prevention of glare and light trespass, the conservation of energy, and promotion of safety and security. (Ord. 2002-11)

**15.30.030 - EXEMPTIONS AND EXCEPTIONS**

D. Full cutoff street lighting, which is part of a federal, state, or municipal installation.

**15.30.060 - GENERAL STANDARDS**

D. All outdoor lighting systems shall be designed and operated so that the area 10 feet beyond the property line of the premises receives no more than .25 (one quarter) of a foot-candle of light from the premises lighting system.

*Response: The applicant understands the requirements of this chapter. A detailed lighting plan will be submitted with construction plans following land use approval.*

**CONCLUSION**

The proposed 32 lot subdivision as reviewed in this document complies with all relevant code standards with the exception of three sections. The applicant has submitted a narrative and the required fee for variances to the following sections:

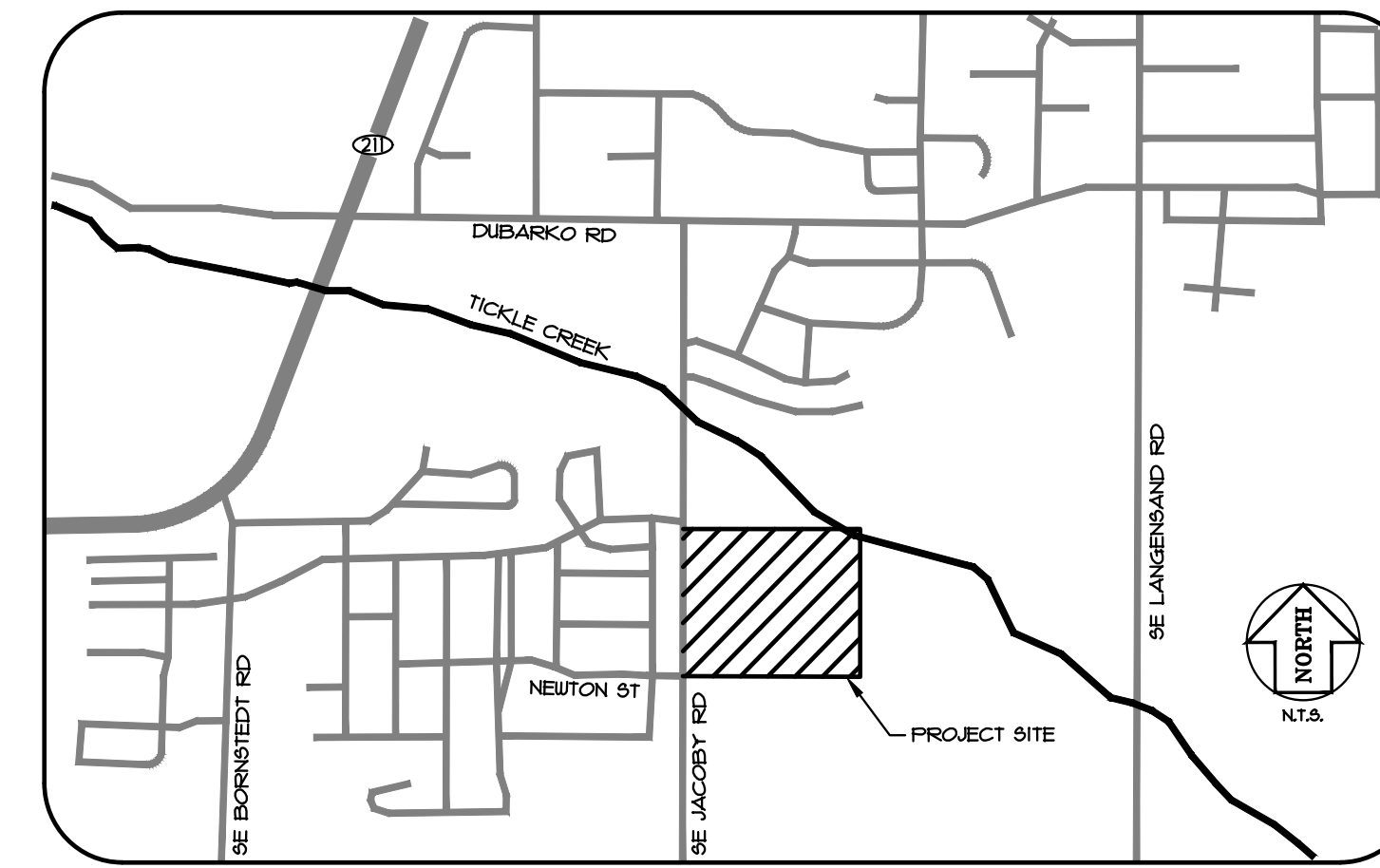
- Section 17.82.20 to allow all homes adjacent to Jacoby Road to be constructed with their front doors facing the internal local street rather than Jacoby Road;
- Section 17.100.120(A) to allow creation of a single tier of lots (Lot 30) adjacent to Jacoby Road, a collector street; and
- Section 17.100.120(B) to exceed the 400 foot block length maximum for the north side of Woodstock St., from Camden Ct. to the eastern property line.

In addition, the applicant has requested the Planning Commission consider a Type III Code Interpretation regarding tree protection regulations applicable to the proposed subdivision. As reviewed in this document, the applicant requests the Planning Commission approve the application as submitted.

# JACOBY HEIGHTS SUBDIVISION

Exhibit C

32-LOT SUBDIVISION  
PRELIMINARY PLAT MAP  
DECEMBER 2018



**CLIENT**  
CORY KNIGHT  
16513 SE ORCHARD VIEW LN.  
DAMASCUS, OR 97089

**PLANNER**  
TRACY BROUN PLANNING CONSULTANTS, LLC  
11075 FIR DR.  
SANDY, OR 97055

**SURVEYOR ENGINEER**  
ALL COUNTY SURVEYORS & PLANNERS, INC.  
P.O. BOX 955 SANDY, OR 97055  
PHONE: 503-668-3151

- SHEET INDEX**
- COVER SHEET & PRELIMINARY PLAT MAP
  - EXISTING CONDITIONS & TREE RETENTION INVENTORY
  - EXISTING TREES WITH BUILDING SETBACKS MAP
  - FSH AND SLOPES MAP
  - PRELIMINARY STREET & UTILITY PLAN
  - PRELIMINARY STREET TREE PLAN
  - PRELIMINARY PARKING PLAN
  - FUTURE STREET & PEDESTRIAN TRAIL PLAN
  - GRADING & EROSION CONTROL PLAN
  - CUT AND FILL EVALUATION

**LEGEND**

---	PROPERTY LINE
---	LOT LINE
---	FSH
---	EXISTING BUILDING
---	EXISTING EDGE OF PAVEMENT
---	EXISTING SIDEWALK/CONCRETE
---	EXISTING CURB
---	EXISTING WATER LINE
---	EXISTING STORM LINE
---	EXISTING SANITARY LINE
---	EXISTING GAS LINE
---	EXISTING TELEPHONE LINE
---	EXISTING UNDERGROUND POWER
---	EXISTING STORM MANHOLE
---	EXISTING CATCH BASIN
---	EXISTING SANITARY MANHOLE
---	EXISTING UTILITY POLE
---	EXISTING WATER METER
---	EXISTING WATER VALVE
---	EXISTING FIRE HYDRANT
---	EXISTING SIGN
---	EXISTING GROUND CONTOUR
---	EXISTING LIGHT POLE
---	EXISTING DECIDUOUS TREE
---	EXISTING CONIFEROUS TREE
---	NEW LOT LINE
---	NEW EASEMENT LINE
---	NEW CURB
---	NEW SIDEWALK/CONCRETE
---	NEW AC
---	NEW WATER LINE
---	NEW SANITARY LINE
---	NEW STORM LINE
---	SAUCUT LINE
---	NEW FINISH GRADE CONTOUR
---	NEW WATER METER
---	NEW STORM MANHOLE
---	NEW CATCH BASIN
---	NEW SANITARY MANHOLE
---	NEW CLEANOUT
---	NEW FIRE HYDRANT
---	NEW WATER VALVE
---	NEW STREET LIGHT
---	NEW SIGN
---	NEW MAILBOX UNIT

TOTAL NUMBER OF LOTS : 32  
TOTAL NUMBER OF TRACTS : 1

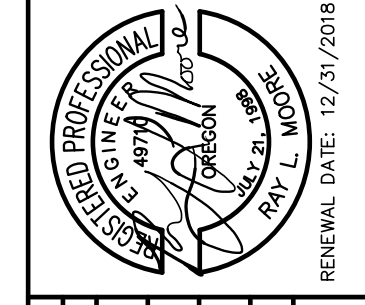
**SITE AREA TABLE**

DESCRIPTION	AREA IN SF	AREA IN AC	% OF TOTAL AREA
GROSS SITE AREA	421,418	9.68	100
PUBLIC TRACTS	20,283	0.41	4.8
ROW DEDICATION	90,499	2.08	21.5
NET SITE AREA	310,696	1.13	73.1
RDA (PER 11.60.20A)	52,444	1.20	--
USA (PER 11.30.20)	258,252	5.93	--

MINIMUM SITE DENSITY : 18 UNITS  
MAXIMUM SITE DENSITY : 41 UNITS

- NOTES**
- THIS IS NOT A BOUNDARY SURVEY. NO LIABILITY IS ASSUMED BY ALL COUNTY SURVEYORS AND PLANNERS FOR THE EXISTENCE OF ANY EASEMENTS, ENCUMBRANCES AND DISCREPANCIES IN BOUNDARY OR TITLE DEFECTS. AT THE TIME OF THIS TOPOGRAPHIC SURVEY, THE BOUNDARY SURVEY FOR THIS PROJECT IS UNDER REVIEW BY THE COUNTY SURVEYOR. BEARINGS AND DISTANCES SHOWN ARE SUBJECT TO CHANGE.
  - UNDERGROUND UTILITIES SHOWN ON THIS SURVEY ARE LIMITED TO THOSE ITEMS VISIBLE BY SURFACE INSPECTION AND LOCATED BY SURFACE SURVEY. UNDISCOVERED UTILITIES, IF ANY, ARE NOT SHOWN.
  - UNDERGROUND UTILITY LOCATIONS MUST BE POTHOLED AND VERIFIED PRIOR TO CONSTRUCTION.
  - THE ELEVATION DATUM IS BASED ON THE CITY OF SANDY BENCHMARK 130. THE BENCHMARK IS LOCATED AT THE SE CORNER OF THE ROSS AND EVANS INTERSECTION. THE PUBLISHED ELEVATION IS 1036.20'
  - LOT LAYOUT OPTION A, SHOWN HERE, SIZES TRACT A FOR THE FUTURE EXPANSION OF THE FSH OVERLAY, OR FOR THE CITY TO ACQUIRE THE LAND FOR PUBLIC PARK SPACE.

BY	DATE	REVISION	SHEET
			1
			OF 10
DESIGNED:	CTH		
DRAWN:	CTH		
CHECKED:	RLM		
APPROVED:	RLM		

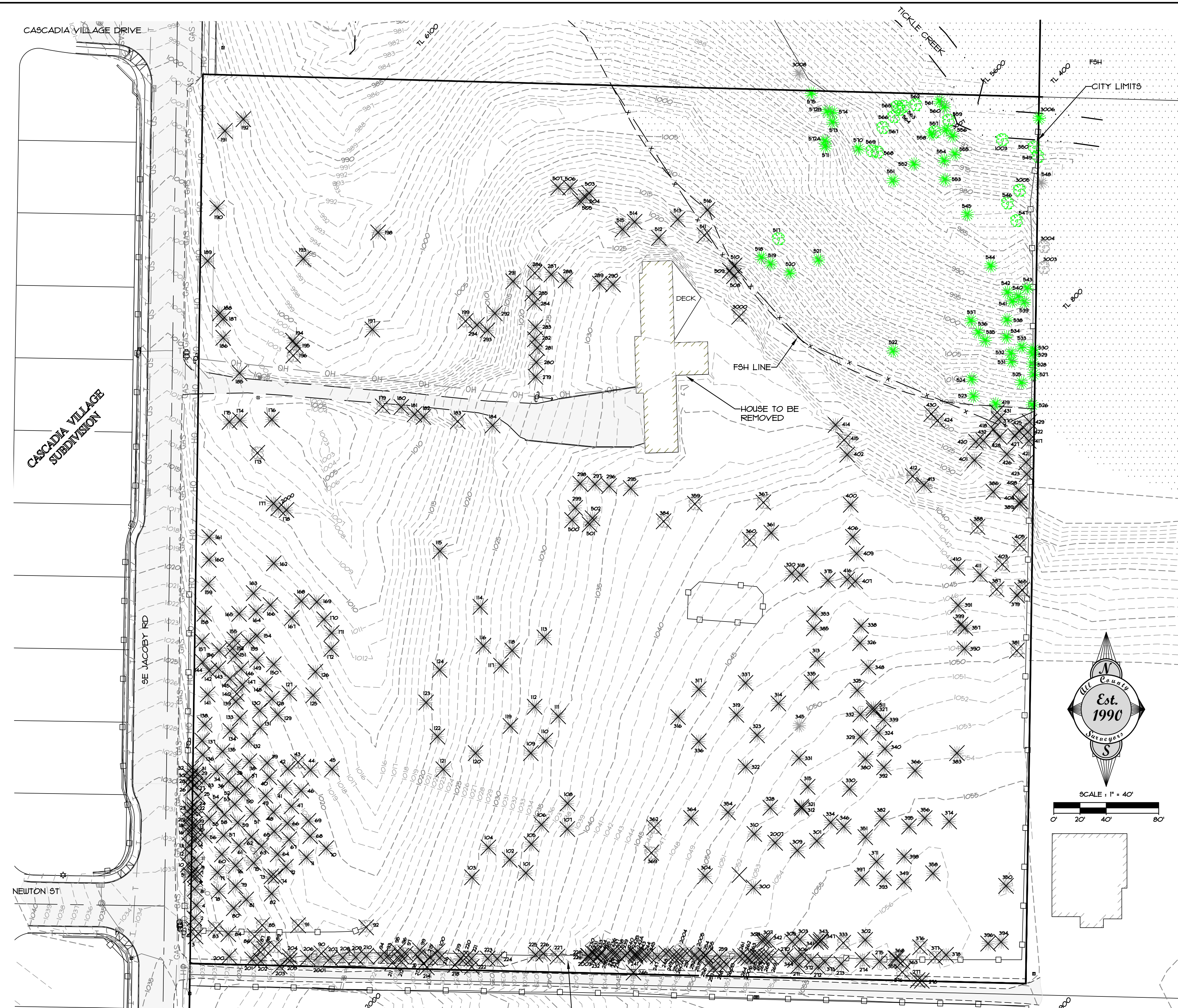


SCALE	N/A	SECTION	24
VERT.:	1"=40'	RANGE	25
HORIZ.:	1"=40'	LEGAL	4E
DATE:	06/01/2018	FILE:	11-199-PLANNING.dwg

PROJECT: JACOBY HEIGHTS SUBDIVISION  
COVER SHEET & PRELIMINARY PLAT MAP  
LOCATION: 19124 SE JACOBY RD SANDY, OR 97055

**Surveyors & Planners, Inc.**  
Surveying, Planning and  
Civil Engineering  
P.O. Box 955 Sandy, OR 97055  
Phone: (503) 668-4730  
Fax: (503) 668-4730  
DATE OF PLOT: 12/14/2018

CORY KNIGHT  
16513 SE ORCHARD VIEW LANE  
DAMASCUS, OR 97089



- LEGEND**
- EXISTING DECIDUOUS TREE TO BE PRESERVED
  - EXISTING CONIFEROUS TREE TO BE PRESERVED
  - EXISTING DECIDUOUS TREE TO BE REMOVED
  - EXISTING CONIFEROUS TREE TO BE REMOVED
  - INSTALL PROTECTIVE BARRIER FENCING TO PROTECT TREES DURING EXCAVATION FOR THE UTILITIES. REQUEST AN INSPECTION OF EROSION CONTROL MEASURES AND TREE PROTECTION MEASURES AS SPECIFIED IN SECTION 17102.50(C) PRIOR TO CONSTRUCTION ACTIVITIES OR GRADING.

EXISTING ACCESS EASEMENT PER DOCUMENT NO. 2008-012714

TOTAL NUMBER OF TREES:	521
TOTAL NUMBER OF TREES REMOVED:	451
TOTAL NUMBER OF TREES PRESERVED:	64

**TREE RETENTION NOTES**

ALL TREES WITHIN THE FRESHLY DELINEATED FISH BOUNDARY SHALL BE RETAINED REGARDLESS OF CONDITION - SEE TABLE RIGHT. SEE ARBORIST REPORT FOR FULL LIST OF ON-SITE TREES.

REFER TO GRADING AND EROSION CONTROL PLAN FOR SITE MASS GRADING PLAN.

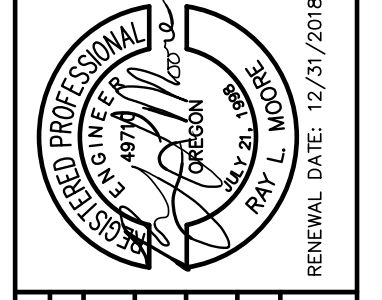
**TREE PRESERVATION INVENTORY**

TAG NUMBER	SPECIES	DBH	CONDITION	ACTION
419	WESTERN RED CEDAR	12	VIABLE	PRESERVE
511	BIG LEAF MAPLE	10	VIABLE	PRESERVE
518	WESTERN RED CEDAR	12	VIABLE	PRESERVE
519	DOUGLAS FIR	9	VIABLE	PRESERVE
520	WESTERN HEMLOCK	14	VIABLE WOUND ON TRUNK	PRESERVE
521	WESTERN RED CEDAR	18	VIABLE NO TAG IN FIELD	PRESERVE
522	WESTERN HEMLOCK	11	VIABLE	PRESERVE
523	WESTERN RED CEDAR	18	VIABLE	PRESERVE
524	WESTERN RED CEDAR	42	BASAL DECAY, TRUNK DECAY FOR 30 FT	PRESERVE
525	WESTERN RED CEDAR	18	VIABLE	PRESERVE
526	WESTERN RED CEDAR	8	LISTED, HUNG UP IN TREE	PRESERVE
527	WESTERN RED CEDAR	12	VIABLE	PRESERVE
528	WESTERN RED CEDAR	12	VIABLE	PRESERVE
529	WESTERN RED CEDAR	9	VIABLE	PRESERVE
530	WESTERN RED CEDAR	18	VIABLE	PRESERVE
531	WESTERN RED CEDAR	12	VIABLE POOR TRUNK TAPER, WINDTHROW POTENTIAL	PRESERVE
532	DOUGLAS FIR	9	VIABLE POOR TRUNK TAPER, WINDTHROW POTENTIAL	PRESERVE
533	DOUGLAS FIR	6	VIABLE, SUPPRESSED	PRESERVE
534	DOUGLAS FIR	15	VIABLE, POOR TRUNK TAPER	PRESERVE
535	WESTERN HEMLOCK	13	20-FT TRUNK SCAR, POOR RESPONSE GROWTH, WINDTHROW POTENTIAL	PRESERVE
536	WESTERN HEMLOCK	8	35-FT TRUNK SCAR, TERMINAL DECLINE	PRESERVE
537	WESTERN RED CEDAR	11	VIABLE	PRESERVE
538	WESTERN HEMLOCK	10	VIABLE, MINOR MECHANICAL DAMAGE TO TRUNK	PRESERVE
539	WESTERN HEMLOCK	16	VIABLE, GROUND FROM NURSE STUMP	PRESERVE
540	DOUGLAS FIR	8	LISTED, HUNG UP IN TREE	PRESERVE
541	RED ALDER	10	VIABLE TRUNK SWOOP	PRESERVE
542	WESTERN HEMLOCK	12	VIABLE	PRESERVE
543	DOUGLAS FIR	8	VIABLE	PRESERVE
544	DOUGLAS FIR	9	VIABLE	PRESERVE
545	DOUGLAS FIR	25	VIABLE	PRESERVE
546	DOUGLAS FIR	18	VIABLE	PRESERVE
547	RED ALDER	11	LISTED, AND SELF-CORRECTED, EXCESSIVE LEAN	PRESERVE
548	RED ALDER	14	VIABLE, ON #	PRESERVE
549	RED ALDER	11	VIABLE, AT CREEK	PRESERVE
550	WESTERN RED CEDAR	21	TRUNK DECAY	PRESERVE
551	WESTERN RED CEDAR	22	VIABLE	PRESERVE
552	WESTERN RED CEDAR	25	VIABLE	PRESERVE
553	WESTERN RED CEDAR	13	VIABLE	PRESERVE
554	DEAD	5	DEAD	PRESERVE
555	RED ALDER	6	VIABLE, UNDERSIZE	PRESERVE
556	RED ALDER	15	VIABLE	PRESERVE
557	DOUGLAS FIR	5	SUPPRESSED, UNDERSIZE	PRESERVE
558	RED ALDER	11	VIABLE, AT CREEK	PRESERVE
559	WESTERN RED CEDAR	33	VIABLE, SCOPED TRUNK DECAY, AT CREEK	PRESERVE
560	WESTERN RED CEDAR	50	VIABLE	PRESERVE
561	RED ALDER	9	EXCESSIVE LEAN, TRUNK BOVS 60 FT TO SOUTH	PRESERVE
562	RED ALDER	8	TERMINAL DECLINE	PRESERVE
563	BIGLEAF MAPLE	24	VIABLE	PRESERVE
564	RED ALDER	10	VIABLE	PRESERVE
565	RED ALDER	12	VIABLE	PRESERVE
566	RED ALDER	12	VIABLE, LEANS TOWARDS SITE	PRESERVE
567	BIGLEAF MAPLE	11	VIABLE	PRESERVE
568	BIGLEAF MAPLE	5	UNDERSIZE, STUMP SUCKER	PRESERVE
569	WESTERN HEMLOCK	7	VIABLE, UNDERSIZE	PRESERVE
570	WESTERN RED CEDAR	21	WOUND ON TRUNK, TRUNK DECAY	PRESERVE
571	WESTERN RED CEDAR	15	WOUND ON BASE, WOOD BORERS	PRESERVE
572A	WESTERN RED CEDAR	43	LARGE TRUNK SWOOP FROM BASE, BROKEN STEM, LOW VIGOR	PRESERVE
572B	WESTERN RED CEDAR	9	VIABLE	PRESERVE
573	WESTERN RED CEDAR	9	VIABLE	PRESERVE
574	WESTERN RED CEDAR	9	VIABLE	PRESERVE
575	BIGLEAF MAPLE	32	BROKEN STEM, TRUNK DECAY, RE-TRENCHED	PRESERVE
1003	RED ALDER	22	VIABLE, ADDED BY ARBORIST	PRESERVE
3005	BIGLEAF MAPLE	15	VIABLE, LISTED AND SELF-CORRECTED, ADDED BY ARBORIST	PRESERVE
3006	WESTERN RED CEDAR	13	VIABLE, ON #, GROUND ON NURSE STUMP, BASE IS 4.5 FT HIGH, ADDED BY ARBORIST	PRESERVE
3007	WESTERN RED CEDAR	8	VIABLE	PRESERVE

NOTE: INDICATES TREES 17" DBH AND GREATER DEEMED TO BE VIABLE BY ARBORIST INSPECTION.

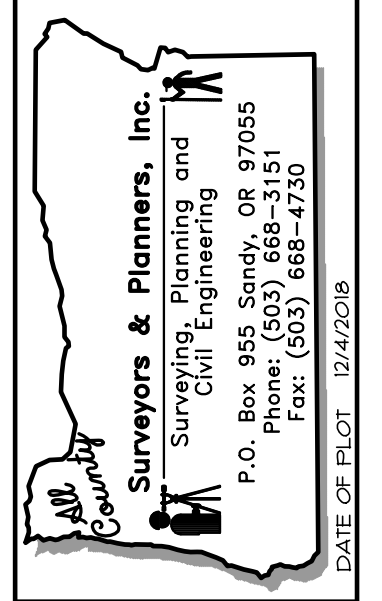
TOTAL NUMBER OF VIABLE, 17" DBH TREES TO BE PRESERVED: 33

BY		SHEET	2
REVISION		OF	10
DATE		DESIGNED:	CTH
		DRAWN:	CTH
		CHECKED:	RLM
		APPROVED:	RLM

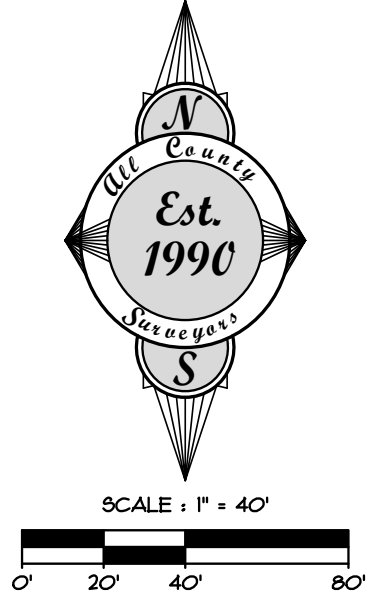


SCALE	N/A	VERT.	N/A	SECTION	24
DATE	06/01/2018	FILE	17199-PLANNING.dwg	RANGE	4E
LEGAL		TWP.		25	

**JACOBY HEIGHTS SUBDIVISION**  
**EXISTING CONDITIONS & TREE RETENTION INVENTORY**  
 19124 SE JACOBY RD SANDY, OR 97055



DATE OF E/C: 12/21/2018

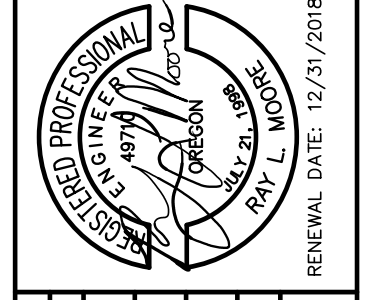


**TREE RETENTION NOTES**

ALL TREES WITHIN THE FRESHLY DELINEATED FSH BOUNDARY SHALL BE RETAINED, REGARDLESS OF CONDITION. SEE ARBORIST REPORT FOR FULL LIST OF ON-SITE TREES.

REFER TO GRADING AND EROSION CONTROL PLAN FOR SITE MASS GRADING PLAN.

DATE	NO.	REVISION	BY
DESIGNED:	CTH		
DRAWN:	CTH		
CHECKED:	RLM		
APPROVED:	RLM		



SCALE	N/A	VERT.	N/A
HORIZ.	1"=40'	DATE	06/01/2018
FILE	171899-PLANNING.dwg	SECTION	24
LEGAL		RANGE	25
TWP.		4E	

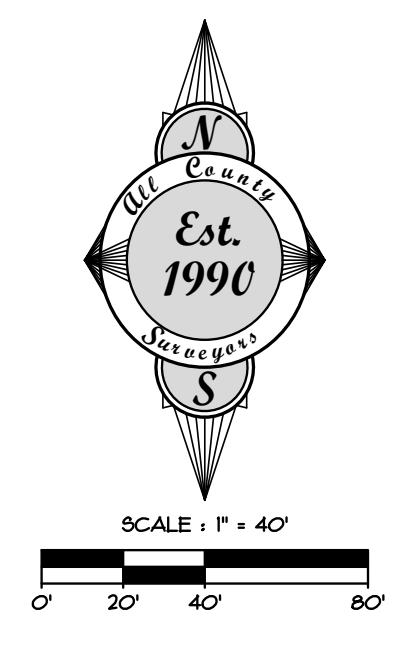
**JACOBY HEIGHTS SUBDIVISION**  
**EXISTING TREES WITH BUILDING SETBACKS MAP**

PROJECT: 19124 SE JACOBY RD SANDY, OR 97055  
 LOCATION: 12422

**Surveyors & Planners, Inc.**  
 Surveying, Planning and Civil Engineering  
 P.O. Box 955 Sandy, OR 97055  
 Phone: (503) 668-4730  
 Fax: (503) 668-4730  
 DATE OF PLOT: 12/25/2018

CORY KNIGHT  
 16153 SE ORCHARD VIEW LANE  
 DAMASCUS, OR 97089

SHEET	3
OF	10



Slopes Table

Number	Minimum Slope	Maximum Slope	Color
1	0.00%	10.00%	Green
2	10.01%	24.99%	Yellow
3	25.00%	Vertical	Orange/Red

**FSH AREAS**

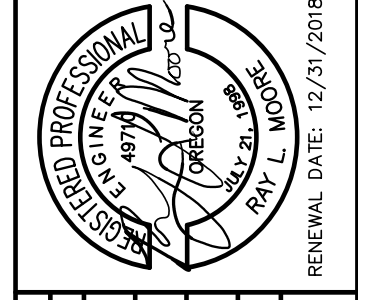
TOTAL AREA FROM 200' SETBACK TO TICKLE CREEK TOP OF BANK  
53,884 SF

UNRESTRICTED AREA WITHIN THE 200' SETBACK FROM THE TICKLE CREEK TOP OF BANK  
1,440 SF

TOTAL RESTRICTED DEVELOPMENT AREA (RDA)  
52,444 SF

AREAS SHOWN ABOVE ARE LIMITED TO FSH WITHIN THE PROJECT BOUNDARY

DATE	NO.	REVISION	BY	SHEET
				4
DESIGNED: CTH	DRAWN: CTH	CHECKED: RLMT	APPROVED: RLMT	OF 10



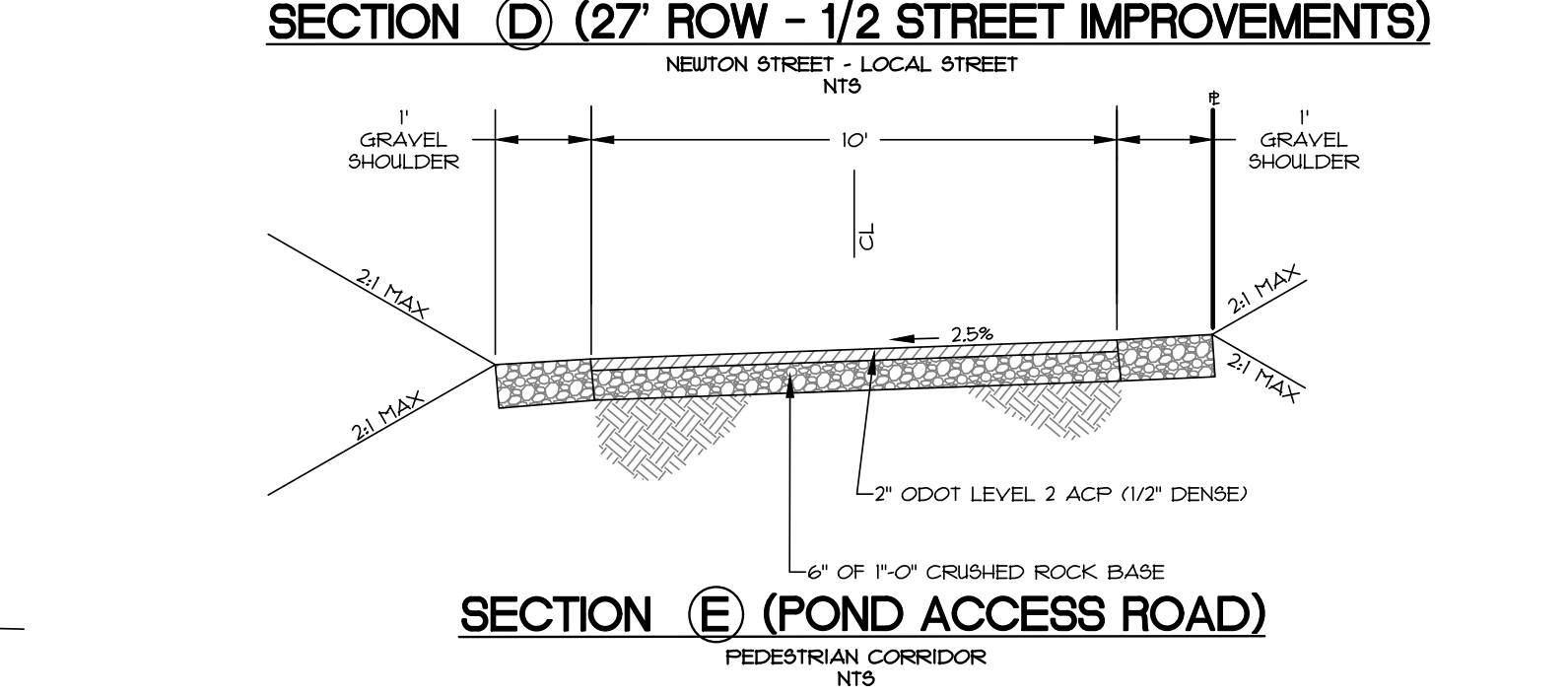
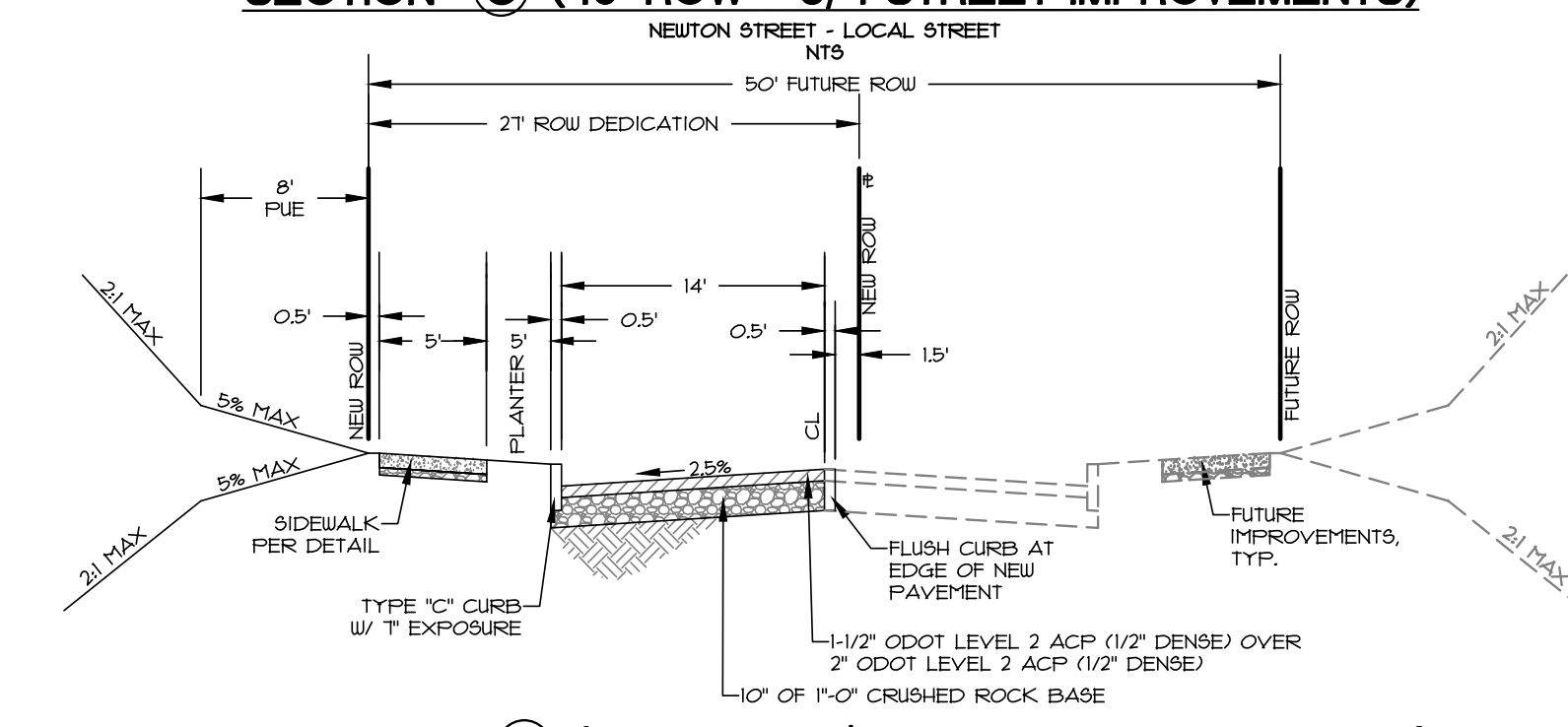
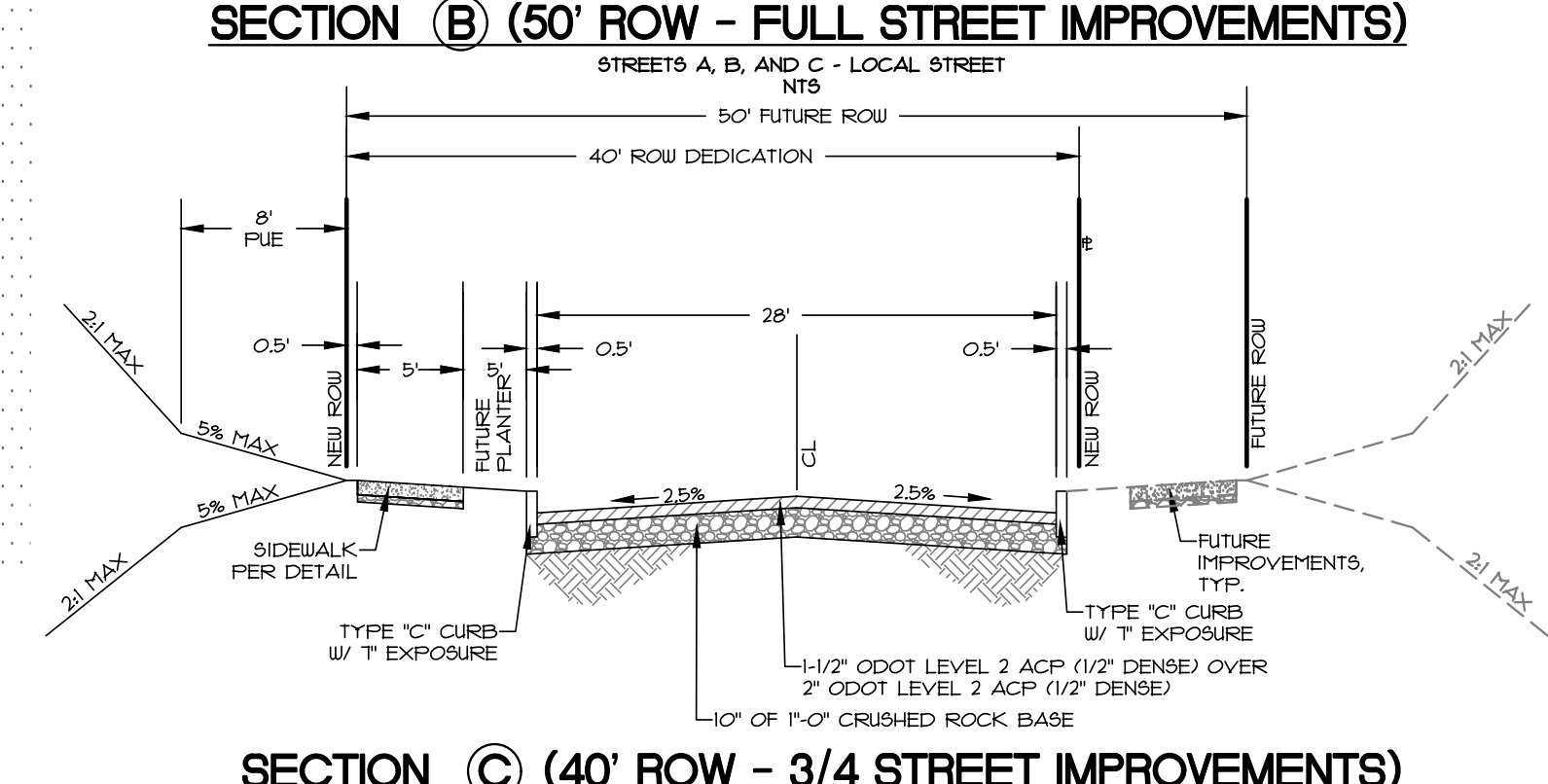
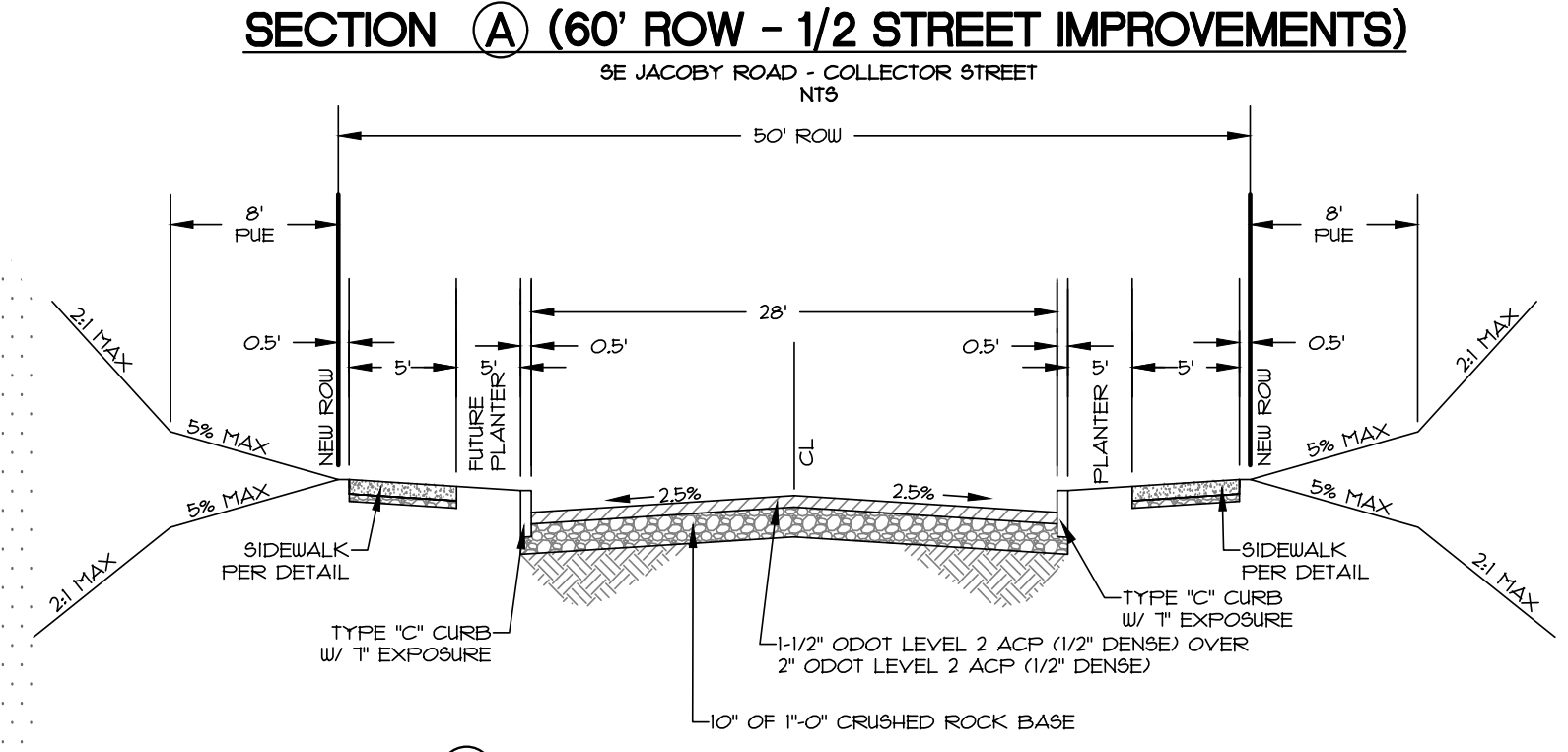
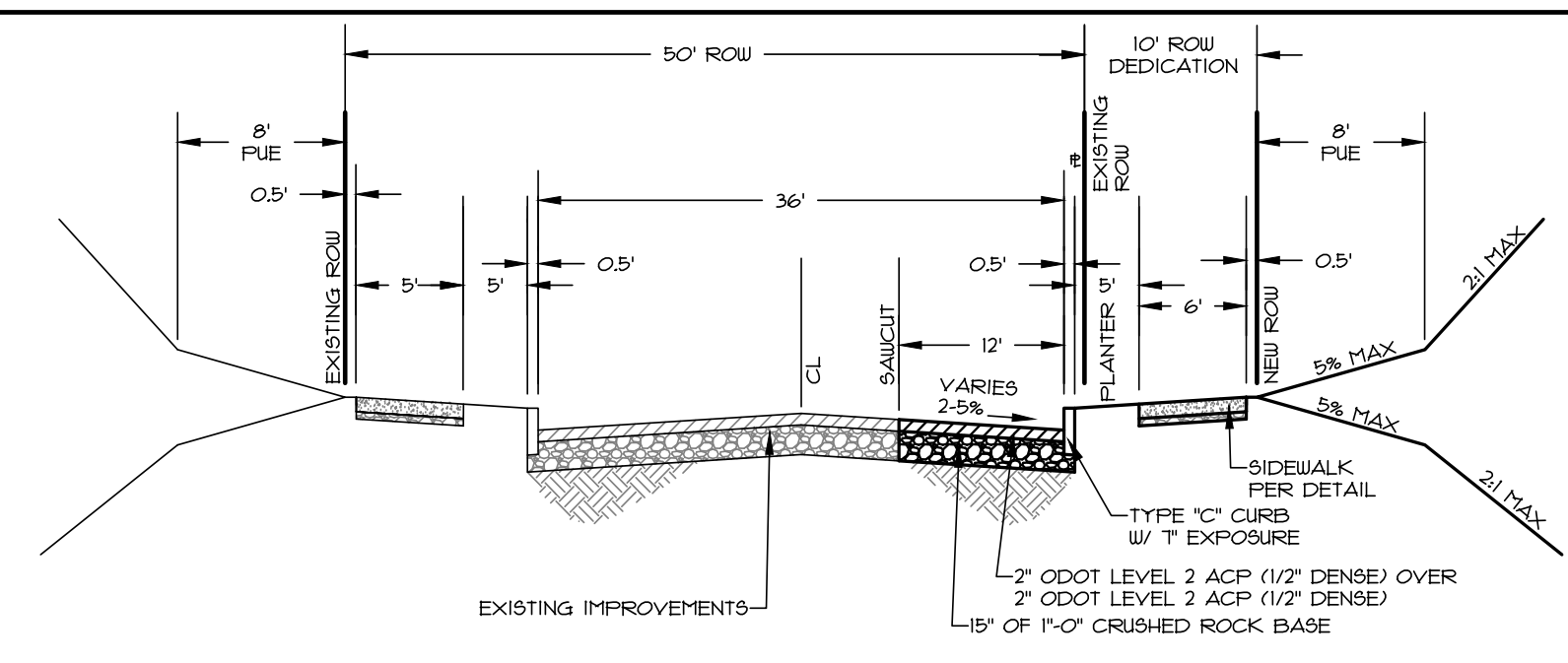
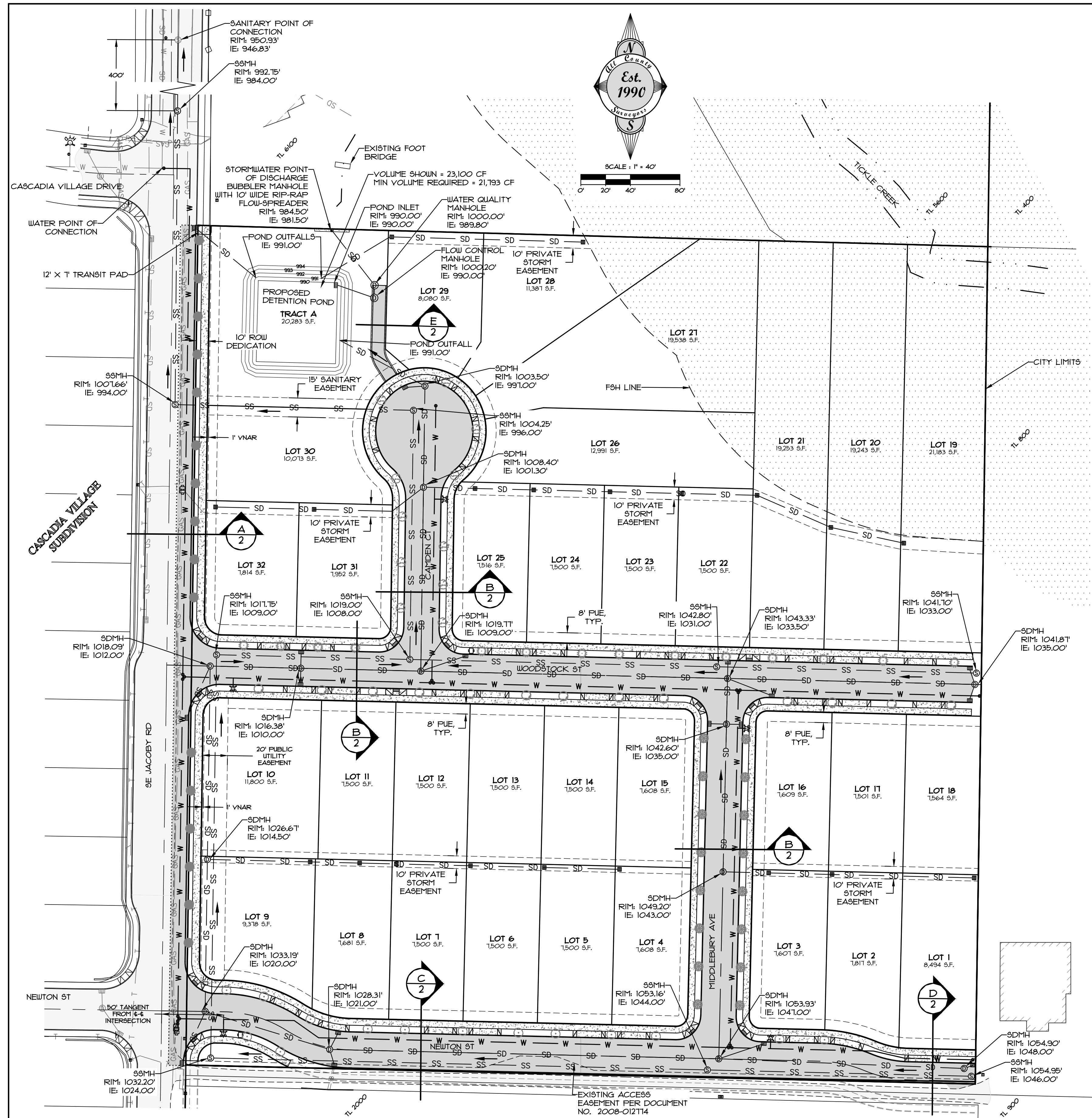
SCALE	VERT.	N/A	SECTION	24
DATE	HORIZ.	1"=40'	TWP.	25
FILE: 17189-PLANNING.dwg	LEGAL		RANGE	4E

**JACOBY HEIGHTS SUBDIVISION**  
FSH AND SLOPES MAP

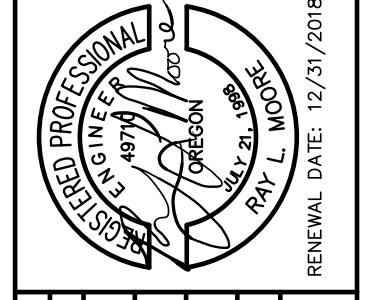
19124 SE JACOBY RD. SANDY, OR 97055

**Surveyors & Planners, Inc.**  
Surveying, Planning and  
Civil Engineering  
P.O. Box 955 Sandy, OR 97055  
Phone: (503) 668-4730  
Fax: (503) 668-4730  
DATE OF PLOT: 12/14/2018

CORY KNIGHT  
16153 SE ORCHARD VIEW LANE  
DAMASCUS, OR 97089



BY	1	SHEET	5
REVISION		OF	10
DATE		DESIGNED	CTH
		DRAWN	CTH
		CHECKED	RLT
		APPROVED	RLT



SCALE	N/A	SECTION	24
VERT. SCALE	1" = 40'	RANGE	25
HORIZ. SCALE	1" = 40'	LEGAL	4E
DATE	06/01/2018		
FILE	17-199-PLANNING.dwg		

**JACOBY HEIGHTS SUBDIVISION**  
**PRELIMINARY STREET & UTILITY PLAN**

PROJECT: 19124 SE JACOBY RD SANDY, OR 97055  
 LOCATION: 19124 SE JACOBY RD SANDY, OR 97055

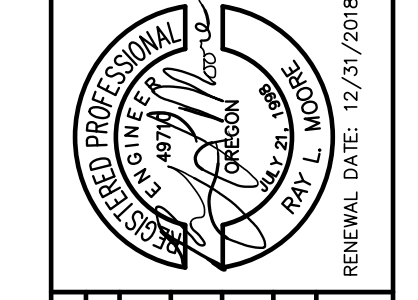
Surveyors & Planners, Inc.  
 Surveying, Planning and  
 Civil Engineering  
 P.O. Box 955 Sandy, OR 97055  
 Phone: (503) 668-4730  
 Fax: (503) 668-4730  
 DATE OF PLOT: 12/12/2018

CORY KNIGHT  
 16153 SE ORCHARD VIEW LANE  
 DAMASCUS, OR 97089



- STREET TREE LEGEND**
- GREEN VASE ZELKOVA - SE JACOBY RD
  - GINKGO HALKA - NEWTON ST
  - VILLAGE GREEN ZELKOVA - MIDDLEBURY AVE
  - PATMORE ASH - WOODSTOCK ST (SOUTH)
  - AMERICAN HOPHORNBEAM - WOODSTOCK ST (NORTH)
  - PAPERBARK MAPLE - CAMDEN CT

DATE	NO.	REVISION	BY	SHEET
				6
				OF 10
DESIGNED:	CTH			
DRAWN:	CTH			
CHECKED:	RLT			
APPROVED:	RLT			



SCALE	N/A	VERT.	N/A
HORIZ.	1"=40'	DATE	06/01/2018
FILE	17189-PLANNING.dwg	LEGAL	
SECTION	TWP. RANGE	SECTION	TWP. RANGE
24	25	24	25
	4E		4E

**JACOBY HEIGHTS SUBDIVISION**  
 PRELIMINARY STREET  
 TREE PLAN  
 19124 SE JACOBY RD. SANDY, OR 97055



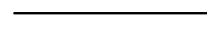


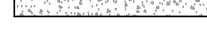
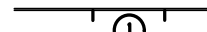


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 DATE OF PLOT: 12/21/2018

CORY KNIGHT  
 16153 SE ORCHARD VIEW LANE  
 DAMASCUS, OR 97089

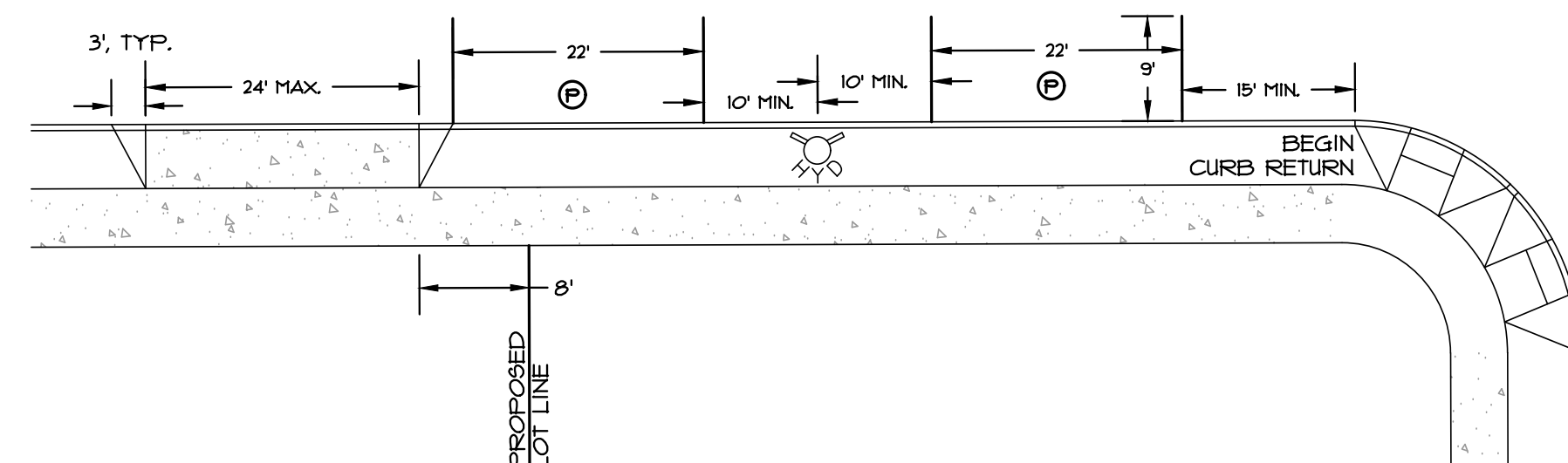
EXISTING ACCESS  
 EASEMENT PER DOCUMENT  
 NO. 2008-01214



**LEGEND**

-  SUBJECT PROPERTY BOUNDARY LINE
-  PROPOSED LOT LINE
-  PROPOSED CURB AND PAVEMENT
-  PROPOSED SIDEWALK
-  PROPOSED UNSTRIPED 22' x 9' ON-STREET PARKING SPACE
-  PARKING SPACE NUMBER CORRESPONDING TO LOT NUMBER
-  PARKING SPACE THAT EXCEEDS THE REQUIREMENT
-  PROPOSED FIRE HYDRANT
-  PROPOSED MBU

**TYPICAL ON-STREET PARKING REQUIREMENT DIMENSIONS**

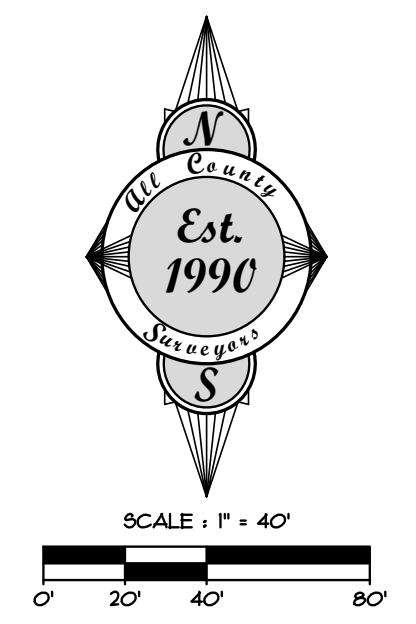


ON-STREET PARKING REQUIREMENTS  
11.98.200 SDC  
REQUIREMENT: 1 ON-STREET PARKING SPACE  
WITHIN 200 FEET OF EACH DWELLING  
REQUIREMENT IS FULFILLED.  
TOTAL NUMBER OF LOTS: 32  
TOTAL NUMBER OF  
ON-STREET PARKING SPACES: 62

BY	REVISION	SHEET
		7
DATE	NO.	OF
		10
DESIGNED: CTH	DRAWN: CTH	CHECKED: RLT
APPROVED: RLT		



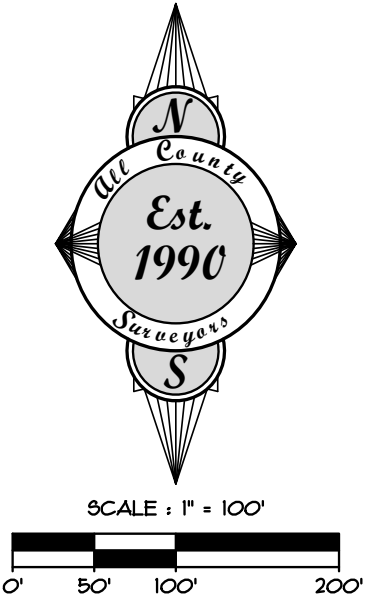
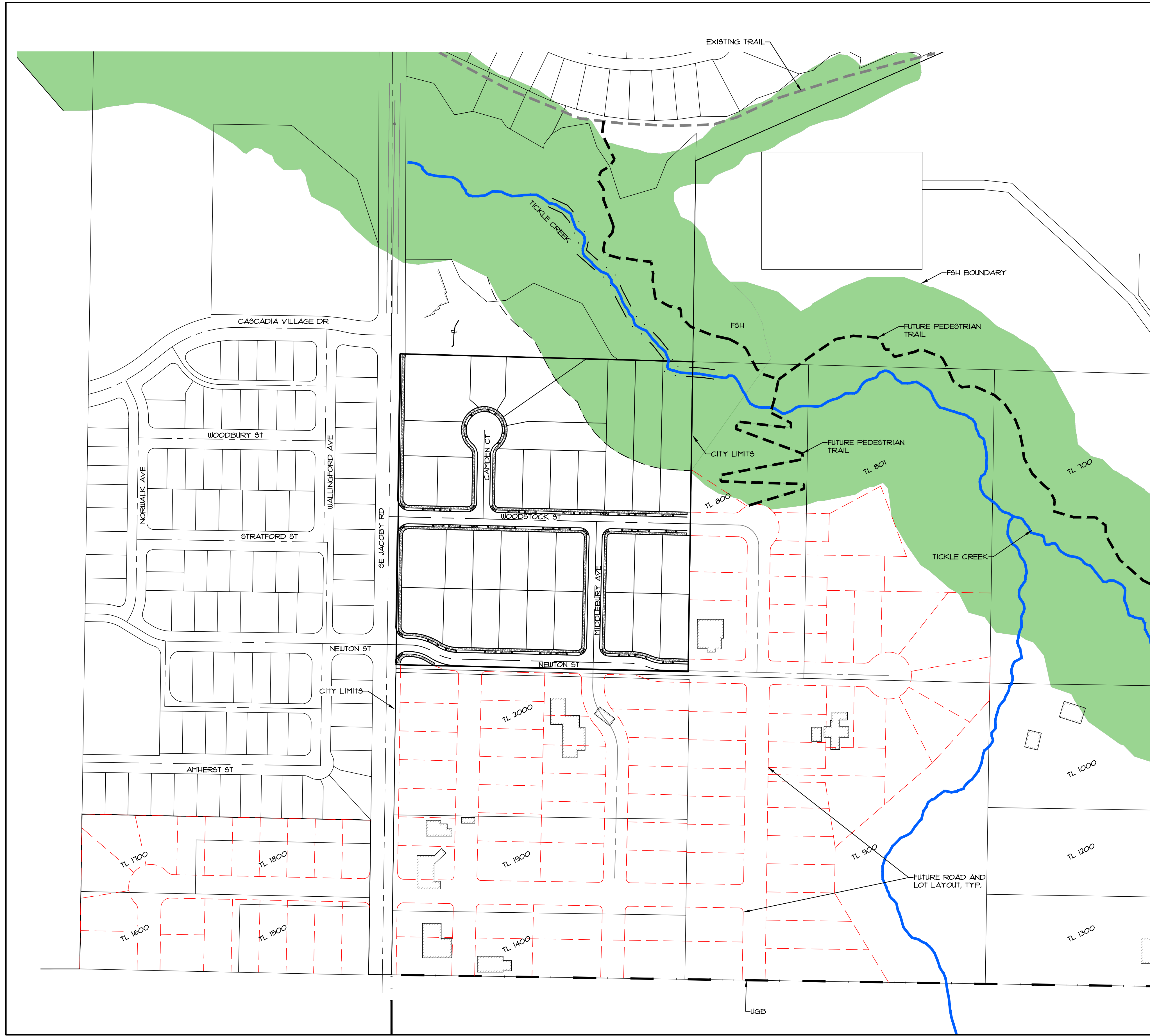
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HORIZ. 1"=40'	DATE: 06/01/2018	TWP.	25
FILE: 17189-PLANNING.dwg	LEGAL	RANGE	4E



**JACOBY HEIGHTS SUBDIVISION**  
PRELIMINARY PARKING  
PLAN  
19124 SE JACOBY RD. SANDY, OR 97055

**Surveyors & Planners, Inc.**  
Surveying, Planning and  
Civil Engineering and  
P.O. Box 955 Sandy, OR 97055  
Tel: (503) 668-4730  
Fax: (503) 668-4730  
DATE OF PLOT: 12/12/2018

CORY KNIGHT  
16153 SE ORCHARD VIEW LANE  
DAMASCUS, OR 97089



<b>PROJECT:</b> <b>JACOBY HEIGHTS SUBDIVISION</b> FUTURE STREET AND PEDESTRIAN TRAIL PLAN <b>LOCATION:</b> 19124 SE JACOBY RD SANDY, OR 97055	SCALE: N/A HORIZ: 1"=100' DATE: 06/01/2018 FILE: 171899-PLANNING.dwg	VERT: N/A DATE: 06/01/2018 FILE: 171899-PLANNING.dwg	REVISION NO. DATE BY	SHEET OF <b>8</b> OF <b>10</b>
	SECTION: 24 TWP: 25 RANGE: 4E	DESIGNED: CTH DRAWN: CTH CHECKED: RLMT APPROVED: RLMT	REDESIGNED: CTH REDRAWN: CTH RECHECKED: RLMT REAPPROVED: RLMT	REVISION NO. DATE BY

**Surveyors & Planners, Inc.**  
 Surveying, Planning and  
 Civil Engineering and  
 Construction  
 P.O. Box 955 Sandy, OR 97055  
 Phone: (503) 668-4730  
 Fax: (503) 668-4730  
 DATE OF PLOT: 12/29/2018

**CORY KNIGHT**  
 16153 SE ORCHARD VIEW LANE  
 DAMASCUS, OR 97089

**EROSION CONTROL NOTES:**

OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

THE IMPLEMENTATION OF THESE ESC PLANS AND CONSTRUCTION MAINTENANCE, REPLACEMENT AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED BY THE LOCAL JURISDICTION, AND VEGETATION/LANDSCAPING IS ESTABLISHED. THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTENANCE AFTER THE PROJECT IS APPROVED UNTIL THE LOTS ARE SOLD.

THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE MARKINGS SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

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

THE ESC FACILITIES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE.

ALL ADJACENT STREETS SHALL BE KEPT FROM DEBRIS, DIRT AND ROCK AT ALL TIMES. USE ROCK ENTRANCE FROM ENTERING AND LEAVING THE SITE. ANY DIRT OR DEBRIS LEAVING THE SITE SHALL BE CLEANED UP IMMEDIATELY.

AN EROSION CONTROL INSPECTION IS REQUIRED BEFORE ANY GROUND DISTURBING ACTIVITY IS COMMENCED ON-SITE. ALSO, THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO INSURE THEIR CONTINUED FUNCTIONING.

STABILIZED GRAVEL ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

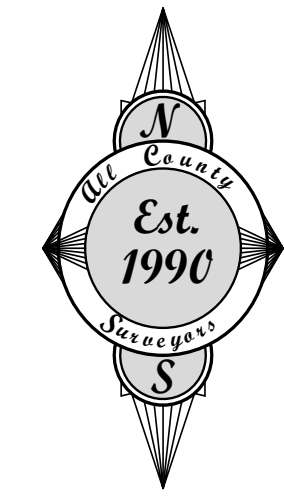
STORM INLETS, BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND/OR VEGETATION IS RE-ESTABLISHED.

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

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

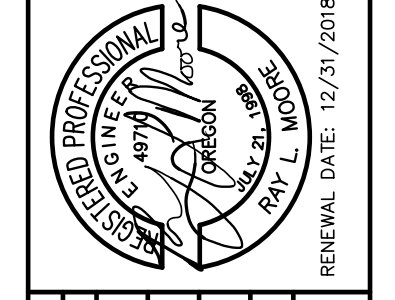
IF THERE ARE EXPOSED SOILS OR SOILS NOT FULLY ESTABLISHED FROM OCTOBER 1ST THROUGH APRIL 30TH, THE WET WEATHER EROSION PREVENTION MEASURES WILL BE IN EFFECT. SEE THE EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (CHAPTER 4) FOR REQUIREMENTS.

THE DEVELOPER SHALL REMOVE ESC MEASURES WHEN VEGETATION IS FULLY ESTABLISHED.



SCALE: 1" = 40'

BY	REVISION	SHEET
DATE	NO.	OF
		10
DESIGNED: CTH	CHECKED: RLT	APPROVED: RLT
DRAWN: CTH		

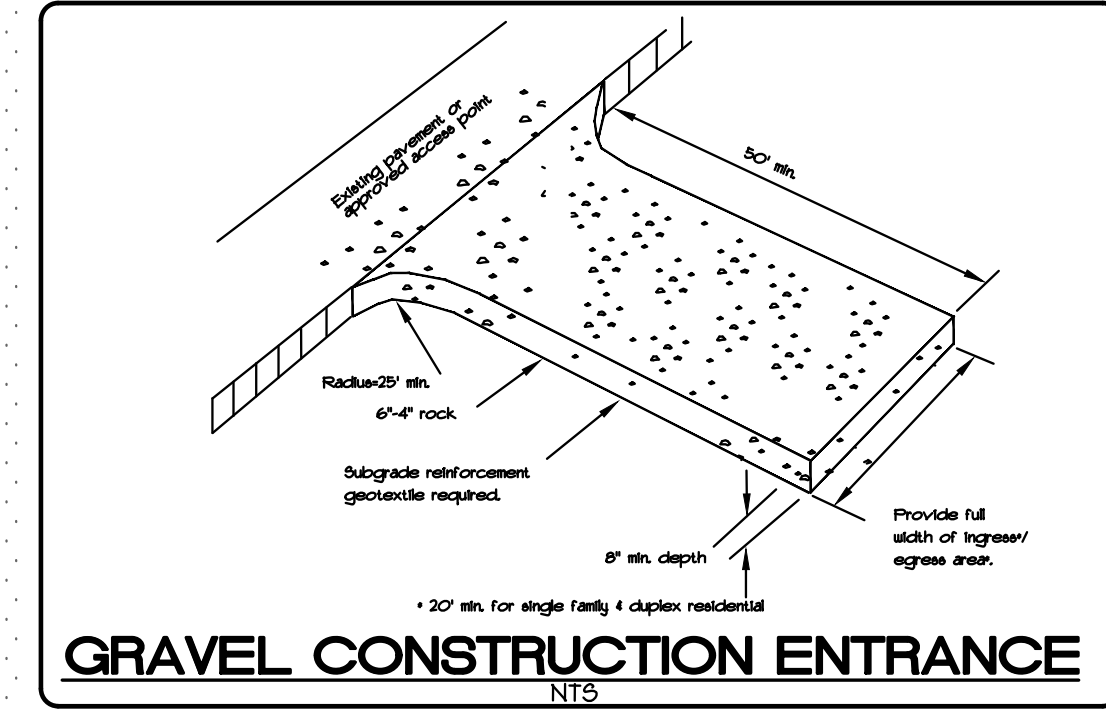


SCALE	DATE	SECTION
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HORIZ: 1"=40'	FILE: 17189-PLANNING.dwg	RANGE
		25
		4E

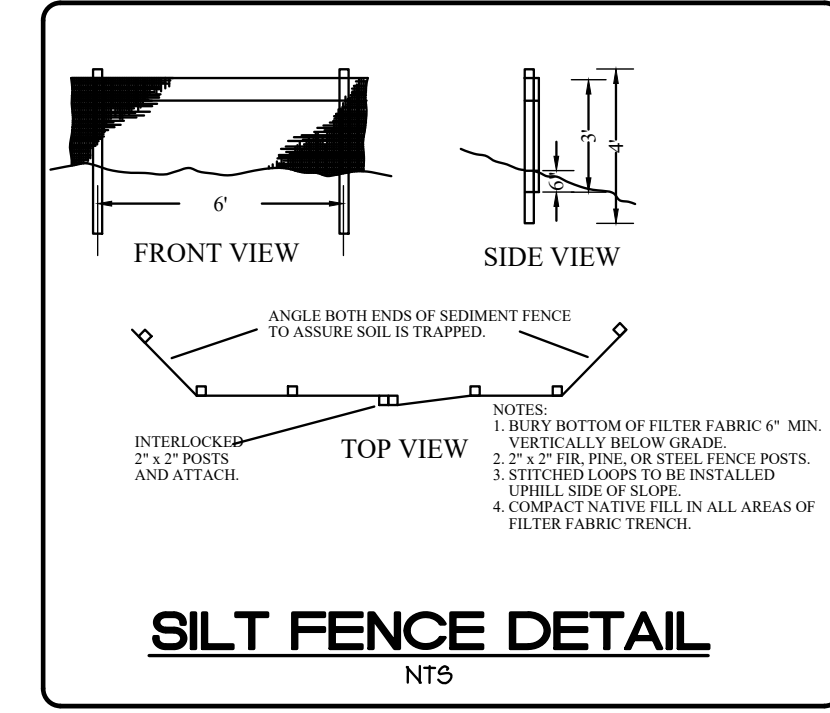
**JACOBY HEIGHTS SUBDIVISION**  
**GRADING & EROSION CONTROL PLAN**  
 PROJECT: 19124 SE JACOBY RD SANDY, OR 97055  
 LOCATION: 19124 SE JACOBY RD SANDY, OR 97055

**Surveyors & Planners, Inc.**  
 Surveying, Planning and Engineering  
 P.O. Box 955 Sandy, OR 97055  
 Phone: (503) 668-4730  
 Fax: (503) 668-4730  
 DATE OF PLOT: 12/12/2018

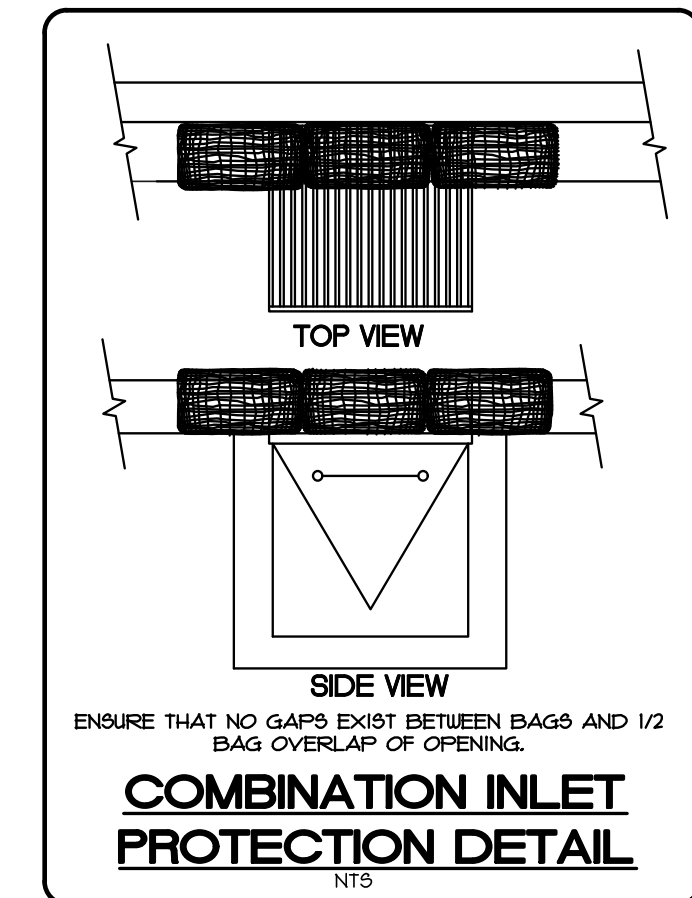
**CORY KNIGHT**  
 16153 SE ORCHARD VIEW LANE  
 DAMASCUS, OR 97089



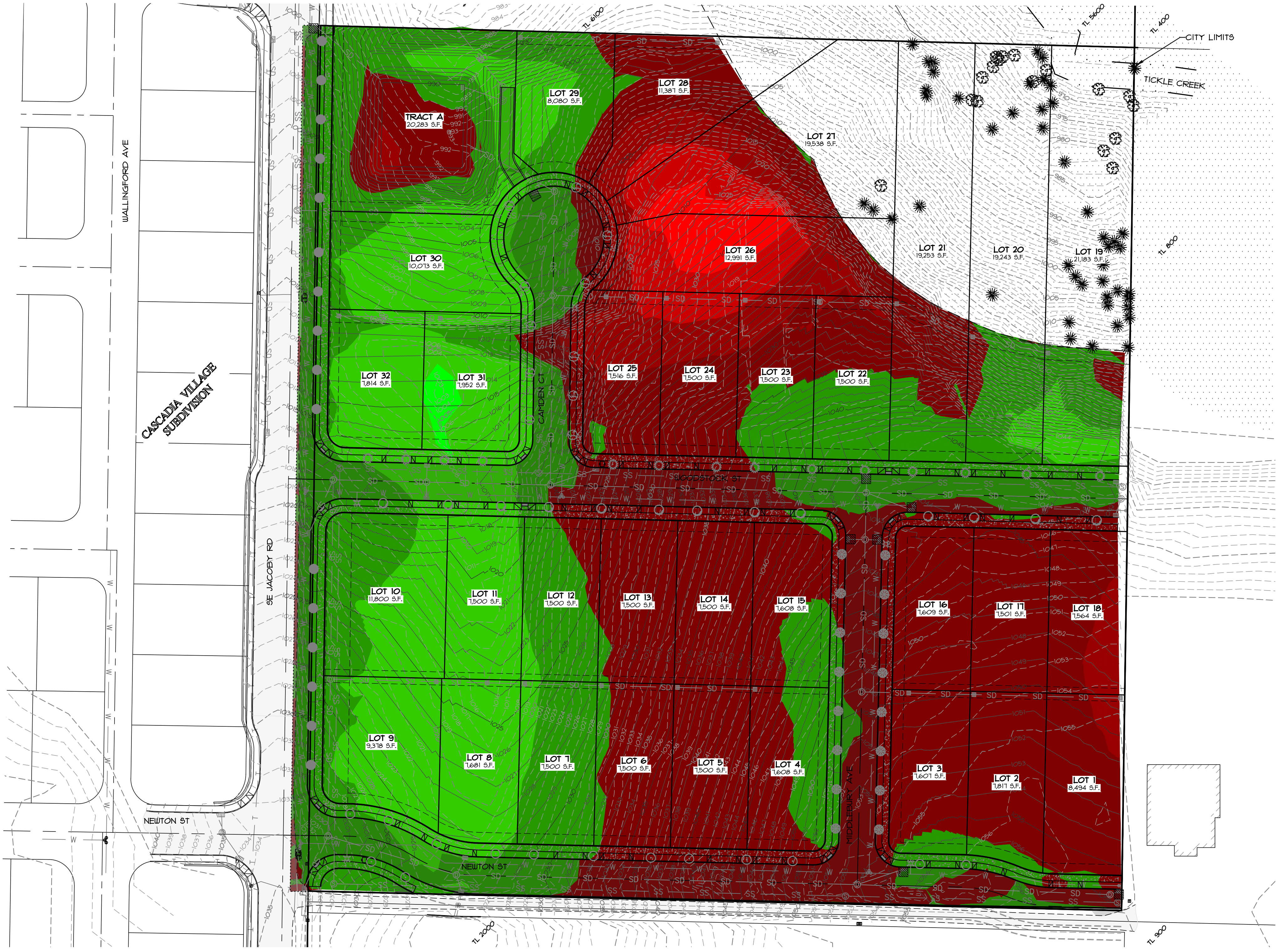
**GRAVEL CONSTRUCTION ENTRANCE**  
 NTS



**SILT FENCE DETAIL**  
 NTS



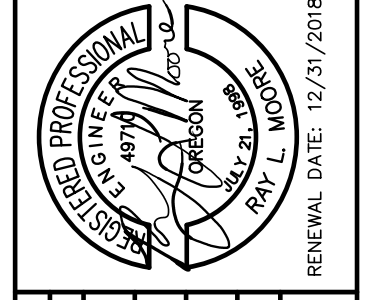
**COMBINATION INLET PROTECTION DETAIL**  
 NTS



Number	Minimum Elevation	Maximum Elevation	Color
1	-20.000	-15.000	Red
2	-15.000	-10.000	Red
3	-10.000	-5.000	Red
4	-5.000	0.000	Red
5	0.000	5.000	Green
6	5.000	10.000	Green
7	10.000	15.000	Green

NEGATIVE ELEVATIONS IN TABLE ABOVE REPRESENT CUT, AND POSITIVE REPRESENTS FILL.

DATE	NO.	REVISION	BY	SHEET
				10
				OF 10
DESIGNED:	CTH			
DRAWN:	CTH			
CHECKED:	RLM			
APPROVED:	RLM			



SCALE:	N/A	VERT.:	N/A
DATE:	06/01/2018	HORIZ.:	1"=40'
FILE:	171899-PLANNING.dwg	LEGAL:	
SECTION:	24	TWP.:	25
RANGE:	4E	RENEWAL DATE:	12/31/2018

PROJECT: **JACOBY HEIGHTS SUBDIVISION**  
**CUT AND FILL EVALUATION**  
 LOCATION: **19124 SE JACOBY RD. SANDY, OR 97055**

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 Construction  
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 Fax: (503) 668-4730  
 DATE OF PLOT: 12/14/2018

CORY KNIGHT  
 16153 SE ORCHARD VIEW LANE  
 DAMASCUS, OR 97089

# EXHIBIT D

## REQUEST FOR CODE INTERPRETATION Jacoby Heights Subdivision File No. 18-025

**Request:** The applicant requests a Planning Commission code interpretation to determine the applicable code section/chapter regarding tree retention in residential subdivisions. With the current application, Planning Department staff has required the applicant to address the requirements of both Chapter 17.92, Landscaping & Screening, General Standards All Zones specifically Section 17.92.10, General Provisions, subsection (C) and the requirements of Chapter 17.102, Urban Forestry Ordinance. It is the applicant's belief that only the requirements of Chapter 17.102, Urban Forestry Ordinance are applicable to regulating trees on the subject property. The requested interpretation is relevant not only to the proposed Jacoby Heights Subdivision application but may also to all similarly zoned properties in the City of Sandy.

**Introduction:** The purpose of this document is to show that the requirements of Section 17.92.10(C) are not intended to be used to regulate tree retention on the subject property. The document starts by reviewing the legislative history leading up to the adoption of these code chapters and it then analyzes the code language of these chapters in detail.

**Legislative History:** Chapter 17.92 was adopted by the City Council as part of an overhaul of the Development Code on October 20, 1997 by Ordinance 9-97. The regulations of Chapter 17.102 were developed after an extensive public involvement process that involved work by an advisory committee. This code was adopted by Ordinance 2002-10 on November 18, 2002, about four years after work on this code had begun. Because Chapter 17.92 was adopted and in place prior to the start of any work on Chapter 17.102, it is clear that these regulations should not be used to regulate trees in residential subdivisions. If Section 17.92.10(C) was applicable there would have been no reason to develop new regulations.

A review of the legislative history provides valuable insight into understanding the intent and applicability of these adopted regulations. The legislative history of Chapter 17.102 is especially revealing in that this chapter was developed over several years before adoption in 2002. The following documents relevant to this discussion were gleaned from the City's online archive system.

- Attachment 1 - Council Goals 1997-98 - "Adopt a Tree Ordinance/Urban Forestry Program".
- Attachment 2 - March 15, 1999 - City Council appoints Urban Forestry Committee to develop tree regulations.
- Attachment 3 - October 30, 2000 - Council Minutes - CC reviews draft Urban Forestry Ordinance.
- Attachment 4 - Council Goals 2001 - "Adopt an Urban Forestry Ordinance".
- Attachment 5 - June 17, 2002 - Lazenby (City Manager) memo to PC regarding "Tree Ordinance".
- Attachment 6 - PC Staff Report, August 26, 2002
- Attachment 7 - Other Code Amendments

- Attachment 8 - November 4, 2002 - Council Minutes public hearing on revised draft Urban Forestry Ordinance.
- Attachment 9 - Ordinance 2002-10 Findings of Fact
- Attachment 10 - Pre-application Notes and Email from James Cramer Regarding Tree Inventory Required.

**Conclusion of Legislative History Review:** It is clear after reviewing the various documents produced after Chapter 17.92 had already been adopted, that the reason the City Council directed Planning staff to develop the tree protection regulations in Chapter 17.102, was because adequate regulations did not already exist. Since the regulations in Chapter 17.92, were adopted prior to this date (1997), it is reasonable to conclude that everyone involved (staff, public, Planning Commission, and City Council) believed the language in Chapter 17.92 did not apply to residential subdivisions. This conclusion is supported by the Findings adopted with Ordinance 2002-10, Council goals, meeting minutes, and various other documents listed above. The “Additional Code Amendments” document (Attachment 7), although never adopted, provides additional evidence supporting this conclusion. This amendment added clarification that retained trees required by Chapter 17.102 could be counted towards required landscaping. This language would not have been included if Chapter 17.92 was intended to regulate tree retention.

**Comparison of Chapters 17.92 and 17.102:** A review of the pure language in these regulations also supports the conclusion that the language in Chapter 17.92 should not be used to regulate tree retention in residential subdivisions. The following section starts by comparing the intent sections of these chapters and then evaluates specific regulatory language.

**Chapter 17.92:** The title of this chapter, “Landscaping & Screening, General Standards - All Zones” speaks to the intent of this chapter. Section 17.92.00, Intent, includes the following language:

*“The City of Sandy recognizes the aesthetic and economic value of landscaping and encourages its use to establish a pleasant community character, unify developments, and buffer or screen unsightly features; to soften and buffer large scale structures and parking lots; and to aid in energy conservation by providing shade from the sun and shelter from the wind. The community desires and intends all properties to be landscaped and maintained.”*

*“This chapter prescribes standards for landscaping, buffering, and screening. While this chapter provides standards for frequently encountered development situations, detailed planting plans and irrigation system designs, when required, shall be reviewed by the City with this purposes clause as the guiding principle.”*

The following terms are relevant when evaluating the intent of this chapter:

*Landscaping: The arrangement of trees, grass, bushes, shrubs, flowers, gardens, fountains, patios, decks, outdoor furniture, and paving materials in a yard space. It does not include the placing or installation of artificial plant materials. (from SDC)*  
*Buffer - A combination of physical space and vertical elements, such as plants, berms, fences or walls, designed to provide space or distance, obstruct undesirable views, serve as an acoustic barrier, generally reduce impacts of adjacent development, or separate and screen incompatible land uses from each other. (from SDC)*

*Buffer: A combination of physical space and vertical elements, such as plants, berms, fences or walls, designed to provide space or distance, obstruct undesirable views, serve as an acoustic barrier, generally reduce impacts of adjacent development, or separate and screen incompatible land uses from each other.*

*Screen: No definition found in SDC. Websters Dictionary defines a screen as, "something that shelters, protects, or hides: such as: a growth or stand of trees, shrubs, or plants."*

Even though the title of this chapter includes the words "All Zones" the language in the intent statement speaks to landscaping in the broad use of the term and including items typically considered landscaping: trees, bushes, grass, etc., arranged in a development or yard. The examples used in the intent statement include: "buffering and screening unsightly features" and "softening and screening large scale structures and parking lots". These examples are relevant to multi-family, commercial, and industrial projects but do not apply to tree retention requirements in residential subdivisions.

**Chapter 17.102, Urban Forestry:** In contrast, the intent of Chapter 17.102 speaks to regulating tree retention and the benefits trees provide.

- A. This chapter is intended to conserve and replenish the ecological, aesthetic and economic benefits of urban forests, by regulating tree removal on properties greater than one acre within the Sandy Urban Growth Boundary.*
- B. This chapter is intended to facilitate planned urban development as prescribed by the Sandy Comprehensive Plan, through the appropriate location of harvest areas, landing and yarding areas, roads and drainage facilities.*
- C. This chapter shall be construed in a manner consistent with Chapter 17.60 Flood and Slope Hazard Overlay District. In cases of conflict, Chapter 17.60 shall prevail.*

**Section 17.92.10(C):** The language Planning staff has recently been using in addition to Chapter 17.102 to regulate tree retention, is found in this section.

- C. "Significant plant and tree specimens should be preserved to the greatest extent practicable and integrated into the design of a development. Trees of 25-inches or greater circumference measured at a height of 4-1/2 ft. above grade are considered significant. Plants to be saved and methods of protection shall be*

*indicated on the detailed planting plan submitted for approval. Existing trees may be considered preserved if no cutting, filling, or compaction of the soil takes place between the trunk of the tree and the area 5-ft. outside the tree's drip line. Trees to be retained shall be protected from damage during construction by a construction fence located 5 ft. outside the dripline."*

The first sentence of this section states: "Significant plant and tree specimens should be preserved to the greatest extent practicable ...". There are two problems with using the language in this sentence. The first is use of the word "should". This word when used in regulatory code is permissive and aspirational and generally denotes a guideline or recommendation. This is opposed to the word "shall" which conveys a mandatory requirement. The second problem with this section is the use of the phrase, "preserved to the greatest extent practicable". This phrase is unclear and is subject to interpretation as to what is required. Who is responsible for defining "greatest extent practicable"?

A comparison of the language in Chapter 17.102 with Section 17.92.10(C) reveals a number of differences between these two sections. Where the regulations in Chapter 17.102 only apply to properties greater than one acre and defines trees as 11-inches diameter or greater, Section 17.92.10(C) doesn't contain a property size limitation and defines trees as 25-inches or greater circumference (7.9 inches). Chapter 17.102 specifically allows retained trees to be located anywhere on the site at the landowner's discretion while Section 17.92.10(C) requires trees to be integrated into the design of the development. In addition to these differences, the protection requirements for retained trees are considerably more restrictive in Chapter 17.92 than the regulations in Chapter 17.102. A table comparing the differences between these regulations is included below.

Comparing Code Requirements

Chapter 17.102 - Urban Forestry	Chapter 17.92 - Landscaping & Screening
Applicable to properties greater than one acre.	No property size specified.
Shall retain three trees/acre.	Trees <u>should</u> be preserved to the greatest extent practicable.
Retained trees can be located <u>anywhere</u> on the site at the landowner's discretion before the harvest begins.	.. integrated into the design of a development.
Trees are defined as 11-inches or greater.	Trees are defined as 25-inches or greater circumference.
Trees proposed for retention shall be healthy.	No tree condition requirement.
At least two of the three retained trees/acre must be conifer species, if possible.	No species preference.
Retained trees shall be protected by fencing 10 horizontal feet from the outside edge of the trunk.	Retained trees shall be protected by a constructed fence five feet outside the drip line.



**Conclusion of Code Language Review:** As reviewed in this section, the language in Section 17.92.10(C) encourages tree protection (“*should be preserved*”) rather than requiring protection (“shall retain three trees/acre”) as specified in Chapter 17.102. Where Chapter 17.92 speaks to landscaping and screening, Chapter 17.102 speaks to the benefits of the urban forest. Where the standards in Chapter 17.102 are prescriptive (*three trees per acre on properties greater than one acre*) the language in Section 17.92.10(C) is permissive, aspirational, and subjective (“*tree specimens should be preserved to the greatest extent practicable*”). Even if the language in Chapter 17.92 was found to apply to residential subdivisions, this language encourages but does not require trees retention.

**Summary:** The applicant requests the Planning Commission consider this request for a Code Interpretation to determine the applicable Code language regulating tree retention for the proposed residential subdivision. As discussed in this document, the applicant believes City staff is incorrectly applying the language in Section 17.92.10(C) to residential subdivisions. The basis for this conclusion includes the following:

1. Chapter 17.102 was adopted four years after Chapter 17.92 was adopted.
2. The record shows that everyone involved in the development and adoption of the tree regulations in Chapter 17.102 believed regulations did not already exist in the Code to protect trees in residential subdivisions.
3. The intent of Chapter 17.92 speaks to landscaping, buffering, and screening, aspects that are generally not relevant at the subdivision level. These requirements are generally only applicable to commercial, industrial, and multi-family projects.
4. The intent of Chapter 17.102 speaks to regulating tree retention and the benefits trees provide.
5. The language in Section 17.92.10(C) conflicts with the tree retention standards in Chapter 17.102, Urban Forestry.
6. The tree retention language in 17.92.10(C) is subjective and does not specify a mandatory requirement. The use of the word “should” denotes a recommendation or guideline and the phrase, “to the greatest extent practicable” is subject to interpretation.
7. The language in Chapter 17.102 is clear and objective and mandates a tree retention requirement.

#### **Why is this Important?**

- If Section 17.92.10(C) is applied to subdivisions, the phrase “*Significant plant and tree specimens should be preserved to the greatest extent practicable...*” will make it virtually impossible to layout out a subdivision on a heavily wooded site. It will be

impossible to meet required street spacing, lot densities, street grades and numerous other design requirements that control subdivision layouts, all while saving trees to the “*greatest extent practicable*”.

- The language in Chapter 17.102 is clear and objective and contains mandatory tree retention standards while the language in Section 17.92.10(C) is subjective and leaves significant room for interpretation. The use of the word “*should*” in Section 17.92.10(C) also denotes that tree retention is a guideline or recommendation while the language in Chapter 17.102 is mandatory.
- The difference between the tree retention requirements of Chapter 17.102 and those in Section 17.92.10(C) can be significant. Where Chapter 17.102 clearly requires three trees 11-inches or greater/acre to be retained anywhere on the site at the owner’s discretion, Section 17.92.10(C) could be interpreted to require all trees 8-inches or larger to be retained (“*to the greatest extent practicable*”).
- Using two different chapters with conflicting requirements is confusing to developers and to staff. As included in Attachment 10, the pre-application conference notes prepared by staff (January 3, 2018), specify that trees 11-inches and greater (six inches within the FSH Overlay) shall be inventoried. This standard is stated again in a email to the applicant by city staff on February 12, 2018. It was only after the applicant paid an Arborist to complete this inventory and it was included with the original application package that staff then told the applicant in the incompleteness letter (dated July 12, 2018) that all trees 8-inches and greater needed to be inventoried. The additional cost to the applicant to have an Arborist return to the site and inventory these additional trees was about \$3,100.

ATTACHMENT 1

CITY COUNCIL 19976-987 GOAL STATEMENT

**1. Improve the city's infrastructure to meet current standards and provide for managed future growth.**

**This Year**

Secure a permit for future sewer plant improvements and operations, including an outfall on the Sandy River.

Develop standards and funding for a Neighborhood Traffic Management Program, including "traffic calming" measures.

~~Complete Tickle Creek local improvement district.~~  
Develop a Stormwater Management Plan.

Adopt a Wastewater Pretreatment Ordinance

~~Complete the Acquire the state forestry site for~~ Vista Loop reservoir expansion.

Begin planning for a Salmon River water plant and Sandy River wastewater outfall.

**Next Two Years**

Find a stable funding source for street maintenance.

Pursue funding to implement alternative transportation methods (e.g., bike/ped paths, routes, maps; ~~improved bus service~~).

Explore a Sidewalk Repair Program.

**Long Range**

Pursue options for alleviating Highway 26 traffic congestion, including a bypass, and safe pedestrian crossings in downtown Sandy.

**2. Manage growth pressures through careful planning.**

**This Year**

Revise the Comprehensive Plan to reflect the Sandy 2040 plan.

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Develop an Economic Development Strategy

Adopt the Downtown Plan.

Adopt development regulations for dedication of parks and other neighborhood amenities.

Adopt a Tree Ordinance/Urban Forestry Program.

#### **Next Two Years**

Begin implementing the downtown plan.

### **3. Build the city's tax base by supporting and expanding the business community.**

#### **This Year**

Build communication channels between the city and businesses.

Work with the Chamber of Commerce in marketing the city as a place to live and work.

Support business efforts to improve the appearance and effectiveness of the downtown core.

Encourage the formation of a Downtown Development Organization.

Attract a movie theater.

In conjunction with businesses and land owners, develop a downtown parking plan

### **4. Build on the city's superb quality of life.**

#### **This Year**

Encourage growth of neighborhood associations and neighborhood block watch. Provide more outreach by the City Council to neighborhoods.

Finish Tupper Park.

Coordinate, improve, and publicize recreational programs and facilities.

Adopt a parks and recreation master plan.

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ATTACHMENT 2  
COUNCIL MINUTES  
Regular Meeting  
March 15, 1999

Mayor Malone called the regular meeting of the City Council to order at 7:03 p.m., on March 15, 1999, in the Council Chambers at City Hall.

Roll Call

Mayor Malone - present	Councilor Hammons - present
Councilor Smith - present	Councilor Allen - present
Councilor Topliff - present	Councilor Kennedy - excused
Council President Bardon - present	

Shadow Council

Sunil Loprinzi - present	Casey Butler - present
Jon Liepold - absent	Morgan Tigli - present
Tessa Brookhart - absent	Laura Pollard - absent
Tyson Bell - present	

Also attending were Scott Lazenby, City Manager, Department Directors, Sue Barker, Recording Secretary and interested citizens.

Changes to Agenda

City Manager Lazenby included two items under new business:  
1) Discussion on issues regarding the sewer plant close out  
2) Review of a request to serve alcohol at the Senior Center.

Public Comment

Consent Calendar

The items on the consent calendar included:

- A. Approval of Council Minutes for March 1, 1999.
- B. Approval of Liquor License Renewal for El Gallo Restaurant
- C. Approval of Resolution No. 99-04, A Resolution Setting Forth Corrective Measures for Deficiencies Disclosed in the FY97-98 Audit Report

Motion

Councilor Allen moved, seconded by Councilor Smith and approved by unanimous voice vote:

To Approve the Consent Calendar as Submitted.

Action Items

Appointment to Urban Forestry Committee

Mayor Malone thanked citizens for their response to serve on the committee. She reported there were 20 applicants.

Council President Bardon supported appointment of Margaret Holman and any members who served on the prior committee.

Councilor Topliff also supported appointment of prior members along with Steel and John Belton.

Mayor Malone also added Bill O'Brion to the list.

Councilor Hammons recommended appointment of all applicants.

Mayor Malone felt that if all applicants were appointed, the committee would not be balanced. She also preferred a smaller committee.

Councilor Allen suggested appointing the seven other appointments as alternates to the committee.

Mayor Malone mentioned she would appoint alternates in case some of the other committee members decide to drop out.

Mayor Malone appointed the following to the Urban Forestry Committee: Brad Picking, Susan Drew, Kevin Frostad, Margaret Holman, Bob Skipper, Bill Trimble, Dan Loftis, Bob Rockwell, Jerry Carlson, John Belton, Elinor Majeski, Steel and William O'Brion. Bob Skipper will be Chairman the committee and Susan Drew will serve as Vice Chair.

Alternates:

Dorothy Douglas, Jerry Lawson, Nita Stamm, Dick Sleeper, Mort Spence, and Sara Hicks.

Appointment to the Transit Committee

Mayor Malone reported that Bud Pullen asked to be on the committee. Mayor Malone appointed the following: Sherry Landauer, Mt. Hood National Forest, Gary Boley, John Charles, Janet Pitts, Bud Pullen, Caren Topliff, Don Allen and Roberta Kennedy. She also noted the committee is still looking for a business representative.

Council Policy Discussion - None

Public Hearing - None

Ordinance No. 99-02 - Assigning Zoning Designation

Mayor Malone called for the second reading of Ordinance No. 99-02 by title only.

ATTACHMENT 3

COUNCIL MINUTES  
Special Meeting  
October 30, 2000

Following the pledge of allegiance, Mayor Malone called the regular meeting of the City Council to order at 7:02 p.m., on October 16, 2000, in the Council Chambers at City Hall.

Roll Call

Mayor Malone - present	Councilor Hammons - excused
Councilor Smith - present	Councilor Allen - present
Councilor Topliff - present	Councilor Kennedy - present
Council President Bardon - present	

Also attending were Heather Brinton, City Attorney, City Manager, Department Directors, Scott Lazenby, Recording Secretary and interested citizens.

Changes to Agenda

Public Comment

Action Items

Council Policy Discussion - None

New Business

Draft Tree Ordinance and Urban Forestry

Kevin Liburdy, Assistant City Planner, explained that the group consisted of four subcommittees:

Undeveloped Lands  
Developed Lands  
Street Trees  
Heritage Committee

City Manager Lazenby reported that the proposal includes a new Urban Forestry Chapter 17.102 has been added to the development code. He noted that Urban Forestry Chapter would deal with both developed and undeveloped lands. He mentioned that Heritage Trees fit under the existing Goal 5 type issues under Chapter 17.62 and street trees are under Section 12.11.

Chapter 17.102 - Urban Forestry

City Manager Lazenby advised that this ordinance would come into effect when you have five or more trees six inches or greater in diameter being cut.

Bob Kallen, 39517 Scenic, asked for clarification on developed and undeveloped properties. City Manager Lazenby mentioned that the Urban Forestry ordinance really doesn't make a distinction. He noted that if you have a home with a lot of trees over six inches, you would still fall under this ordinance if you cut five or more trees.

Bill O'Brion, 18410 Meinig, noted that if you are on a single-family lot that may be considered underdeveloped because it could be sold to someone who could develop it to a greater density. He suggested having an exemption for single family residential that is not able to redevelop.

Kevin Frostad, 37270 Dubarko Drive, mentioned that he is pleased to see this in code language. He felt this is a very modest urban forestry ordinance. He noted this is a big step forward. He felt the two most important aspects are: (1) it provides for a retention requirement (25% of the basal area of the trees on a parcel) and (2) transfers the jurisdiction of urban forestry matters from the Oregon Dept. of Forestry to the City where we feel they belong. Mr. Frostad would support either version of the ordinance.

Margaret Holman, 39385 Idleman, mentioned that the Sandy Forest Practices Act will be a little more stringent than the State Forest Practices Act and noted there were four changes that were inadvertently omitted from the second draft.

1. - Page 44 - Road Maintenance (5)

Amended to read "When applying water and/or environmental safe road oil or other surface stabilizing materials....."

City Manager Lazenby noted this changed would be placed under Section 17.102.40 (D) - Road Construction and Maintenance.

Councilor Smith questioned what is environmental safe road oil.

Bill O'Brion suggested wording it as road binders to minimize dust and that would be environmental safe.

The Council agreed with that change.

2. - Page 45 -629-630-000 Purpose (3)

The purpose of the harvesting rules is to establish standards for forest practices that will maintain the productivity of forestland, minimize soil and debris entering waters of the state, and protect "water quality and quantity and" and wildlife and fish habitat. (inserting water quality and quantity"



3. - Page 46 - 629-630-600(1) Felling, Removal of Slash  
(1) Operators shall not fell, buck and limb trees in ways that ~~minimize disturbance to~~ disturb channels, soils and ~~retain~~ vegetation in riparian management areas, stream, lakes and all wetlands ~~greater than one quarter acre~~, and ~~minimize~~ shall avoid slash accumulations in channels, ~~significant~~ wetlands and lakes.

4. - 629-630-400(4) - Treatment of Waste Materials  
Operators shall ~~dispose of~~ remove from the site all other debris such as machine parts, old wire rope, and used tractor tracks so that such materials do not enter water of the state.

Councilor Smith noted that you want to say "remove and legally dispose of"...and the Council agreed with this change.

Ms Holman questioned if state regulations override city regulations.

City Attorney Brinton advised that generally there is a state preemption of forestry regulations in Oregon which would preempt. However, there is an exemption when cities have adequately adopted their own regulations to deal with certain forest operations.

Bill O'Brion noted that Salem Oregon Forestry officials have reviewed this proposal and they were pleased with it. He also advised that Oregon Forestry officials would be available for expert assistance.

City Manager Lazenby advised that jurisdiction would shift to the city and there is still a role for DSL and other agencies.

City Manager Lazenby reported that a policy issue for the Council is whether or not to exempt anything with a single family home. He also noted that there is a commercial tree cutting exception in the draft if they are harvesting.

City Manager Lazenby presented scenarios and how this ordinance would apply to those situations.

Councilor Smith expressed concerns that the ordinance would prevent people from cutting trees that were planted for the purpose of harvesting.

Bill O'Brion mentioned that the trade off is that if you decide not to develop but still want to cut trees, you need to sign off that you will not develop the property for several years. He noted the consultant kicked out this particular section.

He also noted that the committee was trying to leave placement of the trees being retained up to the landowner as long as they leave 25% basal area.

Bob Kallen has an acre of property with a grove of Douglas Fir averaging more than 20 inches. He noted his neighbors on Scenic would have the same situation.

Bob Rockwell, 40305 McCormick Court, mentioned that there were a number of people on the committee that did not favor taking property away from and people and regulating how many trees they can cut. He noted that the full committee did not review this proposal.

Barbara Sah, 16605 Bluff Road, mentioned that they have planted a lot of trees and opposed the regulations since it would be impossible to measure the number of trees.

Bill O'Brion noted that this ordinance would protect trees and avoid clear cutting trees when new development occurs.

Mayor Malone mentioned that 17.102.25 Exceptions would exempt commercial timber harvest outside the FSHR Overlay District.

City Manager Lazenby suggested taking out "properties enrolled in a forest property tax assessment program".

Mayor Malone suggested taking out (8) city-owned lands from exceptions.

Councilor Topliff suggested taking out (9) those associated with the establishment or alteration of any public park from exceptions.

Bill Knapp, P O Box 880, questioned 17.102.30 Urban Forest Conservation Requirements. He felt this ordinance would force him to cut his trees before the ordinance is adopted. He also questioned if a piece of property outside of FSH setback area, meets the criteria for forest conservation area?

He also noted they have EFU (Exclusive Farm Use) ground and this is not handled the same as a Forest Practice Use. He would like to see an exception for farm use. He mentioned this is in addition to the park dedication requirement and could represent a taking issue.

City Manager Lazenby noted this would provide an incentive for retaining the trees in the riparian area since they would count towards the 25%. He mentioned that the city is hopeful this will apply in the Urban Growth Boundary.

Bill Knapp felt that the FSHR ordinance will take half his farmland and this ordinance will prevent him from using natural tree covers as a rotation crop.

City Manager Lazenby pointed out that the concern is with the farmer who sells his property to a developer and the trees are removed. He pointed out that the property can be cleared if it is not developed within ten years. He felt it should be easy to retain 25% of the trees.

Mayor Malone favored the farm exception similar to the Forest Practices Act.

Bob Skipper, 78800 SE Short Road, Gresham, expressed concerns that everyone should be treated the same with no exceptions. He felt if property owners have to set aside a percentage of their property there should be some benefit to the property owner. He noted that property owners with trees are being penalized. He also mentioned that ten years is too long of a time frame.

Bill O'Brion felt that if you use trees for a cover crop, it is a forest and would fall under number 10 of exceptions.

Bill O'Brion proposed some changes:

17.102.20 - Procedures and Application Requirements

C - Forest Thinning - Removal of Trees of less than 6 inches.

He felt this is not forest thinning but pre-commercial thinning since the trees are too small.

1. On lots of greater than an acre, forest thinning shall be reviewed by the Planning Director.

He felt it should apply to all. He did not recommend flagging trees prior to removal, rather paint should be used to mark trees.

He also mentioned that noticing neighboring property owners should be consistent.

F. Certified Arborist Review. He would like to see foresters included in this section.

G. Agency Review

He noted that the City can request a third-party review.

I Enforcement

He would like to see a cap for the amount of damages.

City Manager Lazenby advised the amount would be up to the judge.

17.102.30 Urban Forest Conservation Requirements

C. Criteria for Determining Forest Conservation Areas.

1. The conservation area shall be part of a contiguous area with at least 80% tree canopy coverage.

He felt this would be the Council choice whether or not to leave contiguous in but as a subcommittee they felt that if the trees were scattered, it would be the property owner's prerogative.

2. If there is insufficient basal area within the riparian setback area to meeting the 25% retention standard, the forest conversation area shall include trees adjacent to the riparian setback area.

He did not like the word shall.

3. The conservation area includes all land within five horizontal feet of the driplines of protected trees.

He would like to see it say "driplines of protected tree(s)" to cover significant trees.

F. Harvesting Period.

He completely disagreed with limiting to a time period during the year.

17.102.40 E. Division 630 Harvesting

He noted there will be situations when harvesting trees will make it necessary to violate some of things in this section. It would still have to go to the Planning Commission. By disallowing, you take away the ability for things are more beneficial to the environment.

City Manager Lazenby did not recommend regulating removal of four or fewer trees on developed property.

Councilor Topliff suggested removing "with surrounding soil heaving" from Section 17.102.25 Exceptions A(7).

Mayor Malone noted that a workshop will be set for the November 20<sup>th</sup> meeting starting at 5:30 p.m.

Margaret Holman questioned how we can promote safety in the neighborhood when trees are being removed. She suggested that if a permit is required, the city could recommend a professional.

Mayor Malone suggested striking the section-requiring street trees where there are not currently street trees.

Bob Skipper mentioned that when permits are issued for existing commercial development, they should comply with the street tree requirements.

Glenda Woodcock, Evans Street, questioned who would maintain the trees. She suggested that there needs to be a program for long term care. She also noted that current codes are not currently being enforced.

Councilor Smith noted that Section 12.11.30 covers maintenance and it is the responsibility of the property owner.

Councilor Topliff spoke of a program with the Friends of Trees which would give group prices to purchase trees and they would help you plant trees.

A citizen also suggested a program for senior or handicap citizens to help maintain the trees.

Margaret Holman noted that the street sweeper will take down the address and report to the city any areas where the trees need to be trimmed.

Mayor Malone continued this matter to November 20, 2000 at 5:30 p.m.

Mayor Malone adjourned the meeting tat 9:30 p.m.

\_\_\_\_\_  
Linda K. Malone, Mayor

ATTEST:

ATTACHMENT 4

Refine downtown design standards in the city's development code. Draft a downtown plan map as a development/planning tool.

Adopt an Urban Forestry ordinance.

Consider new standards for city street standards ("skinny streets").

3. Build the city's tax base by supporting and expanding the business community.

This Year

Encourage the development of a movie theater. →

In conjunction with businesses and land owners, develop a downtown parking plan

Explore options to encourage telecommuting. Encourage home-based businesses.

Next + two years -  
Bowling alley/activity/  
4. Build on the city's superb quality of life.

This Year

Encourage growth of neighborhood associations and neighborhood block watch. Provide more outreach by the City Council to neighborhoods.

Encourage the use of the Neighborhood Traffic Management program.

Explore expansion of computer network  
Develop the library book and materials collection.  
Start "Dark Skies" Ordinance grace.  
Next Two Years

Explore a connection between the Sandy bike/pedestrian trail system and the Springwater and Estacada trails.

Complete Continue facilities  
Complete the development of ballfields as a cooperative venture between Sandy Kids and the Oregon Trail School District.

Pursue the Sandy River bike/ped trail loop plan. ParkMaster

Adopt a "Dark Skies" Ordinance.

Long Range

Explore the creation of a parks and recreation district.

SOS

ATTACHMENT 5



## City of Sandy Staff Report

**DATE:** June 17, 2002  
**TO:** Planning Commission  
**FROM:** Scott Lazenby, City Manager  
**RE:** TREE ORDINANCE

**ATTACHMENTS:** Chapter 17.102; Required Changes to other sections of the Sandy Development Code.

In March, the Planning Commission and City Council held a joint workshop on the draft tree ordinance. At that meeting, the majority of the members in attendance expressed preference for an ordinance that would not prohibit property owners from removing trees, but would provide regulations on how the trees are removed, and establish permit fees that could be used as a source of revenue for an Urban Forestry Fund.

Subsequent to this workshop, Bill O'Brion, a member of the Urban Forestry Committee and now a City Council member, explored ways of preserving existing trees while still allowing property owners a fair measure of flexibility and discretion. His compromise proposal is based on the existing state forestry regulations, which require retention of two trees per acre, for properties that are 25 acres or more in size. This draft ordinance is attached.

### Key Features of the Ordinance

- Tree removal in the areas protected by the steep slope and buffer areas of the FSH ordinance are covered by the FSH ordinance (they are referred to in the tree ordinance to ensure that it encompasses all land in the UGB).
- For areas of one acre or larger that can be further developed, three trees of at least 11 DBH must be retained. At least half of these trees must be a conifer species.
- The acreage threshold and retention requirement are based on contiguous areas under common ownership. For example, suppose a person owns a one-acre parcel that is fully forested, and an adjacent ten-acre parcel that is pastureland with no trees. The retention requirement would be 33 trees, based on the two contiguous parcels under the same ownership.
- No permit is required for tree removal on residential lots that are smaller than one acre.

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#### Advantages of the Draft Ordinance for Tree Preservation

1. The draft ordinance does prohibit removal of all large trees.
2. The draft ordinance is more stringent than the state forest practices act:
  - a. It retains 50% more trees per acre.
  - b. It has a much lower threshold acreage (i.e., one acre vs. twenty-five acres).
  - c. It applies to the total area of contiguous ownership, **not just the area proposed for the forest operation**. Within an urban area, this can significantly increase the retention requirement.
3. The ordinance does not "penalize" owners of property with many existing trees. In fact, it gives them more flexibility in future use of the property, since they have more choices over which trees to retain. Owners of developable property with few trees have less flexibility.

#### Advantages to Property Owners

1. The property owner has full control over which trees are retained (as long as the standards of the ordinance are met).
2. Trees protected by the FSH ordinance can be counted toward the retention requirement.
3. There is no lengthy permit or review period. The property owner must only show that the required number of trees will be retained during and after the forest operation.
4. There is a variance procedure that could serve as a relief valve for property owners. For example, if the **existing** trees fall short of the retention requirement, then none of the trees could be removed. But it could be possible that a tree sits in the middle of the only logical location for a street extension. The planning commission could issue a variance (but the burden of proof on a hardship condition would be on the property owner).
5. Property owners can increase their future options **by planting trees**. The more large trees on their property, the more flexibility they will have over which trees must be retained.

#### Ease of Administration

1. The ordinance is much simpler to administer than the original draft, therefore increasing the likelihood that it will be uniformly enforced.
2. Compliance with the ordinance will be simple to verify. There is no need for complicated basal area calculations or urban development master plans.

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3. There is no need to track the location and identity of retained trees. All that is required is a survey of trees at the time of each forest operation. The trees marked for retention in one forest operation could be replaced by others ten years later, if additional trees had been retained or if other trees grew to 11" DBH.

Recommendation:

This draft ordinance seems to be a good compromise between the desire to preserve existing trees, and property rights, and staff recommends that the Planning Commission and City Council approve it.

If this ordinance is ultimately adopted, we also recommend amendments to the sections of the Development Code dealing with property divisions (partitions, subdivisions), to ensure that retained trees remain protected during the subdivision process.



ATTACHMENT 6

## **City of Sandy Staff Report**

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**SUBJECT:** 02-016 Urban Forestry

**AGENDA DATE:** August 26, 2002

**DEPARTMENT:** Planning & Development

**STAFF CONTACT:** Tracy Brown

**Exhibits:**

- A. Revised Chapter 17.102 (updated since July PC meeting)
- B. Other Proposed Amendments Related To Trees
- C. Written Testimony – Friends of Tickle Creek (submitted 7/22/02)
- D. Written Testimony – John Gardiner (submitted 7/22/02)

### **I. BACKGROUND**

In March, the Planning Commission and City Council held a joint workshop on the draft tree ordinance. At that meeting, the majority of the members in attendance expressed preference for an ordinance that would not prohibit property owners from removing trees, but would provide regulations on how the trees are removed, and establish permit fees that could be used as a source of revenue for an Urban Forestry Fund.

The Planning Commission opened the public hearing on 7/22/02 and took testimony on the proposed code language. The Planning Commission then closed the public hearing and continued deliberations to the 8/26/02 meeting. Since that meeting, staff reviewed the ordinance language and made modifications to include separate sections for land inside the city limits and land outside the city limits but inside the Urban Growth boundary. The link to the revised language is listed above.

Ballot Measure 56 (ORS 227.160 et seq.) was adopted by the voters on November 3, 1998. This law requires the city to notify a property owner if proposed regulations will affect the permissible uses of property and may reduce the value of the property. The original notice was mailed to property owners within the city limits and an additional notice was mailed to property owners outside the city limits but inside the urban growth boundary.

To afford the property owners outside the city limits an opportunity comment on the proposed urban forestry regulation, the Planning Commission should reopen the public hearing and take additional testimony. After close of the public hearing, the Planning Commission could then deliberate and prepare a recommendation to the City Council.

At the hearing on 7/22/02, the Planning Commission had a lengthy discussion and decided that a transcript of the discussion should be prepared to assist them in collating issues and preparing a recommendation. The minutes include a detailed transcript of the discussion and this language is also included in this staff report.

#### Key Features of the Ordinance

- Tree removal in the areas protected by the steep slope and buffer areas of the FSH ordinance are covered by the FSH ordinance (they are referred to in the tree ordinance to ensure that it encompasses all land in the UGB).
- For areas of one acre or larger that can be further developed, three trees of at least 11 DBH must be retained. At least half of these trees must be a conifer species.
- The acreage threshold and retention requirement are based on contiguous areas under common ownership. For example, suppose a person owns a one-acre parcel that is fully forested, and an adjacent ten-acre parcel that is pastureland with no trees. The retention requirement would be 33 trees, based on the two contiguous parcels under the same ownership.
- No permit is required for tree removal on residential lots that are smaller than one acre.

#### Advantages of the Draft Ordinance for Tree Preservation

1. The draft ordinance does prohibit removal of all large trees.
2. The draft ordinance is more stringent than the state forest practices act:
  - a. It retains 50% more trees per acre.
  - b. It has a much lower threshold acreage (i.e., one acre vs. twenty-five acres).
  - c. It applies to the total area of contiguous ownership, not just the area proposed for the forest operation. Within an urban area, this can significantly increase the retention requirement.
3. The ordinance does not "penalize" owners of property with many existing trees. In fact, it gives them more flexibility in future use of the property, since they have more choices over which trees to retain. Owners of developable property with few trees have less flexibility.

#### Advantages to Property Owners

1. The property owner has full control over which trees are retained (as long as the standards of the ordinance are met).
2. Trees protected by the FSH ordinance can be counted toward the retention requirement.
3. There is no lengthy permit or review period. The property owner must only show that the required number of trees will be retained during and after the forest operation.
4. There is a variance procedure that could serve as a relief valve for property owners. For example, if the existing trees fall short of the retention requirement, then none of the trees could be removed. But it could be possible that a tree sits in the middle of the only logical location for a street extension. The planning commission could issue a variance (but the burden of proof on a hardship condition would be on the property owner).
5. Property owners can increase their future options by planting trees. The more large trees on their property, the more flexibility they will have over which trees must be retained.

#### Ease of Administration

1. The ordinance is much simpler to administer than the original draft, therefore increasing the likelihood that it will be uniformly enforced.
2. Compliance with the ordinance will be simple to verify. There is no need for complicated basal area calculations or urban development master plans.

3. There is no need to track the location and identity of retained trees. All that is required is a survey of trees at the time of each forest operation. The trees marked for retention in one forest operation could be replaced by others ten years later, if additional trees had been retained or if other trees grew to 11" DBH.

Recommendation:

The revised draft ordinance will be a first step in regulating tree removal on undeveloped land. Staff recommends that the Planning Commission forward this to the City Council for consideration.

Revisions will also be necessary to other sections of the Development Code dealing with property divisions (partitions, subdivisions), to ensure that retained trees remain protected during the subdivision process. The additional revisions are also included in this packet and a recommendation should include a reference to these additional amendments.

ATTACHMENT 7

**URBAN FORESTRY  
NECESSARY CHANGES TO OTHER CHAPTER OF THE SANDY DEVELOPMENT  
CODE**

***CHAPTER 17.62 - CULTURAL AND HISTORIC RESOURCES***

**17.62.30 CRITERIA FOR DESIGNATION**

The Planning Commission and City Council shall use the following criteria and standards to evaluate whether a particular object, site, structure or place merits a CHR designation. In order to designate a CHR, the Planning Commission and City Council must find, through an Economic, Social, Environmental and Energy (ESEE) analysis, that the benefits of designating the proposed landmark outweigh the benefits of continuing the conflicting use or uses without the designation.

- A. Association with historic or famous events; or
- B. Unique architectural design or mode of construction because of:
  - 1. Representative character of a period or a particular architectural style, building type or method of construction.
  - 2. Extraordinary or unusual architectural merit by reason of design, detail, use of materials or craftsmanship or
  - 3. Identification as the work of an architect, designer or master builder whose individual work has influenced development in the nation, state or community; or
  - 4. Significance as the only remaining, or one of the few remaining, resources of a particular style, building type, design, material or method of construction.
  - 5. Age of resource, or
- C. Inclusion in an official Register of Historic Places; or
- D. Relationship to the broad cultural history of the nation, state or community; or
- E. Identification with a person or persons who have significantly contributed to the history of the city; or
- F. Identification as a unique object representing an aesthetic or educational feature of the community.
- G. Archaeological site designation.
- H. Environmental Significance.
  - 1. Significance as a visual landmark.
  - 2. Integrity of surrounding land-use of the historic period represented.
  - 3. Significance because the resource contributes to the continuity of historical character of the street, neighborhood and/or community.

- I. HERITAGE TREES WHERE THE TREE IS IN A HEALTHY GROWING CONDITION AND ONE OF THE FOLLOWING EXISTS:
  1. THE TREE HAS A DISTINCTIVE SIZE, SHAPE, OR LOCATION, OR IS OF A DISTINCTIVE SPECIES OR AGE WHICH WARRANTS A SIGNIFICANT STATUS; OR
  2. THE TREE POSSESSES EXCEPTIONAL BEAUTY WHICH WARRANTS A SIGNIFICANT STATUS; OR
  3. THE TREE IS SIGNIFICANT DUE TO A FUNCTIONAL OR AESTHETIC RELATIONSHIP TO A NATURAL RESOURCE, SUCH AS TREES LOCATED ALONG STREAM BANKS OR RIDGELINES, OR TREES PROVIDING HABITAT FOR BIRDS AND OTHER WILDLIFE.
  
- J. A HERITAGE STAND OF TREES THAT IS IN A HEALTHY GROWING CONDITION AND ONE OF THE FOLLOWING EXIST:
  1. THE STAND IS RELATIVELY MATURE AND EVENLY AGED AND HAS A PURITY OF SPECIES COMPOSITION OR IS OF A RARE OR UNUSUAL NATURE; OR
  2. THE STAND HAS A CRUCIAL FUNCTIONAL AND/OR AESTHETIC RELATIONSHIP TO A NATURAL RESOURCE, INCLUDING WILDLIFE.

#### **CHAPTER 17.100 - LAND DIVISION**

##### **17.100.30 PROPERTY LINE ADJUSTMENT**

- B. Map Information. The property line adjustment map and narrative shall include the following:
1. The names, addresses and phone numbers of the owner(s) of the subject parcels and authorized representative
  2. Scale of the drawing using an engineer's scale
  3. North arrow and date
  4. Legal description of the property
  5. Dimensions and size of the parcels involved in the property line adjustment
  6. Approximate locations of structures, utilities, rights-of-way and easements
  7. Points of access, existing and proposed
  8. Any natural features such as waterways, drainage area, significant vegetation or rock outcroppings, AND TREES REQUIRED TO BE RETAINED UNDER THE PROVISIONS OF CHAPTER 17.102.
  9. Approximate topography, particularly noting any area of steep slope

##### **17.100.40 MINOR AND MAJOR PARTITIONS**

- C. Tentative Partition Plan. The tentative plan shall be a minimum of 8 1/2 x 11 inches in size and shall include the following information:
1. The date, north point, engineering scale, and legal description
  2. Name and address of the owner of record and of the person who prepared the partition plan

3. Zoning, size and dimensions of the tract to be partitioned
4. Size, dimensions and identification of proposed parcels (Parcel 1, Parcel 2, Parcel 3)
5. Approximate location of any structures on the tract to be partitioned, including setbacks to proposed parcel boundaries
6. Location, names and widths of streets, sidewalks and bikeways within the tract to be partitioned and extending 400 feet beyond the tract boundaries
7. Location, width and purpose of existing and proposed easements on the tract to be partitioned
8. Location and size of sewer, water and drainage facilities proposed to serve the tract to be partitioned
9. Natural features such as waterways, drainage area, significant vegetation or rock outcroppings, **AND TREES REQUIRED TO BE RETAINED UNDER THE PROVISIONS OF CHAPTER 17.102.**

#### 17.100.60 SUBDIVISIONS

##### **D. Data Requirements for Tentative Plat.**

1. Scale of drawing, north arrow, and date.
2. Location of the subdivision by section, township and range, and a legal description sufficient to define the location and boundaries of the proposed tract.
3. A vicinity map, showing adjacent property boundaries and how proposed streets may be extended to connect to existing streets.
4. Names, addresses, and telephone numbers of the owner(s) of the property, the engineer or surveyor, and the date of the survey.
5. Streets: location, names, paved widths, alleys, and right-of-way (existing and proposed) on and within 400 feet of the boundaries of the subdivision tract.
6. Easements: location, widths, purpose of all easements (existing and proposed) on or serving the tract.
7. Utilities: location of storm drainage, sanitary sewers and water lines (existing and proposed) on and abutting the tract. If utilities are not on or abutting the tract, indicate the direction and distance to the nearest locations.
8. Ground elevations shown by contour lines at two-foot vertical intervals for ground slopes of less than 10 percent and at ten-foot vertical intervals for ground slopes exceeding 10 percent. Ground elevation shall be related to an established benchmark or other datum approved by the Director.
9. Natural features such as marshes, rock outcroppings, watercourses on and abutting the property, location of wooded areas, **AND TREES REQUIRED TO BE RETAINED UNDER THE PROVISIONS OF CHAPTER 17.102.**
10. Approximate location of areas subject to periodic inundation or storm sewer overflow, location of any floodplain or flood hazard district.
11. Location, width, and direction of flow of all water courses.
12. Identification of the top of bank and boundary of mandatory setback for any stream or water course.
13. Identification of any associated wetland and boundary of mandatory setback.
14. Identification of any wetland and boundary of mandatory setback.
15. Location of at least one temporary bench mark within the tract boundaries.

16. Existing uses of the property, including location and present use of all existing structures to remain on the property after platting.
17. Lots and Blocks: approximate dimensions of all lots, minimum lot sizes, and proposed lot and block numbers.
18. Existing zoning and proposed land use.
19. Designation of land intended to be dedicated or reserved for public use, with the purpose, conditions, or limitations of such reservations clearly indicated.
20. Proposed development phases, if applicable.
21. Any other information determined necessary by the Director at the preapplication conference, such as a soil report or other engineering study, traffic analysis, floodplain or wetland delineation, etc.

#### **CHAPTER 17.92 LANDSCAPING**

##### **17.92.10 GENERAL PROVISIONS**

Where landscaping is required by this Code, detailed planting plans shall be submitted for review with development applications. No development may commence until the Director or Planning Commission has determined the plans comply with the purposes clause and specific standards in this chapter. All required landscaping and related improvements shall be completed or financially guaranteed prior to the issuance of a Certificate of Occupancy.

- A. Appropriate care and maintenance of landscaping on-site and landscaping in the adjacent public right-of-way is the right and responsibility of the property owner, unless City ordinances specify otherwise for general public and safety reasons. If street trees or other plant materials do not survive or are removed, materials shall be replaced in kind within 6 months.
- B. Significant plant and tree specimens should be preserved to the greatest extent practicable and integrated into the design of a development. Trees of 25-inches or greater circumference measured at a height of 4-½ ft. above grade are considered significant. Plants to be saved and methods of protection shall be indicated on the detailed planting plan submitted for approval. Existing trees may be considered preserved if no cutting, filling, or compaction of the soil takes place between the trunk of the tree and the area 5-ft. outside the tree's drip line. Trees to be retained shall be protected from damage during construction by a construction fence located 5 ft. outside the dripline. **TREES REQUIRED TO BE RETAINED UNDER THE PROVISIONS OF CHAPTER 17.102 SHALL BE INCORPORATED INTO THE LANDSCAPE PLAN, AND MAY BE COUNTED TOWARD THE MINIMUM LANDSCAPED AREA REQUIRED UNDER SECTION 17.92.20.**



ATTACHMENT 8

**Sandy City Council  
Regular Meeting  
November 4, 2002**

Mayor Linda Malone called the regular meeting of the Sandy City Council to order at 7:00 p.m. in the Council Chambers at City Hall. The meeting opened with the Pledge of Allegiance to the flag.

**Roll Call**

Mayor Linda Malone - Present  
Councilor Tina Frostad – Present  
Councilor Gene Smith – Present  
Council President Don Allen – Present  
Councilor Dick Steiner – Present  
Councilor Roberta Kennedy – Present  
Councilor Bill O’Brion – Present

**Shadow Councilors**

Sarah Cancellieri - Present  
Laura Penland - Absent  
Nathan Visan - Absent  
John Reed - Present  
Ryan Montgomery- Present  
Matt Frick - Present

**Also Present:** City Manager Scott Lazenby, Department Directors, Recording Secretary, Nancy Enabnit, and interested citizens.

**Changes to Agenda:**

None

**Public Comment:**

None

**Reports and Comments from Neighborhood Associations:**

None

**Youth Council Report:**

None

**Appointments:**

Library Board Appointment – Staff recommends Linda Gettmann be appointed.

**Motion:** Councilor Kennedy made a motion to appoint Linda Gettmann to fill vacancy on Library Board, seconded by Councilor Allen. There were no abstentions or nay votes.

Yea: 7- Frostad, Smith, Allen, Steiner, Kennedy, O'Brion, Malone  
Nay: 0  
Abstentions: 0  
Motion carried.

**Consent Agenda:**

Sandy City Council Minutes of October 21, 2002

Bill O'Brion asked that a list of citizens present at be included with the minutes. He noted that Drew Anderson as his Eagle Project installed the stairs at Meinig Park on November 2nd. Over 20 Scouts assisted him.

**Motion:** Councilor Allen made a motion to accept the consent agenda with spelling correction of Nancy Jaksich's name, seconded by Councilor O'Brion. There were no abstentions or nay votes.

Yea: 7- Frostad, Smith, Allen, Steiner, Kennedy, O'Brion, Malone  
Nay: 0  
Abstentions: 0  
Motion carried.

**Old Business:**

None

**Public Hearing: File** 02-016, Chapter 17.102 Urban Forestry Ordinance

Public Hearing opened at 7:08.

Mayor Malone called for any abstentions, any declarations of conflict of interest, any exparte contact, any challenges to the jurisdiction of the Planning Commission in this matter, or any challenges to individual members. Answers were negative and unanimous in all cases.

Mayor Malone then reviewed the public hearing procedures.

**Staff Report:**

Kevin Liburdy stated that the major points of this proposal is regulation of tree harvesting and "trees" are defined only as those 11 inches or greater in diameter breast height. Tree harvest on sites greater than 1 acre inside the UGB requires a permit issued by the City. This process also requires a dedication of three, 11 inch or greater trees per acre, under contiguous ownership, prior to harvest. It requires a 70-ft, no-harvest buffer adjacent to Tickle Creek and a 50-ft buffer along other perennial streams inside the UGB, outside the

city limits, but inside the UGB. It eliminates ODF regulation inside the UGB. Kevin then gave an overview of the history of the Ordinance.

Scott Lazenby added that there had been feedback from the Oregon Department of Forestry, and that some of their observations had been added to the Ordinance. He also stated that a few of the citizens had contacted the city with concerns over procedural issues. Scott then read a letter received from the Oregon Department of Forestry in support of an Urban Forestry Ordinance.

**Public Testimony:**

Bob Kallen – 39517 Scenic St. – Sandy, OR 97055

Mr. Kallen reiterated his concerns that he would not be able to maintain the ‘scenic view.’ He stated that his property is taxed at a higher rate due to the view.

Councilor O’Brion gave an explanation of the Urban Forestry Ordinance versus the FSH ordinance to clarify some of the questions Mr. Kallen raised.

Mr. Kallen still feels that this ordinance is too complicated for the average property and he recommends the creation of a separate section in the ordinance to address ‘scenic properties.’

Wally Hewitt – P O Box 462 – Sandy, OR 97055

Mr. Hewitt stated that he has a farm-woodlot operation outside the city limits, but within the UGB. He had concerns about having to consult an arborist or forester to cut hazard trees. He also expressed concerns about the repeated need for permits every time he takes a tree down. He suggested an ongoing permit for woodlot operations. Mr. Hewitt stated that he supports the ordinance in general.

Bob Rockwell – P O Box 724 – Sandy, OR 97055

Mr. Rockwell stated that he was on the original tree committee. He added that the ordinance should be as simple as possible and this version is the best he has seen.

Mayor Malone closed the public hearing at 7:51 p.m.

**Staff Recap:**

Scott Lazenby suggested that by increasing the validity of permits from 180 days to 1 year it would address Mr. Hewitt’s concerns.

Councilor O’Brion thought that any activity during that year should require notification to the City.

Mr. Hewitt stated that prior notification is not always possible with an ongoing operation.

Councilor O’Brion stated that if every operation was like Mr. Hewitt’s there would be no problem, but he feels that 24-hour notification is not too much to ask.

Councilor Frostad stated that she agrees with Councilor O'Brion's comments.

Councilor Smith asked for clarification on 17.02.50 b. (page 12). He stated that it looked contradictory and felt it needed clarification.

Councilor Allen stated that he would like more specifics regarding blow-down, to encourage groves and clarify options.

Councilor O'Brion stated that there are professional foresters on call and available if staff is not comfortable with placement of retained trees.

Councilor Steiner asked how the number 3 (trees) came about.

Councilor O'Brion stated that it came about after review and much discussion trying to reach a compromise for this ordinance.

Councilor Kennedy asked approximately how many forested acres are located within the city limits?, within UGB? She stated that she felt that the ordinance is a simple as it could be and still meet it's goals.

Scott Lazenby stated that we don't have an actual total.

Councilor O'Brion stated that it really is not about acres but about preservation. He stated that this ordinance has been longer than 3 years in the making. He would like to thank staff and committee members for their diligence. Some of the goals accomplished were:

1. 1. City has jurisdiction, which eliminates disputes.
2. 2. Tree retention
3. 3. Dedicated tree fund

He added that 17.102.20 b 2 – need to have a permit after the fact (after emergency removal). He would like to see the addition of a clause that states once you have applied for your permit you will know within 15 days whether you are approved or denied. Page 11, letter D, he stated that the threshold of a Type 1 permit could be even larger to prevent unnecessary appeals.

**Motion:** Councilor Smith made a motion to that removal of 50 trees would require a Type 2 procedure, seconded by Councilor Steiner.

Yea: 5- Smith, Allen, Steiner, Kennedy, O'Brion

Nay: 2 - Frostad, Malone

Abstentions: 0

Motion carried.

Councilor O’Brion continued with line item E letter A. He felt that this was an unnecessary difficulty to impose.

It was pointed out that the Title companies keep a more up-to-date list of property owners and provide the service free of charge.

17.102.40 – page 12 – letter b. – clause that requires 24 hour advance notification.

17.102.50 – letter a #1 that there be line stating that it does not have to be on every specific acre, a total of.

17.102.60 – tree re-planting – under #3 & 4 – need to exclude the 1½-inch caliper. It is not so much the size of the tree, but the quality of the tree.

Councilor O’Brion pointed out that a board or committee needs to be appointed.

Mayor Malone stated that although this ordinance does not satisfy everyone, she feels that it is a good ordinance.

**Motion:** Councilor O’Brion made a motion to direct staff to prepare an ordinance and findings for approval at next meeting, seconded by Councilor Allen. There were no abstentions or nay votes.

Yea: 7- Frostad, Smith, Allen, Steiner, Kennedy, O’Brion, Malone

Nay: 0

Abstentions: 0

Motion carried.

**New Business:**

**Community Development Block Grant Applications:**

Scott Lazenby stated that staff needs direction from Council as to whether these are good projects to submit and what priority Council would like to place on each project. Project descriptions are in Council Packets.

CDBG	Malone	Allen	Smith	Steiner	Frostad	Kennedy	O’Brion
1	3	4	2	1	3	2	1
2	1	3	3	3	4	1	4
3	4	1	4	2	1	3	5
4	2	2	5	5	2	4	2
5	5	5	1	4	5	5	3

Shadow Councilor Frick stated that the ADA items are good and that # 5 part C seems like a good thing.

Shadow Councilor Montgomery rated 3 & 4 as highest priority.

Shadow Councilor Cancellieri rated 3 & 4 as highest priority.

**Sandy River Park Land Acquisition:**

Scott Lazenby stated that there is a deadline as far as the State Parks Grant is concerned. They did award \$250,000 towards the development of the Park. We have tried to obtain

**Exhibit B**  
**FINDINGS OF FACT**  
**ORDINANCE No. 2002-10**

**A. General Findings.**

1. These findings serve as the basis for the City Council's decision to adopt Ordinance No. 2002-10, which adds tree retention requirements to the Sandy Development Code.
2. The regulations primarily implicate Statewide Planning Goals 4 (Forestlands), 6 (Air, Water and Land Quality), and 7 (Natural Hazards).

**B. Statewide Planning Goal Findings.**

1. **Goal 1: Citizen Involvement.** The regulations have been the subject of extensive public review prior to and during the public hearing process.
  - i) An Urban Forestry Committee was established by the City Council in March of 1999. The Committee was instructed to draft an ordinance regulating tree harvests that would require tree retention within the Sandy Urban Growth Boundary (UGB). The breadth of the regulation was based upon the City Council's desire to regulate forest practices within Sandy's UGB and allow property owners to make reasonable use of their lands for tree cutting purposes. The Committee completed its work in October of 1999.
  - ii) Several public hearings were held before the Planning Commission and the City Council on the regulations. Changes were made to the regulations as a result of these hearings.
  - iii) Having provided several opportunities for public input into this legislative decision-making process, the City of Sandy complies with Goal 1.
2. **Goal 2: Land Use Planning.** Goal 2 requires that comprehensive plans include an adequate information base, consideration of alternatives, and implementing measures that are consistent with and adequate to carry out the policy direction found in the local plan. The regulations also demonstrate that Sandy has coordinated with affected state agencies. Goal 2 is met in the following ways:
  - i) By adopting the regulations, Sandy is making a clear public statement regarding its intent to regulate forest practices within its UGB.
  - ii) The regulations adopted by the Council have changed as a result of the public hearing process. Both the Planning Commission and Council

- considered a range of alternatives before adopting the final version of the regulations.
- iii) Through the public hearing process, significant effort has been expended to provide greater clarity regarding key provisions and definitions used in the regulations.
  - iv) Throughout the process, the City has engaged in and maintained a dialogue with the Department of Forestry regarding the regulations. Based upon its conversations with the Department, the City has incorporated into the regulations many of the Department's suggestions.
  - v) Upon successful acknowledgement of the regulations, the City will seek to amend its Growth Management Agreement with Clackamas County in order to regulate forest practices within Sandy's UGB but outside of its city limits.
3. Goal 3: Agricultural Lands. This goal is not applicable to the regulations.
4. Goal 4: Forest Lands. The regulations mostly affect property within Sandy's city limits – property not zoned as forest land. However, the City Council acknowledges that it intends to eventually regulate forest practices on property outside Sandy's city limits and within Sandy's UGB – including property zoned forest land by Clackamas County. With regard to those lands, compliance with Goal 4 is demonstrated via the following:
- i) Via ORS 527.722, the Oregon Legislature has specifically authorized Sandy to regulate forest practices on such lands.
  - ii) Land use designations on such lands shall remain the same. With the exception of a modest 3 tree per acre retention requirement and stream buffers, forest operations shall continue to be allowed on forest lands.
  - iii) The regulations shall not alter existing land divisions standards on forest lands, nor shall the regulations alter existing dwelling citing standards on such lands.
  - iv) Through the retention requirement, a modest amount of forest land is guaranteed to be conserved, consistent with the Goal's plain language.
  - v) In certain areas where water quality is threatened and/or natural hazards exist, the regulations will interface with Sandy's Flood Slope Hazard Overlay zone, which will regulate forest practices consistent with sound management of soil, air, water, and fish and wildlife resources.
  - vi) Overall, the regulations will maintain the forest land base and will continue to allow economically efficient forest practices that assure a continuous supply of harvest stock as the leading use on forest land.
5. Goal 5: Natural Resources. Based on the following discussion, the City Council concludes that Goal 5 does not apply to the regulations. As defined at OAR 660-023-0010(5), the regulations are a "post-acknowledgement plan amendment" (PAPA) because, in pertinent part, they constitute an "adoption of [a] new . . . land use regulation." In adopting a PAPA, local governments

are required to apply Goal 5 only if the PAPA "affects a Goal 5 resource." OAR 660-023-0250(3). As defined further in 0250(3), a PAPA affects a Goal 5 resource "only" if the PAPA (1) "creates or amends" a "resource list;" or "a portion of a land use regulation adopted in order to protect a significant Goal 5 resource or to address specific requirements of Goal 5;" or (2) "allows new uses that could be conflicting uses with a particular significant Goal 5 resource site on an acknowledged resource list."

i) Based on the exclusive categories above, the PAPA does not affect any Goal 5 resource.

(1) Trees are not a part of any resource list maintained by the City of Sandy – therefore the PAPA is not amending such a list. Neither is a resource list being created via the regulations.

(2) The regulations are not creating or amending a land use regulation adopted in order to protect a significant Goal 5 resource, because trees are not a significant Goal 5 resource under OAR 660, Division 23. Nor will the regulations create or amend a land use regulation adopted in order to address specific requirements of Goal 5, because the City Council does not intend to address those requirements through these regulations. LUBA precedent supports this conclusion. See *Home Builders Ass'n of Lane County v. City of Eugene*, 41 Or LUBA 370 (2002) (no authority for the proposition that local jurisdiction is required to apply Goal 5 before it regulates resources that are not a part of the local jurisdiction's Goal 5 inventory); *Ramsey v. City of Portland*, 30 Or LUBA 212 (1995) (an ordinance regulating the cutting of trees does not affect any Goal 5 site nor implicate Goal 5).

(3) Finally, the regulations are not providing for any new "uses;" therefore there will be no conflicts with any particular Goal 5 resource sites.

6. Goal 6: Air, Land and Water Resources Quality. The City Council finds that Goal 6 is met in the following ways:

i) By requiring trees to be retained on certain properties within Sandy's UGB, the regulations will have a modest effect on improving water quality when compared to the current lack of a tree retention requirement, because runoff and sedimentation to sensitive surface and groundwater areas will likely decrease.

ii) The retention requirement, alone and in combination with other applicable provisions of Sandy's development code, shall further ensure that waste and process discharges from future development will comply with applicable state and federal environmental statutes and rules

iii) The retention requirement will also contribute to ensuring that such discharges will not degrade, overload, or threaten the availability of air, water or land with Sandy's UGB.

7. Goal 7: Natural Disasters and Hazards. Chapters 17.56 and 17.60 of the Sandy Municipal Code primarily address Goal 7. However, these regulations



will also address Goal 7 by adding additional safeguards to development in potentially hazardous areas. As applied to potentially hazardous areas, the tree retention requirement will reduce the possibility of landslides and encourage a less dense development pattern in such areas. Goal 7 is met.

8. Goal 8: Recreation. By requiring tree retention, the regulations assist in preserving trees for Sandy's future. Thus, the regulations will only increase general recreational opportunities today and in the future for Sandy's residents and visitors. However, the regulations do not authorize nor address the citing of recreational and destination resorts. The City Council finds that Goal 8 is met.
9. Goal 9: Economy of the State. The regulations will have a negligible effect on the profitability of forest practices. The value of certain properties may increase as a result of this ordinance. Goal 9 is met.
10. Goal 10: Housing. Because a developer may choose where on a given property to retain trees, and because the vast majority of developments voluntarily retain trees above the regulations' retention requirement, the regulations will have little to no effect on Sandy's ability to provide needing housing. Goal 10 is met.
11. Goal 11: Public Facilities and Services. The regulations will have no effect on the ability of the City to provide public facilities and services. Goal 11 is met.
12. Goal 12: Transportation. The regulations will have no effect the City's Transportation System Plan. Goal 12 is met.
13. Goal 13: Energy Conservation. The regulations arguably encourage a more energy-efficient and compact urban growth form. The retention requirement could also provide shade in the summer months. Otherwise, the regulations have a negligible affect on energy conservation. Goal 13 is thus met.
14. Goal 14: Urbanization. As above, the regulations arguably encourage a more compact urban growth form, thus reducing pressure on agricultural and farmland. Otherwise, the regulations have a negligible affect on urban growth management objectives. Goal 14 is thus met.

### C. Conclusion.

For all of the above reasons, the Sandy City Council finds Ordinance No 2002-10 to be in conformance with the State of Oregon's Statewide Planning Goals.

ATTACHMENT 10  
PRE-APPLICATION CONFERENCE NOTES

**Project Name:** Jacoby Estates Subdivision

**Pre-Application Conference Date:** January 3, 2018

**Applicant Name:** Cory Knight and Mac Even

**Engineer Name:** All County Surveyors and Planners

**Staff:** Thomas Fisher, Emily Mcharg, Kelly O'Neill Jr., James A. Cramer & Mike Walker

**PLANNING DEPARTMENT REVIEW**

**Sandy Development Code (SDC):** Sandy Development Code Sections 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.22 Notices; 17.30 Zoning Districts; 17.34 SFR Single Family Residential; 17.60 FSH Overlay; 17.80 Additional Setbacks on Collectors; 17.82 Special Setbacks on Transit Streets; 17.84 Improvements Required with Development; 17.86 Parkland and Open Space; 17.90 Landscaping and Design Standards; 17.92 Landscaping and Screening; 17.98 Parking, Loading and Access Requirements; 17.100 Land Division; 17.102 Urban Forestry; and Chapter 15.30 Dark Sky.

*Caveat: This analysis includes a review of those code sections that may conflict with the proposed design as submitted. This review is not intended to be a comprehensive analysis of all applicable code sections.*

**Parking Analysis**

- Locations of the driveways should be identified for review (SDC 17.90.90.B.5).
- 2 off-street parking spaces per dwelling required (SDC 17.98.20), demonstrate compliance.
- On-street parking plan shall be submitted for review. One space required for every dwelling unit within 200 feet of each lot.

**Access and Utilities**

- Frontage improvements along east side of SE Jacoby Road are required with development of property.
- Need analysis to determine if sewer pump station in Timberline Trails has sufficient capacity for this development proposal (based on 32 lots).
- Need analysis on depth of sanitary sewer and storm in Lots 9 and 10 to determine if 20 foot wide easement is sufficient.
- Submit a traffic impact analysis (TIA). Need \$1,500 for traffic consultant.
- Streets shall be named in common with Cascadia Village (i.e. New England towns).
- Distance between Jacoby Road and any internal streets shall be spaced at least 150 feet. Plan only details the intersection spacing on Street B at 125 feet so lots by Street A need to be deeper.
- If wider area is dedicated at Newton Street and Jacoby Road to create proper alignment then street improvements need to be designed accordingly.
- Vision clearance areas must remain unobstructed (SDC 17.74.30).
- Transit requires a transit amenity on Jacoby Road in NW corner of Tract B. The amenity required is a 6 foot long green metal bench (Fairweather model PL-3, powder-coated RAL6028) mounted on a 7 foot by 9.5 foot concrete pad which could accommodate a 5 foot by 7.5 foot bus shelter.
- Existing access easement on Newton Street shall be submitted for review.
- Future "conservation easement" document within Lots 19-21 required be submitted for review.
- Dedicate both Tracts A and B.
- Any well and septic system associated with the existing single-family home will need to be abandoned and the house be removed (with demolition permit) prior to plating subdivision.

**Other Planning Items**

- Parks fee in-lieu required at approximately \$99,485.
- Landscaping is required on Tract B (Landscape standards within SDC 17.92).

- Density needs to be determined based on net acreage (9.64 acres per County GIS records, density is 3 to 5.8 units per net acre). Right-of-way, Tract A, Tract B, and pedestrian connection to Tract A need to be removed from the gross acreage.
- A variance would be required to allow a single stack housing development (Lots 29-32), two tier required per SDC 17.100.120 (Jacoby is a Collector St.)
- Houses would have to face “Jacoby” or you would have to apply for a variance (SDC 17.82 Special Setbacks on Transit Streets).
- Proposed building footprints should be identified for review (SDC 17.90.90.B.2). Setback standards can be found in SDC 17.34.30. Additionally, Section 17.80.20 states any structure located on streets identified in the Transportation System Plan as collectors shall have a minimum setback of 20 feet measured from the property line. This applies to applicable front, rear and side yards. (Jacoby is identified as a collector).
- Blocks can’t be greater than 400 feet unless justified by topographic, natural area, or other physical conditions. Blocks greater than 400 feet require a variance. Blocks greater than 600 feet require a pedestrian and bicycle access way (17.100.120.B).
- A dedicated tract from the terminus of Street C to connect to Tract A for future development of the Tickle Creek Trail. The trail will need to be improved for pedestrian access.
- Are there any proposed retaining walls? If so, what are their locations, heights, and materials? Section 17.74.40 details code standards which could require a variance.
- A geotechnical study will need to be done for any area at 25 percent slope or greater that is proposed to contain development.
- A wetland mitigation study will define restricted development areas on the site, which in turn will define tree retention requirements in those areas. Will need to define the top of bank for Tickle Creek.
- Submit an arborist report and tree plan for trees 11-inches DBH and greater (and trees 6-inches DBH and greater in the restricted development area). Tree retention at 3 trees per acre. Trees must be 11” DBH or greater and in good health. Identify on the plans which trees are to be removed as well as retained.

**Application Process:** Type III SUB review with requested variances (most likely three or more variances).

**Projected Processing Steps:**

- Submittal Requirements: See requirements lists on City of Sandy website.  
<https://www.ci.sandy.or.us/Planning-Requirements/>
- Fees: \$3,000 for Type III subdivision review plus \$80 per lot; \$1,000 per variance; \$700 for FSH Overlay review; \$150 for Tree Removal review; \$1,500 for Third Party traffic consultant.
- Staff review for completeness (30 days max.), if determined incomplete then the applicant submits additional information as required, staff then reviews for completeness again, if the application is deemed complete then the application is processed.

**From:** James Cramer <jcramer@ci.sandy.or.us>  
**Date:** February 12, 2018 at 3:04:57 PM PST  
**To:** cory@taylorgrouprealty.com  
**Subject:** Jacoby Estates

Cory,

Kelly passed along the document you left for him to look over and respond too. Below is the City's response to your inquiries as well as a couple items for consideration we came across during our research and observation of the property.

- A wetlands report will not be required for the development. Section 17.60 details the requirements for development within the FSH overlay and since no development is proposed within the overlay, or within the required setbacks of this code section, Staff is comfortable not requiring a report at this time.
- As a reminder, a Geological Assessment is required for any area at 25 percent slope or greater that is proposed to contain development (17.56.40).
- We discussed the potential for a credit to the Park In-Lieu fee based on the appraised value of Track B. Should you propose to be given a credit for that land area we would need to see an appraised value to determine how we would like to proceed with that element of the project.
- Should the owner decide to dedicate any portion of land the appropriate documents per Section 17.86.30 would be required with the initial submission for consideration.
- As mentioned in the preapplication notes, an arborist report and tree plan for trees 11-inches DBH and greater (and trees 6-inches DBH and greater in the restricted development area). Tree retention at 3 trees per acre. It has been observed that the site may have been removing trees without approval. If that is the case those actions need to stop immediately until approval for their removal has been given.
- Additionally 17.102.60 details planting that needs to occur when removing trees which does not appear to be occurring.

Please let me know if you have any additional question and fill me in on any improvements being made to the property so we can ensure they are meeting code.

--  
James A. Cramer  
Associate Planner  
City of Sandy  
39250 Pioneer Blvd  
Sandy, OR 97055  
phone (503) 783-2587  
jcramer@ci.sandy.or.us

# EXHIBIT E

## Storm Drainage Design and Calculations For the Jacoby Heights Subdivision

June 5, 2018

**Prepared By:**

All County Surveyors and Planners, Inc.  
Tyler Henderson, E.I.  
Ray L. Moore, P.E., P.L.S.  
P.O. Box 955 Sandy, Oregon 97055  
Phone: (503) 668-3151 Fax: (503) 668-4730  
Job #16-045

**Prepared For:**

Mr. Cory Knight  
16513 SE Orchard View Lane  
Damascus, OR 97089



RENEWAL DATE: 12/31/2016

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**Appendices:**

**Appendix A**

- Vicinity Map
- Site Layout
- Time of Concentration Plan
- Pre-Developed Areas
- Developed Areas

**Appendix B**

- Standard Formulas
- Coefficients
- SCS Runoff Curve Numbers (CN)
- Pre-Developed Time of Concentration Calculations
- Developed Time of Concentration Calculations
- Hydrograph Analysis Summary
- Detention System Summary
- Stage Storage Summary
- Rectangular, Sharp Crested Weir Calculations
- Contech CDS2015-4-C Detail

**PURPOSE:**

The purpose of this analysis is to:

- Describe existing and proposed site conditions.
- Provide detention calculations for the 2-yr, 5-yr, 10-yr, and 25-yr storm events.
- Provide water quality calculations.

**PROJECT LOCATION AND DESCRIPTION:**

The project site is located on the east side of Jacoby Road in Sandy, Oregon. The site includes only taxlot 2300. The +/-9.7-acre site consists of grassy fields, and plentiful tree cover. The land is generally sloped to the north and west with an average slope of about 10%. A Vicinity Map and Site Layout (with proposed storm sewer layout) can be found in Appendix A.

**PROPOSED IMPROVEMENTS**

The proposed Jacoby Heights Subdivision project will consist of 31-single family residential lots ranging from 7,500 SF to 16,500 SF. The site improvements will include streets, curbs, sidewalks, utilities, etc.

New storm sewer pipes, manholes, and catch basins will be installed to convey storm water to a detention pond located in Tract B. A new water quality manhole will be installed downstream of the detention pond (See Site Layout – Appendix A).

**HYDROGRAPH PARAMETERS:**

**Rainfall**

The rainfall distribution numbers below were taken from the City of Sandy Stormwater Website: <http://www.ci.sandy.or.us/Stormwater/>

- 2 year, 24 hr. rainfall = 3.5"
- 5 year, 24 hr. rainfall = 4.5"
- 10 year, 24 hr. rainfall = 4.8"
- 25 year, 24 hr. rainfall = 5.5"

**Soils**

The soil data for this site is from *Soil Survey of Clackamas County, Oregon* published by the United States Department of Agriculture (USDA). The post-development soil is assumed to be the same as pre-development.

- Soil Type: 15B, Cazadero silty clay loam. Hydrologic Group "C"
- 15D, Cazadero silty clay loam. Hydrologic Group "C"
- 24B, Cottrell silty clay loam. Hydrologic Group "C"

(See Appendix B for Runoff Curve Numbers)

### Areas and Curve Numbers

Drainage basin areas were determined using a topographic map drafted in AutoCAD. See the Pre-Developed Area and Developed Area in Appendix A.

The impervious area for these post-developed basins includes the proposed roofs, streets, sidewalks, planter strips, driveways, and curbs. See the following tables for a specific breakdown of these areas.

Pre-Development		
Areas	CN	Land Use Description
Pervious (9.42 acres)*	82	Lawn & Young Second Growth Forest Land
Impervious (0.26 acres)	98	Existing Building, AC, Concrete
Post-Development		
Areas	CN	Land Use Description
Pervious (7.02 acres)	86	Lawns "Good Condition"
Impervious (2.66 acres)	98	Buildings, AC, Sidewalks, etc.

Pre-Developed Pervious CN: Weighted CN

\*Lawn "Good Condition" 1.08 AC: CN=86

Wood or Forest Land "Young Second Growth" 8.34 AC: CN=81

$[(1.08AC \times 86) + (8.34AC \times 81)] / (1.08+8.34) = 81.57 = 82.0$

Pre-Developed Impervious CN: See Runoff Curve Numbers Appendix B

Post-Developed Pervious CN: See Runoff Curve Numbers Appendix B

Post-Developed Impervious CN: See Runoff Curve Numbers Appendix B

### Time of Concentration

The times of concentrations (Tc), were calculated using the equations and spreadsheets shown in Appendix B.

Pre-development Tc= 48.0 minutes

Post-development Tc= 5.8 minutes

### Hydrograph Modeling Results

Hydrographs for the site were determined using a spreadsheet based on the King County, Washington Hydrograph Program, version 4.21B, which uses the Santa Barbara Urban Hydrograph (SBUH) method.



**DETENTION SIZING RESULTS:**

The Post-Development flows were routed through a proposed 4-foot deep detention pond. The 4-foot deep detention pond has been designed so that the Post-Developed release rates for the entire site do not exceed the Pre-Developed rates for the 2-year, 5-year, 10-year, and 25-year storm events per the City of Sandy public Works Design Standards. See the Detention System Summary in Appendix B.

The required storage volume is 21,793-cubic feet. This can be contained in a 4-foot deep pond with a bottom area of 3,781 square feet.

**Flow Control:**

The flow control orifices were designed to release the Post-development Peak-Q's at or below the Pre-developed Peak-Q's.  
(See the Detention System Summary - Appendix B)

<b>Orifice Table</b>		
<b>Orifice</b>	<b>Dia. (inches)</b>	<b>Height (feet)</b>
Bottom	7.65	0.0
Top	8.85	3.17

**WATER QUALITY DESIGN:**

**CDS Storm Water Treatment Device**

A CDS manhole by Contech Stormwater Solutions was designed for water quality for the site - see detail in Appendix B. The impervious area for the site includes AC pavement, sidewalks, planter strips, and roofs. The impervious area is 2.66-acres.

Proposed asphalt, walks, planters etc.:	0.88 acres
Roof, Patio, Driveway*:	1.78 acres
Total Impervious Area:	2.66 acres

*40'x50' Building footprint:	2000SF
20'x20' Driveway:	400SF
10'x10' Patio:	100SF
Total:	2,500SF X 31 lots = 77,500SF

The flow (Q) from this runoff was calculated using the rational method ( $Q = CIA$ )

Where  $Q = \text{flow (cfs)}$

$C = \text{runoff coefficient} = 0.90$  pavement and Roofs

$I = \text{Intensity} = 0.2$  inches per hour (Water Quality Design Storm)

$A = \text{Impervious Area} = 2.66$  Acres

$$Q = 0.90 \times 0.2 \times 2.66$$

$$Q = 0.48 \text{ cfs}$$

The Contech Storm Water Treatment Device Model: CDS2015-4-C has a treatment capacity of 0.7 cfs which exceeds the required 0.48 cfs.

**A Storm Water Treatment Device CDS Model CDS2015-4-C can be used to adequately treat the water for the site**

**CONCLUSIONS:**

- The conveyance system for the proposed Jacoby Heights Subdivision site has been sized to handle the peak 25-year, 24-hour storm.
- On-site detention has been designed to maintain existing downstream storm water runoff characteristics in accordance with the City of Sandy requirements.
- A CDS Storm Water Treatment Device will be used for water quality.

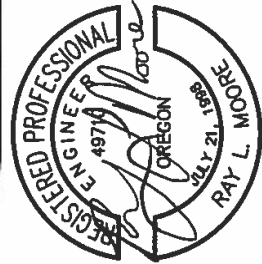
## **Appendix A**

- Vicinity Map
- Site Layout
- Time of Concentration Plan
- Pre-Developed Areas
- Developed Areas

# VICINITY MAP



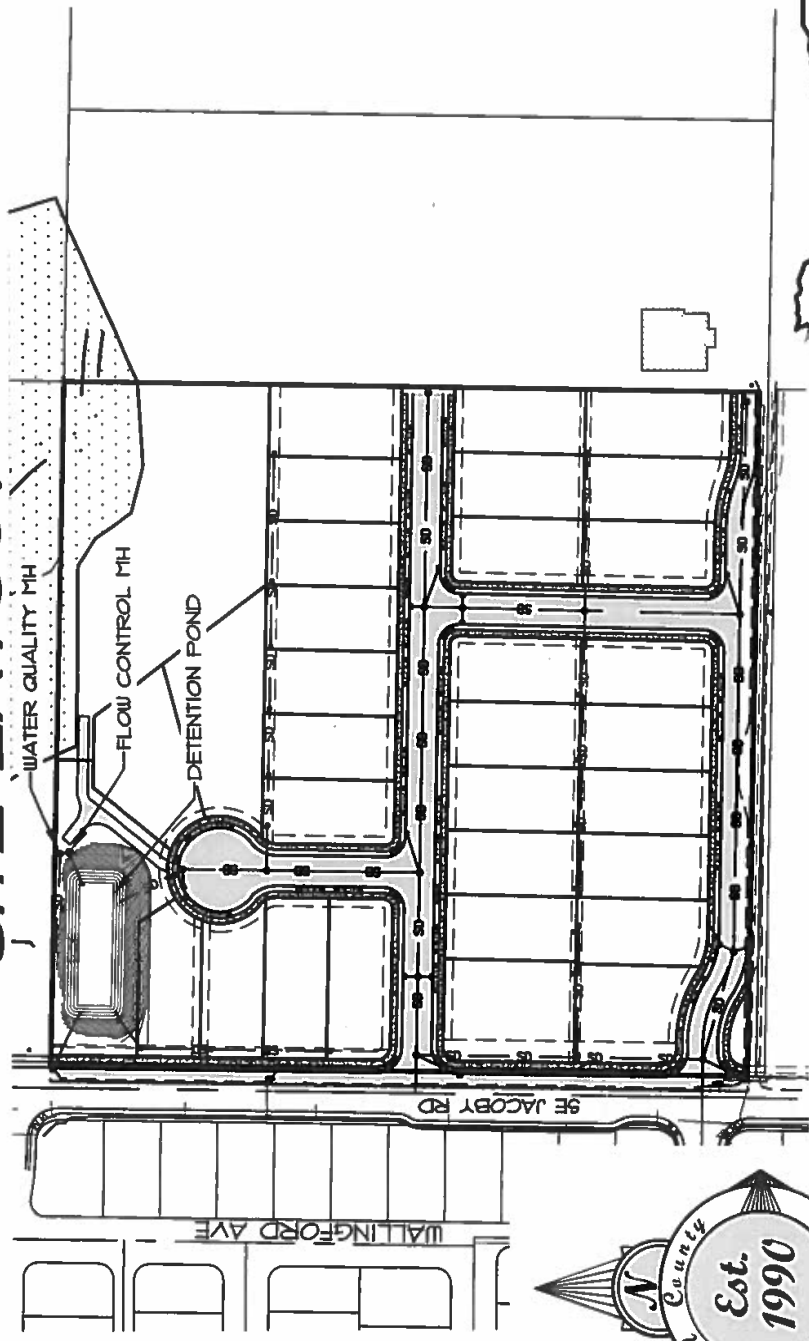
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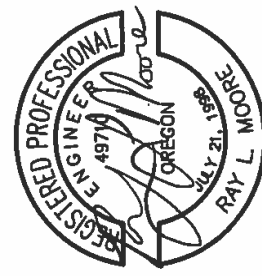
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DATE OF PLOT: 06/03/2018

# SITE LAYOUT

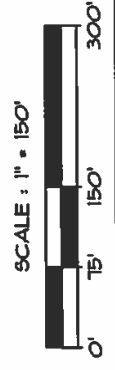
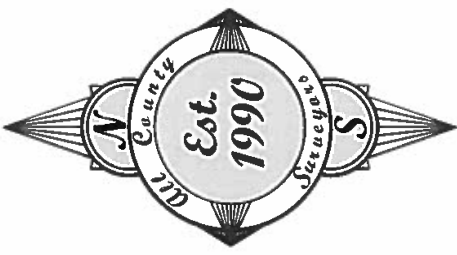


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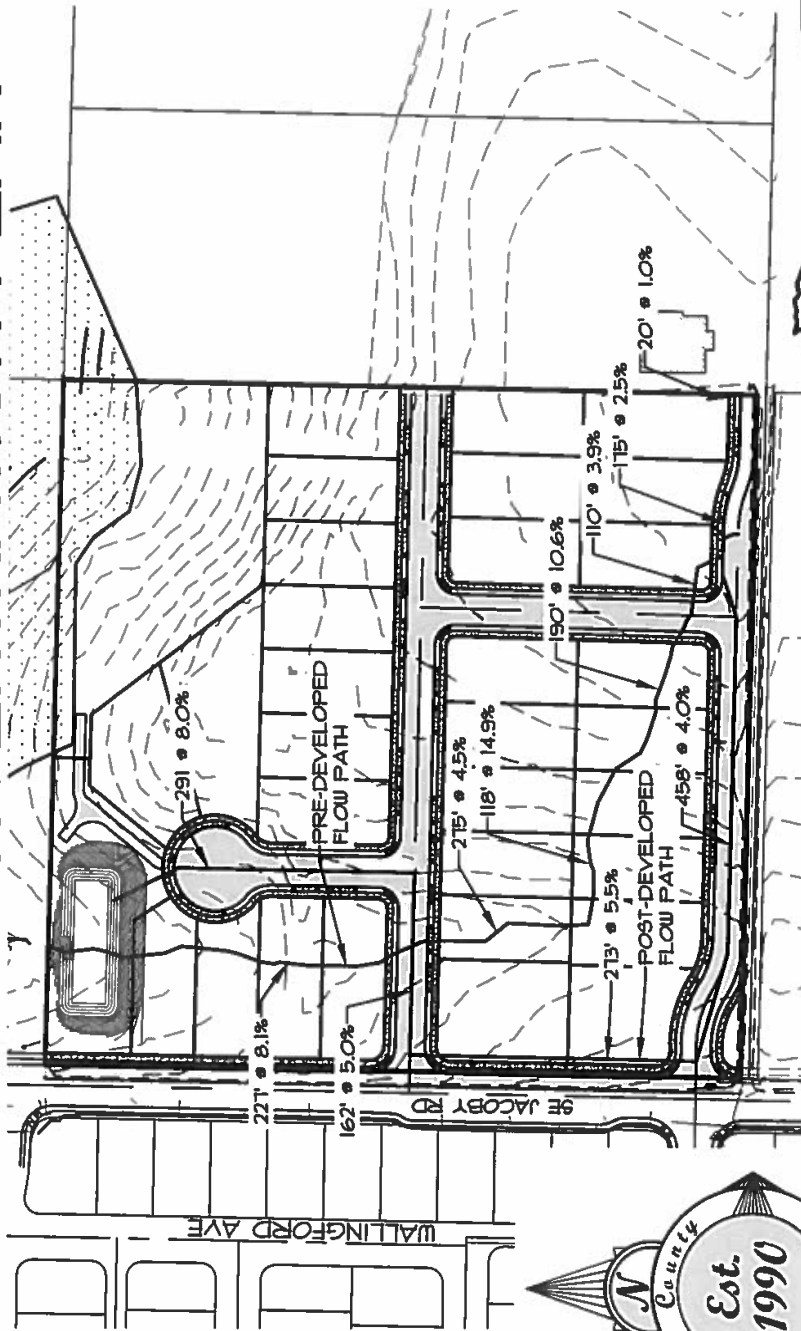
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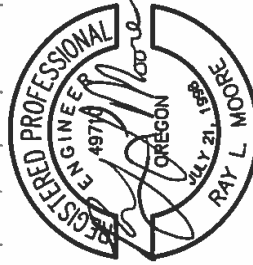
RENEWAL DATE: 12/31/2018



# TIME OF CONCENTRATION PLAN

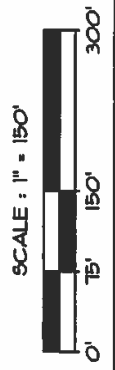
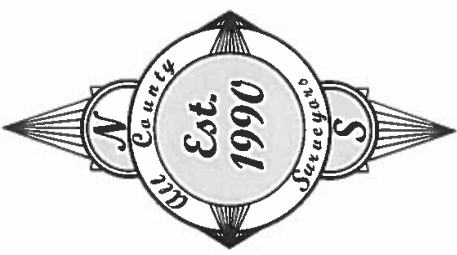


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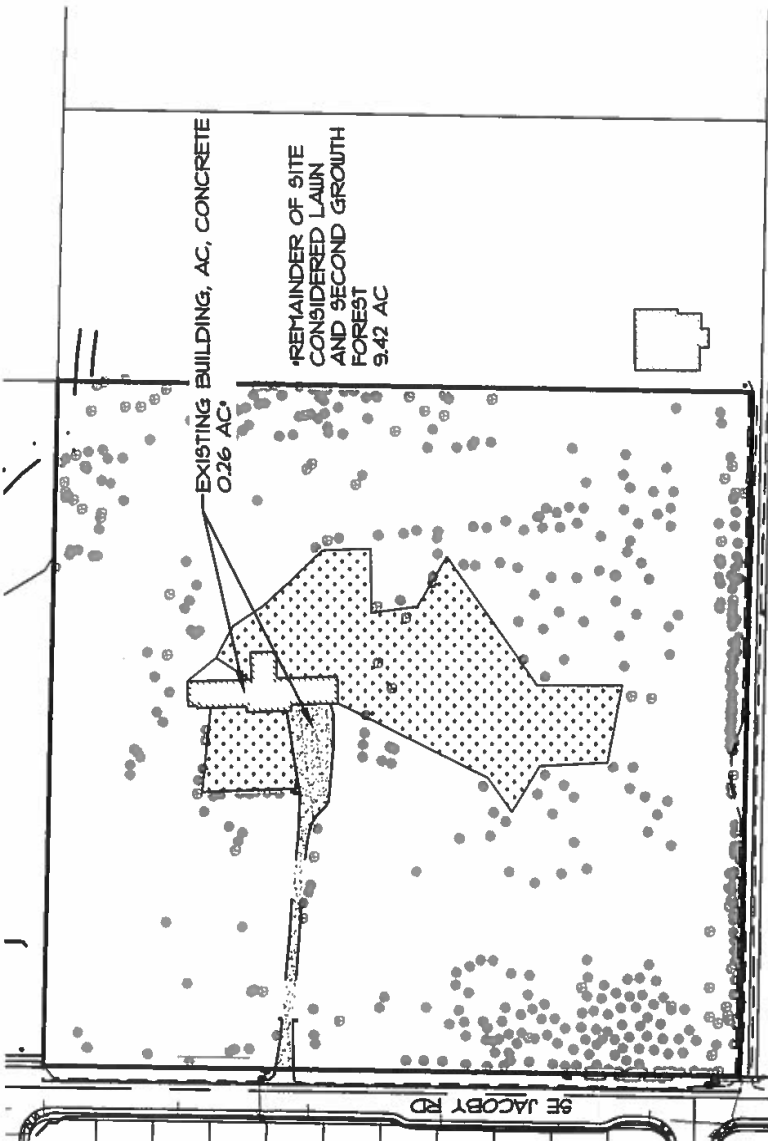


IT-199-PLANNING.dwg  
 DATE OF PLOT: 06/03/2018

RENEWAL DATE: 12/31/2018

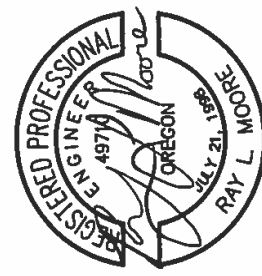


# PRE-DEVELOPED AREAS

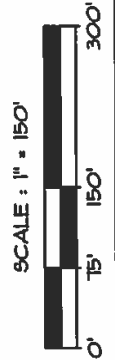
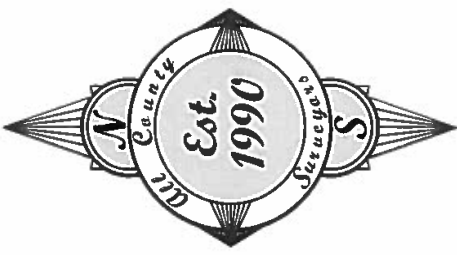


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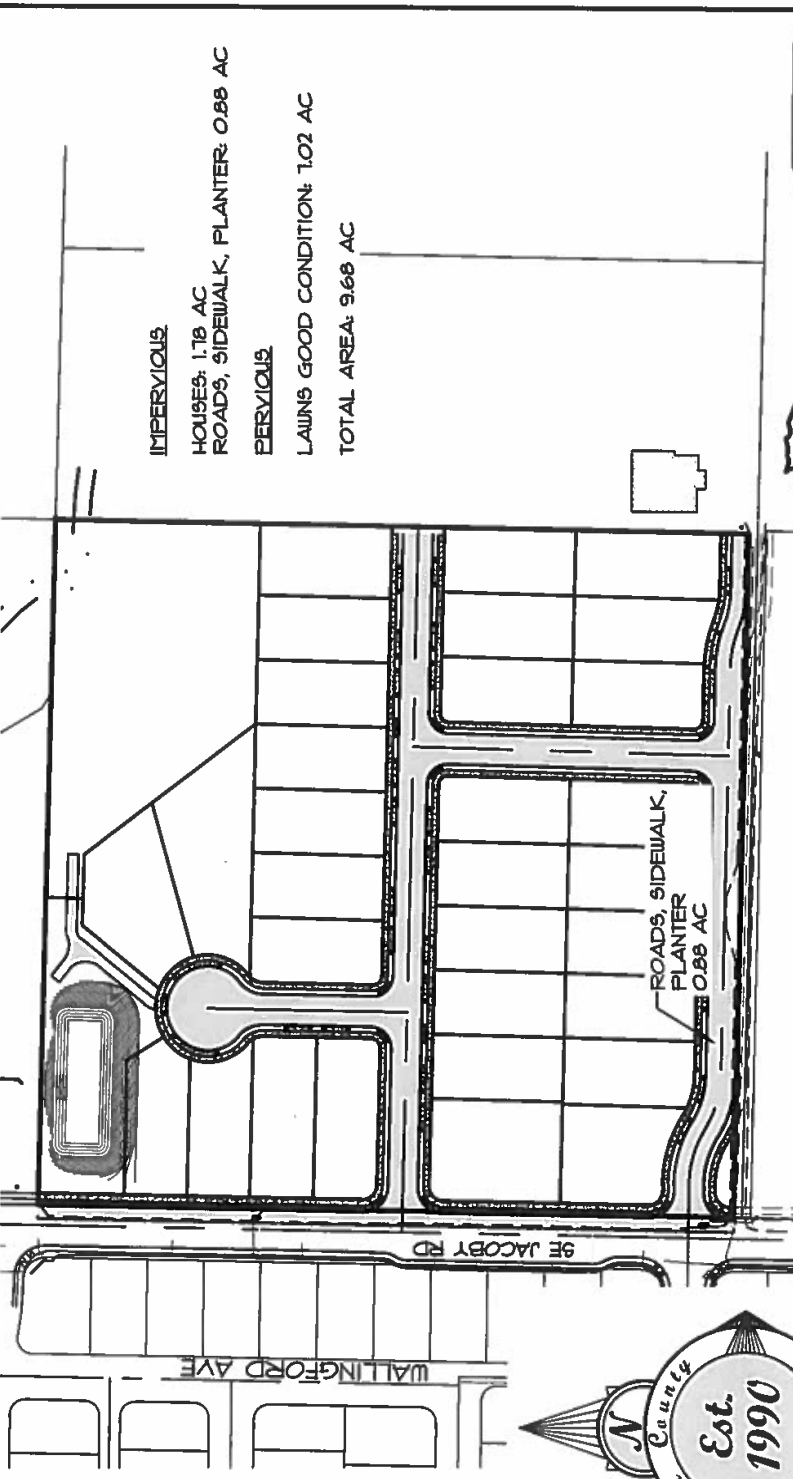
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 DATE OF PLOT: 06/03/2018



RENEWAL DATE: 12/31/2018



# DEVELOPED AREAS

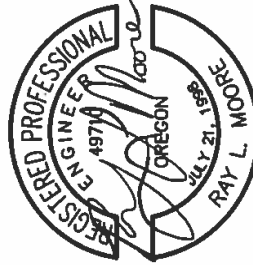


IMPERVIOUS  
 HOUSES: 1.78 AC  
 ROADS, SIDEWALK, PLANTER: 0.88 AC  
 PERVIOUS  
 LAWNS GOOD CONDITION: 1.02 AC  
 TOTAL AREA: 9.68 AC

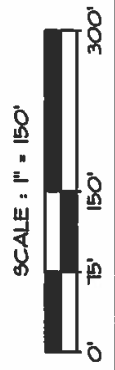
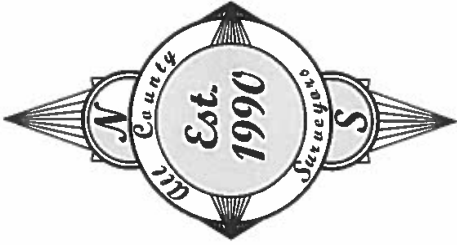
ROADS, SIDEWALK,  
 PLANTER  
 0.88 AC

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RENEWAL DATE: 12/31/2018





## **Appendix B**

- Standard Formulas
- Coefficients
- Curve Runoff Numbers (CN)
- Pre-Developed Time of Concentration Calculations
- Developed Time of Concentration Calculations
- Hydrograph Analysis Summary
- Detention System Summary
- Stage Storage Summary
- Rectangular, Sharp Crested Weir Calculations
- Contech CDS2015-4-C Detail

## Standard formulas used for the Time of Concentration Calculations

Overland Flow (max 300' total)

$$\frac{(0.42)[(Ns)(L)]^{0.8}}{(P_2)^{0.5}(S_0)^{0.4}}$$

Tc	= time of concentration for less than 300' of travel (minutes)
Ns	= sheet flow Manning's effective roughness coefficient
L	= flow length (ft)
P2	= 2-year, 24 hour rainfall (in)
So	= slope of hydraulic grade line (land slope, ft/ft)

Shallow Concentrated Flow (after initial 300')

$$T = \frac{L}{(60)(k\sqrt{S_0})}$$

T	= travel time for sheet flow (min)
L	= flow length (ft)
So	= slope of hydraulic grade line (land slope, ft/ft)
k	= time of concentration velocity factor (ft/s)

Flow in Swales

Q = (1.486/n) x A x R<sup>2/3</sup> x S<sup>1/2</sup> (Manning's Equation)

Tc	= time of concentration for gutter flow (minutes)
A	= area of flow (sf)
R	= hydraulic radius (ft)
Ls	= side slope
Q	= quantity of flow (ft <sup>3</sup> /sec)
V	= average velocity of flow (ft/sec)
L	= length of flow
Ve	= vertical length of side slope
Ho	= horizontal length of side slope
Bw	= base width (in)
D	= depth (in)
S	= slope (ft/ft)
n	= Manning's n

Flow in gutters

$$V = \frac{1.12}{n} (S)^{0.5} (S_x)^{0.67} (T)^{0.67}$$

Tc	= time of concentration for gutter flow (minutes)
V	= average velocity of flow (ft/sec)
Q	= quantity of flow (ft <sup>3</sup> /sec)
S	= street longitudinal slope (ft/ft)
Sx	= street cross slope (ft/ft)
T	= total width of flow in the gutter (ft)
n	= sheet flow Manning's (pavement = 0.018)
L	= Length of flow (ft)

Flow in pipes

Mannings Equation

Tc	= time of concentration in pipe (minutes)
V	= calculated velocity pipe full (ft/sec)
Q	= quantity of flow (ft <sup>3</sup> /sec)
n	= Manning's n
D	= pipe Diameter (in)
S	= slope (ft/ft)
L	= length of pipe

## COEFFICIENTS

**Ns =** = Manning's coefficient (sheet flow)  
n values are for sheet flow only

### Design Value

- 0.011 Concrete or asphalt
- 0.010 Bare soil
- 0.020 Graveled surface
- 0.020 Bare clay - loam (eroded)
- 0.150 Grass (short prairie)
- 0.240 Grass (dense lawn)
- 0.410 Grass (bermuda)
- 0.400 Woods (light underbrush)
- 0.800 Woods (dense underbrush)

**k =** = time of concentration velocity factor (ft/s)

### Design Value

- 3 Forest with heavy ground cover and meadows (n=0.10)
- 5 Brushy ground with some trees (n=0.060)
- 8 Fallow or cultivation (n=0.040)
- 9 High grass (n=0.035)
- 11 Short grass, pasture or lawns (n=0.030)
- 13 Nearly bare ground (n=0.025)
- 27 Paved and gravel areas (n=0.012)

**n =** = Manning's coefficient (channel)

### Design Value

#### CONSTRUCTED CHANNELS

##### A. Earth, straight and uniform

- 0.018 Earth (straight and uniform)
- 0.025 Gravel (straight and uniform)
- 0.027 Grass (with weeds)

##### B. Earth, winding and sluggish

- 0.025 Earth (no vegetation)
- 0.030 Grass (some weeds)
- 0.035 Dense weeds (deep channel)
- 0.030 Earth (rubble bottom and sides)
- 0.035 Stony bottom and weedy banks
- 0.040 Cobble bottom with clean sides

##### C. Rock lined

- 0.035 Smooth and uniform
- 0.040 Jagged and irregular

##### D. Channels not maintained (weeds and brush uncut)

- 0.050 Dense weeds (high as flow depth)
- 0.050 Clean bottom (brush on sides)
- 0.100 Dense brush (high stage)
- 0.200 Water quality swales (mowed regulary)

#### NATURAL STREAMS

- 0.029 Clean (straight no pools)
- 0.035 Clean (straight no pools with weeds and stones)
- 0.039 Clean (winding pools )
- 0.042 Clean (winding pools weeds and stones)
- 0.052 Clean (winding pools weeds and large stones)
- 0.065 Weedy (sluggish with deep pools)
- 0.112 Very weedy (sluggish with deep pools)

### SCS RUNOFF CURVE NUMBERS (CN)

For Selected Land Uses

LAND USE DESCRIPTION		RUNOFF CURVE NUMBERS (CN) BY HYDROLOGIC SOIL GROUP			
		A	B	C	D
Cultivated land (1):	winter condition	86	91	94	95
Mountain open areas:	low growing brush and grasslands	74	82	89	92
Meadow or pasture:		65	78	85	89
Wood or forest land:	undisturbed or older second growth	42	64	76	81
Wood or forest land:	young second growth or brush	55	72	81	86
Orchard:	with cover crop	81	88	92	94
Open spaces, lawns, parks, golf courses, cemeteries, landscaping					
Good condition:	grass cover on 75% or more of the area	68	80	86	90
Fair condition:	grass cover on 50% to 75% of the area	77	85	90	92
Gravel roads and parking lots		76	85	89	91
Dirt Roads and parking lots		72	82	87	89
Impervious surfaces:	pavement, roof, etc.	98	98	98	98
Open water bodies:	lakes, wetlands, ponds, etc.	100	100	100	100
Single Family Residential (2)					
Dwelling Unit/Gross Acre (DU/GA)	% Impervious (3)				
1.0	15				
2.0	25				
3.0	34				
4.0	42				
5.0	48				
6.0	52				
7.0	56				
Planned unit developments, condominiums, apartments, commercial businesses and industrial areas.	Use actual impervious area.				
(1) Detailed information relating to specific agricultural land uses is available in the National Engineering Engineering Handbook, Section 4, Hydrology, chapter 9, August 1972. (2) Assume site drains to storm system. (3) For this land use, the remaining pervious areas are assumed to be lawn in good condition.					

**Project Name: Jacoby Heights Subdivision**  
**PRE-DEVELOPED - TIME OF CONCENTRATION CALCULATIONS**

Job # 17-199  
 Date: 2/5/2018

**48.0 = Total Tc (min)**

**Overland Flow (max 300' total)**

			total	
Tc =	17.0	17.6	34.6	= travel time for less than 300' (min)
Ns =	0.4	0.4		= Manning's coefficient (sheet flow)
L =	110	190	300	= flow length (ft)
P2 =	3.5	3.5		= 2-year, 24 hour rainfall (in)
So =	3.90%	10.60%		= slope of the land (%)

**Shallow Concentrated Flow (after initial 300')**

			total		
T =	1.7	7.2	4.4	13.3	= travel time for sheet flow (min)
L =	118	275	227	620	= flow length (ft)
So =	14.90%	4.50%	8.10%		= slope of the land (%)
k =	3	3	3		= time of concentration velocity factor (ft/s)

**Flow in Swales**

			total		
Tc =	0.00			0.0	= travel time in swale (min)
A =	6.00				= area of flow (sf)
R =	0.59				= hydraulic radius (ft)
Ls =	4.12				= side slope wet (ft)
Q =	3.12				= quantity of flow (ft <sup>3</sup> /sec)
V =	0.52				= velocity
L =	0			0	= flow length (ft)
Ve =	1				= vertical distance of side
Ho =	4				= horizontal distance of side
Bw =	24				= base width of swale (in)
D =	12				= depth of flow ESTIMATE (in)
S =	1.00%				= slope of the swale (%)
n =	0.2				= Manning's coefficient (channel)

**Flow in Gutters**

			total		
Tc =	0.0			0.0	= travel time in gutter (min)
fps =	0.02				= average velocity of flow (ft/sec)
T =	0.0				= calculated width of flow in the gutter (ft)
Qc =	0.00				= quantity of flow (as calculated Q=CIA) (ft <sup>3</sup> /sec)
C =	0.90				= runoff coefficient for rational method (paved=0.9)
I =	2.75				= rainfall intensity (assume 5 min tc)
W =	18.00				= width of pavement draining to CB
S =	8.00%				= street longitudinal slope (%)
Sx =	2.50%				= street cross slope (%)
n =	0.016				= Manning's coefficient (pavement = 0.016)
L =	0.0			0	= length of flow and drainage basin (ft)

**Flow in Pipes**

			total		
Tc =	0.1			0.1	= travel time in pipe (min)
V =	7.03				= calculated velocity pipe full (ft/sec)
Q =	12.41				= quantity of flow (ft <sup>3</sup> /sec)
n =	0.011				= Manning's coefficient (pipe)
D =	18				= pipe diameter (in)
S =	1.00%				= slope of pipe (%)
L =	30.0			30	= length of pipe (ft)

**Project Name: Jacoby Heights Subdivision**  
**DEVELOPED - TIME OF CONCENTRATION CALCULATIONS**

Job # 17-199  
 Date: 2/5/2018

**5.8 = Total Tc (min)**

**Overland Flow (max 300' total)**

				total	
Tc =	0.4			0.4	= travel time for less than 300' (min)
Ns =	0.011				= Manning's coefficient ( <u>sheet flow</u> )
L =	20			20	= flow length (ft)
P2 =	3.5				= 2-year, 24 hour rainfall (in)
So =	1.00%				= slope of the land (%)

**Shallow Concentrated Flow (after initial 300')**

				total	
T =	0.0			0.0	= travel time for sheet flow (min)
L =	0			0	= flow length (ft)
So =	2.00%				= slope of the land (%)
k =	1				= time of concentration velocity factor (ft/s)

**Flow in Swales**

				total	
Tc =	0.00			0.0	= travel time in swale (min)
A =	0.01				= area of flow (sf)
R =	0.04				= hydraulic radius (ft)
Ls =	0.12				= side slope wet (ft)
Q =	0.00				= quantity of flow (ft <sup>3</sup> /sec)
V =	0.02				= velocity
L =	0			0	= flow length (ft)
Ve =	1				= vertical distance of side
Ho =	1				= horizontal distance of side
Bw =	1				= base width of swale (in)
D =	1				= depth of flow ESTIMATE (in)
S =	1.00%				= slope of the swale (%)
n =	1				= Manning's coefficient ( <u>channel</u> )

**Flow in Gutters**

				total	
Tc =	3.4			3.4	= travel time in gutter (min)
fps =	0.85				= average velocity of flow (ft/sec)
T =	2.9				= calculated width of flow in the gutter (ft)
Qc =	0.09				= quantity of flow (as calculated Q=CIA) (ft <sup>3</sup> /sec)
C =	0.90				= runoff coefficient for rational method (paved=0.9)
I =	1.73				= rainfall intensity (assume 5 min tc)
W =	14.00				= width of pavement draining to CB
S =	0.50%				= street longitudinal slope (%)
Sx =	2.50%				= street cross slope (%)
n =	0.016				= Manning's coefficient ( <u>pavement</u> = 0.016)
L =	175.0			175	= length of flow and drainage basin (ft)

**Flow in Pipes**

					total	
Tc =	0.8	0.4	0.3	0.4	1.9	= travel time in pipe (min)
V =	9.07	10.64	10.15	12.83		= calculated velocity pipe full (ft/sec)
Q =	7.12	8.35	7.96	10.07		= quantity of flow (ft <sup>3</sup> /sec)
n =	0.013	0.013	0.013	0.013		= Manning's coefficient ( <u>pipe</u> )
D =	12	12	12	12		= pipe diameter (in)
S =	4.00%	5.50%	5.00%	8.00%		= slope of pipe (%)
L =	458.0	273.0	162.0	291.0	893	= length of pipe (ft)

**Project Name: Jacoby Heights Subdivision**  
**Hydrograph Analysis Summary**

Job # 17-199  
 Date: 2/5/2018

Rainfall (year)	Rainfall (inches)
2	3.50
5	4.50
10	4.80
25	5.50
100	0.00

Pre-Developed	
<b>Pervious</b>	
Area =	9.42 acres
CN =	82 na
<b>Impervious</b>	
Area =	0.26 acres
CN =	98 na
Tc =	48 min
Total A =	9.68 acres

Developed	
<b>Pervious</b>	
Area =	7.02 acres
CN =	86 na
<b>Impervious</b>	
Area =	2.66 acres
CN =	96 na
Tc =	5.8 min
Total A =	9.68 acres

Note: The hydrographs shown are based on the S.C.S Type - 1A, 24 hour storm using the SBUH method based on the King County Model.

Pre-Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	2.38	3.71	4.13	6.12	0.00
Volume	cfs =>	63,452	93,363	102,835	124,657	-
Tpeak	min =>	490	490	490	490	10
Tpeak	hr =>	8.17	8.17	8.17	8.17	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.17	0.00	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00	0.00
30	0.50	0.00	0.00	0.00	0.00	0.00
40	0.67	0.00	0.00	0.00	0.00	0.00
50	0.83	0.00	0.00	0.00	0.00	0.00
60	1.00	0.00	0.00	0.00	0.01	0.00
70	1.17	0.00	0.01	0.01	0.01	0.00
80	1.33	0.00	0.01	0.01	0.01	0.00
90	1.50	0.00	0.01	0.01	0.01	0.00
100	1.67	0.01	0.01	0.01	0.01	0.00
110	1.83	0.01	0.01	0.01	0.02	0.00
120	2.00	0.01	0.01	0.02	0.02	0.00
130	2.17	0.01	0.02	0.02	0.02	0.00
140	2.33	0.01	0.02	0.02	0.02	0.00
150	2.50	0.01	0.02	0.02	0.03	0.00
160	2.67	0.01	0.02	0.02	0.03	0.00
170	2.83	0.02	0.02	0.03	0.03	0.00
180	3.00	0.02	0.03	0.03	0.03	0.00
190	3.17	0.02	0.03	0.03	0.04	0.00
200	3.33	0.02	0.03	0.03	0.06	0.00
210	3.50	0.02	0.03	0.04	0.08	0.00
220	3.67	0.02	0.04	0.05	0.11	0.00
230	3.83	0.02	0.05	0.07	0.14	0.00
240	4.00	0.03	0.07	0.10	0.19	0.00
250	4.17	0.03	0.09	0.13	0.23	0.00
260	4.33	0.03	0.12	0.16	0.28	0.00
270	4.50	0.04	0.15	0.20	0.33	0.00
280	4.67	0.05	0.19	0.24	0.38	0.00
290	4.83	0.07	0.23	0.29	0.45	0.00
300	5.00	0.09	0.27	0.34	0.52	0.00
310	5.17	0.12	0.32	0.40	0.59	0.00
320	5.33	0.14	0.37	0.45	0.66	0.00
330	5.50	0.17	0.42	0.50	0.72	0.00
340	5.67	0.20	0.47	0.56	0.78	0.00
350	5.83	0.24	0.52	0.62	0.86	0.00
360	6.00	0.28	0.59	0.69	0.95	0.00
370	6.17	0.32	0.65	0.76	1.04	0.00
380	6.33	0.36	0.71	0.83	1.12	0.00
390	6.50	0.40	0.77	0.89	1.19	0.00
400	6.67	0.44	0.83	0.95	1.26	0.00
410	6.83	0.50	0.92	1.06	1.39	0.00
420	7.00	0.59	1.06	1.21	1.57	0.00
430	7.17	0.67	1.18	1.34	1.74	0.00
440	7.33	0.79	1.35	1.53	1.97	0.00
450	7.50	0.93	1.57	1.77	2.27	0.00
460	7.67	1.21	2.00	2.25	2.85	0.00
470	7.83	1.83	2.94	3.29	4.12	0.00
480	8.00	2.32	3.66	4.08	5.07	0.00
490	8.17	2.38	3.71	4.13	5.12	0.00
500	8.33	2.29	3.54	3.93	4.86	0.00
510	8.50	2.17	3.33	3.70	4.56	0.00
520	8.67	2.07	3.17	3.51	4.32	0.00

Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	6.21	8.75	9.52	11.33	0.00
Volume	cfs =>	84,878	117,658	127,619	151,060	-
Tpeak	min =>	470	470	470	470	10
Tpeak	hr =>	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.17	0.00	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00	0.00
30	0.50	0.00	0.01	0.01	0.02	0.00
40	0.67	0.01	0.03	0.04	0.07	0.00
50	0.83	0.03	0.07	0.08	0.11	0.00
60	1.00	0.05	0.10	0.11	0.15	0.00
70	1.17	0.07	0.12	0.14	0.18	0.00
80	1.33	0.09	0.14	0.16	0.20	0.00
90	1.50	0.10	0.16	0.18	0.22	0.00
100	1.67	0.11	0.17	0.19	0.24	0.00
110	1.83	0.14	0.21	0.23	0.28	0.00
120	2.00	0.17	0.25	0.27	0.33	0.00
130	2.17	0.18	0.26	0.29	0.34	0.00
140	2.33	0.19	0.27	0.30	0.36	0.00
150	2.50	0.20	0.28	0.31	0.38	0.00
160	2.67	0.20	0.29	0.32	0.42	0.00
170	2.83	0.23	0.33	0.37	0.51	0.00
180	3.00	0.26	0.38	0.44	0.60	0.00
190	3.17	0.27	0.43	0.49	0.66	0.00
200	3.33	0.27	0.47	0.54	0.71	0.00
210	3.50	0.29	0.50	0.58	0.76	0.00
220	3.67	0.31	0.54	0.62	0.80	0.00
230	3.83	0.36	0.62	0.71	0.91	0.00
240	4.00	0.42	0.71	0.80	1.03	0.00
250	4.17	0.45	0.75	0.85	1.09	0.00
260	4.33	0.48	0.79	0.89	1.13	0.00
270	4.50	0.51	0.83	0.93	1.18	0.00
280	4.67	0.54	0.86	0.97	1.22	0.00
290	4.83	0.61	0.97	1.08	1.36	0.00
300	5.00	0.69	1.09	1.21	1.51	0.00
310	5.17	0.73	1.13	1.26	1.57	0.00
320	5.33	0.76	1.17	1.30	1.61	0.00
330	5.50	0.79	1.20	1.34	1.65	0.00
340	5.67	0.81	1.24	1.37	1.69	0.00
350	5.83	0.90	1.37	1.51	1.86	0.00
360	6.00	1.00	1.50	1.66	2.04	0.00
370	6.17	1.04	1.55	1.71	2.09	0.00
380	6.33	1.07	1.58	1.75	2.13	0.00
390	6.50	1.09	1.62	1.78	2.17	0.00
400	6.67	1.12	1.65	1.81	2.20	0.00
410	6.83	1.36	2.00	2.19	2.66	0.00
420	7.00	1.63	2.38	2.61	3.15	0.00
430	7.17	1.69	2.46	2.69	3.24	0.00
440	7.33	2.03	2.92	3.20	3.85	0.00
450	7.50	2.40	3.44	3.75	4.50	0.00
460	7.67	3.54	5.04	5.50	6.57	0.00
470	7.83	6.21	8.75	9.52	11.33	0.00
480	8.00	6.11	8.55	9.29	11.02	0.00
490	8.17	3.69	5.13	5.57	6.59	0.00
500	8.33	2.57	3.56	3.85	4.55	0.00
510	8.50	2.17	3.00	3.25	3.83	0.00
520	8.67	2.16	2.97	3.22	3.79	0.00

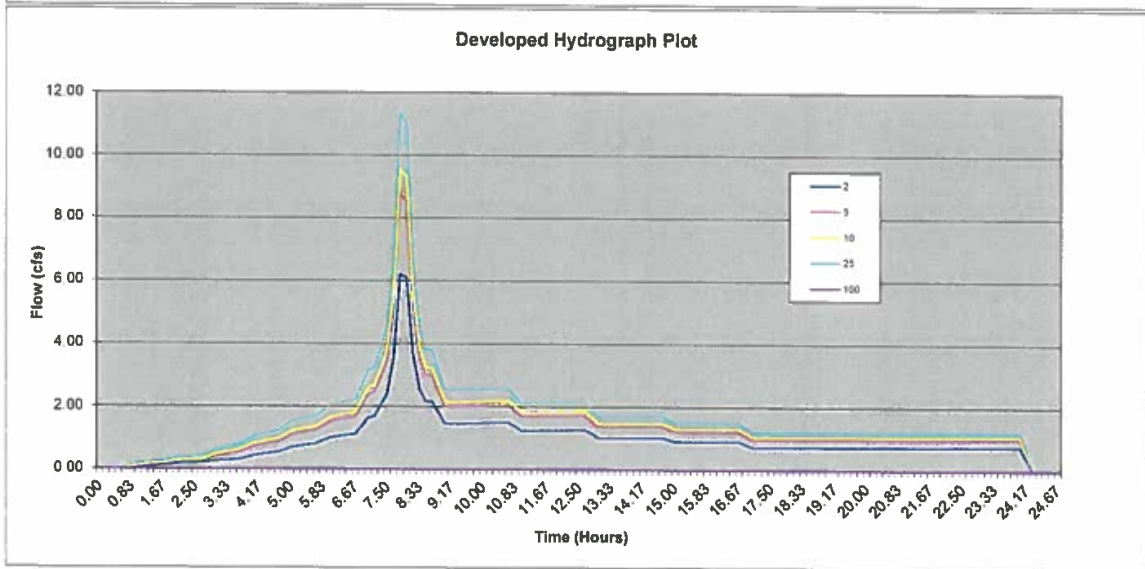
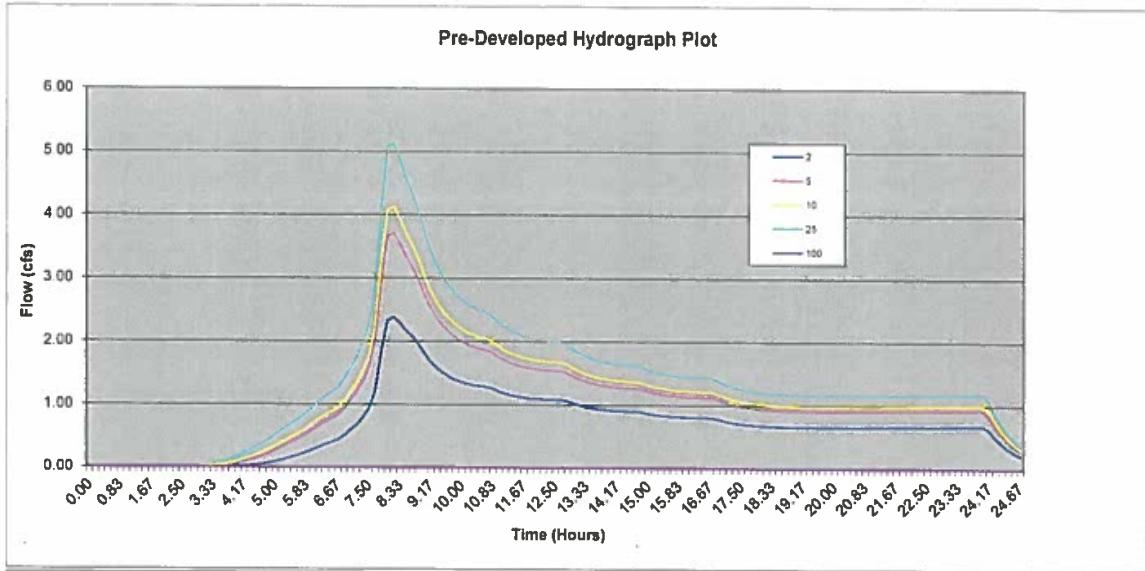
Pre-Developed Hydrographs							Developed Hydrographs				
Year	=====	2	5	10	25	100	2	5	10	25	100
Qpeak	cfs =>	2.38	3.71	4.13	5.12	0.00	6.21	8.75	9.62	11.33	0.00
Volume	cf =>	63,452	93,363	102,635	124,657	-	84,978	117,658	127,819	151,060	-
Tpeak	min =>	490	490	490	490	10	470	470	470	470	10
Tpeak	hr =>	8.17	8.17	8.17	8.17	0.17	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
530	8.83	1.95	2.96	3.28	4.02	0.00	1.83	2.51	2.72	3.20	0.00
540	9.00	1.79	2.72	3.00	3.68	0.00	1.47	2.01	2.18	2.56	0.00
550	9.17	1.67	2.52	2.78	3.40	0.00	1.45	1.98	2.14	2.52	0.00
560	9.33	1.57	2.36	2.61	3.18	0.00	1.45	1.99	2.15	2.52	0.00
570	9.50	1.50	2.24	2.46	3.00	0.00	1.46	1.99	2.15	2.53	0.00
580	9.67	1.44	2.14	2.35	2.86	0.00	1.46	2.00	2.16	2.54	0.00
590	9.83	1.39	2.06	2.26	2.75	0.00	1.47	2.01	2.17	2.54	0.00
600	10.00	1.35	2.00	2.19	2.66	0.00	1.48	2.01	2.17	2.55	0.00
610	10.17	1.32	1.95	2.14	2.59	0.00	1.48	2.02	2.18	2.56	0.00
620	10.33	1.30	1.91	2.10	2.53	0.00	1.49	2.03	2.19	2.56	0.00
630	10.50	1.29	1.88	2.06	2.49	0.00	1.49	2.03	2.19	2.57	0.00
640	10.67	1.28	1.86	2.04	2.46	0.00	1.50	2.04	2.20	2.57	0.00
650	10.83	1.25	1.82	1.99	2.39	0.00	1.38	1.87	2.02	2.36	0.00
660	11.00	1.21	1.75	1.91	2.30	0.00	1.25	1.69	1.82	2.13	0.00
670	11.17	1.17	1.70	1.86	2.23	0.00	1.24	1.68	1.81	2.12	0.00
680	11.33	1.15	1.65	1.81	2.17	0.00	1.24	1.68	1.81	2.12	0.00
690	11.50	1.13	1.62	1.77	2.12	0.00	1.25	1.69	1.82	2.12	0.00
700	11.67	1.11	1.60	1.74	2.09	0.00	1.25	1.69	1.82	2.13	0.00
710	11.83	1.10	1.58	1.72	2.06	0.00	1.25	1.69	1.82	2.13	0.00
720	12.00	1.09	1.56	1.70	2.04	0.00	1.26	1.69	1.83	2.13	0.00
730	12.17	1.09	1.55	1.69	2.02	0.00	1.26	1.70	1.83	2.14	0.00
740	12.33	1.08	1.54	1.68	2.01	0.00	1.26	1.70	1.83	2.14	0.00
750	12.50	1.08	1.54	1.68	2.00	0.00	1.26	1.70	1.84	2.14	0.00
760	12.67	1.08	1.53	1.67	1.99	0.00	1.27	1.71	1.84	2.14	0.00
770	12.83	1.06	1.50	1.64	1.95	0.00	1.15	1.54	1.66	1.94	0.00
780	13.00	1.02	1.45	1.58	1.88	0.00	1.02	1.37	1.47	1.72	0.00
790	13.17	0.99	1.40	1.53	1.82	0.00	1.01	1.36	1.46	1.70	0.00
800	13.33	0.97	1.37	1.49	1.77	0.00	1.01	1.36	1.46	1.71	0.00
810	13.50	0.95	1.34	1.46	1.73	0.00	1.01	1.36	1.46	1.71	0.00
820	13.67	0.93	1.32	1.43	1.70	0.00	1.01	1.36	1.47	1.71	0.00
830	13.83	0.92	1.30	1.41	1.68	0.00	1.02	1.36	1.47	1.71	0.00
840	14.00	0.91	1.29	1.40	1.66	0.00	1.02	1.36	1.47	1.71	0.00
850	14.17	0.91	1.28	1.39	1.65	0.00	1.02	1.37	1.47	1.71	0.00
860	14.33	0.90	1.27	1.38	1.63	0.00	1.02	1.37	1.47	1.71	0.00
870	14.50	0.90	1.26	1.37	1.63	0.00	1.02	1.37	1.47	1.72	0.00
880	14.67	0.90	1.26	1.37	1.62	0.00	1.02	1.37	1.47	1.72	0.00
890	14.83	0.88	1.24	1.35	1.60	0.00	0.97	1.29	1.39	1.62	0.00
900	15.00	0.87	1.21	1.32	1.56	0.00	0.90	1.21	1.30	1.52	0.00
910	15.17	0.85	1.19	1.29	1.53	0.00	0.90	1.21	1.30	1.51	0.00
920	15.33	0.84	1.17	1.27	1.51	0.00	0.90	1.21	1.30	1.51	0.00
930	15.50	0.83	1.16	1.26	1.49	0.00	0.90	1.21	1.30	1.51	0.00
940	15.67	0.82	1.15	1.24	1.47	0.00	0.90	1.21	1.30	1.51	0.00
950	15.83	0.82	1.14	1.23	1.46	0.00	0.91	1.21	1.30	1.51	0.00
960	16.00	0.81	1.13	1.23	1.45	0.00	0.91	1.21	1.30	1.51	0.00
970	16.17	0.81	1.13	1.22	1.44	0.00	0.91	1.21	1.30	1.52	0.00
980	16.33	0.81	1.12	1.22	1.44	0.00	0.91	1.21	1.30	1.52	0.00
990	16.50	0.80	1.12	1.21	1.43	0.00	0.91	1.21	1.30	1.52	0.00
1000	16.67	0.80	1.12	1.21	1.43	0.00	0.91	1.21	1.31	1.52	0.00
1010	16.83	0.79	1.09	1.19	1.40	0.00	0.83	1.10	1.19	1.38	0.00
1020	17.00	0.76	1.06	1.14	1.35	0.00	0.74	0.98	1.06	1.23	0.00
1030	17.17	0.74	1.02	1.11	1.31	0.00	0.73	0.97	1.05	1.22	0.00
1040	17.33	0.72	1.00	1.08	1.28	0.00	0.73	0.97	1.05	1.22	0.00
1050	17.50	0.71	0.98	1.06	1.25	0.00	0.73	0.97	1.05	1.22	0.00
1060	17.67	0.70	0.96	1.04	1.23	0.00	0.73	0.98	1.05	1.22	0.00
1070	17.83	0.69	0.95	1.03	1.21	0.00	0.73	0.98	1.05	1.22	0.00
1080	18.00	0.68	0.94	1.02	1.20	0.00	0.73	0.98	1.05	1.22	0.00
1090	18.17	0.67	0.93	1.01	1.19	0.00	0.73	0.98	1.05	1.22	0.00
1100	18.33	0.67	0.93	1.00	1.18	0.00	0.73	0.98	1.05	1.22	0.00
1110	18.50	0.67	0.92	1.00	1.17	0.00	0.73	0.98	1.05	1.22	0.00
1120	18.67	0.66	0.92	0.99	1.17	0.00	0.74	0.98	1.05	1.22	0.00
1130	18.83	0.66	0.91	0.99	1.17	0.00	0.74	0.98	1.05	1.22	0.00
1140	19.00	0.66	0.91	0.99	1.16	0.00	0.74	0.98	1.05	1.22	0.00
1150	19.17	0.66	0.91	0.98	1.16	0.00	0.74	0.98	1.05	1.22	0.00
1160	19.33	0.66	0.91	0.98	1.16	0.00	0.74	0.98	1.05	1.22	0.00
1170	19.50	0.66	0.91	0.98	1.16	0.00	0.74	0.98	1.05	1.22	0.00
1180	19.67	0.66	0.91	0.98	1.16	0.00	0.74	0.98	1.05	1.22	0.00
1190	19.83	0.66	0.91	0.98	1.16	0.00	0.74	0.98	1.05	1.22	0.00
1200	20.00	0.66	0.91	0.98	1.16	0.00	0.74	0.98	1.06	1.22	0.00
1210	20.17	0.66	0.91	0.98	1.16	0.00	0.74	0.98	1.06	1.22	0.00
1220	20.33	0.66	0.91	0.98	1.16	0.00	0.74	0.98	1.06	1.23	0.00
1230	20.50	0.66	0.91	0.98	1.16	0.00	0.74	0.98	1.06	1.23	0.00





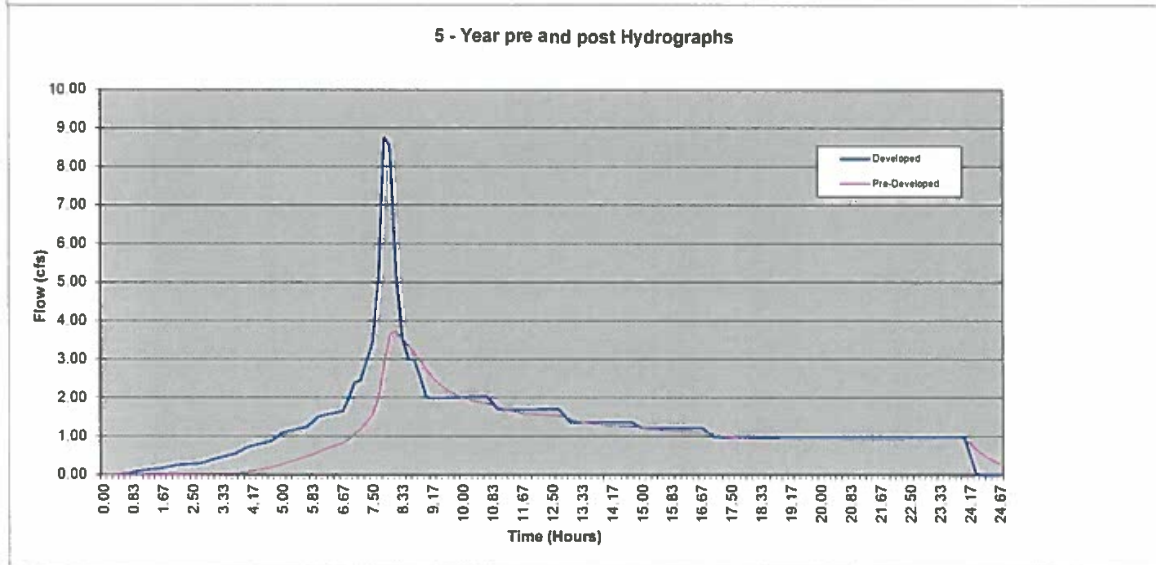
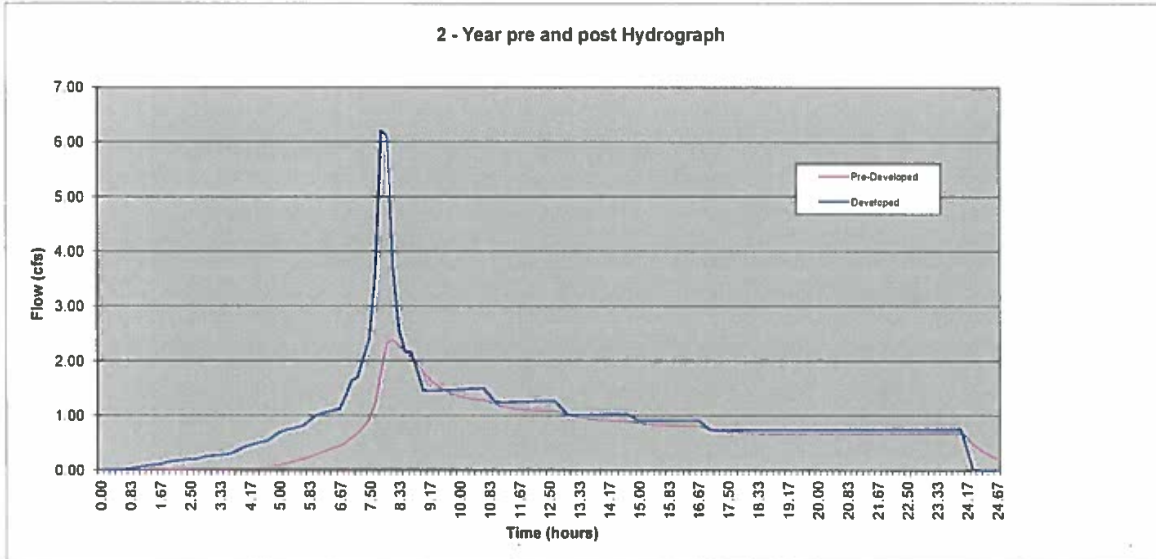
Pre-Developed Hydrographs					
Year	2	5	10	25	100
Qpeak	cfs => 2.38	3.71	4.13	5.12	0.00
Volume	cf => 83.452	93.363	102.635	124.657	-
Tpeak	min => 490	490	490	490	10
Tpeak	hr => 8.17	8.17	8.17	8.17	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
2	5	10	25	100	
6.21	8.76	9.62	11.33	0.00	
84.978	117.658	127.619	151.060	-	
470	470	470	470	10	
7.83	7.83	7.83	7.83	0.17	
2	5	10	25	100	
Hyd	Hyd	Hyd	Hyd	Hyd	
(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	



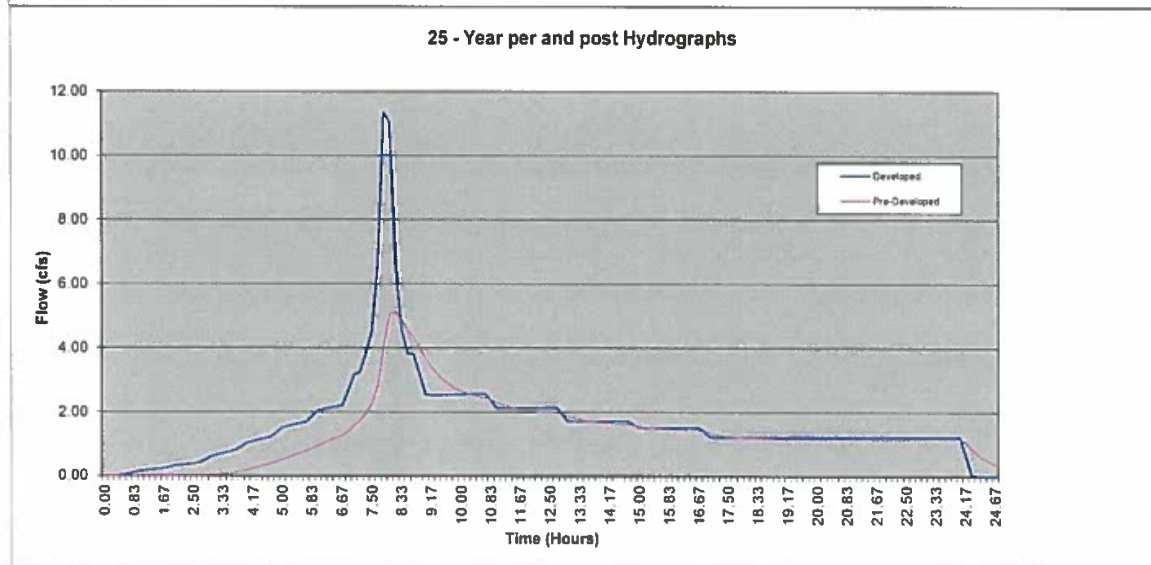
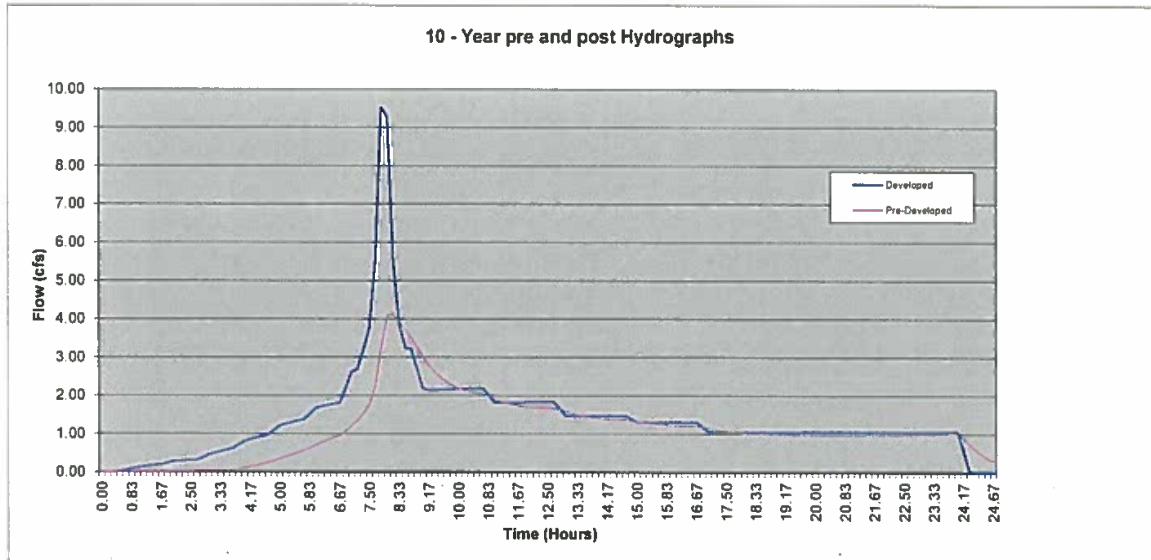
Pre-Developed Hydrographs					
Year =====>	2	5	10	25	100
Qpeak cfs =>	2.38	3.71	4.13	5.12	0.00
Volume cf =>	63,452	83,363	102,635	124,857	-
Tpeak min =>	490	490	490	490	10
Tpeak hr =>	8.17	8.17	8.17	8.17	0.17
Hydrograph Name=>	2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)

Developed Hydrographs					
Year =====>	2	5	10	25	100
Qpeak cfs =>	6.21	8.75	9.62	11.33	0.00
Volume cf =>	84,978	117,658	127,619	151,060	-
Tpeak min =>	470	470	470	470	10
Tpeak hr =>	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)



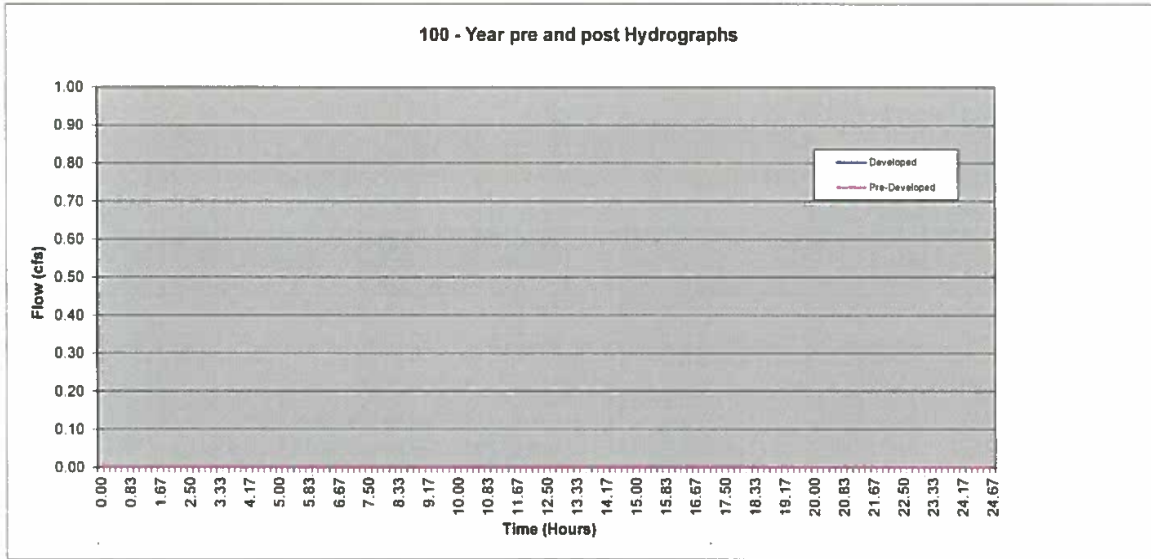
Pre-Developed Hydrographs					
Year	2	5	10	25	100
Qpeak	2.38	3.71	4.13	5.12	0.00
Volume	83,452	93,363	102,635	124,657	-
Tpeak	490	490	490	490	10
Tpeak	8.17	8.17	8.17	8.17	0.17
Hydrograph Name	2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
Year	2	5	10	25	100
Qpeak	6.21	8.76	9.62	11.33	0.00
Volume	84,878	117,658	127,618	151,060	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name	2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)



Pre-Developed Hydrographs					
Year	2	5	10	25	100
Qpeak	2.38	3.71	4.13	5.12	0.00
Volume	63,452	93,363	102,635	124,657	-
Tpeak	490	490	490	490	10
Tpeak	8.17	8.17	8.17	8.17	0.17
Hydrograph Name	2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
Year	2	5	10	25	100
Qpeak	6.21	8.75	9.52	11.33	0.00
Volume	84,978	117,858	127,819	151,060	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name	2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)



**Project Name:** Jacoby Heights Subdivision  
**Detention System Summary**  
**Job #** 17-199  
**Date:** 2/5/2018

Note: The detention system design is based on the King County Model "Facility Design Routine"

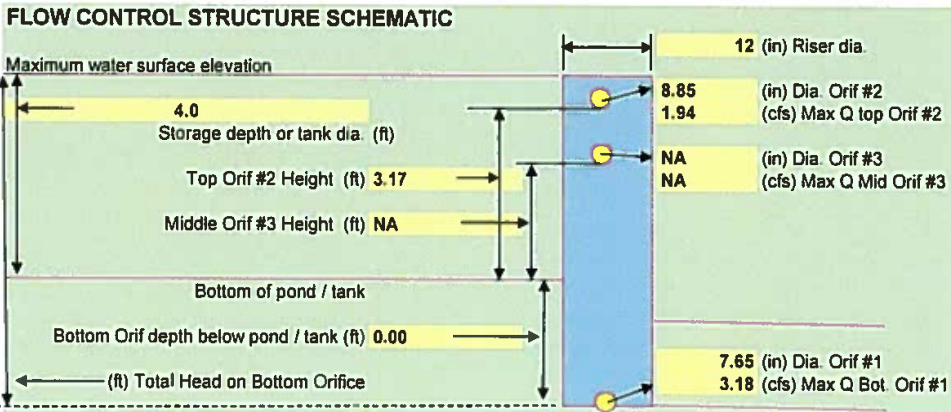
**1) Detention Facility Design Input:**

2) Type of facility:	DETENTION POND	
3) Pond side slopes:	3 to 1	
4) Pond storage depth:	4 ft (from bottom of pond to overflow)	
5) Vertical permeability:	0 min/in	
6) Number of orifices:	2	
7) Riser dia =>	12 in	
8) Orifice coefficient:	0.62 (typically 0.62)	
9) IE - bottom orifice:	0 ft (distance below bottom of pond - Negative #)	
10) Max Q Bottom Orif. #1	3.18 cfs	
11) Top Orif #2 Height =	3.17 ft	
12) Max Q Mid Orif. #3	0.00 cfs	Orifice not being used
13) Mid Orif #3 Height =	0.00 ft	Orifice not being used

**Detention Facility Design Results:**

Performance year	Developed Inflow cfs	Pre-Developed Outflow cfs	Actual Outflow cfs	Peak Stage ft	Storage cf
100	0	0	0	0	-
25	11.33	5.12	5.12	4.00	21,793
10	9.52	4.13	4.12	3.47	18,058
5	8.75	3.71	3.51	3.26	16,669
2	6.21	2.38	2.38	2.23	10,420
Required Storage =====					21,793

Total Q =	Bottom Orif	Middle Orif	Top Orif	Optional Weir Design (for top orifice)
Head (ft) =	3.18	0.00	1.94	1.09 La (ft)
Dist. from bottom of pond (ft) =	4.00	0.00	0.83	124.99 < deg
Orif. Dia. (in) =	7.65	0.00	3.17	Weir is an option
			8.85	



**Project Name:** Jacoby Heights Subdivision

## Detention Facility Type

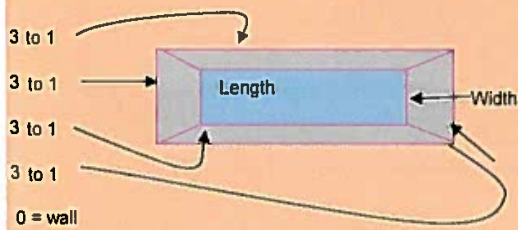
Job # 17-199  
Date: 2/5/2018

### Detention Facility Type:

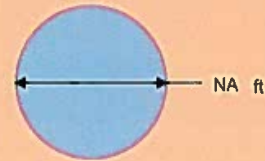
#### DETENTION POND

L = 61.5 ft  
W = 61.5 ft  
D = 4.0 ft  
Pond Area = 3,781 sf

#### DETENTION POND



#### DETENTION TANK NA



#### USER DEFINED POND

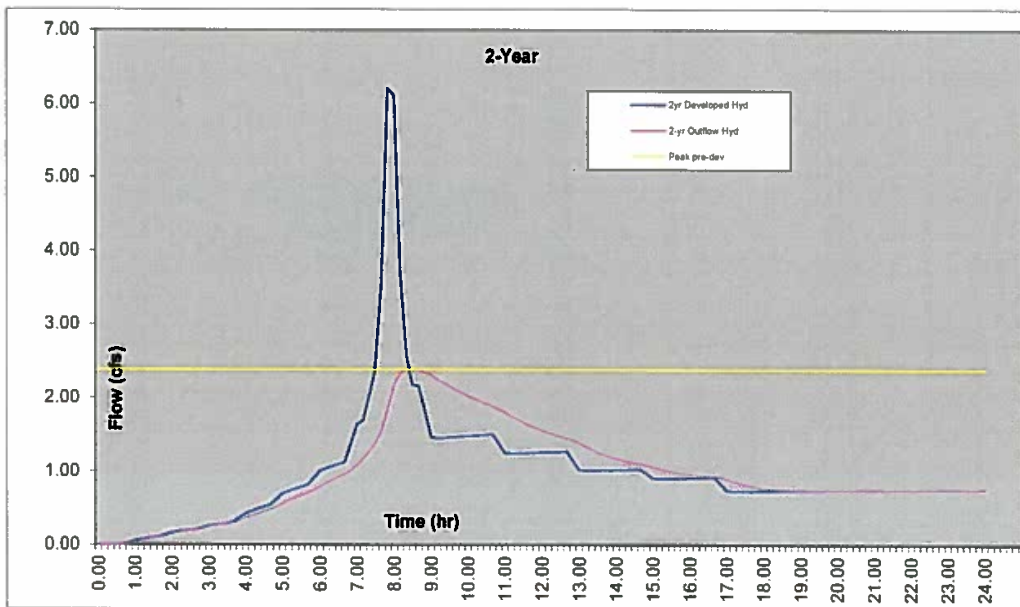
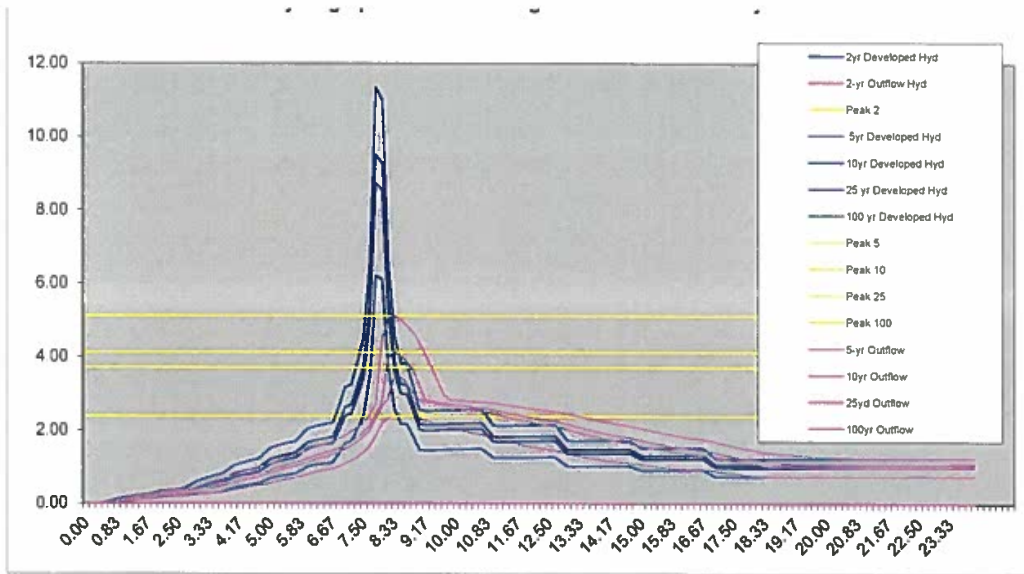
NA

Pond Geometry

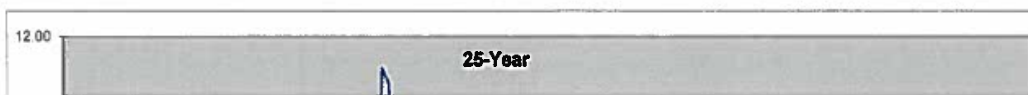
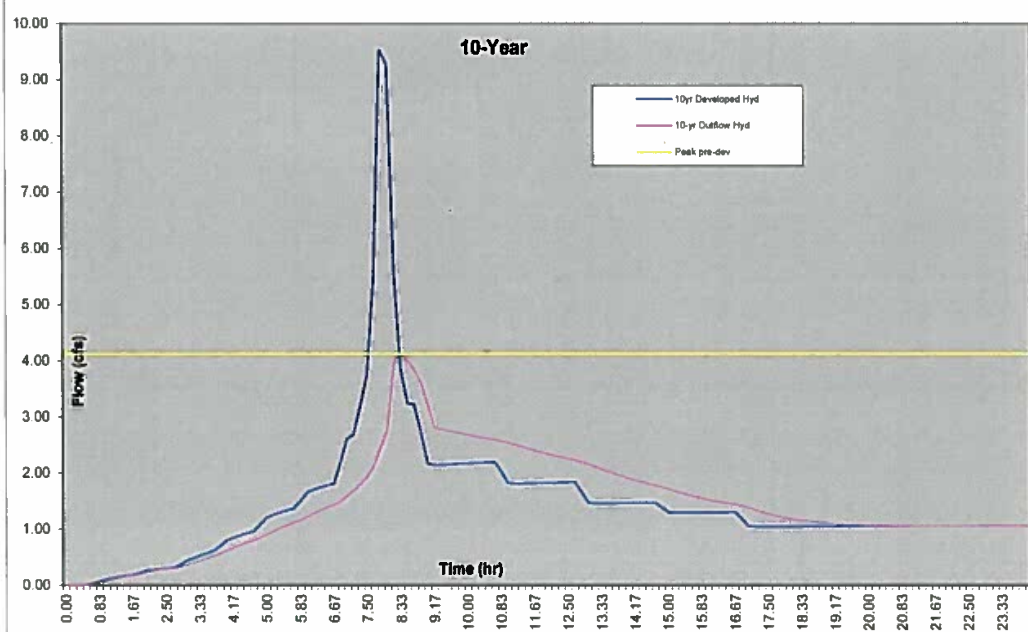
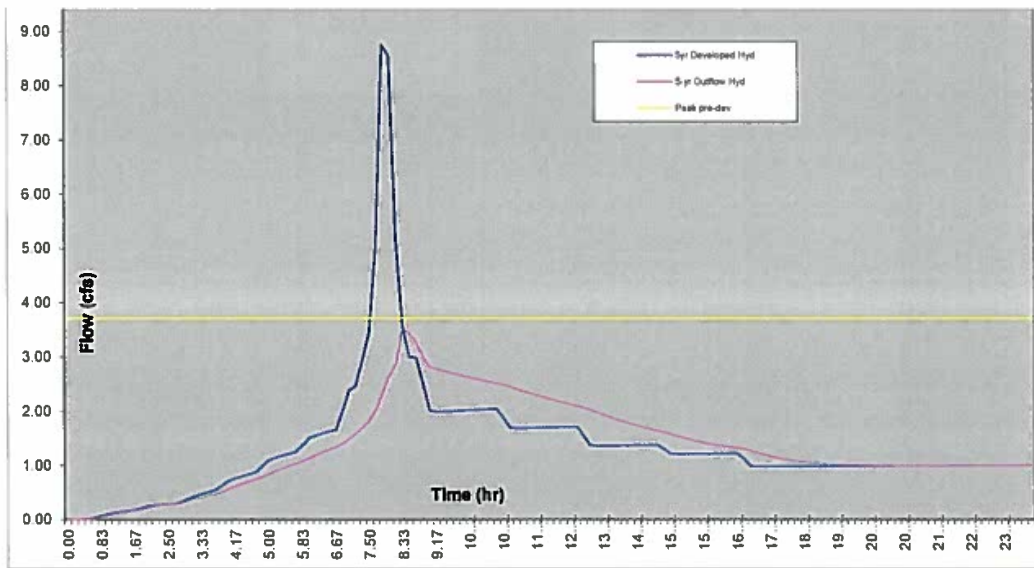
Stage (ft)	Area (sf)
0	NA
1	NA
2	NA
3	NA
4	NA
5	NA
6	NA
7	NA
8	NA
9	NA
10	NA
11	NA
12	NA
13	NA
14	NA
15	NA

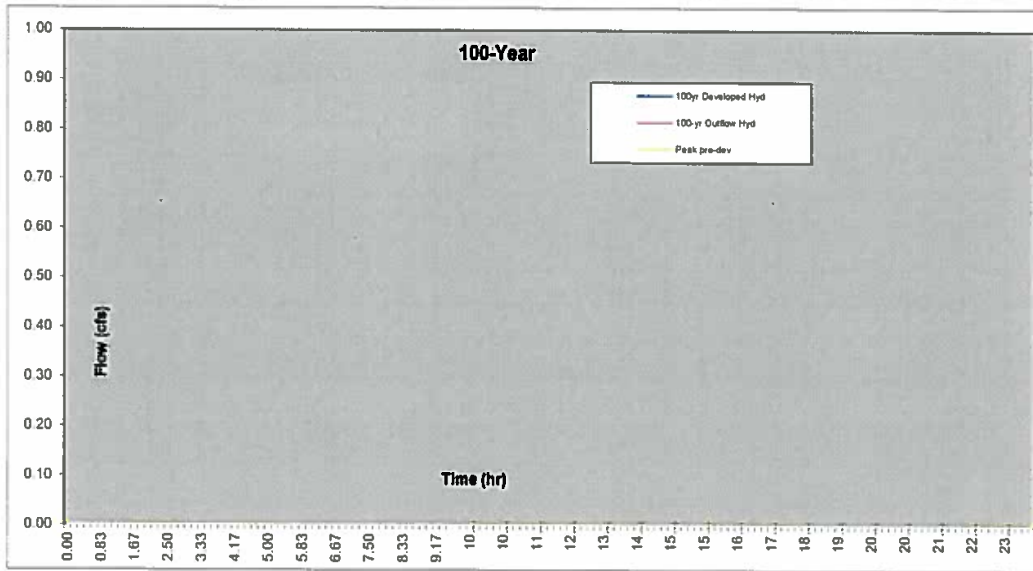
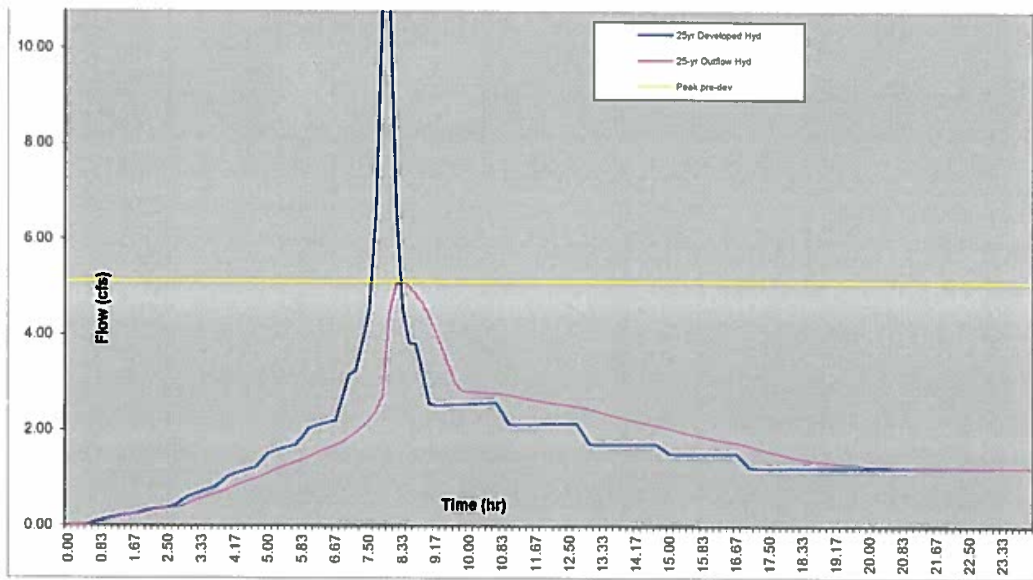


All Storm Hydrographs Routed Through The Detention Facility





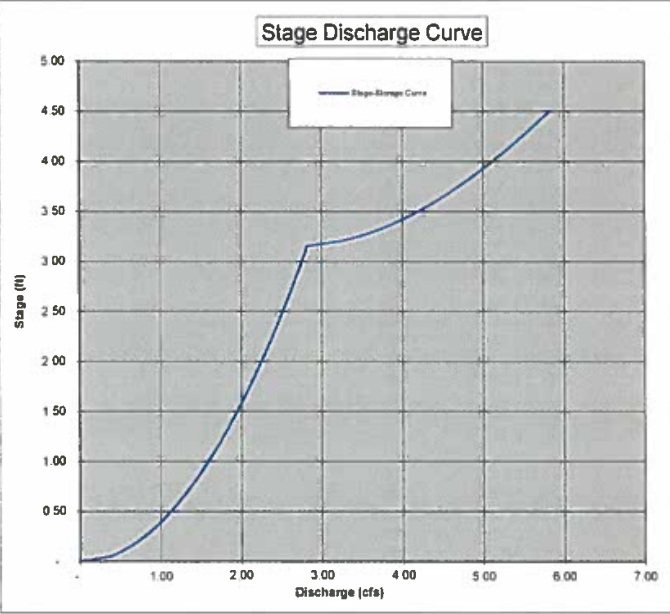
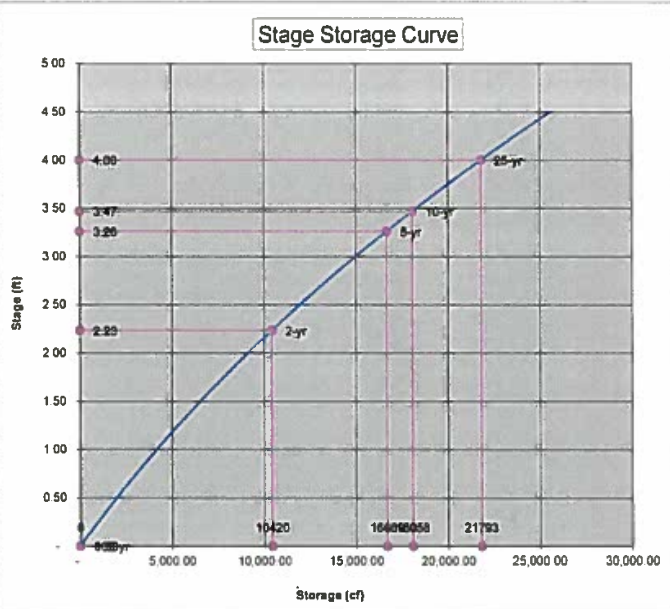




Project Name: Jacoby Heights Subdivision  
 Stage Storage Summary

Job # 17-199  
 Date: 2/5/2018

Stage ft	Storage cf	Discharge cfs
0.05	189.95	0.36
0.10	381.75	0.50
0.15	575.42	0.62
0.20	770.96	0.71
0.25	968.37	0.80
0.30	1,167.68	0.87
0.35	1,368.89	0.94
0.40	1,572.00	1.01
0.45	1,777.03	1.07
0.50	1,983.99	1.12
0.55	2,192.88	1.18
0.60	2,403.71	1.23
0.65	2,616.50	1.28
0.70	2,831.25	1.33
0.75	3,047.96	1.38
0.80	3,266.66	1.42
0.85	3,487.35	1.47
0.90	3,710.03	1.51
0.95	3,934.73	1.55
1.00	4,161.43	1.59
1.05	4,390.16	1.63
1.10	4,620.93	1.67
1.15	4,853.74	1.71
1.20	5,088.59	1.74
1.25	5,325.51	1.78
1.30	5,564.50	1.81
1.35	5,805.57	1.85
1.40	6,048.73	1.88
1.45	6,293.98	1.91
1.50	6,541.33	1.95
1.55	6,790.81	1.98
1.60	7,042.40	2.01
1.65	7,296.13	2.04
1.70	7,552.00	2.07
1.75	7,810.02	2.10
1.80	8,070.20	2.13
1.85	8,332.55	2.16
1.90	8,597.07	2.19
1.95	8,863.79	2.22
2.00	9,132.69	2.25
2.05	9,403.81	2.28
2.10	9,677.13	2.30
2.15	9,952.68	2.33
2.20	10,230.46	2.36
2.25	10,510.48	2.39
2.30	10,792.75	2.41
2.35	11,077.28	2.44
2.40	11,364.08	2.46
2.45	11,653.15	2.49
2.50	11,944.51	2.51
2.55	12,238.17	2.54
2.60	12,534.12	2.56
2.65	12,832.39	2.59
2.70	13,132.98	2.61
2.75	13,435.91	2.64
2.80	13,741.17	2.66
2.85	14,048.78	2.68
2.90	14,358.74	2.71
2.95	14,671.08	2.73
3.00	14,985.79	2.75
3.05	15,302.88	2.78
3.10	15,622.37	2.80
3.15	15,944.26	2.82
3.20	16,268.56	3.21
3.25	16,595.29	3.47









**Project Name: Jacoby Heights Subdivision**  
**Rectangular, Sharp Crested Weir Calculations**

Job # 17-199  
 Date: 2/5/2018

Weir Equation:  $Q = C(L-0.2H)H^{3/2}$

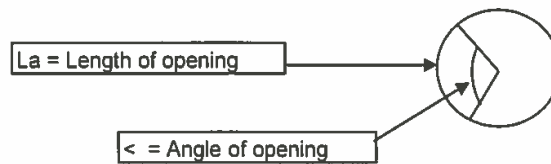
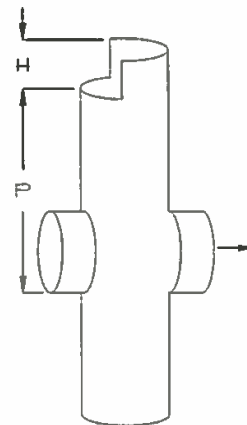
- Q = Flow over weir (cfs)
- C =  $3.27 + 0.40 H/P$  (ft)
- L = Adjusted length of weir (La - 0.1H x 2) this is to account for side constraints
- La = Actual length of weir along pipes interior circumference (ft)
- H = Distance from bottom of weir to maximum head (ft)
- P = Distance from bottom of weir to outfall invert elevation (ft)
- D = Inside riser pipe diameter (in)
- < = Angle of opening for weir (maximum 180 degrees)

**Given:**

Q	1.94 cfs
H	0.83 ft
P	3.17 ft
D	12 in

**Find:**

C	3.37 ft
L	0.92 ft
La	1.09 ft
<	125 degrees



**CDS2015-4-C DESIGN NOTES**

CDS2015-4-C RATED TREATMENT CAPACITY IS 0.7 CFS (19.9 L/M) OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 10.0 CFS (283 L/M). IF THE SITE CONDITIONS EXCEED 10.0 (283 L/M) CFS, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

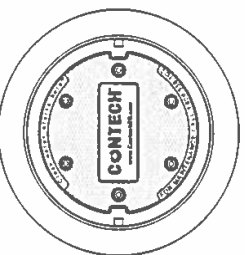
THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

**CONFIGURATION DESCRIPTION**

- GRATED INLET ONLY (NO INLET PIPE)
- GRATED INLET WITH INLET PIPE OR PIPES
- CURB INLET ONLY (NO INLET PIPE)
- CURB INLET WITH INLET PIPE OR PIPES
- SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
- SEDIMENT TRAP FOR MUD/SILT CONTAMINATING UNITS

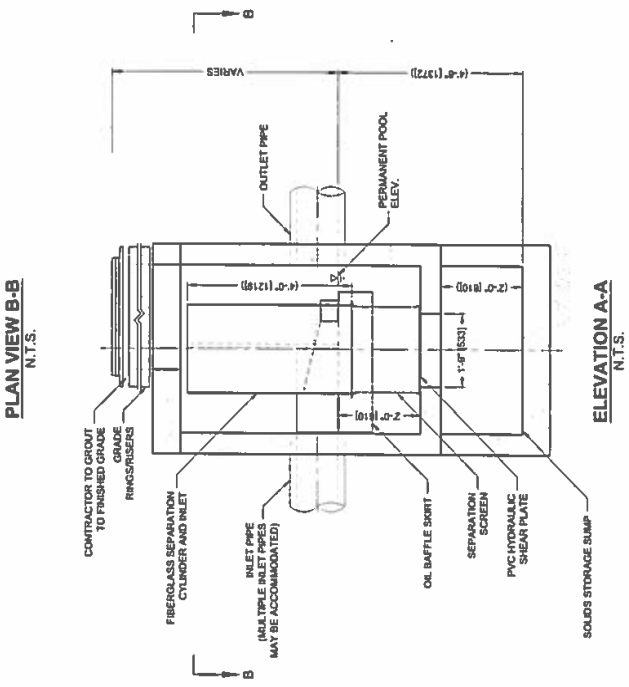
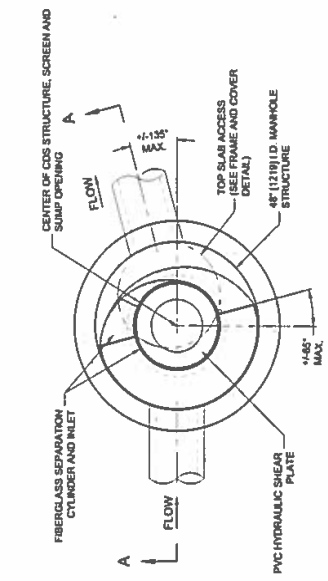
**SITE SPECIFIC DATA REQUIREMENTS**

STRUCTURE ID	WATER QUALITY FLOW RATE (CFS OR L/M)	*
	PEAK FLOW RATE (CFS OR L/M)	*
	RETURN PERIOD OF PEAK FLOW (YRS)	*
	SCREEN APERTURE (2400 OR 4700)	*
PIPE DATA:	I.E. MATERIAL	
	INLET PIPE 1	*
	INLET PIPE 2	*
	OUTLET PIPE	*
	DIAMETER	*
	ANTI-FLOTATION BALLAST	*
	WIDTH	*
	HEIGHT	*
NOTES/SPECIAL REQUIREMENTS:		
* PER ENGINEER OF RECORD		



**FRAME AND COVER**  
(DIAMETER VARIES)  
N.T.S.

- GENERAL NOTES**
- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
  - ALL DIMENSIONS UNLESS NOTED OTHERWISE.
  - FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. [www.conteches.com](http://www.conteches.com)
  - CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
  - CONTRACTOR TO PROVIDE INSTALL AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
  - AT OR BELOW THE OUTLET PIPE INVERT ELEVATION, ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
  - PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
- INSTALLATION NOTES**
- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
  - INVERT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
  - CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
  - CONTRACTOR TO PROVIDE INSTALL AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
  - CONTRACTOR TO VERIFY ALL JOINTS ARE WATER TIGHT. HOLDING WATER TO FURNISH INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.



**CONTECH**  
ENGINEERED SOLUTIONS LLC

9025 Centre Pointe Dr., Suite 400, West Chester, OH 45399  
800-338-1122 613-845-7000 613-845-7003 FAX

CDS2015-4-C  
INLINE CDS  
STANDARD DETAIL



# Jacoby Road Subdivision

Traffic Impact Analysis  
Sandy, Oregon

Date:  
June 15, 2018

Prepared for:  
Cory Knight  
Taylor Group Realty

Prepared by:  
Richard Martin, EI  
William Farley, PE



RENEWS: 12/31/2019



LANCASTER  
ENGINEERING

321 SW 4th Ave., Suite 400 | Portland, OR 97204 | 503.248.0313 | lancasterengineering.com

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### ***Executive Summary***

1. A subdivision is proposed that will include the construction of 31 single-family detached houses located at 19124 SE Jacoby Road in Sandy, Oregon.
2. The trip generation calculations show that the proposed development is projected to generate an additional 23 morning peak hour and 31 evening peak hour site trips. Trip generation was based on a previously submitted site plan that showed 32 houses, and should be considered conservative.
3. All study intersections are currently operating acceptably per City of Sandy and ODOT standards and are projected to continue operating acceptably upon build-out of the proposed development through year 2020. No operational mitigation is necessary or recommended.
4. A crash pattern was identified at the intersection of OR-211 at Dubarko Road. The planned turn lanes and signal at the intersection outlined in the Sandy TSP will help to mitigate this crash pattern. No safety mitigation is recommended as part of this development.
5. Adequate sight distance is available at both proposed site access locations.
6. Consistent with improvements outlined in the City's TSP, left-turn lane warrants are met under existing conditions for the intersection of OR-211 at Dubarko Road.
7. Preliminary traffic signal warrants are not projected to be met for the intersection of OR-211 at Dubarko Road, even with the completion of the proposed development.

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## ***Introduction***

A subdivision is proposed that will include the construction of 31 single-family detached houses located at 19124 SE Jacoby Road in Sandy, Oregon. This report addresses the traffic impacts of the proposed development on the nearby street system. Based on correspondence with John Replinger, the City's consulting transportation engineer, and City of Sandy staff, the report conducts safety and capacity/level-of-service analyses at the following intersections:

- Eagle Creek-Sandy Highway No. 172 (OR-211) at Dubarko Road;
- SE Jacoby Road at Dubarko Road;
- Newton Street at SE Jacoby Road (south site access); and
- Street B at SE Jacoby Road (proposed north access intersection).

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

## ***Project and Location Description***

The 31-lot subdivision is proposed for development at 19124 SE Jacoby Road in Sandy, Oregon. The subject site is located near the southern edge of city limits in a developing area, surrounded by low density houses to the east, west, and south. The Zion Meadows, Marshall Ridge, Mt. View Ridge, and Snowberry subdivisions to the west are currently under construction and were included as in-process trips in the site trips and capacity analysis sections.

Upon development of the site, the subdivision will take access to SE Jacoby Road via an eastern extension of Newton Street and a new site access between Newton Street and Cascadia Village Drive currently designated as Street B.

## ***Vicinity Streets***

OR-211 is classified by the City of Sandy as a Major Arterial and by the Oregon Department of Transportation (ODOT) as a District Highway. The roadway generally has a two-lane cross-section and has a posted speed of 45 mph within the site vicinity. Curbs, sidewalks, and bike lanes are not generally provided on either side of the roadway; however, an off-street path is provided along the western side of the roadway for a short distance north of Dubarko Road.

Dubarko Road is classified by the City of Sandy as a Residential Minor Arterial roadway between OR-211 and Jacoby Road and as a Minor Arterial to the east of Jacoby Road. The roadway has a two-lane cross-section

1e

and a posted speed limit of 25 mph. Curbs and sidewalks are generally provided along both sides of the roadway. Bicycle lanes are present along both sides of the road in the site vicinity.

SE Jacoby Road is classified by the City of Sandy as a Collector. The roadway has a two-lane cross-section and a posted speed limit of 25 mph. Curbs and sidewalks are intermittently provided along both sides of the roadway.

Newton Street is classified by the City of Sandy as a Local Street. The roadway has a two-lane cross-section and a statutory residential speed limit of 25 mph. Curbs and sidewalks are provided along both sides of the roadways.

### *Study Intersections*

The intersection of OR-211 at Dubarko Road is a four-legged intersection that is stop-controlled for the minor street eastbound and westbound approaches of Dubarko Road. The northbound approach has one shared lane for all turning movements. The southbound, eastbound, and westbound approaches have one shared through / left-turn lane, one right-turn lane, and a bicycle lane located between the two vehicle lanes. Crosswalks are unmarked at the intersection.

The intersection of Dubarko Road at SE Jacoby Road is a three-legged intersection that is stop-controlled for the northbound minor street approach of SE Jacoby Road. Each approach has one shared lane for all turning movements. The eastbound and westbound approach of Dubarko Road has bicycle lanes located to the right of the travel lane. Crosswalks are unmarked but available across all approaches.

The intersection of SE Jacoby Road at Newton Street is a three-legged intersection that is stop-controlled for the eastbound minor street approach of Newton Street. Each approach has one shared lane for all turning movements. Crosswalks are unmarked at the intersection.

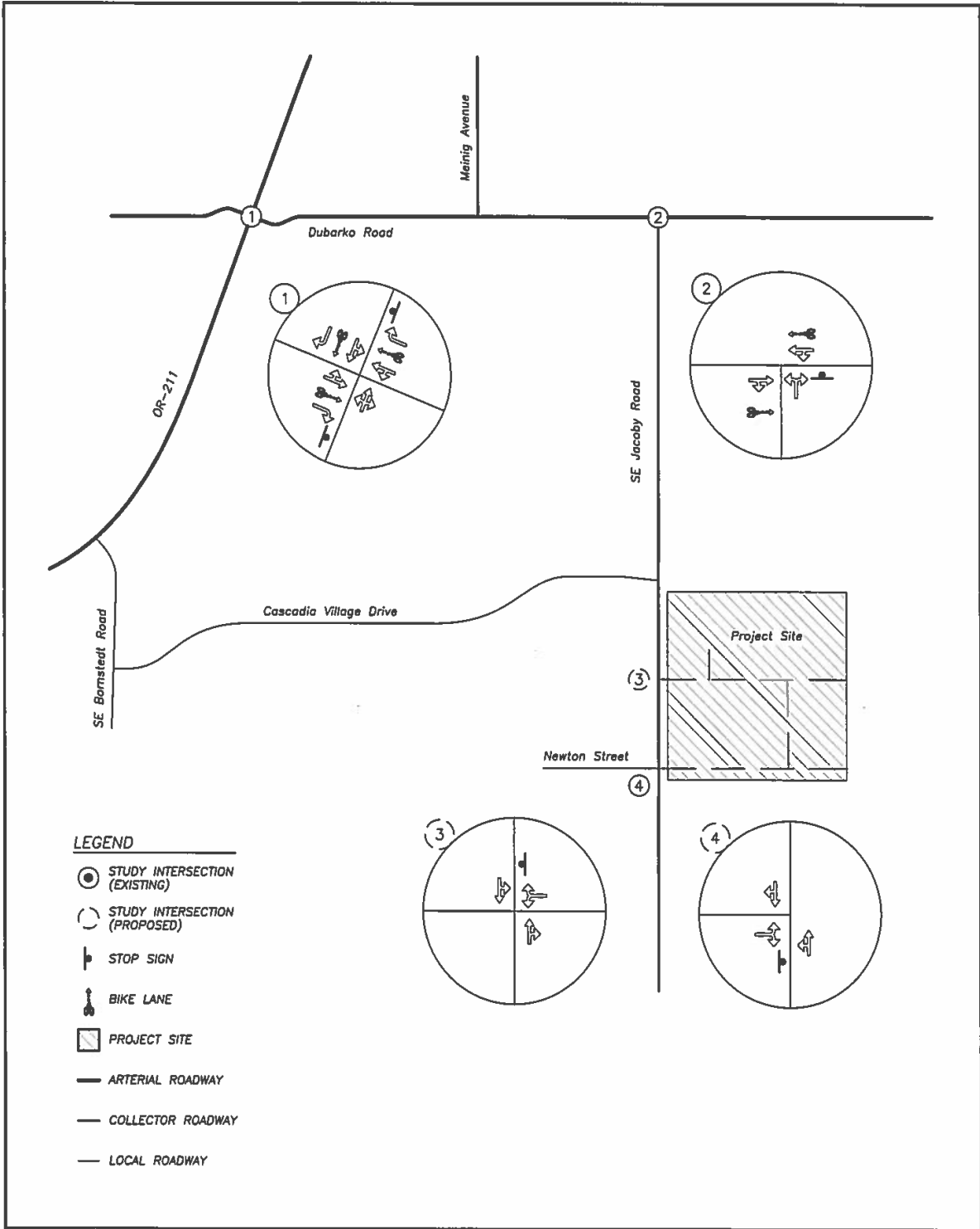
A vicinity map displaying the project site, vicinity streets, and the study intersections with their associated lane configurations is shown in Figure 1 on page 4.

### *Traffic Counts*

Traffic counts were conducted at the existing study intersections on Tuesday, May 1<sup>st</sup>, 2018, from 4:00 to 6:00 PM and on Wednesday, May 2<sup>nd</sup>, 2018, from 7:00 to 9:00 AM.

Per requirements established in ODOT's *Analysis Procedures Manual*, a seasonal adjustment factor of 1.05 was calculated for traffic along OR-211 based on the commuter seasonal trend. The adjustment factor was applied to the highway's through movement traffic volumes to reflect the 30<sup>th</sup> highest hour volumes along the ODOT facility.

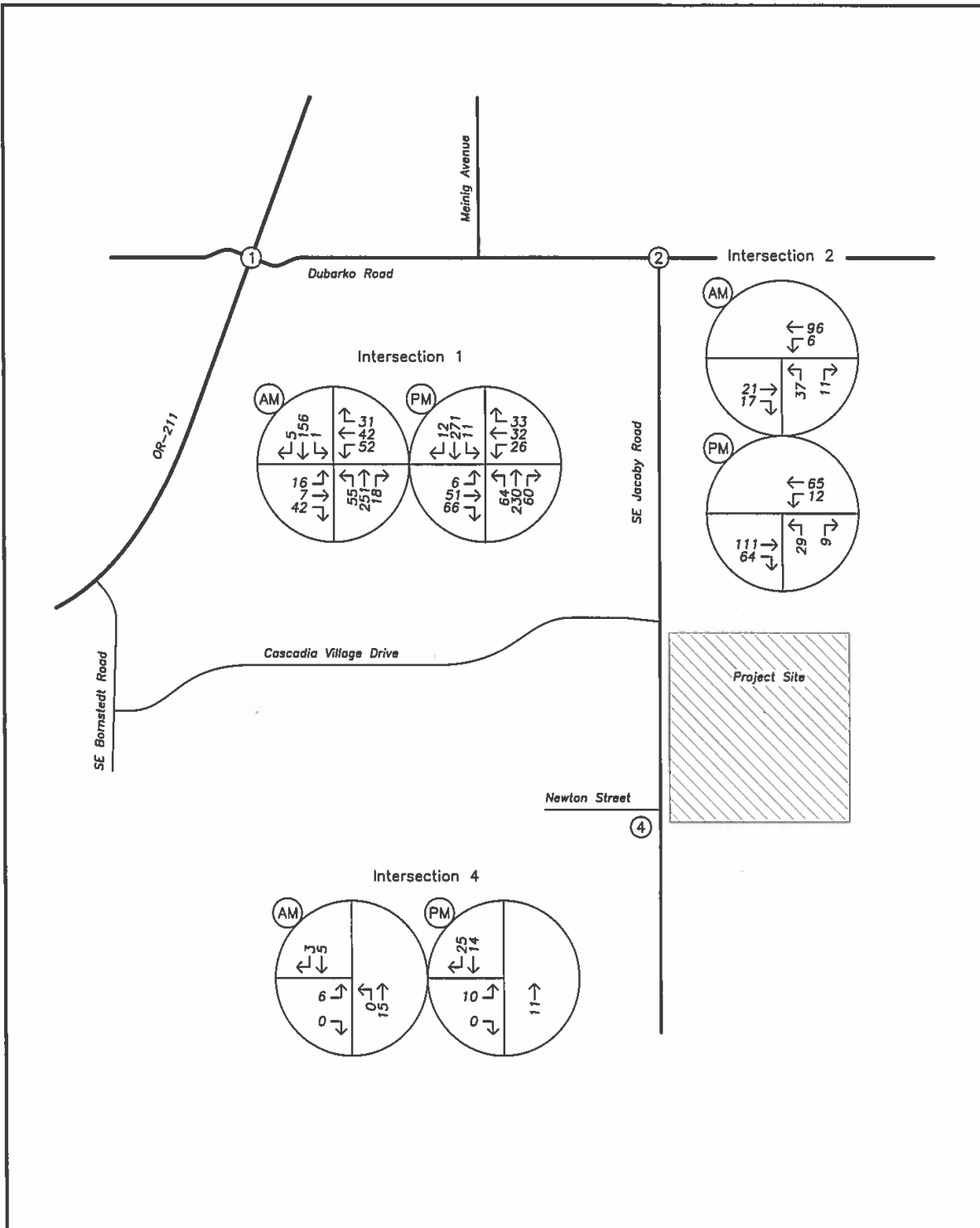
Figure 2 on page 5 shows the existing morning and evening peak hour traffic volumes at the study intersections.



*le* VICINITY MAP

no scale

FIGURE 1  
PAGE 4



**TRAFFIC VOLUMES**  
 Existing Conditions  
 AM and PM Peak Hours

no scale

**FIGURE 2**  
**PAGE 5**

2e

## Site Trips

### Trip Generation

The proposed subdivision will construct 31 single-family houses while removing one existing house for a net increase of 30 houses. A prior site plan for the subdivision called for the construction of 32 single-family homes. Analysis within this report is based on the higher lot count.

To estimate the number of trips that will be generated by the proposed development, trip rates from the *Trip Generation Manual*<sup>1</sup> were used. Data from land-use code 210, *Single-Family Detached Housing*, was used to estimate the proposed development's trip generation based on the number of dwelling units.

The trip generation calculations show that the proposed development of 31 additional homes is projected to generate an additional 23 morning peak hour and 31 evening peak hour site trips. The trip generation estimates of the proposed development are summarized in Table 1 below. Detailed trip generation calculations are included in the technical appendix to this report.

Table 1: Trip Generation Summary

	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Existing Home	210	1 unit	0	1	1	1	0	1	10
Proposed Development	210	32 units	6	18	24	20	12	32	302
<b>Net Increase</b>		<b>31 units</b>	<b>6</b>	<b>17</b>	<b>23</b>	<b>19</b>	<b>12</b>	<b>31</b>	<b>292</b>

### Trip Distribution

The directional distribution of site trips to and 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 study intersections.

The following trip distribution was estimated and used for analysis:

<sup>1</sup> Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10<sup>th</sup> Edition, 2017.

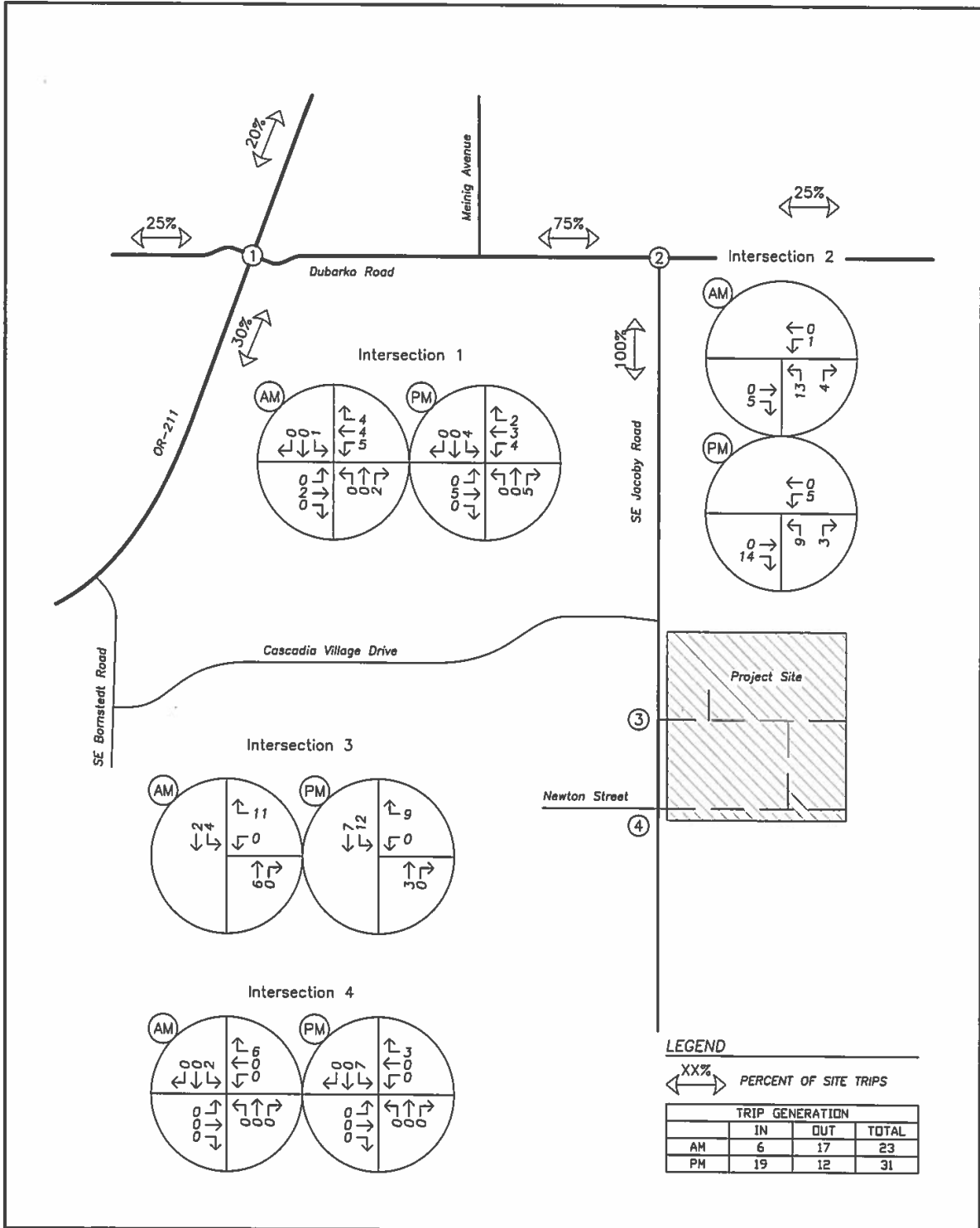


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- Approximately 30 percent of site trips will travel to/from the south along OR-211;
- Approximately 25 percent of site trips will travel to/from the west along OR-211;
- Approximately 25 percent of site trips will travel to/from the west along Dubarko Road; and
- Approximately 20 percent of site trips will travel to/from the north along along OR-211.

For a conservative analysis of the study intersection of Jacoby Road at Dubarko Road, it was assumed that all site trips will travel north on Jacoby Road to the intersection rather than take Cascadia Village Drive to Bornstedt Road. Under existing and potentially future conditions, the site may be served by multiple routes/roadways to gain access to the greater transportation system, including Cascadia Village Drive, Newton Street, Village Boulevard, and Arletha Court.

The trip assignment for the site trips generated by the proposed development during the morning and evening peak hours are shown in Figure 3 on page 8.



**TRAFFIC VOLUMES**  
 Trip Generation and Distribution  
 AM and PM Peak Hours

no scale

**FIGURE 3**  
**PAGE 8**

2e

## ***Operational Analysis***

### ***Background Volumes***

To provide analysis of the impact of the proposed development on the nearby transportation facilities, an estimate of future traffic volumes is required.

In order to calculate the future traffic volumes for non-ODOT facilities, a compounded growth rate of two percent per year for an assumed build-out condition of two years was applied to the measured existing traffic volumes to approximate year 2020 background conditions.

To estimate the future traffic volumes for ODOT facilities, a linear growth rate of 3.2 percent per year was calculated for the traffic volumes along OR-211 using ODOT's 2035 Future Volume Tables. This growth rate was applied to the measured existing traffic volumes over a two-year period to determine year 2020 background traffic volumes for the through traffic traveling along OR-211. A compounded growth rate of two percent per year for an assumed build-out condition of two years was applied to all other turning movement traffic volumes.

In addition to the traffic volume growth described above, there are four in-process developments that are currently or will be approved for construction near the site vicinity and are expected to impact nearby study intersections. The in-process developments include the Zion Meadows, Marshall Ridge, Mt. View Ridge, and Snowberry subdivisions.

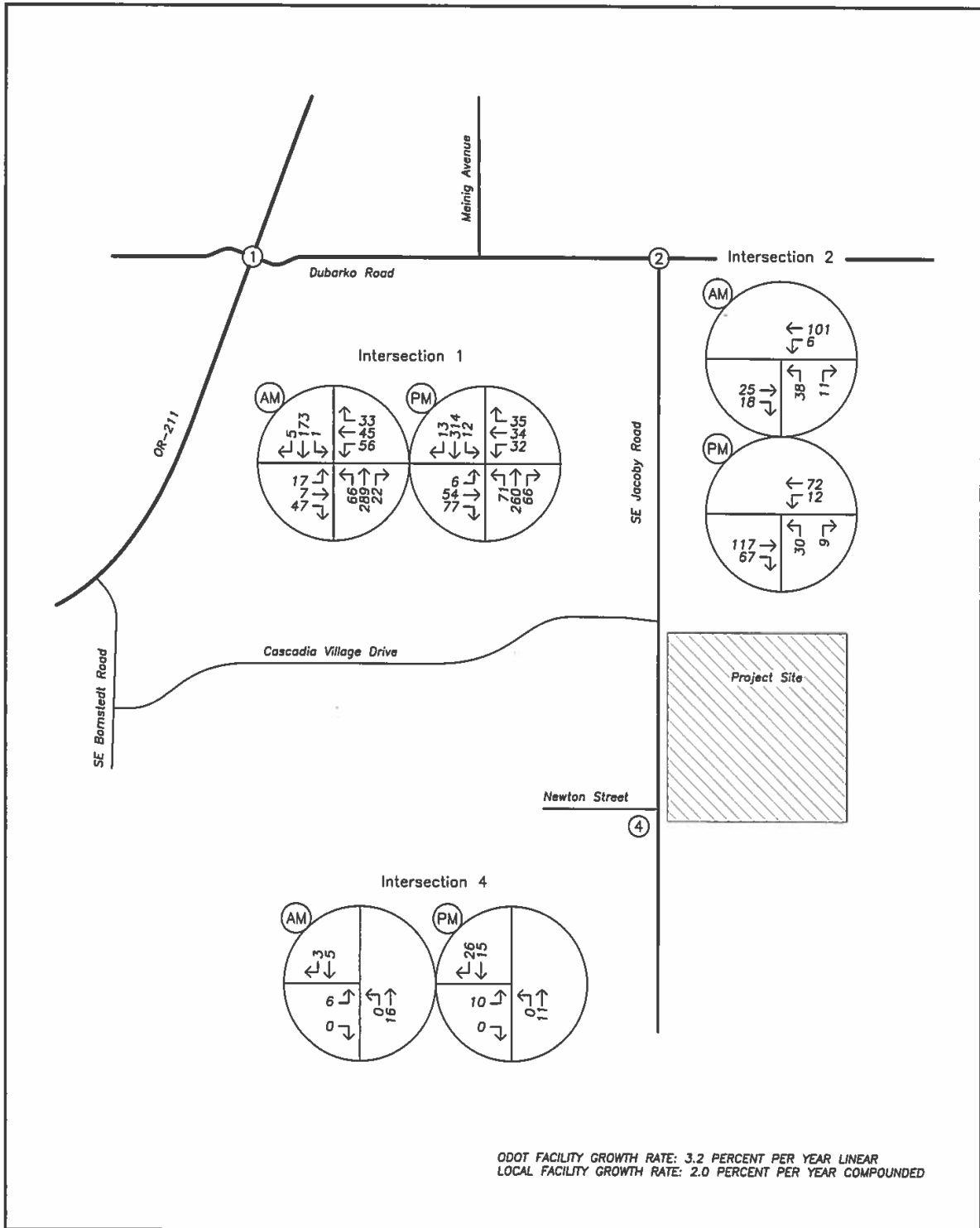
The four in-process developments are currently not fully contributing trips to the transportation system, but were assumed to be completed by the 2020 build-out year of the proposed development. Additional trips corresponding to each in-process development were added to the existing year traffic volumes in addition to the two years of traffic growth at each of the applicable study intersections.

Figure 4 on page 10 shows the projected year 2020 background traffic volumes at the study intersections during the morning and evening peak hours.

### ***Background Volumes plus Site Trips***

Peak hour trips calculated to be generated by the proposed development, as described earlier within the *Site Trips* section, were added to the projected year 2020 background traffic volumes to obtain the expected 2020 background volumes plus site trips.

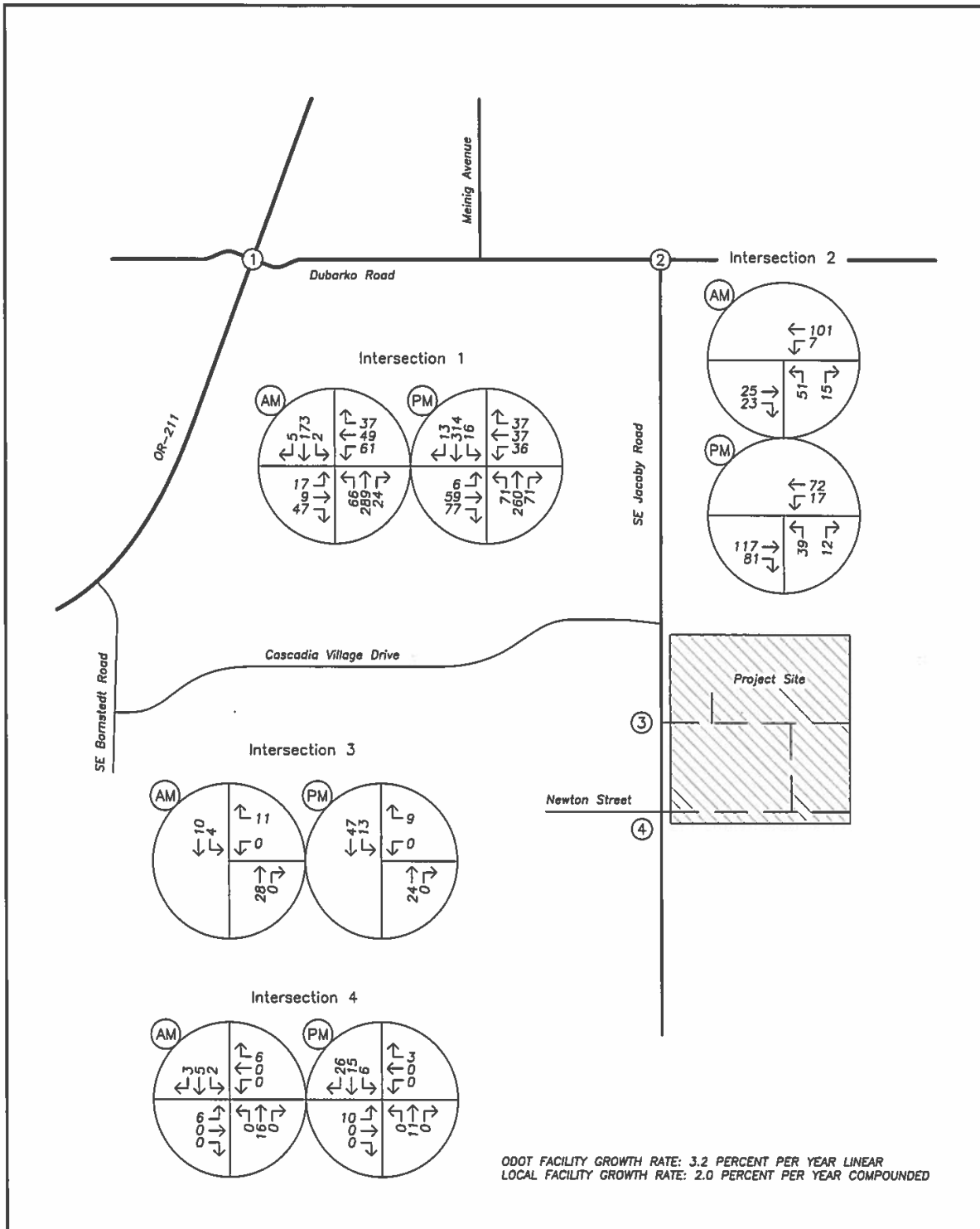
Figure 5 on page 11 shows the projected year 2020 peak hour background traffic volumes plus proposed development site trips at the study intersections during the morning and evening peak hours.



**TRAFFIC VOLUMES**  
 2020 Background Plus In-Process Trips  
 AM Peak Hour



**FIGURE 4**  
**PAGE 10**



**TRAFFIC VOLUMES**  
 2020 Background Plus In-Process and Site Trips  
 AM and PM Peak Hours



**FIGURE**  
**5**  
**PAGE**  
**11**

2e

### *Intersection Capacity Analysis*

A capacity and delay analysis was conducted for each of the study intersections per the unsignalized intersection analysis methodologies in the *HIGHWAY CAPACITY MANUAL* (HCM)<sup>2</sup>. According to the City of Sandy's Transportation System Plan (TSP), both signalized and unsignalized intersections are required to operate at level of service (LOS) D or better. The LOS of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay.

OR-211 is an ODOT facility located outside the Portland Metropolitan Region. According to Table 6 – *Volume to Capacity Ratio Targets Outside Metro* of the *Oregon Highway Plan* (OHP), intersections on District Highways with speed limits of 45 mph or more within an Urban Growth Boundary and not inside a Metropolitan Planning Organization are required to operate with a v/c ratio of 0.90 or less for the major-street approach. The volume to capacity (v/c) ratio is a measure that compares the traffic volume (demand) against the available capacity of an intersection. For the purposes of this analysis the highest calculated v/c ratio is reported, regardless of the intersection approach.

The intersection of OR-211 at Dubarko Road currently operates at LOS C with v/c ratios of 0.36 or less during both peak hours, and under all future analysis scenarios is projected to operate at LOS D with v/c ratios of 0.50 or less.

The intersection of Dubarko Road at SE Jacoby Road currently operates at LOS A during the AM peak hour and B during the PM peak hour. Under full build-out conditions it is projected to operate at LOS B during both peak hours. All analysis scenarios operate with a v/c ratio of 0.11 or less.

The site access intersections of Street B at SE Jacoby Road and Newton Street at SE Jacoby Road operate with low traffic volumes and little vehicle delay. All analysis scenarios are projected to operate at LOS A with v/c ratios of 0.02 or less.

The v/c, delay, and LOS results of the capacity analysis are shown in Table 2 for the morning and evening peak hours. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

---

<sup>2</sup> Transportation Research Board, *HIGHWAY CAPACITY MANUAL*, 2000.  
Jacoby Road Subdivision — Traffic Impact Analysis

**Table 2: Intersection Capacity Analysis Summary**

	Morning Peak Hour			Evening Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
<b>OR-211 at Dubarko Road</b>						
2018 Existing Conditions	C	23	0.37	C	24	0.25
2020 Background Conditions	D	30	0.48	D	32	0.35
2020 Background Plus Site Conditions	D	33	0.52	D	33	0.38
<b>Dubarko Road at SE Jacoby Road</b>						
2018 Existing Conditions	A	10	0.08	B	10	0.07
2020 Background Conditions	A	10	0.08	B	11	0.07
2020 Background Plus Site Conditions	B	10	0.11	B	11	0.10
<b>Street B at SE Jacoby Road</b>						
2020 Background Plus Site Conditions	A	9	0.01	A	9	0.01
<b>SE Jacoby Road at Newton Street</b>						
2018 Existing Conditions	A	9	0.01	A	9	0.01
2020 Background Conditions	A	9	0.01	A	9	0.01
2020 Background Plus Site Conditions	A	9	0.01	A	9	0.01

Based on the results of the operational analysis, all study intersections are currently operating acceptably per City of Sandy and ODOT standards and are projected to continue operating acceptably upon build-out of the proposed development through year 2020. No operational mitigation is necessary or recommended.

## **Safety Analysis**

### **Crash Data Analysis**

Using data obtained from the ODOT's Crash Analysis and Reporting Unit, a review of the most recent available five years of crash history (January 2012 to December 2016) at the study area intersections was performed. The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection. Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the evening peak period represents 10 percent of average daily traffic (ADT) at the intersection. Crash rates in excess of one to two crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

No crashes were found to be reported at the intersection of SE Jacoby Road at Dubarko Road during the analysis period.

One crash was reported at the intersection of SE Jacoby Road at SE Newton Street during the analysis period. The crash was a turning movement collision where a cyclist ran through a stop sign, failing to yield the right-of-way to a car, and collided with the vehicle, resulting in a non-incapacitating injury sustained by the cyclist. The crash rate was calculated to be 0.91 CMEV.

There were 28 crashes reported at the intersection of Dubarko Road at OR-211 during the analysis period. Of these crashes, 16 occurred before and 12 occurred after the intersection was improved to allow eastbound and westbound vehicles to approach the intersection at a right angle.

Thirteen of the crashes were angle-type collisions and occurred as a result of westbound or eastbound vehicles failing to yield the right-of-way to northbound or southbound vehicles. Six of the crashes were rear-end collisions, of which three occurred during snowy or icy conditions and two are attributed to be caused by slipping or swerving due to the snow or ice. Six of the crashes were turning-movement collisions and were the result of turning vehicles failing to yield the right-of-way to through-moving vehicles. One of the crashes was a sideswipe collision. One of the crashes was an improper backing movement collision. One of the crashes was a fixed-object collision.

There were 11 crashes that resulted in property damage only while the other 17 crashes resulted in reports of injuries. There were 26 reports of possible injuries or complaints of pain and 7 reports of non-incapacitating injuries. The crash rate was calculated to be 1.83 CMEV. As this intersection is an ODOT facility, the crash rate was compared to the 90<sup>th</sup> percentile rate outlined in the ODOT *Analysis Procedures Manual*<sup>3</sup> (APM). As seen in Exhibit 4-1 of the APM, the 90<sup>th</sup> percentile crash rate for a 4-leg minor stop-control rural roadway is 1.08 CMEV. Since the calculated crash rate is higher than the 90<sup>th</sup> percentile rate, improvements to the

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<sup>3</sup> [https://www.oregon.gov/ODOT/Planning/Documents/APMv2\\_Ch4.pdf](https://www.oregon.gov/ODOT/Planning/Documents/APMv2_Ch4.pdf)



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intersection may be required. Installation of the planned turn lanes and traffic signal outlined in the Sandy TSP will likely reduce the crash rate at this intersection.

Based on the most recent five years of crash data, no other significant trends or crash patterns were identified at the study intersections. Accordingly, no specific safety mitigation is necessary or recommended.

### *Sight Distance Analysis*

Sight distances were measured and evaluated in accordance with standards established in *A Policy of Geometric Design of Highways and Streets*<sup>4</sup>. According to AASHTO standards, the driver's eye is assumed to be 14.5 feet from the near edge of the nearest travel lane of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye-height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

Based on the posted speeds of 25 mph, the minimum recommended intersection sight distance to ensure safe and efficient operation of intersections along both roadways are 280 feet viewing in both directions along the major-street from the minor-street approaches.

For the proposed intersection of Street B at Jacoby Road, ISD was measured to be 350 feet to the north and 410 feet to the south. For the proposed southern site access at the intersection of Newton Street at Jacoby Road, ISD was measured to be 545 feet to the north and 595 feet to the south.

Based on the detailed analysis, adequate sight distance is available in both directions at both locations. No mitigations are necessary or recommended.

### *Warrant Analysis*

Left-turn and traffic signal warrants were examined for the study intersections where such treatments would be applicable.

The intersection of OR-211 at Dubarko Road is planned for construction of a northbound right-turn lane, a southbound left-turn lane, a northbound left-turn lane, and a traffic signal according to the City of Sandy TSP Preferred Plan. These plans are identified as a Long-Term Project with ODOT specified as the lead agency.

Preliminary traffic signal warrants are not projected to be met for the intersection of OR-211 at Dubarko Road under any analysis scenario, including year 2020 with completion of the proposed subdivision. As such, no new traffic signals are recommended as part of this development.

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 used were developed from methodology outlined in the NCHRP Report 457, published by the Transportation Research Board in 2001. Turn lane warrants

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

2e

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 met under existing conditions for all three turn lanes outlined in the Sandy TSP.

Left-turn lane warrants were examined for the intersections of SE Jacoby Road at Dubarko Road, SE Jacoby Road at Street B, and SE Jacoby Road at Newton Street. Left turn lanes are not warranted under any analysis scenarios. Detailed warrant analysis calculation sheets are provided in the technical appendix of this report.

### **Conclusions**

All study intersections are currently operating acceptably per City of Sandy and ODOT standards and are projected to continue operating acceptably upon build-out of the proposed development through year 2020. No operational mitigation is necessary or recommended.

A crash pattern was identified at the intersection of OR-211 at Dubarko Road. The planned turn lanes and signal at the intersection outlined in the Sandy TSP will help to mitigate this crash pattern. No safety mitigation is recommended as part of this development.

Adequate sight distance is available in both directions at both proposed site access intersections. No sight distance mitigations are necessary or recommended.

Turn lane warrants are met under existing conditions for three turn lanes outlined in the Sandy TSP for the intersection of OR-211 at Dubarko Road. A traffic signal is also planned at that intersection, but signal warrants are not yet met under any analysis scenario. Turn lane warrants are not met under any analysis scenario for the other three study area intersections. No turn lane or signal mitigations are recommended as part of this development.

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**Appendix**

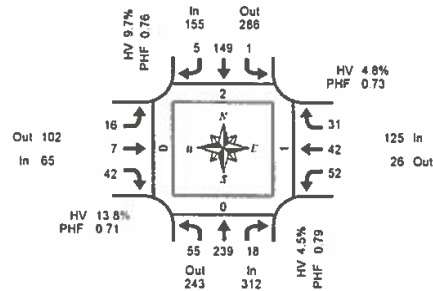
**Total Vehicle Summary**



Clay Carney  
(503) 533-2740

**Hwy 211 & Dubarko Dr**

Wednesday, May 02, 2018  
7:00 AM to 9:00 AM



**Peak Hour Summary**  
7:00 AM to 8:00 AM

**5-Minute Interval Summary**  
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				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	3	14	2	0	0	12	0	0	2	1	1	0	4	4	3	0	46	1	0	1	0
7:05 AM	3	27	0	0	0	11	0	0	1	0	4	0	4	3	3	0	56	0	0	0	0
7:10 AM	5	21	3	0	0	7	0	0	1	1	1	0	7	7	5	0	58	0	0	0	0
7:15 AM	14	21	0	0	0	11	1	0	2	1	1	0	3	4	7	0	65	0	0	0	0
7:20 AM	5	19	2	0	1	17	0	0	2	1	5	0	2	3	2	0	59	0	0	0	0
7:25 AM	6	29	3	0	0	15	1	0	2	0	7	0	11	4	5	0	63	0	0	0	0
7:30 AM	5	23	1	0	0	15	1	0	3	0	3	0	7	4	2	0	64	1	0	0	0
7:35 AM	5	19	0	0	0	15	0	0	0	1	5	0	1	0	0	0	46	0	0	0	0
7:40 AM	1	23	0	0	0	20	0	0	0	0	5	0	5	1	1	0	56	0	0	0	0
7:45 AM	4	9	4	0	0	11	0	0	0	1	3	0	2	4	2	0	40	0	0	0	0
7:50 AM	2	15	1	0	0	6	1	0	2	0	4	0	2	3	1	0	37	0	0	0	0
7:55 AM	2	19	2	0	0	9	1	0	1	1	3	0	4	5	0	0	47	0	0	0	0
8:00 AM	1	14	0	0	0	9	0	0	2	1	1	0	2	1	3	0	34	0	0	0	0
8:05 AM	3	17	0	0	1	11	0	0	0	1	3	0	1	0	1	0	36	0	0	0	0
8:10 AM	2	20	4	0	1	9	1	0	1	0	3	0	1	2	3	0	47	0	0	0	0
8:15 AM	2	19	0	0	0	9	0	0	0	0	1	0	4	4	1	0	40	0	0	0	0
8:20 AM	1	13	2	0	0	8	0	0	0	0	3	0	1	6	5	0	39	0	0	0	0
8:25 AM	4	17	1	0	0	5	1	0	0	1	1	0	1	1	1	0	33	0	0	1	0
8:30 AM	3	15	0	0	0	9	1	0	1	0	1	0	0	3	1	0	34	0	0	0	0
8:35 AM	5	19	1	0	0	9	0	0	0	2	1	0	1	2	2	0	42	0	0	0	0
8:40 AM	2	12	0	0	0	10	3	0	1	0	1	0	4	0	1	0	34	0	0	0	0
8:45 AM	2	10	2	0	0	5	1	0	0	3	0	0	1	1	0	0	25	0	0	0	0
8:50 AM	1	23	2	0	2	9	0	0	2	2	4	0	3	3	4	0	55	0	0	0	0
8:55 AM	1	24	2	0	1	12	1	0	2	2	5	0	1	5	2	0	58	0	0	0	0
Total Survey	82	442	32	0	6	254	13	0	25	19	66	0	72	70	55	0	1,136	2	0	2	0

**15-Minute Interval Summary**  
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				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	11	62	5	0	0	30	0	0	4	2	6	0	15	14	11	0	160	1	0	1	0
7:15 AM	25	69	5	0	1	43	2	0	6	2	13	0	16	11	14	0	207	0	0	0	0
7:30 AM	11	65	1	0	0	50	1	0	3	1	13	0	13	5	3	0	166	1	0	0	0
7:45 AM	8	43	7	0	0	26	2	0	3	2	10	0	8	12	3	0	124	0	0	0	0
8:00 AM	6	51	4	0	2	29	1	0	3	2	7	0	4	3	7	0	119	0	0	0	0
8:15 AM	7	49	3	0	0	22	1	0	0	1	5	0	6	11	7	0	112	0	0	1	0
8:30 AM	10	46	1	0	0	28	4	0	2	2	3	0	5	5	4	0	110	0	0	0	0
8:45 AM	4	57	6	0	3	26	2	0	4	7	9	0	5	9	6	0	136	0	0	0	0
Total Survey	82	442	32	0	6	254	13	0	25	19	66	0	72	70	55	0	1,136	2	0	2	0

**Peak Hour Summary**  
7:00 AM to 8:00 AM

By Approach	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	312	243	555	0	155	286	441	0	65	102	167	0	125	26	151	0	657	2	0	1	0
%HV	4.5%				9.7%				13.8%				4.8%				6.7%				
PHF	0.79				0.76				0.71				0.73				0.79				

By Movement	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	55	239	18	312	1	149	5	155	16	7	42	65	52	42	31	125	657
%HV	5.5%	3.3%	16.7%	4.5%	0.0%	10.1%	0.0%	9.7%	12.5%	28.6%	11.9%	13.8%	1.9%	7.1%	6.5%	4.8%	6.7%
PHF	0.55	0.64	0.64	0.79	0.25	0.75	0.63	0.76	0.57	0.58	0.70	0.71	0.65	0.75	0.52	0.73	0.79

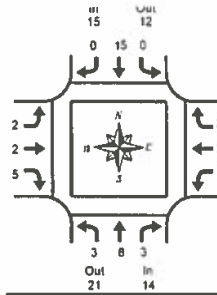
**Rolling Hour Summary**  
7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				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	55	239	18	0	1	149	5	0	16	7	42	0	52	42	31	0	657	2	0	1	0
7:15 AM	50	228	17	0	3	148	6	0	15	7	43	0	41	31	27	0	616	1	0	0	0
7:30 AM	32	208	15	0	2	127	5	0	9	6	35	0	31	31	20	0	521	1	0	1	0
7:45 AM	31	189	15	0	2	105	8	0	8	7	25	0	23	31	21	0	465	0	0	1	0
8:00 AM	27	203	14	0	5	105	8	0	9	12	24	0	20	26	24	0	479	0	0	1	0

# Heavy Vehicle Summary



Clay Camby  
(503) 833-2740



Out 6  
In 9

**Peak Hour Summary  
7:00 AM to 8:00 AM**

## Hwy 211 & Dubarko Dr

Wednesday, May 02, 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 Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				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	2	0	2	0	1	0	1	0	0	0	0	3
7:05 AM	0	1	0	1	0	1	0	1	0	0	0	0	1	0	0	1	3
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	2
7:15 AM	2	2	0	4	0	0	0	0	1	1	1	3	0	0	1	1	8
7:20 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
7:25 AM	0	1	0	1	0	2	0	2	0	0	1	1	0	0	0	0	4
7:30 AM	1	1	1	3	0	3	0	3	1	0	0	1	0	1	0	1	8
7:35 AM	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	4
7:40 AM	0	0	0	0	0	2	0	2	0	0	2	2	0	1	0	1	5
7:45 AM	0	0	2	2	0	0	0	0	0	0	1	1	0	0	0	0	3
7:50 AM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
7:55 AM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
8:00 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
8:05 AM	1	3	0	4	0	3	0	3	0	0	0	0	0	0	0	0	7
8:10 AM	0	1	0	1	0	1	0	1	0	0	1	1	0	0	0	0	3
8:15 AM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:20 AM	0	2	0	2	0	1	0	1	0	0	0	0	1	1	1	3	6
8:25 AM	2	0	0	2	0	2	0	2	0	0	0	0	0	0	0	0	4
8:30 AM	2	1	0	3	0	1	0	1	0	0	0	0	0	0	0	0	4
8:35 AM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
8:40 AM	0	0	0	0	0	2	1	3	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	3
8:50 AM	0	1	0	1	0	1	0	1	0	0	1	1	0	0	0	0	3
8:55 AM	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	2
<b>Total Survey</b>	<b>8</b>	<b>20</b>	<b>3</b>	<b>31</b>	<b>0</b>	<b>33</b>	<b>1</b>	<b>34</b>	<b>2</b>	<b>2</b>	<b>8</b>	<b>12</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>9</b>	<b>86</b>

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	0	1	0	1	0	3	0	3	0	1	0	1	1	1	1	3	8
7:15 AM	2	3	0	5	0	3	0	3	1	1	2	4	0	0	1	1	13
7:30 AM	1	3	1	5	0	7	0	7	1	0	2	3	0	2	0	2	17
7:45 AM	0	1	2	3	0	2	0	2	0	0	1	1	0	0	0	0	6
8:00 AM	1	5	0	6	0	6	0	6	0	0	1	1	0	0	0	0	13
8:15 AM	2	3	0	5	0	3	0	3	0	0	0	0	1	1	1	3	11
8:30 AM	2	2	0	4	0	5	1	6	0	0	0	0	0	0	0	0	10
8:45 AM	0	2	0	2	0	4	0	4	0	0	2	2	0	0	0	0	8
<b>Total Survey</b>	<b>8</b>	<b>20</b>	<b>3</b>	<b>31</b>	<b>0</b>	<b>33</b>	<b>1</b>	<b>34</b>	<b>2</b>	<b>2</b>	<b>8</b>	<b>12</b>	<b>2</b>	<b>4</b>	<b>3</b>	<b>9</b>	<b>86</b>

### Heavy Vehicle Peak Hour Summary 7:00 AM to 8:00 AM

By Approach	Northbound Hwy 211			Southbound Hwy 211			Eastbound Dubarko Dr			Westbound Dubarko Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	14	21	35	15	12	27	9	6	15	6	5	11	44
PHF	0.58			0.54			0.56			0.38			0.65

By Movement	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	3	8	3	14	0	15	0	15	2	2	5	9	1	3	2	6	44
PHF	0.38	0.50	0.38	0.58	0.00	0.54	0.00	0.54	0.50	0.50	0.42	0.56	0.25	0.38	0.25	0.38	0.65

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
7:00 AM	3	8	3	14	0	15	0	15	2	2	5	9	1	3	2	6	44
7:15 AM	4	12	3	19	0	18	0	18	2	1	6	9	0	2	1	3	49
7:30 AM	4	12	3	19	0	18	0	18	1	0	4	5	1	3	1	5	47
7:45 AM	5	11	2	18	0	16	1	17	0	0	2	2	1	1	1	3	40
8:00 AM	5	12	0	17	0	18	1	19	0	0	3	3	1	1	1	3	42

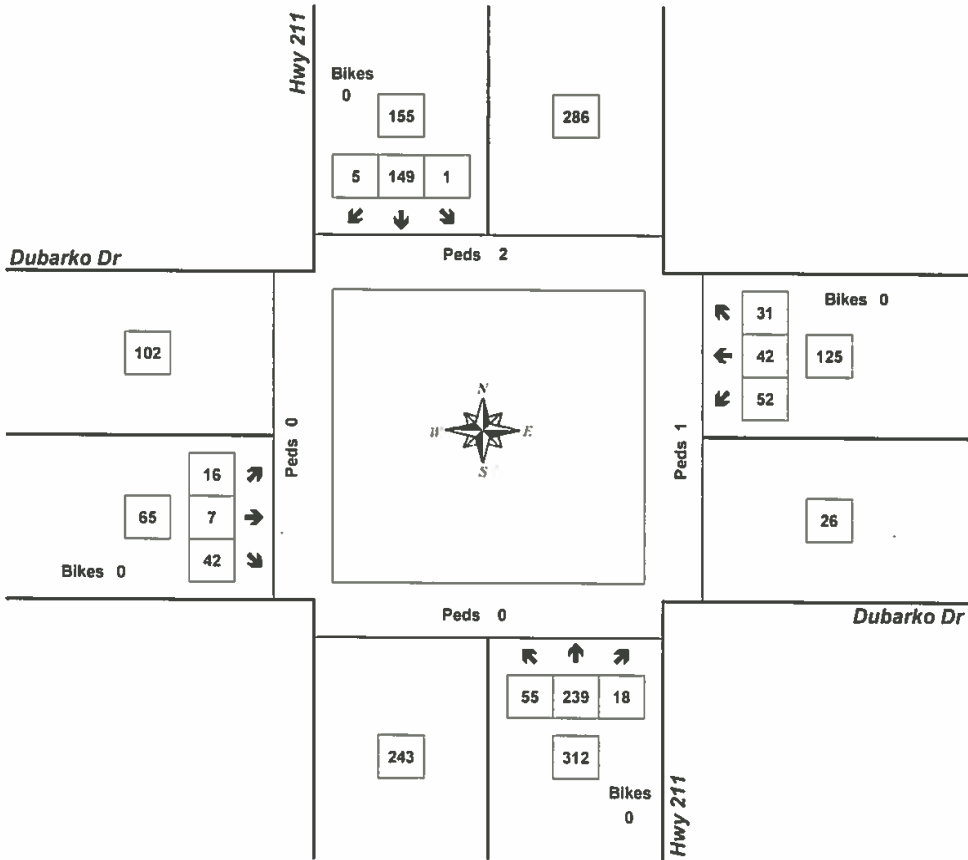
**Peak Hour Summary**



Clay Carney  
(503) 833-2740

**Hwy 211 & Dubarko Dr**

7:00 AM to 8:00 AM  
Wednesday, May 02, 2018



Approach	PHF	HV%	Volume
EB	0.71	13.8%	65
WB	0.73	4.8%	125
NB	0.79	4.5%	312
SB	0.76	9.7%	155
<b>Intersection</b>	<b>0.79</b>	<b>6.7%</b>	<b>657</b>

Count Period: 7:00 AM to 9:00 AM

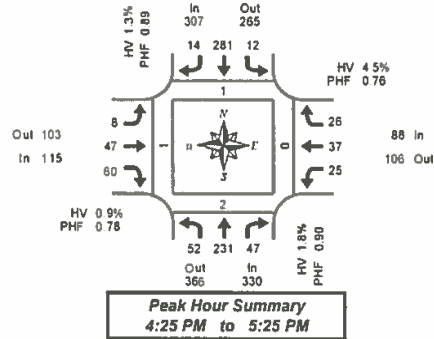
**Total Vehicle Summary**



Clay Camey  
(503) 833-2740

**Hwy 211 & Dubarko Dr**

Tuesday, May 01, 2018  
4:00 PM to 6:00 PM



**5-Minute Interval Summary**  
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Interval Total	Pedestrians Crosswalk				
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West	
4:00 PM	1	15	3	0	0	20	1	0	0	5	4	0	0	3	2	0	0	54	0	0	0	1
4:05 PM	4	23	3	0	0	19	1	0	1	4	7	0	2	3	3	0	70	0	0	0	0	
4:10 PM	1	25	2	0	2	24	0	0	1	4	2	0	2	3	0	0	66	0	0	0	1	
4:15 PM	5	12	3	0	1	23	1	0	1	4	8	0	3	4	5	0	70	0	0	0	0	
4:20 PM	2	21	3	0	1	22	0	0	1	1	1	0	0	3	1	0	57	1	0	0	0	
4:25 PM	5	30	8	0	2	25	0	0	0	1	3	0	0	3	1	0	76	0	0	0	0	
4:30 PM	5	16	3	0	1	18	2	0	1	4	6	0	0	4	0	0	60	1	1	0	0	
4:35 PM	3	12	3	0	0	27	2	0	1	5	1	0	1	5	2	0	62	0	0	0	0	
4:40 PM	7	17	5	0	1	27	1	0	1	1	3	0	4	6	3	0	78	0	0	0	0	
4:45 PM	2	21	1	0	1	28	1	0	1	6	8	0	2	2	1	0	72	0	0	0	0	
4:50 PM	2	21	2	0	1	16	1	0	0	4	3	0	3	5	3	0	81	0	1	0	0	
4:55 PM	3	16	4	0	4	23	1	0	1	9	4	0	0	0	0	0	85	0	0	0	0	
5:00 PM	7	14	4	0	0	19	1	1	2	5	9	0	1	2	5	0	89	0	0	0	0	
5:05 PM	5	15	9	0	0	24	1	0	0	3	4	0	3	3	3	0	70	0	0	0	0	
5:10 PM	7	18	3	0	1	30	1	0	1	0	7	0	2	4	4	0	78	0	0	0	0	
5:15 PM	3	21	8	0	0	24	2	0	0	5	7	0	6	1	1	0	78	0	0	0	0	
5:20 PM	3	30	1	0	1	22	1	0	0	4	5	0	3	2	3	0	75	0	0	0	0	
5:25 PM	4	17	4	0	4	21	1	0	0	8	5	0	0	3	4	0	71	0	0	0	0	
5:30 PM	7	12	4	1	2	17	2	0	1	2	3	0	3	1	4	0	58	0	0	0	0	
5:35 PM	8	21	5	0	0	24	0	0	1	2	3	0	1	2	0	0	67	0	0	0	0	
5:40 PM	4	15	6	0	0	18	1	0	0	4	6	0	2	2	1	0	59	0	0	0	0	
5:45 PM	6	20	7	0	1	24	1	0	1	3	5	0	3	5	3	0	79	0	0	0	0	
5:50 PM	7	14	4	0	1	21	0	0	0	7	7	0	2	3	2	0	88	0	0	0	0	
5:55 PM	3	22	7	0	1	14	1	0	0	8	5	0	0	4	3	0	88	0	0	0	1	
Total Survey	104	448	98	1	25	528	23	1	15	99	116	0	43	73	55	0	1,627	2	2	0	3	

**15-Minute Interval Summary**  
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	6	63	8	0	2	63	2	0	2	13	13	0	4	9	5	0	190	0	0	0	1
4:15 PM	12	63	12	0	4	70	1	0	2	6	12	0	3	10	8	0	203	1	0	0	0
4:30 PM	15	45	11	0	2	72	5	0	3	10	10	0	5	15	5	0	198	1	1	0	1
4:45 PM	7	58	7	0	6	65	3	0	2	19	15	0	5	7	4	0	198	0	1	0	0
5:00 PM	19	47	16	0	1	73	3	1	3	8	20	0	6	9	12	0	217	0	0	0	0
5:15 PM	10	68	11	0	5	67	4	0	0	17	17	0	9	6	8	0	222	0	0	0	0
5:30 PM	19	48	15	1	2	59	3	0	2	8	12	0	6	5	5	0	184	0	0	0	0
5:45 PM	16	56	18	0	3	59	2	0	1	18	17	0	5	12	8	0	215	0	0	0	1
Total Survey	104	448	98	1	25	528	23	1	15	99	116	0	43	73	55	0	1,627	2	2	0	3

**Peak Hour Summary**  
4:25 PM to 5:25 PM

By Approach	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	330	366	696	0	307	285	572	1	115	103	218	0	88	106	194	0	840	1	2	0	1
%HV	1.8%				1.3%				0.9%				4.5%				1.8%				
PHF	0.90				0.89				0.78				0.76				0.92				

By Movement	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	52	231	47	330	12	281	14	307	8	47	60	115	25	37	26	88	840
%HV	3.8%	1.3%	2.1%	1.8%	0.0%	1.4%	0.0%	1.3%	0.0%	0.0%	1.7%	0.9%	8.0%	5.4%	0.0%	4.5%	1.8%
PHF	0.68	0.84	0.65	0.90	0.50	0.88	0.70	0.89	0.67	0.62	0.75	0.78	0.57	0.62	0.54	0.76	0.92

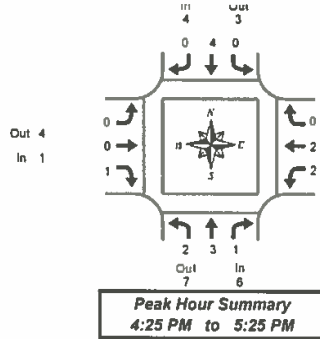
**Rolling Hour Summary**  
4:00 PM to 6:00 PM

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	40	229	38	0	14	270	11	0	9	48	50	0	17	41	22	0	789	2	2	0	2
4:15 PM	53	213	46	0	13	280	12	1	10	43	57	0	19	41	29	0	816	2	2	0	1
4:30 PM	51	218	45	0	14	277	15	1	8	54	62	0	25	37	29	0	835	1	2	0	1
4:45 PM	55	221	49	1	14	264	13	1	7	52	64	0	26	27	29	0	821	0	1	0	0
5:00 PM	84	219	60	1	11	258	12	1	6	51	66	0	26	32	33	0	836	0	0	0	1

**Heavy Vehicle Summary**



Clay Carney  
(503) 833-2740



**Hwy 211 & Dubarko Dr**

Tuesday, May 01, 2018  
4:00 PM to 6:00 PM

**Peak Hour Summary  
4:25 PM to 5:25 PM**

**Heavy Vehicle 5-Minute Interval Summary  
4:00 PM to 6:00 PM**

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
4:05 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	1	3
4:10 PM	0	1	0	1	0	0	0	0	1	0	0	1	0	0	0	0	2
4:15 PM	0	0	0	0	0	1	0	1	0	0	1	1	0	0	0	1	3
4:20 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
4:25 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:35 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:40 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
4:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	3	3
4:55 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
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	2	0	2	0	0	0	0	0	0	1	1	1	0	0	1	4
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	1	0	0	1	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	2
5:35 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
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	1	1	0	3	0	3	0	0	0	0	0	0	0	0	4
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	2	7	2	11	1	15	0	16	1	0	2	3	3	2	1	6	36

**Heavy Vehicle 15-Minute Interval Summary  
4:00 PM to 6:00 PM**

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	3	0	3	0	3	0	3	1	0	0	1	0	0	1	1	8
4:15 PM	1	1	0	2	0	2	0	2	0	0	1	1	1	0	0	1	6
4:30 PM	1	0	1	2	0	2	0	2	0	0	0	0	0	0	0	0	4
4:45 PM	0	1	0	1	0	2	0	2	0	0	0	0	1	2	0	3	6
5:00 PM	0	2	0	2	0	0	0	0	0	0	1	1	1	0	0	1	4
5:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	3
5:45 PM	0	0	1	1	0	3	0	3	0	0	0	0	0	0	0	0	4
Total Survey	2	7	2	11	1	15	0	16	1	0	2	3	3	2	1	6	36

**Heavy Vehicle Peak Hour Summary  
4:25 PM to 5:25 PM**

By Approach	Northbound Hwy 211			Southbound Hwy 211			Eastbound Dubarko Dr			Westbound Dubarko Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	6	7	13	4	3	7	1	4	5	4	1	5	15
PHF	0.75			0.25			0.25			0.33			0.54

By Movement	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	2	3	1	6	0	4	0	4	0	0	1	1	2	2	0	4	15
PHF	0.25	0.38	0.25	0.75	0.00	0.25	0.00	0.25	0.00	0.00	0.25	0.25	0.50	0.25	0.00	0.33	0.54

**Heavy Vehicle Rolling Hour Summary  
4:00 PM to 6:00 PM**

Interval Start Time	Northbound Hwy 211				Southbound Hwy 211				Eastbound Dubarko Dr				Westbound Dubarko Dr				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	5	1	8	0	9	0	9	1	0	1	2	2	2	1	5	24
4:15 PM	2	4	1	7	0	6	0	6	0	0	2	2	3	2	0	5	20
4:30 PM	1	3	1	5	1	4	0	5	0	0	1	1	2	2	0	4	15
4:45 PM	0	3	0	3	1	5	0	6	0	0	1	1	2	2	0	4	14
5:00 PM	0	2	1	3	1	6	0	7	0	0	1	1	1	0	0	1	12



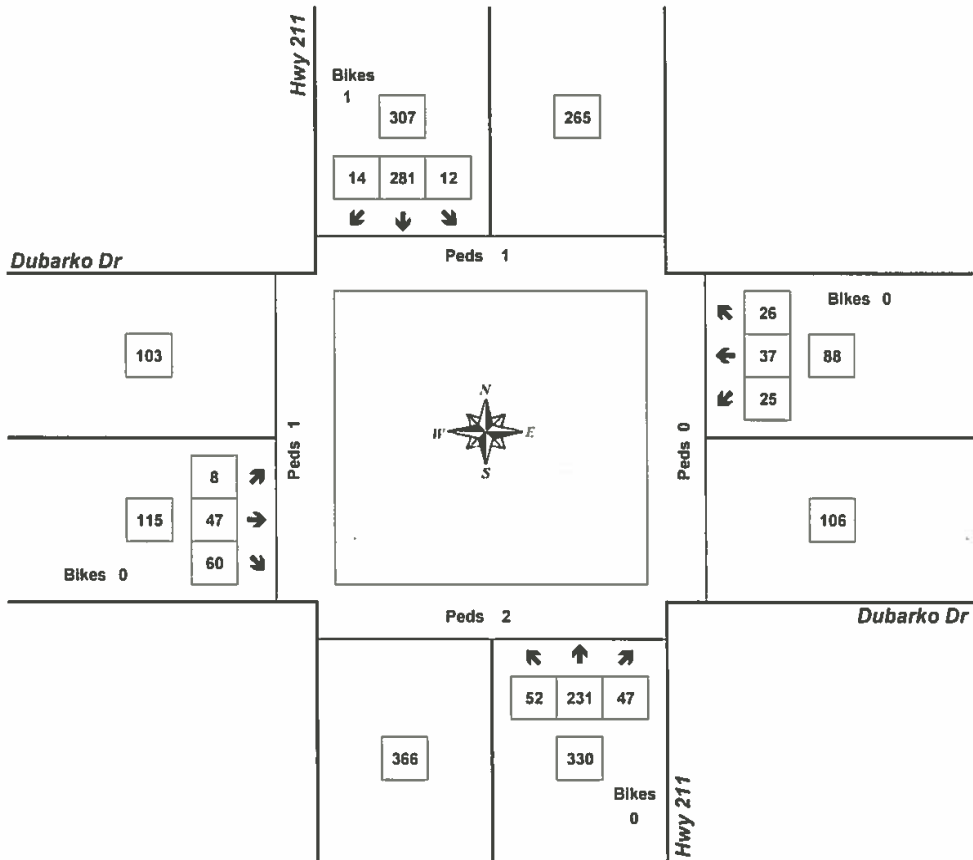
**Peak Hour Summary**



Clay Carney  
(503) 833-2740

**Hwy 211 & Dubarko Dr**

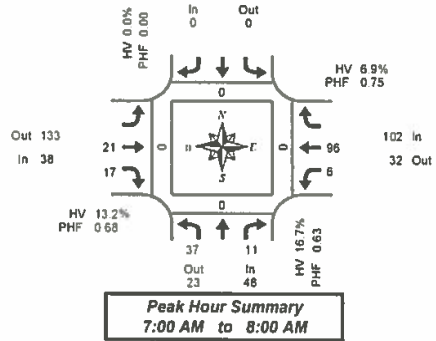
4:25 PM to 5:25 PM  
Tuesday, May 01, 2018



Approach	PHF	HV%	Volume
EB	0.78	0.9%	115
WB	0.76	4.5%	88
NB	0.90	1.8%	330
SB	0.89	1.3%	307
<b>Intersection</b>	<b>0.92</b>	<b>1.8%</b>	<b>840</b>

Count Period: 4:00 PM to 6:00 PM

**Total Vehicle Summary**



**Jacoby Rd & Dubarko Dr**  
**Wednesday, May 02, 2018**  
**7:00 AM to 9:00 AM**

**5-Minute Interval Summary  
7:00 AM to 9:00 AM**

Interval Start Time	Northbound Jacoby Rd			Bikes	Southbound Jacoby Rd			Bikes	Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes		In	Out	Total		T	R	Bikes	L	T	Bikes		North	South	East	West
7:00 AM	5	0	0						1	2	0	1	8	0	17	0	0	0	0
7:05 AM	4	2	0						1	1	0	0	8	0	16	0	0	0	0
7:10 AM	6	0	0						3	0	0	0	14	0	23	0	0	0	0
7:15 AM	6	1	0						3	1	0	1	10	0	22	0	0	0	0
7:20 AM	3	0	0						2	4	0	0	8	0	18	0	0	0	0
7:25 AM	1	1	0						2	0	0	1	14	0	19	0	0	0	0
7:30 AM	2	0	0						2	2	0	0	10	0	16	0	0	0	0
7:35 AM	0	2	0						1	0	0	1	2	0	6	0	0	0	0
7:40 AM	0	0	0						1	1	0	0	8	0	10	0	0	0	0
7:45 AM	3	2	0						2	1	0	0	3	0	11	0	0	0	0
7:50 AM	2	3	0						1	2	0	2	6	0	16	0	0	0	0
7:55 AM	5	0	0						1	3	0	0	5	0	14	0	0	0	0
8:00 AM	4	0	0						1	1	0	1	3	0	10	0	0	0	0
8:05 AM	5	1	0						2	1	0	0	2	0	11	0	0	0	0
8:10 AM	2	0	0						2	1	0	1	4	0	10	0	0	0	0
8:15 AM	4	0	0						1	1	0	1	4	0	11	0	0	0	0
8:20 AM	3	0	0						3	1	0	0	9	0	16	0	0	0	0
8:25 AM	2	0	0						2	1	0	0	2	0	7	0	0	0	0
8:30 AM	4	3	0						1	1	0	1	1	0	11	0	1	0	0
8:35 AM	0	2	0						2	0	0	2	8	0	12	0	0	0	0
8:40 AM	2	0	0						3	1	0	0	3	0	9	0	0	0	0
8:45 AM	0	2	0						1	3	0	1	3	0	10	0	0	0	0
8:50 AM	6	1	0						2	1	0	2	5	0	17	0	0	0	0
8:55 AM	1	0	0						2	2	0	0	6	0	11	0	1	0	0
<b>Total Survey</b>	<b>70</b>	<b>20</b>	<b>0</b>						<b>43</b>	<b>31</b>	<b>0</b>	<b>15</b>	<b>144</b>	<b>0</b>	<b>323</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>

**15-Minute Interval Summary  
7:00 AM to 9:00 AM**

Interval Start Time	Northbound Jacoby Rd			Bikes	Southbound Jacoby Rd			Bikes	Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes		In	Out	Total		T	R	Bikes	L	T	Bikes		North	South	East	West
7:00 AM	15	2	0						5	3	0	1	30	0	56	0	0	0	0
7:15 AM	10	2	0						8	5	0	2	32	0	59	0	0	0	0
7:30 AM	2	2	0						4	3	0	1	20	0	32	0	0	0	0
7:45 AM	10	5	0						4	6	0	2	14	0	41	0	0	0	0
8:00 AM	11	1	0						5	3	0	2	9	0	31	0	0	0	0
8:15 AM	9	0	0						6	3	0	1	15	0	34	0	0	0	0
8:30 AM	6	5	0						6	2	0	3	10	0	32	0	1	0	0
8:45 AM	7	3	0						5	6	0	3	14	0	38	0	1	0	0
<b>Total Survey</b>	<b>70</b>	<b>20</b>	<b>0</b>						<b>43</b>	<b>31</b>	<b>0</b>	<b>15</b>	<b>144</b>	<b>0</b>	<b>323</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>

**Peak Hour Summary  
7:00 AM to 8:00 AM**

By Approach	Northbound Jacoby Rd				Southbound Jacoby Rd				Eastbound Dubarko Dr				Westbound Dubarko Dr				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	48	23	71	0	0	0	0	0	38	133	171	0	102	32	134	0	188	0	0	0	0
%HV	16.7%				0.0%				13.2%				6.9%				10.6%				
PHF	0.63				0.00				0.68				0.75				0.75				

By Movement	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Total				
	L	R	Total	Total	T	R	Total	L	T	Total	Total						
Volume	37	11	48	0	21	17	38	6	96	102	188						
%HV	10.8%	NA	36.4%	16.7%	NA	NA	NA	0.0%	NA	18.0%	5.9%	13.2%	16.7%	6.3%	NA	6.9%	10.6%
PHF	0.58	0.55	0.63	0.00	0.58	0.71	0.68	0.75	0.75	0.75	0.75						

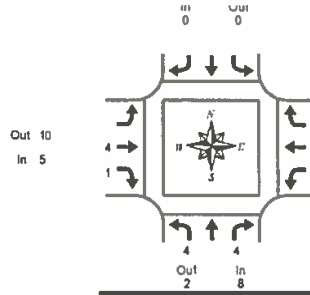
**Rolling Hour Summary  
7:00 AM to 9:00 AM**

Interval Start Time	Northbound Jacoby Rd			Bikes	Southbound Jacoby Rd			Bikes	Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes		In	Out	Total		T	R	Bikes	L	T	Bikes		North	South	East	West
7:00 AM	37	11	0						21	17	0	6	96	0	188	0	0	0	0
7:15 AM	33	10	0						21	17	0	7	75	0	163	0	0	0	0
7:30 AM	32	8	0						19	15	0	6	58	0	138	0	0	0	0
7:45 AM	36	11	0						21	14	0	8	48	0	136	0	1	0	0
8:00 AM	33	9	0						22	14	0	9	48	0	135	0	2	0	0

# Heavy Vehicle Summary



Clay Camey  
(503) 833-2740



**Peak Hour Summary**  
7:00 AM to 8:00 AM

## Jacoby Rd & Dubarko Dr

Wednesday, May 02, 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 Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total
	L	R	Total			Total	T	R	Total	L	T	Total	
7:00 AM	1	0	1			0	0	1	1	0	0	0	2
7:05 AM	0	1	1			0	0	0	0	0	1	1	2
7:10 AM	2	0	2			0	0	0	0	0	1	1	3
7:15 AM	0	1	1			0	1	0	1	0	2	2	4
7:20 AM	1	0	1			0	1	0	1	0	0	0	2
7:25 AM	0	0	0			0	0	0	0	0	0	0	0
7:30 AM	0	0	0			0	1	0	1	0	0	0	1
7:35 AM	0	1	1			0	0	0	0	1	0	1	2
7:40 AM	0	0	0			0	0	0	0	0	1	1	1
7:45 AM	0	1	1			0	1	0	1	0	0	0	2
7:50 AM	0	0	0			0	0	0	0	0	1	1	1
7:55 AM	0	0	0			0	0	0	0	0	0	0	0
8:00 AM	0	0	0			0	0	0	0	0	0	0	0
8:05 AM	0	0	0			0	0	0	0	0	0	0	0
8:10 AM	0	0	0			0	0	0	0	0	0	0	0
8:15 AM	0	0	0			0	0	0	0	1	0	1	1
8:20 AM	1	0	1			0	0	0	0	0	2	2	3
8:25 AM	0	0	0			0	0	0	0	0	0	0	0
8:30 AM	0	1	1			0	0	1	1	0	0	0	2
8:35 AM	0	1	1			0	0	0	0	0	0	0	1
8:40 AM	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
8:50 AM	0	0	0			0	0	0	0	0	0	0	0
8:55 AM	0	0	0			0	0	0	0	0	0	0	0
Total Survey	5	6	11			0	4	2	6	2	8	10	27

### Heavy Vehicle 15-Minute Interval Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total
	L	R	Total			Total	T	R	Total	L	T	Total	
7:00 AM	3	1	4			0	0	1	1	0	2	2	7
7:15 AM	1	1	2			0	2	0	2	0	2	2	6
7:30 AM	0	1	1			0	1	0	1	1	1	2	4
7:45 AM	0	1	1			0	1	0	1	0	1	1	3
8:00 AM	0	0	0			0	0	0	0	0	0	0	0
8:15 AM	1	0	1			0	0	0	0	1	2	3	4
8:30 AM	0	2	2			0	0	1	1	0	0	0	3
8:45 AM	0	0	0			0	0	0	0	0	0	0	0
Total Survey	5	6	11			0	4	2	6	2	8	10	27

### Heavy Vehicle Peak Hour Summary

7:00 AM to 8:00 AM

By Approach	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	8	2	10	0	0	0	5	10	15	7	8	15	20
PHF	0.50			0.00			0.63			0.44			0.56

By Movement	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Total
	L	R	Total			Total	T	R	Total	L	T	Total	
Volume	4	4	8			0	4	1	5	1	6	7	20
PHF	0.33	0.50	0.50			0.00	0.50	0.25	0.63	0.25	0.38	0.44	0.56

### Heavy Vehicle Rolling Hour Summary

7:00 AM to 9:00 AM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total
	L	R	Total			Total	T	R	Total	L	T	Total	
7:00 AM	4	4	8			0	4	1	5	1	6	7	20
7:15 AM	1	3	4			0	4	0	4	1	4	5	13
7:30 AM	1	2	3			0	2	0	2	2	4	6	11
7:45 AM	1	3	4			0	1	1	2	1	3	4	10
8:00 AM	1	2	3			0	0	1	1	1	2	3	7

**Peak Hour Summary**



Clay Coney  
(503) 833-2740

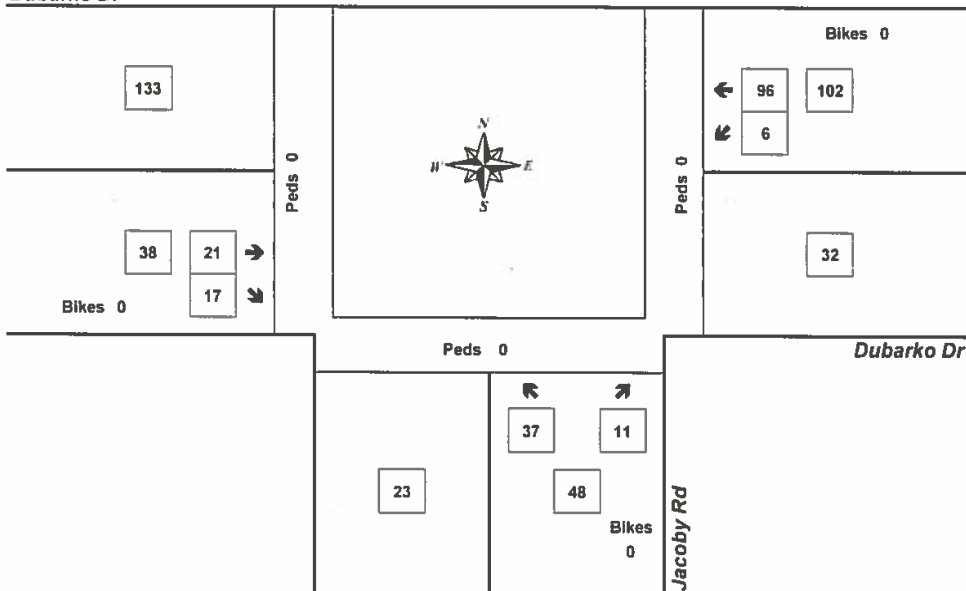
**Jacoby Rd & Dubarko Dr**

7:00 AM to 8:00 AM  
Wednesday, May 02, 2018

Bikes  
0

**Dubarko Dr**

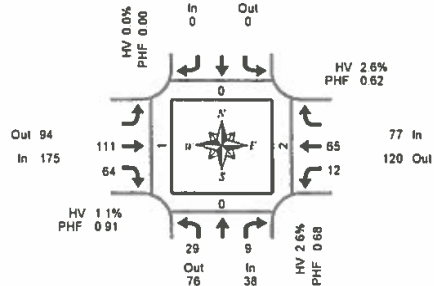
Peds 0



Approach	PHF	HV%	Volume
EB	0.68	13.2%	38
WB	0.75	6.9%	102
NB	0.63	16.7%	48
SB	0.00	0.0%	0
<b>Intersection</b>	<b>0.75</b>	<b>10.6%</b>	<b>188</b>

Count Period: 7:00 AM to 9:00 AM

### Total Vehicle Summary



### Jacoby Rd & Dubarko Dr Tuesday, May 01, 2018 4:00 PM to 6:00 PM

**Peak Hour Summary  
5:00 PM to 6:00 PM**

#### 5-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes			Bikes	T	R	Bikes	L	T	Bikes		North	South	East	West
4:00 PM	4	1	0			0	10	2	0	0	6	0	23	0	0	0	0
4:05 PM	1	1	0			0	11	3	0	0	6	0	22	0	0	0	0
4:10 PM	3	0	0			0	7	2	0	2	5	0	19	0	0	0	0
4:15 PM	1	0	0			0	6	3	0	2	6	0	18	0	0	0	0
4:20 PM	1	2	0			0	7	3	0	1	5	0	19	0	0	0	0
4:25 PM	5	4	0			0	5	1	0	1	4	0	20	0	0	0	0
4:30 PM	2	2	0			0	4	6	0	3	4	0	21	0	0	0	0
4:35 PM	3	2	0			0	5	5	0	0	6	0	21	0	0	0	0
4:40 PM	4	0	0			0	4	3	0	1	7	1	19	0	0	0	0
4:45 PM	2	1	0			0	8	4	0	0	6	0	21	0	0	0	0
4:50 PM	7	0	0			0	7	5	0	0	6	0	25	0	0	0	0
4:55 PM	5	0	0			0	13	7	0	1	1	0	27	0	0	0	0
5:00 PM	0	1	0			0	7	7	0	2	4	0	21	0	0	2	0
5:05 PM	6	0	0			0	9	5	0	0	7	0	27	0	0	0	0
5:10 PM	2	1	0			0	6	4	0	1	8	0	22	0	0	0	1
5:15 PM	1	1	0			0	13	7	0	0	4	0	26	0	0	0	0
5:20 PM	3	0	0			0	7	5	0	0	5	0	20	0	0	0	0
5:25 PM	3	0	0			0	8	8	0	1	4	0	24	0	0	0	0
5:30 PM	2	1	0			0	8	7	0	1	4	0	23	0	0	0	0
5:35 PM	0	0	0			0	6	8	0	0	2	0	16	0	0	0	0
5:40 PM	1	2	0			0	10	3	0	0	3	1	19	0	0	0	0
5:45 PM	3	0	0			0	13	2	0	2	11	0	31	0	0	0	0
5:50 PM	4	1	0			0	9	3	0	4	8	0	29	0	0	0	0
5:55 PM	4	2	0			0	15	5	0	1	5	0	32	0	0	0	0
Total Survey	67	22	0			0	198	108	0	23	127	2	545	0	0	2	1

#### 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes			Bikes	T	R	Bikes	L	T	Bikes		North	South	East	West
4:00 PM	8	2	0			0	28	7	0	2	17	0	64	0	0	0	0
4:15 PM	7	6	0			0	18	7	0	4	15	0	57	0	0	0	0
4:30 PM	9	4	0			0	13	14	0	4	17	0	61	0	0	0	0
4:45 PM	14	1	0			0	28	16	0	1	13	0	73	0	0	0	0
5:00 PM	8	2	0			0	22	16	0	3	19	0	70	0	0	2	1
5:15 PM	7	1	0			0	28	20	0	1	13	0	70	0	0	0	0
5:30 PM	3	3	0			0	24	18	0	1	9	1	58	0	0	0	0
5:45 PM	11	3	0			0	37	10	0	7	24	0	92	0	0	0	0
Total Survey	67	22	0			0	198	108	0	23	127	2	545	0	0	2	1

#### Peak Hour Summary 5:00 PM to 6:00 PM

By Approach	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Total	Pedestrians Crosswalk					
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total		North	South	East	West		
Volume	38	76	114	0	0	0	175	94	269	0	77	120	197	1	290	0	0	2	1
%HV	2.6%			0.0%			1.1%			2.6%			1.7%						
PHF	0.68			0.00			0.91			0.62			0.79						

By Movement	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Total		
	L	R	Total			Total	T	R	Total	L	T	Total			
Volume	29	9	38			0	111	64	175	12	65	77	290		
%HV	0.0%	NA	1.1%	2.6%	NA	NA	NA	0.8%	1.6%	1.1%	0.0%	3.1%	NA	2.6%	1.7%
PHF	0.66		0.75	0.68		0.00	0.75	0.70	0.91	0.43	0.68	0.62	0.79		

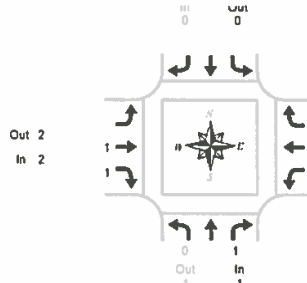
#### Rolling Hour Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total	Pedestrians Crosswalk			
	L	R	Bikes			Bikes	T	R	Bikes	L	T	Bikes		North	South	East	West
4:00 PM	38	13	0			0	87	44	0	11	62	1	255	0	0	0	0
4:15 PM	38	13	0			0	81	53	0	12	64	1	261	0	0	2	1
4:30 PM	38	8	0			0	91	66	0	9	62	1	274	0	0	2	1
4:45 PM	32	7	0			0	102	70	0	6	54	1	271	0	0	2	1
5:00 PM	29	9	0			0	111	64	0	12	65	1	290	0	0	2	1

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## Jacoby Rd & Dubarko Dr

Tuesday, May 01, 2018  
4:00 PM to 6:00 PM

**Peak Hour Summary**  
5:00 PM to 6:00 PM

### Heavy Vehicle 5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd Total	Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total
	L	R	Total		T	R	Total	L	T	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	1	1	0	0	0	0	0	1	1	2
4:10 PM	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	1	1	1
4:20 PM	1	0	1	0	0	0	0	0	0	0	1
4:25 PM	0	0	0	0	0	1	1	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	1	0	1	1
4:35 PM	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	0	0	0	0	0	0	0	2	2	2
4:55 PM	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
5:05 PM	0	0	0	0	0	0	0	0	0	0	0
5:10 PM	0	0	0	0	0	0	0	0	1	1	1
5:15 PM	0	1	1	0	0	0	0	0	0	0	1
5:20 PM	0	0	0	0	0	0	0	0	0	0	0
5:25 PM	0	0	0	0	0	1	1	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	1	1	1
5:35 PM	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	1	1	0	0	0	1
5:50 PM	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	2	3	0	1	2	3	1	6	7	13

### Heavy Vehicle 15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd Total	Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total
	L	R	Total		T	R	Total	L	T	Total	
4:00 PM	0	1	1	0	0	0	0	0	1	1	2
4:15 PM	1	0	1	0	0	1	1	0	1	1	3
4:30 PM	0	0	0	0	0	0	0	1	0	1	1
4:45 PM	0	0	0	0	0	0	0	2	0	2	2
5:00 PM	0	0	0	0	0	0	0	1	1	1	1
5:15 PM	0	1	1	0	0	1	1	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	1	1	1	1
5:45 PM	0	0	0	0	1	0	1	0	0	0	1
Total Survey	1	2	3	0	1	2	3	1	6	7	13

### Heavy Vehicle Peak Hour Summary

5:00 PM to 6:00 PM

By Approach	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Dubarko Dr			Westbound Dubarko Dr			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	1	2	0	0	0	2	2	4	2	2	4	5
PHF	0.25			0.00			0.50			0.50			0.63

By Movement	Northbound Jacoby Rd			Southbound Jacoby Rd Total	Eastbound Dubarko Dr			Westbound Dubarko Dr			Total
	L	R	Total		T	R	Total	L	T	Total	
Volume	0	1	1	0	1	1	2	0	2	2	5
PHF	0.00	0.25	0.25	0.00	0.25	0.25	0.50	0.00	0.50	0.50	0.63

### Heavy Vehicle Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd Total	Eastbound Dubarko Dr			Westbound Dubarko Dr			Interval Total
	L	R	Total		T	R	Total	L	T	Total	
4:00 PM	1	1	2	0	0	1	1	1	4	5	8
4:15 PM	1	0	1	0	0	1	1	1	4	5	7
4:30 PM	0	1	1	0	0	1	1	1	3	4	6
4:45 PM	0	1	1	0	0	1	1	0	4	4	6
5:00 PM	0	1	1	0	1	1	2	0	2	2	5

**Peak Hour Summary**



Clay Coney  
(503) 833-2740

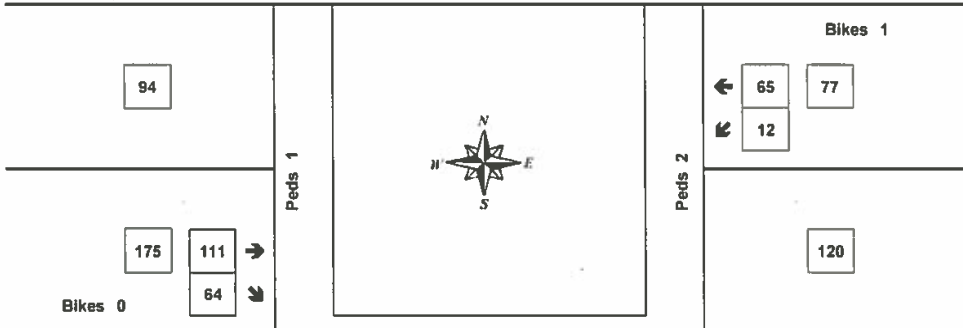
**Jacoby Rd & Dubarko Dr**

5:00 PM to 6:00 PM  
Tuesday, May 01, 2018

Bikes  
0

**Dubarko Dr**

Peds 0



Bikes 0

Bikes 1

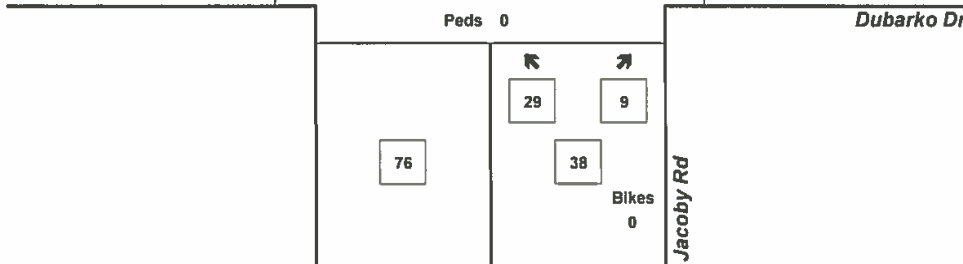


Peds 1

Peds 2

Peds 0

**Dubarko Dr**



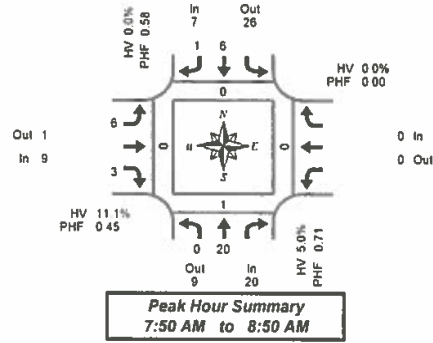
Bikes  
0

**Jacoby Rd**

Approach	PHF	HV%	Volume
EB	0.91	1.1%	175
WB	0.62	2.6%	77
NB	0.68	2.6%	38
SB	0.00	0.0%	0
<b>Intersection</b>	<b>0.79</b>	<b>1.7%</b>	<b>290</b>

Count Period: 4:00 PM to 6:00 PM

**Total Vehicle Summary**



**Jacoby Rd & Newton St**  
 Wednesday, May 02, 2018  
 7:00 AM to 9:00 AM

**5-Minute Interval Summary  
7:00 AM to 9:00 AM**

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes	L	T	Bikes		North	South	East	West
7:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
7:05 AM	0	3	0	0	0	0	1	0	0	0	0	0	4	0	0	0	0
7:10 AM	0	2	0	0	0	0	2	0	0	0	0	0	4	0	0	0	0
7:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0
7:20 AM	0	4	0	0	2	1	0	0	0	0	0	0	7	0	0	0	0
7:25 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
7:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:40 AM	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1
7:45 AM	0	1	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0
7:50 AM	0	4	0	0	1	0	0	0	0	0	0	0	6	0	0	0	0
7:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	2	0	0	1	0	0	1	0	0	0	0	4	0	0	0	0
8:05 AM	0	3	0	0	1	0	0	0	0	0	0	0	4	0	0	0	0
8:10 AM	0	2	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0
8:15 AM	0	2	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0
8:20 AM	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
8:25 AM	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
8:30 AM	0	0	0	0	1	0	0	2	1	0	0	0	4	0	0	0	0
8:35 AM	0	2	0	0	0	0	0	1	1	0	0	0	4	0	0	0	0
8:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	1	0	0	2	1	0	0	1	0	0	0	5	0	0	0	0
8:50 AM	0	1	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0
8:55 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Total Survey	0	33	0	0	10	5	0	11	3	0	0	0	62	0	1	0	2

**15-Minute Interval Summary  
7:00 AM to 9:00 AM**

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes	L	T	Bikes		North	South	East	West
7:00 AM	0	5	0	0	0	0	4	0	0	0	0	0	9	0	0	0	0
7:15 AM	0	5	0	0	3	2	0	0	0	0	0	0	10	0	0	0	0
7:30 AM	0	0	0	0	1	1	0	0	0	0	0	0	2	0	0	0	2
7:45 AM	0	5	0	0	1	0	0	2	0	0	0	0	8	0	0	0	0
8:00 AM	0	7	0	0	2	0	0	1	0	0	0	0	10	0	1	0	0
8:15 AM	0	6	0	0	0	0	0	1	0	0	0	0	7	0	0	0	0
8:30 AM	0	2	0	0	1	0	0	3	2	0	0	0	8	0	0	0	0
8:45 AM	0	3	0	0	2	2	0	0	1	0	0	0	8	0	0	0	0
Total Survey	0	33	0	0	10	5	0	11	3	0	0	0	62	0	1	0	2

**Peak Hour Summary  
7:50 AM to 8:50 AM**

By Approach	Northbound Jacoby Rd				Southbound Jacoby Rd				Eastbound Newton St				Westbound Newton St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	20	9	29	0	7	26	33	0	9	1	10	0	0	0	0	0	36	0	1	0	0
%HV			5.0%				0.0%				11.1%				0.0%		5.6%				
PHF			0.71				0.58				0.45				0.00		0.90				

By Movement	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Total
	L	T	Total	T	R	Total	L	R	Total	L	T	Total	
Volume	0	20	20	6	1	7	6	3	9	0	0	0	36
%HV	0.0%	5.0%	NA	0.0%	0.0%	0.0%	0.0%	NA	33.3%	11.1%	NA	NA	5.6%
PHF	0.00	0.71	0.71	0.75	0.25	0.58	0.50	0.38	0.45	NA	NA	0.00	0.90

**Rolling Hour Summary  
7:00 AM to 9:00 AM**

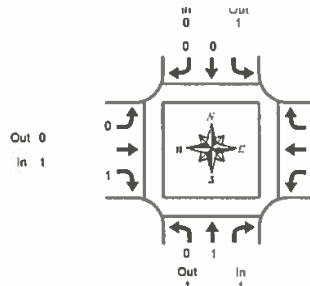
Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes	L	T	Bikes		North	South	East	West
7:00 AM	0	15	0	0	5	3	0	6	0	0	0	0	29	0	0	0	2
7:15 AM	0	17	0	0	7	3	0	3	0	0	0	0	30	0	1	0	2
7:30 AM	0	18	0	0	4	1	0	4	0	0	0	0	27	0	1	0	2
7:45 AM	0	20	0	0	4	0	0	7	2	0	0	0	33	0	1	0	0
8:00 AM	0	18	0	0	5	2	0	5	3	0	0	0	33	0	1	0	0



# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## Jacoby Rd & Newton St

Wednesday, May 02, 2018  
7:00 AM to 9:00 AM

Peak Hour Summary  
7:50 AM to 8:50 AM

### Heavy Vehicle 5-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total
	L	T	Total	T	R	Total	L	R	Total	Total	Total		
7:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	1
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:10 AM	0	1	1	0	0	0	1	0	0	1	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:20 AM	0	1	1	0	0	0	0	0	0	0	0	0	1
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:35 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:50 AM	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
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:20 AM	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
8:30 AM	0	0	0	0	0	0	0	0	1	1	0	0	1
8:35 AM	0	1	1	0	0	0	0	0	0	0	0	0	1
8:40 AM	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
8:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:55 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	3	3	0	0	0	2	1	3	0	0	0	6

### Heavy Vehicle 15-Minute Interval Summary 7:00 AM to 9:00 AM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total
	L	T	Total	T	R	Total	L	R	Total	Total	Total		
7:00 AM	0	1	1	0	0	0	2	0	2	0	0	0	3
7:15 AM	0	1	1	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	1	0	0	0	0	1	1	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	3	3	0	0	0	2	1	3	0	0	0	6

### Heavy Vehicle Peak Hour Summary 7:50 AM to 8:50 AM

By Approach	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	1	2	0	1	1	1	0	1	0	0	0	2
PHF	0.25			0.00			0.25			0.00			0.25

By Movement	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Total
	L	T	Total	T	R	Total	L	R	Total	Total	Total		
Volume	0	1	1	0	0	0	0	1	1	0	0	2	
PHF	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.25	0.25	0.00	0.00	0.25	

### Heavy Vehicle Rolling Hour Summary 7:00 AM to 9:00 AM

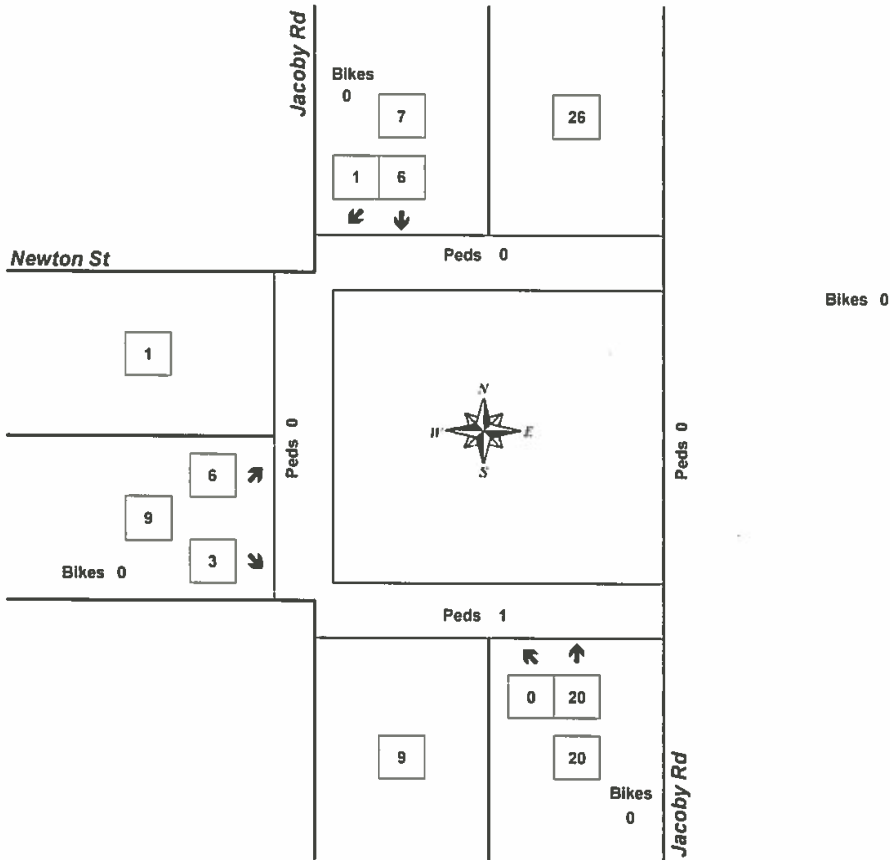
Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total
	L	T	Total	T	R	Total	L	R	Total	Total	Total		
7:00 AM	0	2	2	0	0	0	2	0	2	0	0	0	4
7:15 AM	0	1	1	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	1	0	0	0	0	1	1	0	0	0	2
8:00 AM	0	1	1	0	0	0	0	1	1	0	0	0	2

**Peak Hour Summary**



**Jacoby Rd & Newton St**

7:50 AM to 8:50 AM  
Wednesday, May 02, 2018



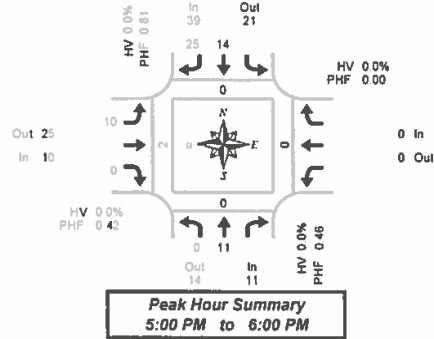
Approach	PHF	HV%	Volume
EB	0.45	11.1%	9
WB	0.00	0.0%	0
NB	0.71	5.0%	20
SB	0.58	0.0%	7
<b>Intersection</b>	<b>0.90</b>	<b>5.6%</b>	<b>36</b>

Count Period: 7:00 AM to 9:00 AM

**Total Vehicle Summary**



Clay Camey  
(503) 833-2740



**Jacoby Rd & Newton St**

Tuesday, May 01, 2018  
4:00 PM to 6:00 PM

**5-Minute Interval Summary**  
4:00 PM to 6:00 PM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes	L	R	Bikes		North	South	East	West
4:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
4:05 PM	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4:10 PM	0	0	0	0	2	0	1	0	0	0	0	0	3	0	0	0	0
4:15 PM	0	0	0	1	2	0	1	0	0	0	0	0	3	0	0	0	0
4:20 PM	0	1	0	0	1	0	1	0	0	0	0	0	3	0	0	0	0
4:25 PM	0	0	0	1	0	0	1	0	0	0	0	0	2	0	0	0	0
4:30 PM	0	0	0	2	1	0	1	0	0	0	0	0	4	0	0	0	0
4:35 PM	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	3	0	0	1	0	0	0	0	0	5	0	0	0	0
4:50 PM	0	1	0	0	1	0	1	0	0	0	0	0	3	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	4	3	0	0	0	0	0	0	0	7	0	0	0	0
5:05 PM	0	0	0	2	1	0	0	0	0	0	0	0	3	0	0	0	0
5:10 PM	0	2	0	1	1	0	1	0	0	0	0	0	5	0	0	0	0
5:15 PM	0	0	0	1	3	0	0	0	0	0	0	0	4	0	0	0	0
5:20 PM	0	4	0	0	4	0	0	0	0	0	0	0	8	0	0	0	0
5:25 PM	0	2	0	1	2	0	1	0	0	0	0	0	6	0	0	0	0
5:30 PM	0	0	0	1	1	0	1	0	0	0	0	0	2	0	0	0	1
5:35 PM	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1
5:40 PM	0	2	0	1	0	0	2	0	0	0	0	0	5	0	0	0	0
5:45 PM	0	0	0	1	3	0	0	0	0	0	0	0	4	0	0	0	0
5:50 PM	0	0	0	1	5	0	4	0	0	0	0	0	10	0	0	0	0
5:55 PM	0	1	0	0	2	0	2	0	0	0	0	0	5	0	0	0	0
Total Survey	0	15	0	22	35	0	16	0	0	0	0	0	88	0	0	0	2

**15-Minute Interval Summary**  
4:00 PM to 6:00 PM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes	L	R	Bikes		North	South	East	West
4:00 PM	0	1	0	1	2	0	1	0	0	0	0	0	5	0	0	0	0
4:15 PM	0	1	0	2	3	0	2	0	0	0	0	0	8	0	0	0	0
4:30 PM	0	0	0	2	4	0	1	0	0	0	0	0	7	0	0	0	0
4:45 PM	0	2	0	3	1	0	2	0	0	0	0	0	8	0	0	0	0
5:00 PM	0	2	0	7	5	0	1	0	0	0	0	0	15	0	0	0	0
5:15 PM	0	6	0	2	9	0	1	0	0	0	0	0	18	0	0	0	0
5:30 PM	0	2	0	3	1	0	2	0	0	0	0	0	8	0	0	0	2
5:45 PM	0	1	0	2	10	0	6	0	0	0	0	0	19	0	0	0	0
Total Survey	0	15	0	22	35	0	16	0	0	0	0	0	88	0	0	0	2

**Peak Hour Summary**  
5:00 PM to 6:00 PM

By Approach	Northbound Jacoby Rd				Southbound Jacoby Rd				Eastbound Newton St				Westbound Newton St				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	11	14	25	0	39	21	60	0	10	25	35	0	0	0	0	0	0	0	0	0	2
%HV	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PHF	0.00	0.46	0.46	0.00	0.50	0.63	0.81	0.00	0.42	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79

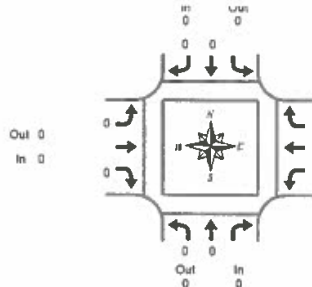
**Rolling Hour Summary**  
4:00 PM to 6:00 PM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes	L	R	Bikes		North	South	East	West
4:00 PM	0	4	0	8	10	0	6	0	0	0	0	0	28	0	0	0	0
4:15 PM	0	5	0	14	13	0	8	0	0	0	0	0	38	0	0	0	0
4:30 PM	0	10	0	14	19	0	5	0	0	0	0	0	48	0	0	0	0
4:45 PM	0	12	0	15	16	0	6	0	0	0	0	0	49	0	0	0	2
5:00 PM	0	11	0	14	25	0	10	0	0	0	0	0	60	0	0	0	2

# Heavy Vehicle Summary



Clay Carney  
(503) 833-2740



## Jacoby Rd & Newton St

Tuesday, May 01, 2018  
4:00 PM to 6:00 PM

Peak Hour Summary  
5:00 PM to 6:00 PM

### Heavy Vehicle 5-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total
	L	T	Total	T	R	Total	L	R	Total	Total	Total		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:20 PM	0	1	1	0	0	0	0	0	0	0	0	1	
4:25 PM	0	0	0	1	0	1	0	0	0	0	0	1	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:50 PM	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	
5:00 PM	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	
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	
5:15 PM	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	
5:25 PM	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	
5:35 PM	0	0	0	0	0	0	0	0	0	0	0	0	
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Total Survey</b>	0	1	1	1	0	1	0	0	0	0	0	2	

### Heavy Vehicle 15-Minute Interval Summary 4:00 PM to 6:00 PM

Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total
	L	T	Total	T	R	Total	L	R	Total	Total	Total		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	0	1	1	1	0	1	0	0	0	0	0	2	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	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	
5:15 PM	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	
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Total Survey</b>	0	1	1	1	0	1	0	0	0	0	0	2	

### Heavy Vehicle Peak Hour Summary 5:00 PM to 6:00 PM

By Approach	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

By Movement	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Total
	L	T	Total	T	R	Total	L	R	Total	Total	Total		
Volume	0	0	0	0	0	0	0	0	0	0	0	0	
PHF	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

### Heavy Vehicle Rolling Hour Summary 4:00 PM to 6:00 PM

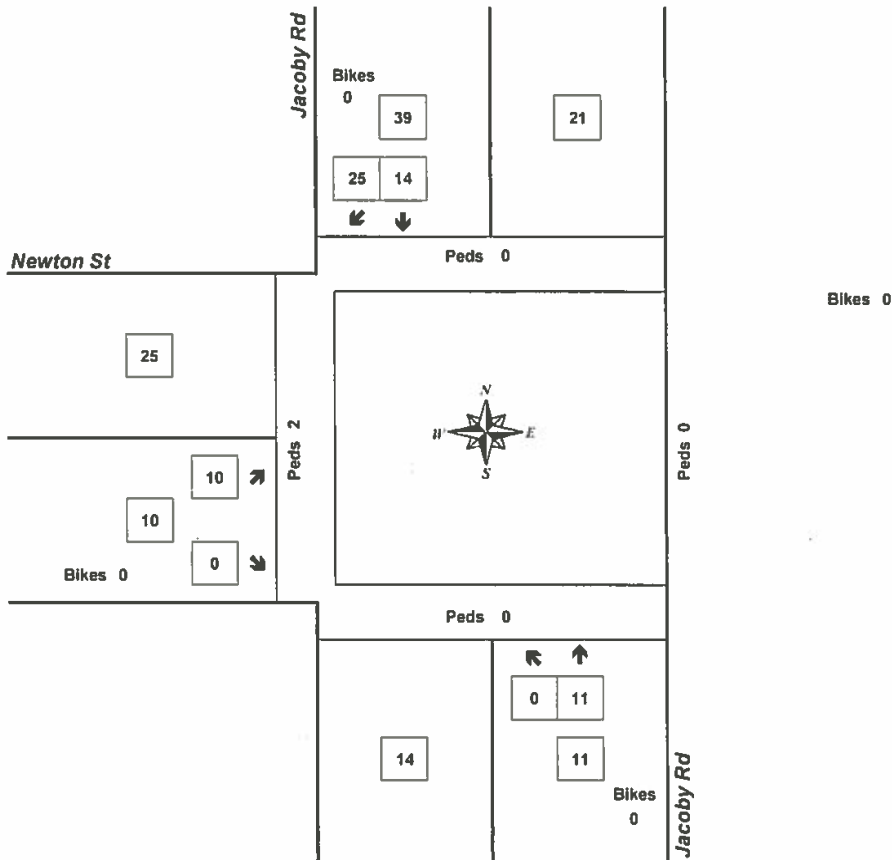
Interval Start Time	Northbound Jacoby Rd			Southbound Jacoby Rd			Eastbound Newton St			Westbound Newton St			Interval Total
	L	T	Total	T	R	Total	L	R	Total	Total	Total		
4:00 PM	0	1	1	1	0	1	0	0	0	0	0	2	
4:15 PM	0	1	1	1	0	1	0	0	0	0	0	2	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	

**Peak Hour Summary**



**Jacoby Rd & Newton St**

5:00 PM to 6:00 PM  
Tuesday, May 01, 2018



Approach	PHF	HV%	Volume
EB	0.42	0.0%	10
WB	0.00	0.0%	0
NB	0.46	0.0%	11
SB	0.81	0.0%	39
<b>Intersection</b>	<b>0.79</b>	<b>0.0%</b>	<b>60</b>

Count Period: 4:00 PM to 6:00 PM

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN HIGH SYSTEM CRASH LISTING

DOBARKO RD at EAGLE CRK-SANDY HT, City of Sandy, Clackamas County, 01/01/2012 to 12/31/2016

1, 4 of 28 Crash records shown.

CITY OF SANDY, CLACKAMAS COUNTY

SER#	P R S M DATE	CLASS	CITY STREET	RD CHAR	INT-REL	INT-REL	OFFRD	MTHR	CRASH	TRLR	SPCL	USE	CAUSE				
DATE	TIME	FROM	TO	DIR	LEG	TRAF-	DRY	SURF	COLL	TYPE	TYPE	TYPE	TYPE				
DATE	TIME	FROM	TO	DIR	LEG	TRAF-	DRY	SURF	COLL	TYPE	TYPE	TYPE	TYPE				
DATE	TIME	FROM	TO	DIR	LEG	TRAF-	DRY	SURF	COLL	TYPE	TYPE	TYPE	TYPE				
DATE	TIME	FROM	TO	DIR	LEG	TRAF-	DRY	SURF	COLL	TYPE	TYPE	TYPE	TYPE				
01165	H H H 03/10/2016	16	DOBARKO RD	INTER	CROSS	N	N	CLAY	0-1STOP	01	NONE	0	BACK				
	TH		EAGLE CRK-SANDY HT	E	STOP	SIGN	N	DAY	INJ	01	DRVR	HORE	22	M	OR-Y	011	000
N	6P	45 23	122 15	06	0								OR<25				
N		48 39															
00533	H H H 02/07/2014	16	DOBARKO RD	INTER	CROSS	N	N	SNOW	S-1STOP	01	NONE	0	STRTGHT				
	FR		EAGLE CRK-SANDY HT	E	STOP	SIGN	N	SNOW	REAR	UNKN	B-M						
N	4P	45 23	122 15	06	0								000				
N		22 76124	48 3879599										000				
													000				
													000				
00556	N N N 02/07/2014	16	DOBARKO RD	INTER	CROSS	H	N	SNOW	S-1STOP	01	NONE	0	STRTGHT				
	FR		EAGLE CRK-SANDY HT	E	STOP	SIGN	N	SNOW	REAR	PRVTE	E-M						
N	1P	45 23	122 15	06	0								001				
N		22 76124	48 3879599										000				
													000				
													000				
00578	H H N 02/07/2014	16	DOBARKO RD	INTER	CROSS	H	N	SNOW	S-1STOP	01	NONE	0	STRTGHT				
	FR		EAGLE CRK-SANDY HT	E	STOP	SIGN	N	SNOW	REAR	PRVTE	E-M						
N	4P	45 23	122 15	06	0								000				
N		22 76124	48 3879599										026				
													000				
													000				
00503	H H H 12/23/2012	16	DOBARKO RD	INTER	CROSS	N	Y	SNOW	FIX OBJ	01	NONE	0	STRTGHT				
	FR		EAGLE CRK-SANDY HT	E	STOP	SIGN	N	SNOW	REAR	PRVTE	E-M						
N	4P	45 23	122 15	06	0								000				
N		22 76124	48 3879599										026				
													000				
													000				
00503	H H H 12/23/2012	16	DOBARKO RD	INTER	CROSS	N	Y	SNOW	FIX OBJ	01	NONE	0	STRTGHT				
	FR		EAGLE CRK-SANDY HT	E	STOP	SIGN	N	SNOW	REAR	PRVTE	E-M						
N	4P	45 23	122 15	06	0								000				
N		22 76124	48 3879599										026				
													000				
													000				

Disclaimer: The information contained in this report is compiled from individual officer and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The crash analysis and reporting unit is committed to providing the highest quality crash data to customers. However, because the number of crash reports is limited, the accuracy of the information may vary. The Oregon Department of Transportation cannot be held responsible for any inaccuracies or omissions in the data. The Oregon Department of Transportation cannot be held responsible for any inaccuracies or omissions in the data. The Oregon Department of Transportation cannot be held responsible for any inaccuracies or omissions in the data.



OREGON - DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-SYSTEM CRASH LISTING

DUBARCO RD at EAGLE CRK-SANDY ST, City of Sandy, Clackamas County, 01/01/2012 to 12/31/2016  
9 - 12 of 28 Crash records shown.

SR	FD	RS	MD	CLASS	CITY STREET	RD CHAR	INT TYPE	OFFRD	MTR	CRASH	SPCL USE	TRLR	TY	MOVE	PRTC	INJ	A	S	LOC	ERROR	ACT EVENT	CAUSE
INVEST	DATE	DIST	FROM	TO	LOCN	DIRECT	LEGS	TRAP	DRY	WTH	CRASH	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE	TYPE
RD DPT	TIME	FROM	TO	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN	LOCN
UNLOCY	D.C.S.L.K.L.XT	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG	LONG
00070	N H N H N H	01/06/2012	16	DUBARCO RD	CH	INTER	CROSS	N	RAIN	S-1STOP	01 NONE	0	STRTGHT	SM-NE	01 DRVR	NONE	18 M	OR-Y	OR<25	026	000	07
	FR			EAGLE CRK-SANDY HY	04	CH	0	NONE	N	REAR	PRVTE	SM-NE	PRVTE	SM-NE								
	SP	45 23	-122 15	017200100500																		
	N	22.7612385	48.3879621																			
00516	Y H N H H	02/09/2012	16	DUBARCO RD	CH	INTER	CROSS	N	RAIN	ANGL-OTH	01 NONE	0	STRTGHT	SM-NE	01 DRVR	NONE	21 M	OTH-Y	OR<25	658,021	000	30.03
	WE			EAGLE CRK-SANDY HY	04	CH	0	STOP SIGN	N	ANGL	PRVTE	M-E	PRVTE	M-E								
	12P	45 23	-122 15	017200100500																		
	N	22.7612384	48.3879627																			
01124	N H N H H	03/24/2012	16	DUBARCO RD	CH	INTER	CROSS	N	CLD	ANGL-OTH	01 NONE	0	STRTGHT	SM-NE	01 DRVR	NONE	17 UNK	OTH-Y	N-RES	000	000	00
	SA			EAGLE CRK-SANDY HY	04	CH	0	STOP SIGN	N	TURN	PRVTE	S-N	PRVTE	S-N								
	6P	45 23	-122 15	017200100500																		
	N	22.7612384	48.3879627																			
02844	H N H N H	08/03/2012	16	DUBARCO RD	CH	INTER	CROSS	N	CLR	ANGL-OTH	01 NONE	0	STRTGHT	SM-NE	01 DRVR	NONE	16 M	OR-Y	OR<25	028	000	02
	FR			EAGLE CRK-SANDY HY	03	CH	0	STOP SIGN	N	TURN	PRVTE	M-S	PRVTE	M-S								
	SP	45 23	-122 15	017200100500																		
	N	22.7612384	48.3879627																			

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OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON SYSTEM CRASH LISTING

DUBARCO RD at EAGLE CRK SANDY HT, City of Sandy, Clatsamas County, 01/01/2012 to 12/31/2016

11 - 15 of 28 Crash records shown.

CDS380  
06/06/2018

CITY OF SANDY, CLATSAMAS COUNTY

SR	P	R	S	M	DATE	CLASS	CITY STREET	RD CHAP	INT. TYPE	OFFRD	MTHR	CRASH	SECL USE	PRTC	INJ	G	E	LICNS	CAUSE										
NO	DFT	ELG	H	TIME	FROM	DIST	FIRST STREET	DIRECT	LEGS	TRAF	DRY	DRY	TRLA	TYPE	SVTY	E	X	RES	ACT. EVENT										
UNLOC7	D	C	S	L	K	LONG	UNLOC7	LOC7N	BLANES1	COM1	DRY	DRY	ANG1-OTH	01	NONE	0	STRGHT	02											
02878	N	N	N	09/05/2012	16		DUBARCO RD	INTER	CROSS	N	CLR	ANGL-OTH	01	NONE	0	STRGHT	S - H	01	DRVR	NONE	16	M	OR-Y	OR-25	000	000	00		
N							EAGLE CRK SANDY HT	CH	0	STOP	SIGN	N	DRY	ANGL	PPD														
N							017200100500	04	0																				
							48.3873867																						
03356	N	N	N	09/08/2012	16		DUBARCO RD	INTER	CROSS	N	CLR	ANGL-OTH	01	NONE	0	STRGHT	S - H	01	DRVR	NONE	16	P	OR-Y	OR-25	000	000	00	02	
N							EAGLE CRK SANDY HT	CH	0	STOP	SIGN	N	DRY	ANGL															
N							017200100500	01	0																				
							48.3873867																						
00799	N	N	N	03/08/2013	16		DUBARCO RD	INTER	CROSS	N	CLR	ANGL-OTH	01	NONE	0	STRGHT	S - H	01	DRVR	NONE	25	M	OR-Y	OR-25	000	000	00	02	
N							EAGLE CRK SANDY HT	CH	0	STOP	SIGN	N	DRY	ANGL															
N							017200100500	01	0																				
							48.3873867																						
01347	N	N	N	04/21/2013	16		DUBARCO RD	INTER	CROSS	N	CLR	ANGL-OTH	01	NONE	0	STRGHT	S - H	01	DRVR	NONE	34	M	OR-Y	OR-25	000	000	00	02	
N							EAGLE CRK SANDY HT	CH	0	STOP	SIGN	N	DRY	ANGL															
N							017200100500	04	0																				
							48.3873867																						

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
URBAN NON-STEEN CRASH LISTING  
DUBARNO RD at EAGLE CRK SANDY ST, City of Sandy, Clatsamas County, 01/01/2012 to 12/31/2016

16 - 19 of 28 Crash records above

SRV	P	R	E	M	DATE	CLASS	CITY STREET	RD CHAR	INT. TYPE	OFFRD	MTR	CRASH	SECL	USE	TRLA	OTY	MOVE	FROM	TO	STRAIGHT	02	PSNG	INJC	05	P	A	S	CAUSE		
ID	DPT	E	L	G	H	A	DIRCT	LOC	UBANS	LECS	TRAF	DRWG	LIGHT	SURTY	DRY	DAY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
LOC	C	B	L	K	LAT	LONG	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	LOC	
02342	N	H	H	N	07/01/2013	16	DUBARNO RD	INTER	CROSS	N	STOP	SIGN	N	CLD	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
							EAGLE CRK SANDY HY	CH																						
							04																							
							017200100500																							
							48.387348																							
04702	N	H	H	N	12/06/2013	16	DUBARNO RD	INTER	CROSS	N	YIELD		N	CLD	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
							EAGLE CRK SANDY HY	CH																						
							01																							
							017200100500																							
							48.387348																							
04837	N	H	N	N	01/25/2014	16	DUBARNO RD	INTER	CROSS	N	STOP	SIGN	N	CLD	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
							EAGLE CRK SANDY HY	CH																						
							03																							
							017200100500																							
							48.3875559																							
00972	N	H	N	N	03/09/2014	16	DUBARNO RD	INTER	CROSS	N	STOP	SIGN	N	CLD	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
							EAGLE CRK SANDY HY	CH																						
							03																							
							017200100500																							
							48.3875559																							

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OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 URBAN HON SYSTEM CRASH LISTING  
**DUBARKO RD at EAGLE CRK SANDY HT, City of Sandy, Clatsamas County, 01/01/2012 to 12/31/2014**  
 20 - 24 of 28 Crash records shown.

CDS380  
 06/06/2018

CITY OF SANDY, CLATSAMAS COUNTY

SR	P	H	S	M	D	CLASS	CITY STREET	RD CHAR	JMT TYPE	INT	OFFRD	WTHR	CFASH	SRCL USE	MOVE	PRFC	INJ	G	E	L	RES	LOC	ERROR	ACT	EVENT	CAUSE	
INVEST	B	A	U	C	DAY	DIST	FIRST STREET	DIRECT	(MEDIAN)	INT	RD	DRY	CLR	ANGL-OTH	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
RD DPT	E	L	G	H	R	TIME	SECOND STREET	LOC	LEGS	TRAF	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
UNLOC7	D	C	S	L	K	LAT	LONG	LOC	(LANES)	CONTR	LOC	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY	
04884	N	H	N	N	11/18/2014	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	01	DRVR	NONE	61	F	OR-Y	OR-25	000	000	00	
N					TU		EAGLE CRK SANDY HY	CH	STOP SIGN	N	N	DRY	ANGL	PRVTE	N	S											
N					45 23 22.76	-122 15 48.39	017200100500	01	0	0	N	DLIT	POD	PSNGR CAR													
04952	N	H	N	N	11/22/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE	0	01	DRVR	NONE	38	M	OR-Y	OR-25	015	000	00	
N					SU		EAGLE CRK SANDY HY	CH	STOP SIGN	N	N	DRY	TURN	PRVTE	N	NE											
N					45 23 22.76	-122 15 48.39	017200100500	03	0	0	N	DAY	INJ	PSNGR CAR													
05614	N	H	N	N	12/25/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE	0	01	DRVR	NONE	41	M	OR-Y	OR-25	000	000	00	
N					FR		EAGLE CRK SANDY HY	CH	STOP SIGN	N	N	WET	ANGL	PRVTE	N	S											
N					45 23 22.76	-122 15 48.39	017200100500	01	0	0	N	DLIT	INJ	PSNGR CAR													
02172	N	H	N	N	06/05/2015	16	DUBARKO RD	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	01	DRVR	NONE	29	M	OR-Y	OR-25	000	000	00	
N					FR		EAGLE CRK SANDY HY	CH	STOP SIGN	N	N	DRY	TURN	PRVTE	N	S											
N					45 23 22.76	-122 15 48.39	017200100500	04	0	0	N	DAY	POD	PSNGR CAR													

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OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

DUBARRO RD at EAGLE CRK-SANDY HY, City of Sandy, Clackamas County, 01/01/2013 to 12/31/2016

URBAN NON-SYSTEM CRASH LISTING  
25 - 28 of 28 Crash records shown

SER#	P	R	S	M	D	CLASS	CITY STREET	RD CHAR	INT. TYPE	OFFRD	MTHR	CRASH	SECL USE	ACT. EVENT	CAUSE																														
INVEST	E	A	C	O	D	DIST	FIRST STREET	DIRECT	(MEDIAN)	INT. BEL	RUBBY	SURP	COLL	ORNER	TALE	CTY	MOVE	P	TTC	I	J	C	P	E	L	I	C	N	S	P	E	X	R	E	S	LOC	ERROR	ACT. EVENT	CAUSE						
UNLOC'D	D	C	E	L	K	L	LONG	LOC'D	(LANES)	CONTR	DRVWY	LIGHT	SURTY	VA	TYPE	TO	PH	TYPE	SVETY	E	X	R	E	S	LOC	ERROR	ACT. EVENT	CAUSE																	
03599	N	N	N	N	H	09/05/2016	16 DUBARRO RD	INTER	CROSS	N	CLR	ANGL-OTH	01	NONE	0	STWGT	01	DRVR	INJC	77	M	OTH-Y	H	RES			015	00									02								
	N						EAGLE CRK SANDY HY	CH	STOP SIGN	N	DAY	ANGL		PRVTE	E	M									028		000	00																	
	N						017200100500							PSNGR CAR																															
						45 23 22 76 -122 15 48 39																																							
03967	N	N	N	N	H	09/30/2016	16 DUBARRO RD	INTER	CROSS	N	CLR	ANGL-OTH	01	NONE	0	STWGT	01	DRVR	INJC	61	F	OTH-Y	H	RES			015	00																	
	N						EAGLE CRK SANDY HY	CH	STOP SIGN	N	DAY	ANGL		PRVTE	M	E																													
	N						017200100500							PSNGR CAR																															
						45 23 22 76 -122 15 48 39																																							
02427	N	N	N	N	H	05/31/2016	16 DUBARRO RD	INTER	CROSS	N	CLR	ANGL-OTH	01	NONE	9	STWGT	01	DRVR	INJC	53	F	DR-Y	OR<25																						
	N						EAGLE CRK-SANDY HY	CH	STOP SIGN	H	UNK	ANGL	M/A		M	E																													
	N						017200100500							PSNGR CAR																															
						45 23 22 76 -122 15 48 39																																							
02031	N	N	N	N	H	05/16/2016	16 DUBARRO RD	INTER	CROSS	N	CLR	ANGL-OTH	01	NONE	9	STWGT	01	DRVR	INJC	53	F	DR-Y	OR<25																						
	N						EAGLE CRK-SANDY HY	CH	STOP SIGN	H	DAY	ANGL	M/A		M	E																													
	N						017200100500							PSNGR CAR																															
						45 23 22 76 -122 15 48 39																																							

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HCM 2010 TWSC  
1: Hwy 211 & SE Dubarko Road

06/07/2018

Intersection												
Int Delay, s/veh	5.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕	↕		↕	↕
Traffic Vol, veh/h	16	7	42	52	42	31	55	251	18	1	156	5
Future Vol, veh/h	16	7	42	52	42	31	55	251	18	1	156	5
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	1	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	120	-	-	-	-	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	14	14	14	5	5	5	5	5	5	10	10	10
Mvmt Flow	20	9	53	66	53	39	70	318	23	1	197	6

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	717	681	197	704	676	333	203	0	0	342	0	0
Stage 1	199	199	-	471	471	-	-	-	-	-	-	-
Stage 2	518	482	-	233	205	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.64	6.34	7.15	6.55	6.25	4.15	-	-	4.2	-	-
Critical Hdwy Stg 1	6.24	5.64	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.64	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4.126	3.426	3.545	4.045	3.345	2.245	-	-	2.29	-	-
Pot Cap-1 Maneuver	330	358	815	348	371	702	1351	-	-	1174	-	-
Stage 1	776	714	-	568	554	-	-	-	-	-	-	-
Stage 2	519	534	-	763	726	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	261	334	815	303	347	700	1351	-	-	1173	-	-
Mov Cap-2 Maneuver	261	334	-	303	347	-	-	-	-	-	-	-
Stage 1	726	713	-	531	518	-	-	-	-	-	-	-
Stage 2	411	499	-	704	725	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	19.6	1.3	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1351	-	-	280	815	321	700	1173	-	-
HCM Lane V/C Ratio	0.052	-	-	0.104	0.065	0.371	0.056	0.001	-	-
HCM Control Delay (s)	7.8	0	-	19.3	9.7	22.7	10.4	8.1	0	-
HCM Lane LOS	A	A	-	C	A	C	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.3	0.2	1.7	0.2	0	-	-

HCM 2010 TWSC  
 2: SE Jacoby Road & SE Dubarko Road

06/07/2018

Intersection						
Int Delay, s/veh	2.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↕	↕	
Traffic Vol, veh/h	21	17	6	96	37	11
Future Vol, veh/h	21	17	6	96	37	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	13	13	7	7	17	17
Mvmt Flow	28	23	8	128	49	15

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	51	0	184
Stage 1	-	-	-	-	40
Stage 2	-	-	-	-	144
Critical Hdwy	-	-	4.17	-	6.57
Critical Hdwy Stg 1	-	-	-	-	5.57
Critical Hdwy Stg 2	-	-	-	-	5.57
Follow-up Hdwy	-	-	2.263	-	3.653
Pot Cap-1 Maneuver	-	-	1524	-	772
Stage 1	-	-	-	-	945
Stage 2	-	-	-	-	848
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1524	-	767
Mov Cap-2 Maneuver	-	-	-	-	767
Stage 1	-	-	-	-	939
Stage 2	-	-	-	-	848

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	809	-	-	1524	-
HCM Lane V/C Ratio	0.079	-	-	0.005	-
HCM Control Delay (s)	9.8	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

HCM 2010 TWSC  
4: SE Jacoby Road & Newton Street

06/07/2018

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			4	4	
Traffic Vol, veh/h	6	0	0	15	5	3
Future Vol, veh/h	6	0	0	15	5	3
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	56	56	56	56	56	56
Heavy Vehicles, %	33	33	13	13	0	0
Mvmt Flow	11	0	0	27	9	5

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	41	14	16	0	0
Stage 1	14	-	-	-	-
Stage 2	27	-	-	-	-
Critical Hdwy	6.73	6.53	4.23	-	-
Critical Hdwy Stg 1	5.73	-	-	-	-
Critical Hdwy Stg 2	5.73	-	-	-	-
Follow-up Hdwy	3.797	3.597	2.317	-	-
Pot Cap-1 Maneuver	897	983	1533	-	-
Stage 1	934	-	-	-	-
Stage 2	921	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	893	981	1530	-	-
Mov Cap-2 Maneuver	893	-	-	-	-
Stage 1	932	-	-	-	-
Stage 2	919	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1530	-	893	-	-
HCM Lane V/C Ratio	-	-	0.012	-	-
HCM Control Delay (s)	0	-	9.1	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



HCM 2010 TWSC  
1: Hwy 211 & SE Dubarko Road

06/07/2018

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕			↕	↕
Traffic Vol, veh/h	6	51	66	26	32	33	64	230	60	11	271	12
Future Vol, veh/h	6	51	66	26	32	33	64	230	60	11	271	12
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	120	-	-	-	-	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	3	3	3
Mvmt Flow	7	56	73	29	35	36	70	253	66	12	298	13
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	785	782	299	819	762	286	312	0	0	319	0	0
Stage 1	323	323	-	426	426	-	-	-	-	-	-	-
Stage 2	462	459	-	393	336	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	311	327	743	295	336	755	1254	-	-	1235	-	-
Stage 1	691	652	-	608	588	-	-	-	-	-	-	-
Stage 2	582	568	-	634	644	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	254	301	742	215	309	755	1253	-	-	1235	-	-
Mov Cap-2 Maneuver	254	301	-	215	309	-	-	-	-	-	-	-
Stage 1	643	644	-	567	548	-	-	-	-	-	-	-
Stage 2	483	529	-	516	636	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.1		18.6		1.5		0.3					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	1253	-	-	295	742	258	755	1235	-	-		
HCM Lane V/C Ratio	0.056	-	-	0.212	0.098	0.247	0.048	0.01	-	-		
HCM Control Delay (s)	8	0	-	20.5	10.4	23.5	10	7.9	0	-		
HCM Lane LOS	A	A	-	C	B	C	B	A	A	-		
HCM 95th %tile Q(veh)	0.2	-	-	0.8	0.3	0.9	0.2	0	-	-		

HCM 2010 TWSC  
 2: SE Jacoby Road & SE Dubarko Road

06/07/2018

Intersection						
Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔		↔	
Traffic Vol, veh/h	111	64	12	65	29	9
Future Vol, veh/h	111	64	12	65	29	9
Conflicting Peds, #/hr	0	0	0	0	1	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	1	1	3	3	3	3
Mvmt Flow	141	81	15	82	37	11
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	222	0	295	184
Stage 1	-	-	-	-	182	-
Stage 2	-	-	-	-	113	-
Critical Hdwy	-	-	4.13	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.227	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1341	-	694	856
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	909	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1341	-	685	854
Mov Cap-2 Maneuver	-	-	-	-	685	-
Stage 1	-	-	-	-	837	-
Stage 2	-	-	-	-	908	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	1.2	10.4			
HCM LOS			B			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	719	-	-	1341	-	
HCM Lane V/C Ratio	0.067	-	-	0.011	-	
HCM Control Delay (s)	10.4	-	-	7.7	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 2010 TWSC  
 4: SE Jacoby Road & Newton Street

06/07/2018

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			+	+	
Traffic Vol, veh/h	10	0	0	11	14	25
Future Vol, veh/h	10	0	0	11	14	25
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	13	0	0	14	18	32

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	50	36	52	0	0
Stage 1	36	-	-	-	-
Stage 2	14	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	964	1042	1567	-	-
Stage 1	992	-	-	-	-
Stage 2	1014	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	960	1040	1564	-	-
Mov Cap-2 Maneuver	960	-	-	-	-
Stage 1	990	-	-	-	-
Stage 2	1012	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1564	-	960	-	-
HCM Lane V/C Ratio	-	-	0.013	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM 2010 TWSC  
1: Hwy 211 & SE Dubarko Road

06/07/2018

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗		↕			↖	↗
Traffic Vol, veh/h	17	7	47	56	45	33	66	289	22	1	173	5
Future Vol, veh/h	17	7	47	56	45	33	66	289	22	1	173	5
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	2	2	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	120	-	-	-	-	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	14	14	14	5	5	5	5	5	5	10	10	10
Mvmt Flow	22	9	59	71	57	42	84	366	28	1	219	6

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	821	785	219	808	777	384	225	0	0	396	0	0
Stage 1	221	221	-	550	550	-	-	-	-	-	-	-
Stage 2	600	564	-	258	227	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.64	6.34	7.15	6.55	6.25	4.15	-	-	4.2	-	-
Critical Hdwy Stg 1	6.24	5.64	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.64	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4.126	3.426	3.545	4.045	3.345	2.245	-	-	2.29	-	-
Pot Cap-1 Maneuver	280	311	792	296	325	657	1326	-	-	1120	-	-
Stage 1	755	699	-	514	511	-	-	-	-	-	-	-
Stage 2	468	490	-	740	711	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	210	285	792	250	298	654	1326	-	-	1118	-	-
Mov Cap-2 Maneuver	210	285	-	250	298	-	-	-	-	-	-	-
Stage 1	694	698	-	471	469	-	-	-	-	-	-	-
Stage 2	353	449	-	675	710	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.4	25.2	1.4	0
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1326	-	-	227	792	269	654	1118	-	-
HCM Lane V/C Ratio	0.063	-	-	0.134	0.075	0.475	0.064	0.001	-	-
HCM Control Delay (s)	7.9	0	-	23.3	9.9	29.9	10.9	8.2	0	-
HCM Lane LOS	A	A	-	C	A	D	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.2	2.4	0.2	0	-	-

HCM 2010 TWSC  
 2: SE Jacoby Road & SE Dubarko Road

06/07/2018

Intersection						
Int Delay, s/veh	2.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	25	18	6	101	38	11
Future Vol, veh/h	25	18	6	101	38	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	13	13	7	7	17	17
Mvmt Flow	33	24	8	135	51	15

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	57	0	196
Stage 1	-	-	-	-	45
Stage 2	-	-	-	-	151
Critical Hdwy	-	-	4.17	-	6.57
Critical Hdwy Stg 1	-	-	-	-	5.57
Critical Hdwy Stg 2	-	-	-	-	5.57
Follow-up Hdwy	-	-	2.263	-	3.653
Pot Cap-1 Maneuver	-	-	1516	-	760
Stage 1	-	-	-	-	940
Stage 2	-	-	-	-	841
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1516	-	755
Mov Cap-2 Maneuver	-	-	-	-	755
Stage 1	-	-	-	-	934
Stage 2	-	-	-	-	841

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	797	-	-	1516	-
HCM Lane V/C Ratio	0.082	-	-	0.005	-
HCM Control Delay (s)	9.9	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

HCM 2010 TWSC  
 3: SE Jacoby Road & Street B

06/07/2018

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		P			P
Traffic Vol, veh/h	0	0	22	0	0	8
Future Vol, veh/h	0	0	22	0	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	24	0	0	9

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	33	24	0	0	24
Stage 1	24	-	-	-	-
Stage 2	9	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	980	1052	-	-	1591
Stage 1	999	-	-	-	-
Stage 2	1014	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	980	1052	-	-	1591
Mov Cap-2 Maneuver	980	-	-	-	-
Stage 1	999	-	-	-	-
Stage 2	1014	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1591	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	-

HCM 2010 TWSC  
4: SE Jacoby Road & Newton Street

06/07/2018

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		+			+			+			+	
Traffic Vol, veh/h	6	0	0	0	0	0	0	16	0	0	5	3
Future Vol, veh/h	6	0	0	0	0	0	0	16	0	0	5	3
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	56	56	56	56	56	56	56	56	56	56	56	56
Heavy Vehicles, %	33	33	33	0	0	0	13	13	13	0	0	0
Mvmt Flow	11	0	0	0	0	0	0	29	0	0	9	5

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	43	43	14	41	45	29	16	0	0	29	0	0
Stage 1	14	14	-	29	29	-	-	-	-	-	-	-
Stage 2	29	29	-	12	16	-	-	-	-	-	-	-
Critical Hdwy	7.43	6.83	6.53	7.1	6.5	6.2	4.23	-	-	4.1	-	-
Critical Hdwy Stg 1	6.43	5.83	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.43	5.83	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.797	4.297	3.597	3.5	4	3.3	2.317	-	-	2.2	-	-
Pot Cap-1 Maneuver	887	792	983	968	851	1052	1533	-	-	1597	-	-
Stage 1	932	826	-	993	875	-	-	-	-	-	-	-
Stage 2	914	813	-	1014	886	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	885	790	981	968	849	1052	1530	-	-	1597	-	-
Mov Cap-2 Maneuver	885	790	-	968	849	-	-	-	-	-	-	-
Stage 1	930	824	-	993	875	-	-	-	-	-	-	-
Stage 2	914	813	-	1014	884	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.1	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1530	-	-	885	-	1597	-	-
HCM Lane V/C Ratio	-	-	-	0.012	-	-	-	-
HCM Control Delay (s)	0	-	-	9.1	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

HCM 2010 TWSC  
1: Hwy 211 & SE Dubarko Road

06/07/2018

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔	↔		↔			↔	↔
Traffic Vol, veh/h	6	54	77	32	34	35	71	260	66	12	314	13
Future Vol, veh/h	6	54	77	32	34	35	71	260	66	12	314	13
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	120	-	-	-	-	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	3	3	3
Mvmt Flow	7	59	85	35	37	38	78	286	73	13	345	14

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	888	887	346	929	865	323	360	0	0	359	0	0
Stage 1	372	372	-	479	479	-	-	-	-	-	-	-
Stage 2	516	515	-	450	386	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	265	284	699	249	293	720	1204	-	-	1194	-	-
Stage 1	651	621	-	570	557	-	-	-	-	-	-	-
Stage 2	544	536	-	590	612	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	208	257	698	167	265	720	1203	-	-	1194	-	-
Mov Cap-2 Maneuver	208	257	-	167	265	-	-	-	-	-	-	-
Stage 1	597	612	-	523	511	-	-	-	-	-	-	-
Stage 2	438	492	-	462	603	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	16.8		24.3		1.5		0.3	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1203	-	-	251	698	206	720	1194	-	-
HCM Lane V/C Ratio	0.065	-	-	0.263	0.121	0.352	0.053	0.011	-	-
HCM Control Delay (s)	8.2	0	-	24.4	10.9	31.7	10.3	8	0	-
HCM Lane LOS	A	A	-	C	B	D	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1	0.4	1.5	0.2	0	-	-



HCM 2010 TWSC  
 2: SE Jacoby Road & SE Dubarko Road

06/07/2018

Intersection						
Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	T			T	T	
Traffic Vol, veh/h	117	67	12	72	30	9
Future Vol, veh/h	117	67	12	72	30	9
Conflicting Peds, #/hr	0	0	0	0	1	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	1	1	3	3	3	3
Mvmt Flow	148	85	15	91	38	11

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	233	0	313
Stage 1	-	-	-	-	191
Stage 2	-	-	-	-	122
Critical Hdwy	-	-	4.13	-	6.43
Critical Hdwy Stg 1	-	-	-	-	5.43
Critical Hdwy Stg 2	-	-	-	-	5.43
Follow-up Hdwy	-	-	2.227	-	3.527
Pot Cap-1 Maneuver	-	-	1329	-	678
Stage 1	-	-	-	-	839
Stage 2	-	-	-	-	901
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1329	-	669
Mov Cap-2 Maneuver	-	-	-	-	669
Stage 1	-	-	-	-	829
Stage 2	-	-	-	-	900

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	703	-	-	1329	-
HCM Lane V/C Ratio	0.07	-	-	0.011	-
HCM Control Delay (s)	10.5	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

HCM 2010 TWSC  
 3: SE Jacoby Road & Street B

06/07/2018

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	0	21	0	0	41
Future Vol, veh/h	0	0	21	0	0	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	23	0	0	45

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	68	23	0	0	23
Stage 1	23	-	-	-	-
Stage 2	45	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	937	1054	-	-	1592
Stage 1	1000	-	-	-	-
Stage 2	977	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	937	1054	-	-	1592
Mov Cap-2 Maneuver	937	-	-	-	-
Stage 1	1000	-	-	-	-
Stage 2	977	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1592	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	-

HCM 2010 TWSC  
4: SE Jacoby Road & Newton Street

06/07/2018

Intersection												
Int Delay, s/veh	1.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	10	0	0	0	0	0	0	11	0	0	15	26
Future Vol, veh/h	10	0	0	0	0	0	0	11	0	0	15	26
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	0	2	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	13	0	0	0	0	0	0	14	0	0	19	33

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	52	52	38	50	68	14	54	0	0	14	0	0
Stage 1	38	38	-	14	14	-	-	-	-	-	-	-
Stage 2	14	14	-	36	54	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.52	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.52	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	952	839	1040	955	826	1072	1564	-	-	1617	-	-
Stage 1	982	863	-	1011	888	-	-	-	-	-	-	-
Stage 2	1011	884	-	985	854	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	950	837	1038	955	824	1072	1561	-	-	1617	-	-
Mov Cap-2 Maneuver	950	837	-	955	824	-	-	-	-	-	-	-
Stage 1	980	861	-	1011	888	-	-	-	-	-	-	-
Stage 2	1011	884	-	985	852	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	8.8	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1561	-	-	950	-	1617	-	-
HCM Lane V/C Ratio	-	-	-	0.013	-	-	-	-
HCM Control Delay (s)	0	-	-	8.8	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0	-	0	-	-

HCM 2010 TWSC  
1: Hwy 211 & SE Dubarko Road

06/07/2018

Intersection												
Int Delay, s/veh	7.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕	↕		↕	↕
Traffic Vol, veh/h	17	9	47	61	49	37	66	289	24	2	173	5
Future Vol, veh/h	17	9	47	61	49	37	66	289	24	2	173	5
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	120	-	-	-	-	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	14	14	14	5	5	5	5	5	5	10	10	10
Mvmt Flow	22	11	59	77	62	47	84	366	30	3	219	6

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	830	790	220	812	781	381	226	0	0	396	0	0
Stage 1	226	226	-	549	549	-	-	-	-	-	-	-
Stage 2	604	564	-	263	232	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.64	6.34	7.15	6.55	6.25	4.15	-	-	4.2	-	-
Critical Hdwy Stg 1	6.24	5.64	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.64	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4.126	3.426	3.545	4.045	3.345	2.245	-	-	2.29	-	-
Pot Cap-1 Maneuver	276	309	791	294	323	660	1325	-	-	1120	-	-
Stage 1	750	695	-	515	512	-	-	-	-	-	-	-
Stage 2	465	490	-	736	707	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	201	282	790	246	295	660	1324	-	-	1120	-	-
Mov Cap-2 Maneuver	201	282	-	246	295	-	-	-	-	-	-	-
Stage 1	688	692	-	473	470	-	-	-	-	-	-	-
Stage 2	344	450	-	667	704	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.9	27.1	1.4	0.1
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1324	-	-	223	790	266	660	1120	-	-
HCM Lane V/C Ratio	0.063	-	-	0.148	0.075	0.523	0.071	0.002	-	-
HCM Control Delay (s)	7.9	0	-	23.9	9.9	32.5	10.9	8.2	0	-
HCM Lane LOS	A	A	-	C	A	D	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.2	2.8	0.2	0	-	-

HCM 2010 TWSC  
 2: SE Jacoby Road & SE Dubarko Road

06/07/2018

Intersection						
Int Delay, s/veh	3.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	T			T	T	
Traffic Vol, veh/h	25	23	7	101	51	15
Future Vol, veh/h	25	23	7	101	51	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	13	13	7	7	17	17
Mvmt Flow	33	31	9	135	68	20

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	64	0	202
Stage 1	-	-	-	-	49
Stage 2	-	-	-	-	153
Critical Hdwy	-	-	4.17	-	6.57
Critical Hdwy Stg 1	-	-	-	-	5.57
Critical Hdwy Stg 2	-	-	-	-	5.57
Follow-up Hdwy	-	-	2.263	-	3.653
Pot Cap-1 Maneuver	-	-	1507	-	754
Stage 1	-	-	-	-	936
Stage 2	-	-	-	-	840
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1507	-	749
Mov Cap-2 Maneuver	-	-	-	-	749
Stage 1	-	-	-	-	930
Stage 2	-	-	-	-	840

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	10.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	791	-	-	1507	-
HCM Lane V/C Ratio	0.111	-	-	0.006	-
HCM Control Delay (s)	10.1	-	-	7.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0	-

HCM 2010 TWSC  
 3: SE Jacoby Road & Street B

06/07/2018

Intersection						
Int Delay, s/veh	2.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	11	28	0	4	10
Future Vol, veh/h	0	11	28	0	4	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	30	0	4	11

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	49	30	0	0	30
Stage 1	30	-	-	-	-
Stage 2	19	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	960	1044	-	-	1583
Stage 1	993	-	-	-	-
Stage 2	1004	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	957	1044	-	-	1583
Mov Cap-2 Maneuver	957	-	-	-	-
Stage 1	990	-	-	-	-
Stage 2	1004	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	2.1
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1044	1583
HCM Lane V/C Ratio	-	-	0.011	0.003
HCM Control Delay (s)	-	-	8.5	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 2010 TWSC  
4: SE Jacoby Road & Newton Street

06/07/2018

Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	6	0	0	0	0	6	0	16	0	2	5	3
Future Vol, veh/h	6	0	0	0	0	6	0	16	0	2	5	3
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	56	56	56	56	56	56	56	56	56	56	56	56
Heavy Vehicles, %	33	33	33	0	0	0	13	13	13	0	0	0
Mvmt Flow	11	0	0	0	0	11	0	29	0	4	9	5

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	57	51	14	49	53	29	16	0	0	29	0	0
Stage 1	22	22	-	29	29	-	-	-	-	-	-	-
Stage 2	35	29	-	20	24	-	-	-	-	-	-	-
Critical Hdwy	7.43	6.83	6.53	7.1	6.5	6.2	4.23	-	-	4.1	-	-
Critical Hdwy Stg 1	6.43	5.83	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.43	5.83	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.797	4.297	3.597	3.5	4	3.3	2.317	-	-	2.2	-	-
Pot Cap-1 Maneuver	868	784	983	956	842	1052	1533	-	-	1597	-	-
Stage 1	922	819	-	993	875	-	-	-	-	-	-	-
Stage 2	907	813	-	1004	879	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	856	780	981	954	838	1052	1530	-	-	1597	-	-
Mov Cap-2 Maneuver	856	780	-	954	838	-	-	-	-	-	-	-
Stage 1	920	815	-	993	875	-	-	-	-	-	-	-
Stage 2	898	813	-	1001	875	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	8.5	0	1.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1530	-	-	856	1052	1597	-	-
HCM Lane V/C Ratio	-	-	-	0.013	0.01	0.002	-	-
HCM Control Delay (s)	0	-	-	9.3	8.5	7.3	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

HCM 2010 TWSC  
1: Hwy 211 & SE Dubarko Road

06/07/2018

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕	↕		↕	↕
Traffic Vol, veh/h	6	59	77	36	37	37	71	260	71	16	314	13
Future Vol, veh/h	6	59	77	36	37	37	71	260	71	16	314	13
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	120	-	-	-	-	-	350
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	3	3	3
Mvmt Flow	6	63	83	39	40	40	76	280	76	17	338	14

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	883	881	339	922	857	318	353	0	0	356	0	0
Stage 1	373	373	-	470	470	-	-	-	-	-	-	-
Stage 2	510	508	-	452	387	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.13	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.227	-	-
Pot Cap-1 Maneuver	267	287	706	252	296	725	1211	-	-	1197	-	-
Stage 1	650	620	-	576	562	-	-	-	-	-	-	-
Stage 2	548	540	-	589	611	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	207	259	705	168	268	725	1210	-	-	1197	-	-
Mov Cap-2 Maneuver	207	259	-	168	268	-	-	-	-	-	-	-
Stage 1	598	608	-	530	518	-	-	-	-	-	-	-
Stage 2	440	497	-	457	599	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.1	25.1	1.4	0.4
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1210	-	-	253	705	207	725	1197	-	-
HCM Lane V/C Ratio	0.063	-	-	0.276	0.117	0.379	0.055	0.014	-	-
HCM Control Delay (s)	8.2	0	-	24.6	10.8	32.6	10.3	8.1	0	-
HCM Lane LOS	A	A	-	C	B	D	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.1	0.4	1.7	0.2	0	-	-



HCM 2010 TWSC  
 2: SE Jacoby Road & SE Dubarko Road

06/07/2018

Intersection						
Int Delay, s/veh	2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↕	↕	
Traffic Vol, veh/h	117	81	17	72	39	12
Future Vol, veh/h	117	81	17	72	39	12
Conflicting Peds, #/hr	0	0	0	0	1	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	1	1	3	3	3	3
Mvmt Flow	148	103	22	91	49	15

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	251	0	336
Stage 1	-	-	-	-	200
Stage 2	-	-	-	-	136
Critical Hdwy	-	-	4.13	-	6.43
Critical Hdwy Stg 1	-	-	-	-	5.43
Critical Hdwy Stg 2	-	-	-	-	5.43
Follow-up Hdwy	-	-	2.227	-	3.527
Pot Cap-1 Maneuver	-	-	1309	-	657
Stage 1	-	-	-	-	831
Stage 2	-	-	-	-	888
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1309	-	645
Mov Cap-2 Maneuver	-	-	-	-	645
Stage 1	-	-	-	-	816
Stage 2	-	-	-	-	887

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	10.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	681	-	-	1309	-
HCM Lane V/C Ratio	0.095	-	-	0.016	-
HCM Control Delay (s)	10.8	-	-	7.8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

HCM 2010 TWSC  
3: SE Jacoby Road & Street B

06/07/2018

Intersection						
Int Delay, s/veh	1.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	0	9	24	0	13	47
Future Vol, veh/h	0	9	24	0	13	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	10	26	0	14	51

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	105	26	0	0	26
Stage 1	26	-	-	-	-
Stage 2	79	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	893	1050	-	-	1588
Stage 1	997	-	-	-	-
Stage 2	944	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	885	1050	-	-	1588
Mov Cap-2 Maneuver	885	-	-	-	-
Stage 1	988	-	-	-	-
Stage 2	944	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	1.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1050	1588
HCM Lane V/C Ratio	-	-	0.009	0.009
HCM Control Delay (s)	-	-	8.5	7.3
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 2010 TWSC  
4: SE Jacoby Road & Newton Street

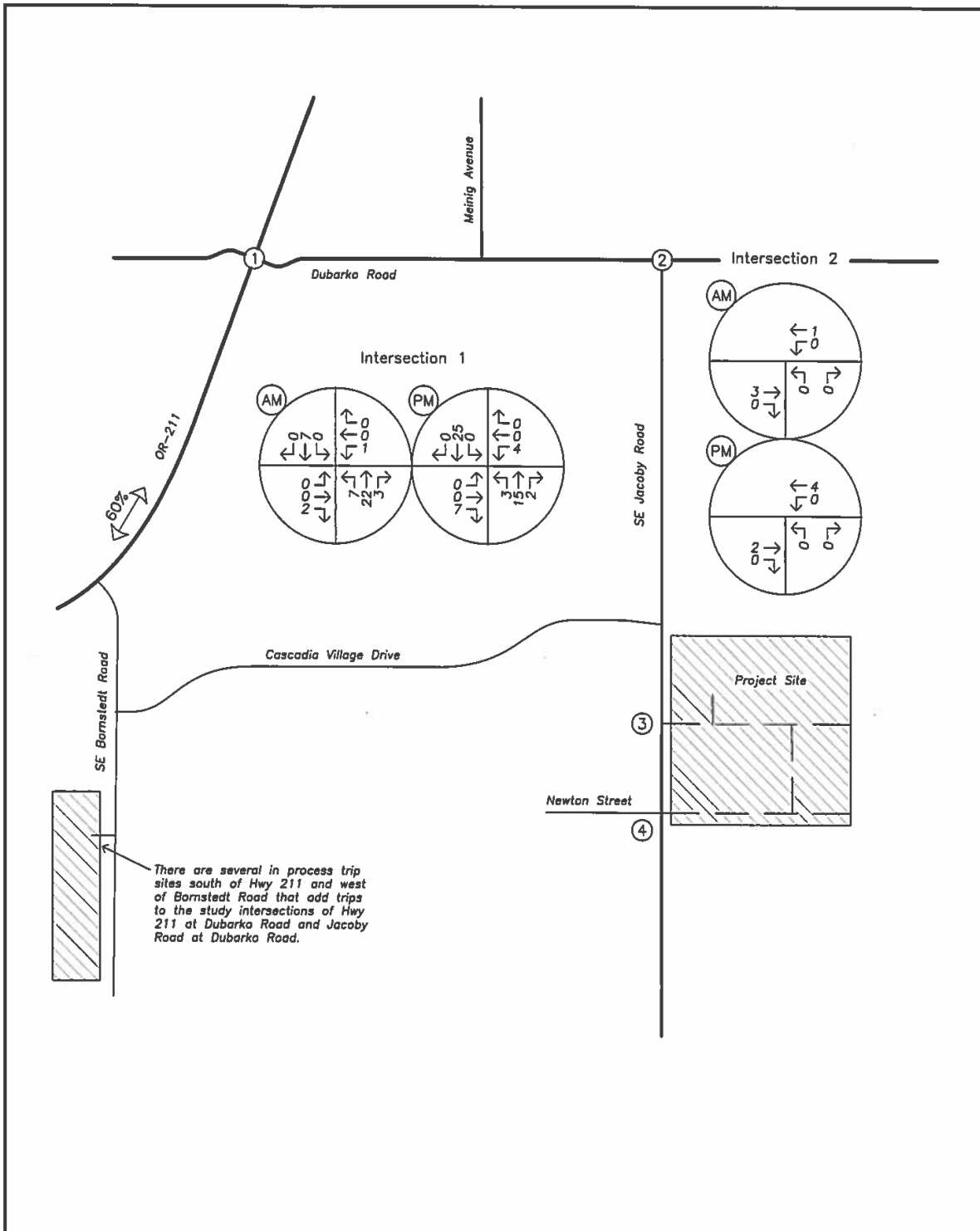
06/07/2018

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	10	0	0	0	0	6	0	11	0	6	15	26
Future Vol, veh/h	10	0	0	0	0	6	0	11	0	6	15	26
Conflicting Peds, #/hr	0	0	0	0	0	0	2	0	0	0	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	92	79	79	79	79	79	79
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	13	0	0	0	0	7	0	14	0	8	19	33

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	72	68	38	66	84	14	54	0	0	14	0	0
Stage 1	54	54	-	14	14	-	-	-	-	-	-	-
Stage 2	18	14	-	52	70	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	924	826	1040	932	810	1072	1564	-	-	1617	-	-
Stage 1	963	854	-	1011	888	-	-	-	-	-	-	-
Stage 2	1006	888	-	966	841	-	-	-	-	-	-	-
Platoon blocked, %												
Mov Cap-1 Maneuver	913	820	1038	928	804	1072	1561	-	-	1617	-	-
Mov Cap-2 Maneuver	913	820	-	928	804	-	-	-	-	-	-	-
Stage 1	961	848	-	1011	888	-	-	-	-	-	-	-
Stage 2	1000	888	-	961	835	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9	8.4	0	0.9
HCM LOS	A	A		

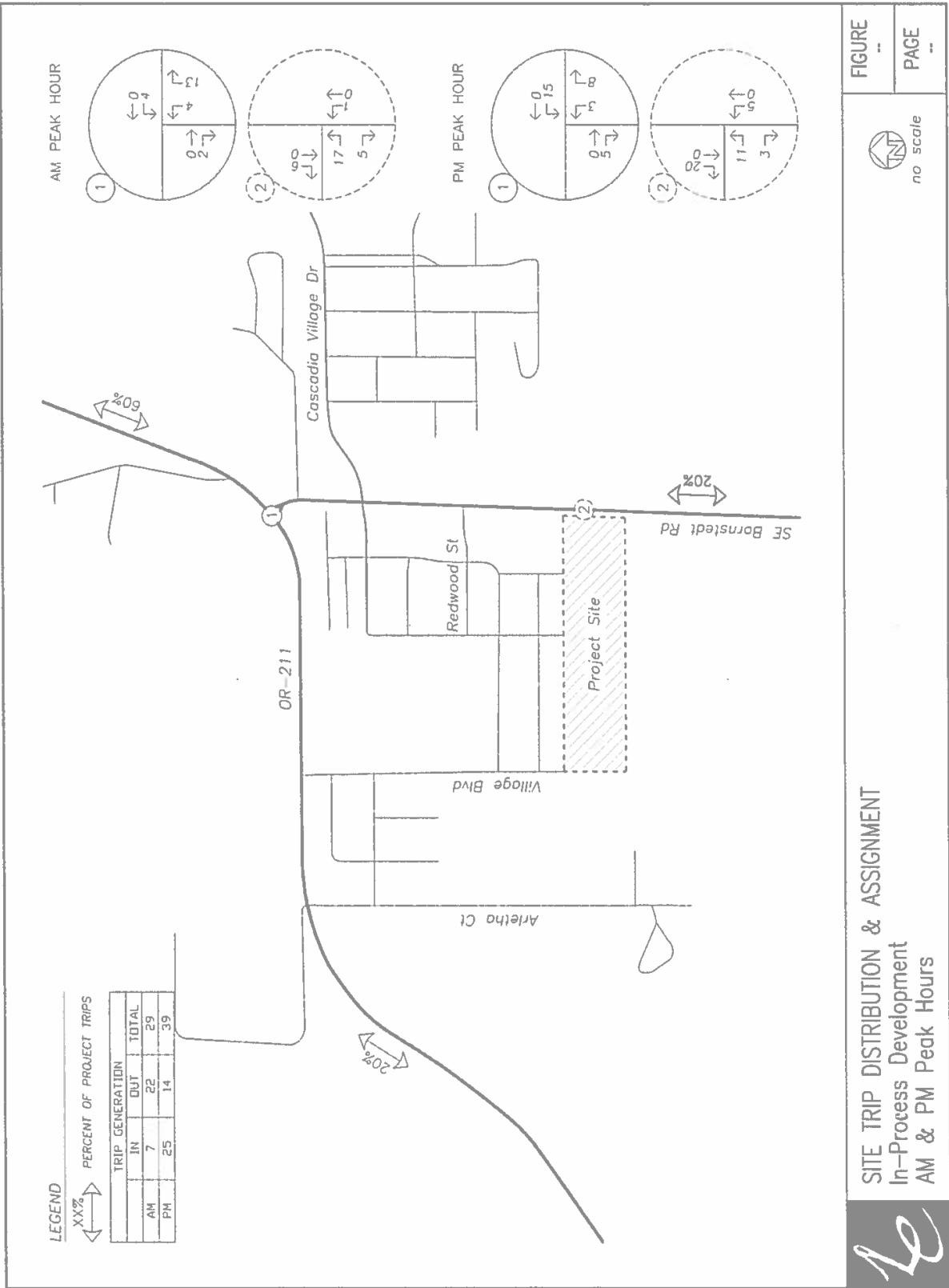
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1561	-	-	913	1072	1617	-	-
HCM Lane V/C Ratio	-	-	-	0.014	0.006	0.005	-	-
HCM Control Delay (s)	0	-	-	9	8.4	7.2	0	-
HCM Lane LOS	A	-	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-



**TRAFFIC VOLUMES**  
 Trip Generation and Distribution - In-Process  
 AM and PM Peak Hours

FIGURE A1  
 PAGE ---

no scale



**SITE TRIP DISTRIBUTION & ASSIGNMENT**  
 In-Process Development  
 AM & PM Peak Hours



1e

### TRIP GENERATION CALCULATIONS

*Land Use:* Single-Family Detached Housing  
*Land Use Code:* 210  
*Setting/Location:* General Urban/Suburban  
*Variable:* Dwelling Units  
*Variable Value:* 40

#### AM PEAK HOUR

*Trip Rate:* 0.74

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	8	22	30

#### PM PEAK HOUR

*Trip Rate:* 0.99

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	25	15	40

#### WEEKDAY

*Trip Rate:* 9.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	189	189	378

#### SATURDAY

*Trip Rate:* 9.54

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	191	191	382

Source: TRIP GENERATION, Tenth Edition

2e

### TRIP GENERATION CALCULATIONS

*Land Use:* Single-Family Detached Housing  
*Land Use Code:* 210  
*Setting/Location:* General Urban/Suburban  
*Variable:* Dwelling Units  
*Variable Value:* 5

#### AM PEAK HOUR

*Trip Rate:* 0.74

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	1	3	4

#### PM PEAK HOUR

*Trip Rate:* 0.99

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	3	2	5

#### WEEKDAY

*Trip Rate:* 9.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	24	24	48

#### SATURDAY

*Trip Rate:* 9.54

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	24	24	48

Source: TRIP GENERATION, Tenth Edition

1e

### TRIP GENERATION CALCULATIONS

*Land Use:* Single-Family Detached Housing  
*Land Use Code:* 210  
*Setting/Location:* General Urban/Suburban  
*Variable:* Dwelling Units  
*Variable Value:* 11

#### AM PEAK HOUR

*Trip Rate:* 0.74

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	2	6	8

#### PM PEAK HOUR

*Trip Rate:* 0.99

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	7	4	11

#### WEEKDAY

*Trip Rate:* 9.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	52	52	104

#### SATURDAY

*Trip Rate:* 9.54

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	52	52	104

Source: TRIP GENERATION, Tenth Edition



1e

### TRIP GENERATION CALCULATIONS

*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, Tenth Edition

2e

### TRIP GENERATION CALCULATIONS

*Land Use:* Single-Family Detached Housing  
*Land Use Code:* 210  
*Setting/Location:* General Urban/Suburban  
*Variable:* Dwelling Units  
*Variable Value:* 32

#### AM PEAK HOUR

*Trip Rate:* 0.74

	Enter	Exit	Total
Directional Distribution	25%	75%	
Trip Ends	6	18	24

#### PM PEAK HOUR

*Trip Rate:* 0.99

	Enter	Exit	Total
Directional Distribution	63%	37%	
Trip Ends	20	12	32

#### WEEKDAY

*Trip Rate:* 9.44

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	151	151	302

#### SATURDAY

*Trip Rate:* 9.54

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	153	153	306

Source: TRIP GENERATION, Tenth Edition

## Traffic Signal Warrant Analysis

Project: 18067 - SE Jacoby Road Subdivision  
 Date: 6/7/2018  
 Scenario: 2018 Existing Conditions

Major Street:	OR 211	Minor Street:	Dubarko Road
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	621	PM Peak Hour Volumes:	214

**Warrant Used:**

    X     100 percent of standard warrants used  
           70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
<u>Major St.</u>	<u>Minor St.</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>
<b>WARRANT 1, CONDITION A</b>					
		100%	70%	100%	70%
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<b>Warrant 1</b>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	6,210	8,850	
Minor Street*	2,140	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	6,210	13,300	
Minor Street*	2,140	1,350	No
<i>Combination Warrant</i>			
Major Street	6,210	10,640	
Minor Street*	2,140	2,120	No

\* Minor street right-turning traffic volumes reduced by 25%

## Traffic Signal Warrant Analysis

Le

Project: 18067 - SE Jacoby Road Subdivision  
 Date: 6/7/2018  
 Scenario: 2020 Background Conditions

Major Street:	OR 211	Minor Street:	Dubarko Road
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	719	PM Peak Hour Volumes:	252

**Warrant Used:**

    X     100 percent of standard warrants used  
           70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
<u>Major St.</u>	<u>Minor St.</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>
<b>WARRANT 1, CONDITION A</b>					
		100%	70%	100%	70%
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	7,190	8,850	
Minor Street*	2,520	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	7,190	13,300	
Minor Street*	2,520	1,350	No
<i>Combination Warrant</i>			
Major Street	7,190	10,640	
Minor Street*	2,520	2,120	No

\* Minor street right-turning traffic volumes reduced by 25%

## Traffic Signal Warrant Analysis

Le

Project: 18067 - SE Jacoby Road Subdivision  
 Date: 6/7/2018  
 Scenario: 2020 Background Conditions

Major Street:	OR 211	Minor Street:	Dubarko Road
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	710	PM Peak Hour Volumes:	238

**Warrant Used:**

    X     100 percent of standard warrants used  
           70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
<u>Major St.</u>	<u>Minor St.</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>	<u>Warrants</u>
<b>WARRANT 1, CONDITION A</b>					
		100%	70%	100%	70%
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<i>Warrant 1</i>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	7,100	8,850	
Minor Street*	2,380	2,650	No
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	7,100	13,300	
Minor Street*	2,380	1,350	No
<i>Combination Warrant</i>			
Major Street	7,100	10,640	
Minor Street*	2,380	2,120	No

\* Minor street right-turning traffic volumes reduced by 25%

## Left-Turn Lane Warrant Analysis

*le*

Project: 18076 - SE Jacoby Road TIS  
 Intersection: Dubarko Road at SE Jacoby Road  
 Date: 6/7/2018  
 Scenario: 2020 Total Traffic - AM

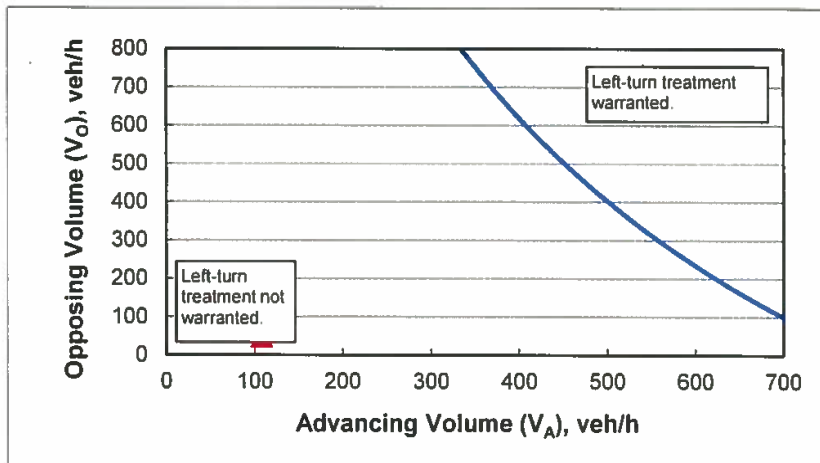
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	30
Left-turns in advancing volume ( $V_A$ ), veh/hr:	7
Advancing volume ( $V_A$ ), veh/h:	108
Opposing volume ( $V_O$ ), veh/h:	49

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	744
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
Left-turn treatment NOT warranted.	



#### CALIBRATION CONSTANTS (2-Lane Roadway)

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

*te*

Project: 18076 - SE Jacoby Road TIS  
 Intersection: Dubarko Road at SE Jacoby Road  
 Date: 6/7/2018  
 Scenario: 2020 Total Traffic - PM

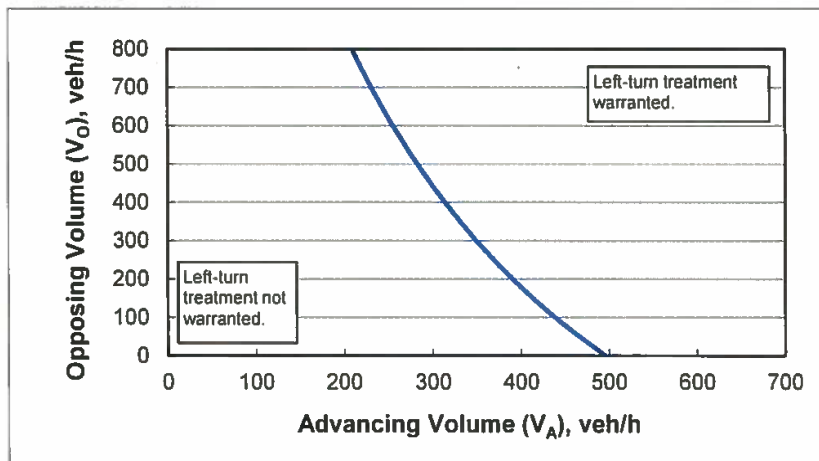
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	30
Left-turns in advancing volume ( $V_A$ ), veh/hr:	17
Advancing volume ( $V_A$ ), veh/h:	89
Opposing volume ( $V_O$ ), veh/h:	198

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	391
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS (2-Lane Roadway)

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

*le*

Project: 18076 - SE Jacoby Road TIS  
 Intersection: Newton Road at SE Jacoby Road  
 Date: 6/7/2018  
 Scenario: 2020 Total Traffic - AM

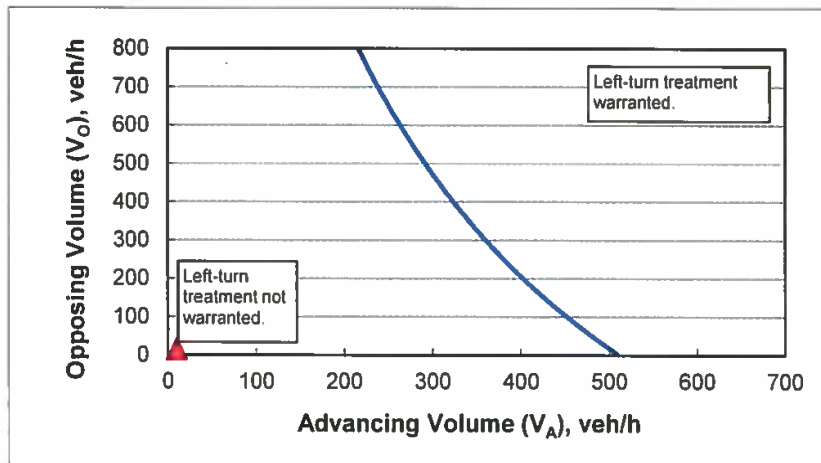
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Left-turns in advancing volume ( $V_A$ ), veh/hr:	2
Advancing volume ( $V_A$ ), veh/h:	10
Opposing volume ( $V_O$ ), veh/h:	16

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	500
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
Left-turn treatment NOT warranted.	



#### CALIBRATION CONSTANTS (2-Lane Roadway)

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

*te*

Project: 18076 - SE Jacoby Road TIS  
 Intersection: Newton Road at SE Jacoby Road  
 Date: 6/7/2018  
 Scenario: 2020 Total Traffic - PM

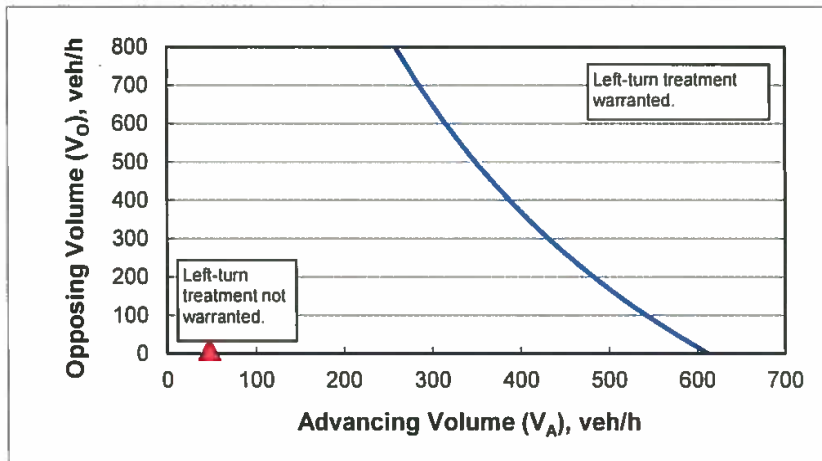
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Left-turns in advancing volume ( $V_A$ ), veh/hr:	6
Advancing volume ( $V_A$ ), veh/h:	47
Opposing volume ( $V_O$ ), veh/h:	11

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	603
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
Left-turn treatment NOT warranted.	



#### CALIBRATION CONSTANTS (2-Lane Roadway)

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

*le*

Project: 18076 - SE Jacoby Road TIS  
 Intersection: Street B at SE Jacoby Road  
 Date: 6/7/2018  
 Scenario: 2020 Total Traffic - AM

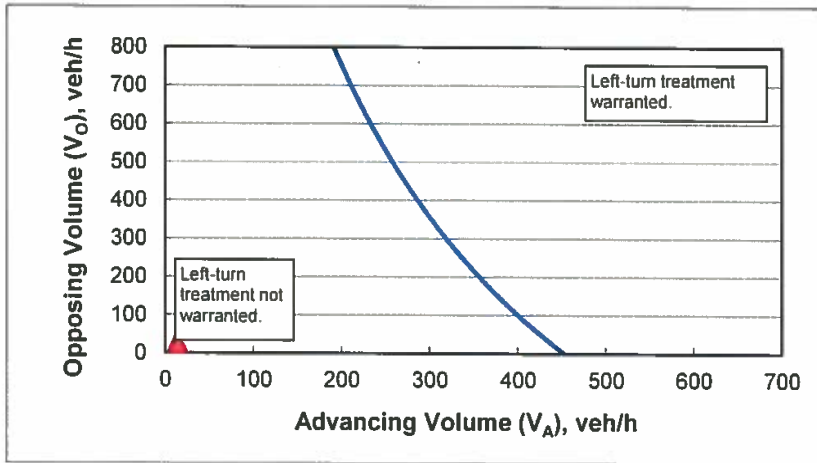
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Left-turns in advancing volume ( $V_A$ ), veh/hr:	4
Advancing volume ( $V_A$ ), veh/h:	14
Opposing volume ( $V_O$ ), veh/h:	28

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	436
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
Left-turn treatment NOT warranted.	



#### CALIBRATION CONSTANTS (2-Lane Roadway)

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

*le*

Project: 18076 - SE Jacoby Road TIS  
 Intersection: Street B at SE Jacoby Road  
 Date: 6/7/2018  
 Scenario: 2020 Total Traffic - PM

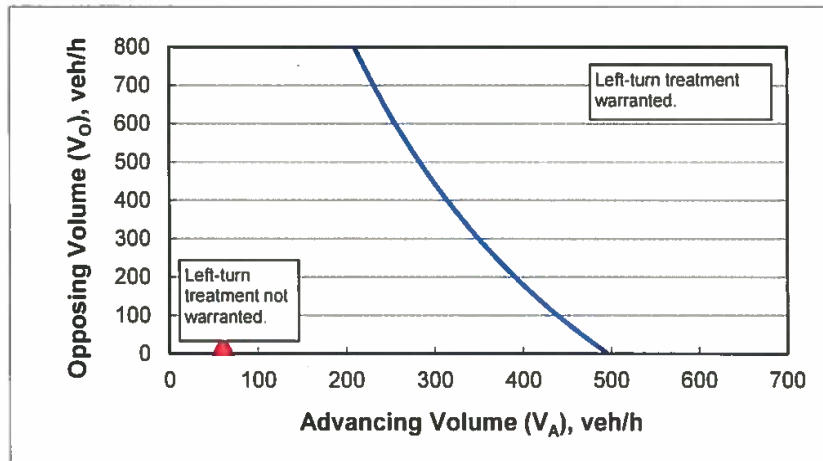
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Left-turns in advancing volume ( $V_A$ ), veh/hr:	13
Advancing volume ( $V_A$ ), veh/h:	60
Opposing volume ( $V_O$ ), veh/h:	24

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	481
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
Left-turn treatment NOT warranted.	



#### CALIBRATION CONSTANTS (2-Lane Roadway)

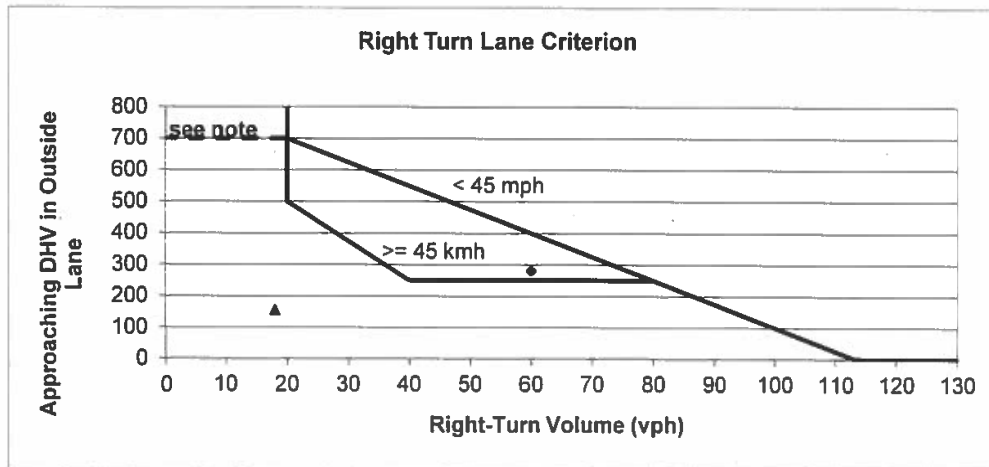
Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9



Project: 18067 - SE Jacoby Road Subdivision  
Date: 6/7/2018  
Scenario: 2018 Existing Conditions - 211 at Dubarko

Speed? 45 mph 72 kmh

AM Peak Hour		PM Peak Hour	
Right-Turn Volume	18	Right-Turn Volume	60
Approaching DHV	155	Approaching DHV	281
Lane Needed?	No	Lane Needed?	Yes



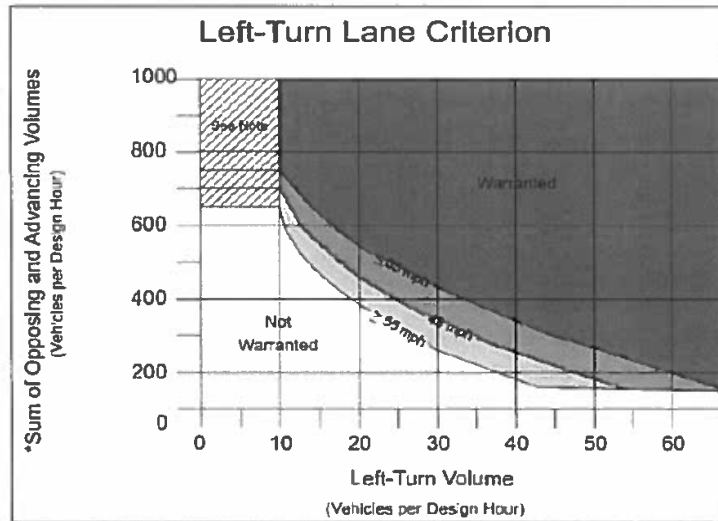
Note: If there is no right turn lane, a shoulder needs to be provided.  
If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.



Project: 13106 - Silverstone  
 Intersection: Nehalem Highway 47 at David Hill Road  
 Date: 6/7/2018  
 Scenario: 2020 Background

Speed? 50 mph

AM Peak Hour		PM Peak Hour	
Left-Turn Volume	90	Left-Turn Volume	69
Approaching DHV	326	Approaching DHV	349
# of Advancing Through Lanes	1	# of Advancing Through Lanes	1
Opposing DHV	304	Opposing DHV	485
# of Opposing Through Lanes	1	# of Opposing Through Lanes	1
<b>O+A DHV</b>	<b>630</b>	<b>O+A DHV</b>	<b>834</b>
Lane Needed?	Yes	Lane Needed?	Yes



Source: Oregon DOT Analysis Procedures Manual 2008

$$\begin{aligned}
 & *(\text{Advancing Vol} / \# \text{ of Advancing Through Lanes}) + \\
 & (\text{Opposing Vol} / \# \text{ of Opposing Through Lanes})
 \end{aligned}$$

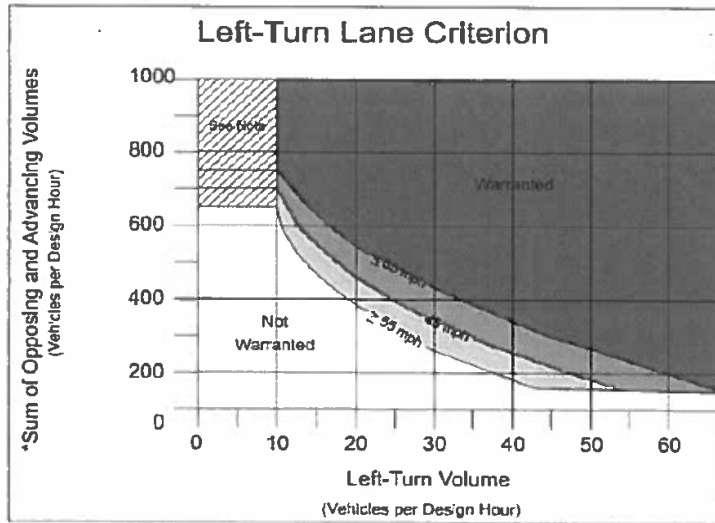
Note. The criterion is not met from zero to ten left turn vehicles per hour, but careful consideration should be given to installing a left turn lane due to the increased potential for accidents in the through lanes. While the turn volumes are low, the adverse safety and operational impacts may require installation of a left turn. The final determination will be based on a field study.



Project: 18067 - Jacoby Road Subdivision  
 Intersection: OR 211 at Dubarko Road  
 Date: 6/7/2018  
 Scenario: 2020 Background plus Site Trips

Speed? 45 mph

AM Peak Hour		PM Peak Hour	
Left-Turn Volume	66	Left-Turn Volume	71
Approaching DHV	367	Approaching DHV	390
# of Advancing Through Lanes	1	# of Advancing Through Lanes	1
Opposing DHV	173	Opposing DHV	329
# of Opposing Through Lanes	1	# of Opposing Through Lanes	1
<b>O+A DHV</b>	<b>540</b>	<b>O+A DHV</b>	<b>719</b>
Lane Needed?	Yes	Lane Needed?	Yes



Source: Oregon DOT Analysis Procedures Manual 2008

\*(Advancing Vol/ # of Advancing Through Lanes)+  
 (Opposing Vol/ # of Opposing Through Lanes)

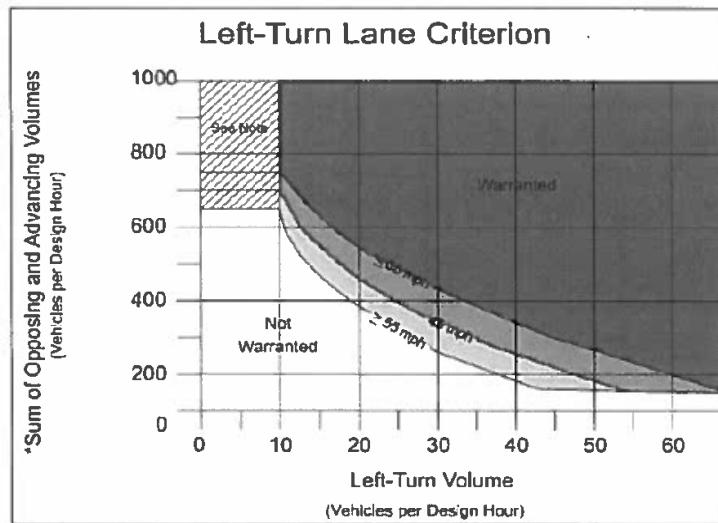
Note: The criterion is not met from zero to ten left turn vehicles per hour, but careful consideration should be given to installing a left turn lane due to the increased potential for accidents in the through lanes. While the turn volumes are low, the adverse safety and operational impacts may require installation of a left turn. The final determination will be based on a field study.



Project: 18067 - Jacoby Road Subdivision  
 Intersection: OR 211 at Dubarko Road  
 Date: 6/7/2018  
 Scenario: 2020 Background plus Site Trips

Speed? 45 mph

AM Peak Hour		PM Peak Hour	
Left-Turn Volume	2	Left-Turn Volume	16
Approaching DHV	173	Approaching DHV	329
# of Advancing Through Lanes	1	# of Advancing Through Lanes	1
Opposing DHV	367	Opposing DHV	390
# of Opposing Through Lanes	1	# of Opposing Through Lanes	1
<b>O+A DHV</b>	<b>540</b>	<b>O+A DHV</b>	<b>719</b>
Lane Needed?	No	Lane Needed?	Yes



Source: Oregon DOT Analysis Procedures Manual 2008

$$*(\text{Advancing Vol} / \# \text{ of Advancing Through Lanes}) + (\text{Opposing Vol} / \# \text{ of Opposing Through Lanes})$$

Note: The criterion is not met from zero to ten left turn vehicles per hour, but careful consideration should be given to installing a left turn lane due to the increased potential for accidents in the through lanes. While the turn volumes are low, the adverse safety and operational impacts may require installation of a left turn. The final determination will be based on a field study.





# JACOBY HEIGHTS SUBDIVISION

## 31-LOT SUBDIVISION

### PRELIMINARY PLAT MAP - OPTION B

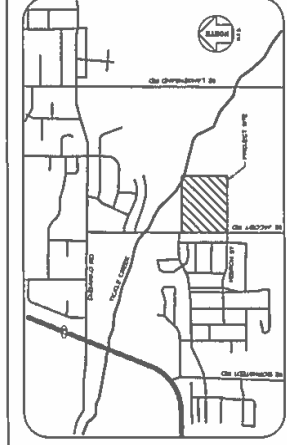
#### JUNE 2018



**JACOBY HEIGHTS SUBDIVISION**  
**PRELIMINARY PLAT MAP OPTION B**

PROJECT: 31-LOT SUBDIVISION, OPTION B  
 DATE: 06/01/2018  
 SCALE: AS SHOWN  
 SHEET NO. 2

PREPARED BY: [Firm Name]  
 CHECKED BY: [Firm Name]  
 APPROVED BY: [Firm Name]



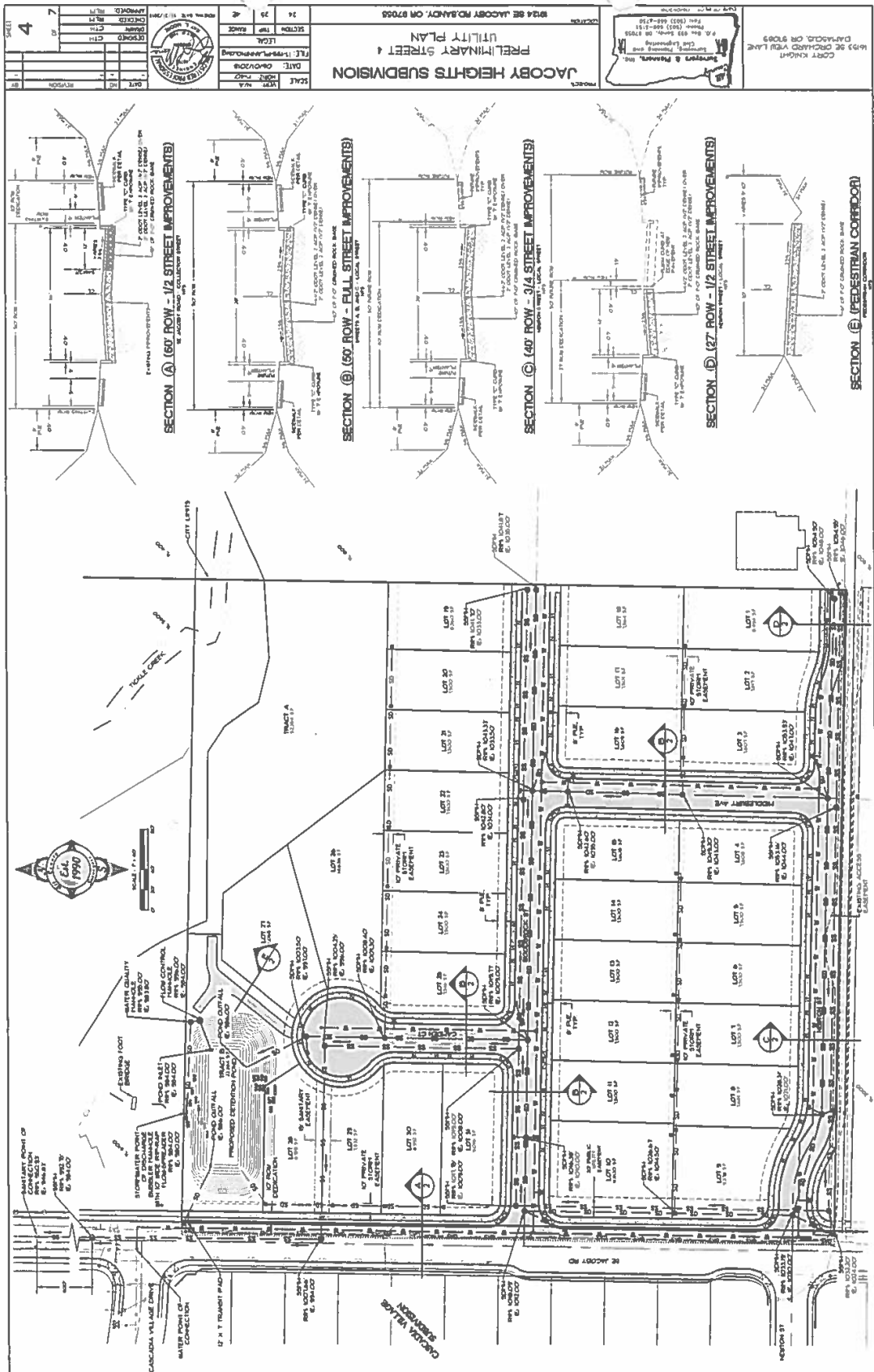
**LEGEND**

1	Lot 1 Line
2	Lot 2 Line
3	Lot 3 Line
4	Lot 4 Line
5	Lot 5 Line
6	Lot 6 Line
7	Lot 7 Line
8	Lot 8 Line
9	Lot 9 Line
10	Lot 10 Line
11	Lot 11 Line
12	Lot 12 Line
13	Lot 13 Line
14	Lot 14 Line
15	Lot 15 Line
16	Lot 16 Line
17	Lot 17 Line
18	Lot 18 Line
19	Lot 19 Line
20	Lot 20 Line
21	Lot 21 Line
22	Lot 22 Line
23	Lot 23 Line
24	Lot 24 Line
25	Lot 25 Line
26	Lot 26 Line
27	Lot 27 Line
28	Lot 28 Line
29	Lot 29 Line
30	Lot 30 Line
31	Lot 31 Line

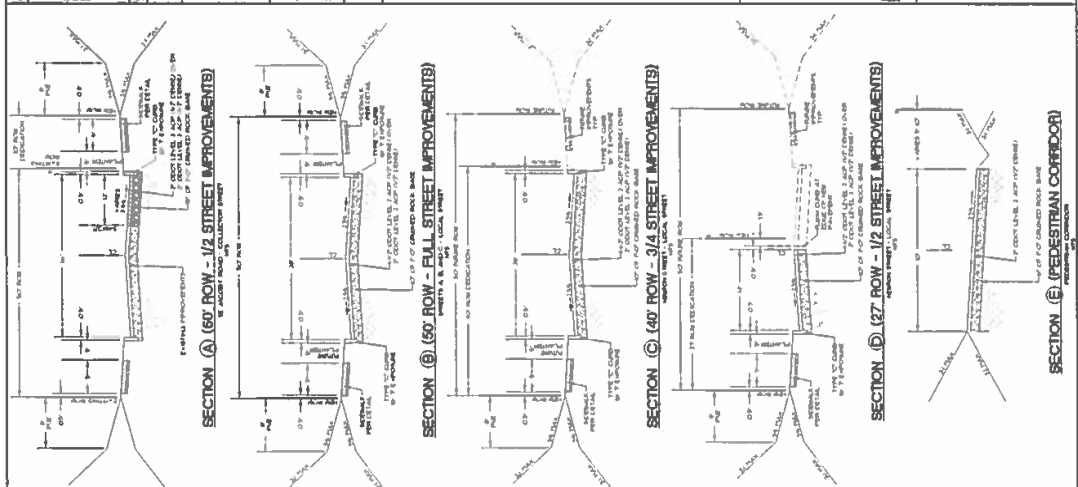
**NOTES**

1. THIS IS A PRELIMINARY PLAT MAP. IT IS NOT TO BE USED FOR CONSTRUCTION.
2. THE ADDITIONAL 11' TO BE SUBDIVISION AT THE INTERSECTION OF NEIGHBORS AVENUE AND JACOBY ROAD IS NOT TO BE SUBDIVISION AT THIS TIME. THE ADDITIONAL 3' TO BE SUBDIVISION AT THE INTERSECTION OF NEIGHBORS AVENUE AND JACOBY ROAD IS NOT TO BE SUBDIVISION AT THIS TIME.
3. THE ADDITIONAL 11' TO BE SUBDIVISION AT THE INTERSECTION OF NEIGHBORS AVENUE AND JACOBY ROAD IS NOT TO BE SUBDIVISION AT THIS TIME.
4. THE ADDITIONAL 3' TO BE SUBDIVISION AT THE INTERSECTION OF NEIGHBORS AVENUE AND JACOBY ROAD IS NOT TO BE SUBDIVISION AT THIS TIME.





PROJECT		JACOBY HEIGHTS SUBDIVISION	
PRELIMINARY PLAN		UTILITY PLAN	
DATE: 06/03/08		DATE: 06/03/08	
SCALE: 1" = 40'		SCALE: 1" = 40'	
SECTION: 24		SECTION: 24	
DATE: 06/03/08		DATE: 06/03/08	
DRAWN BY: JAC		DRAWN BY: JAC	
CHECKED BY: JAC		CHECKED BY: JAC	
APPROVED BY: JAC		APPROVED BY: JAC	
SHEET: 4		SHEET: 4	



60th ROW - 1/2 STREET IMPROVEMENTS

60th ROW - FULL STREET IMPROVEMENTS

314th STREET - 1/2 STREET IMPROVEMENTS

127th ROW - 1/2 STREET IMPROVEMENTS

127th ROW - PEDESTRIAN CORRIDOR

LOT 1, LOT 2, LOT 3, LOT 4, LOT 5, LOT 6, LOT 7, LOT 8, LOT 9, LOT 10, LOT 11, LOT 12, LOT 13, LOT 14, LOT 15, LOT 16, LOT 17, LOT 18, LOT 19, LOT 20, LOT 21, LOT 22, LOT 23, LOT 24, LOT 25, LOT 26, LOT 27, LOT 28, LOT 29, LOT 30, LOT 31, LOT 32, LOT 33, LOT 34, LOT 35, LOT 36, LOT 37, LOT 38, LOT 39, LOT 40, LOT 41, LOT 42, LOT 43, LOT 44, LOT 45, LOT 46, LOT 47, LOT 48, LOT 49, LOT 50, LOT 51, LOT 52, LOT 53, LOT 54, LOT 55, LOT 56, LOT 57, LOT 58, LOT 59, LOT 60, LOT 61, LOT 62, LOT 63, LOT 64, LOT 65, LOT 66, LOT 67, LOT 68, LOT 69, LOT 70, LOT 71, LOT 72, LOT 73, LOT 74, LOT 75, LOT 76, LOT 77, LOT 78, LOT 79, LOT 80, LOT 81, LOT 82, LOT 83, LOT 84, LOT 85, LOT 86, LOT 87, LOT 88, LOT 89, LOT 90, LOT 91, LOT 92, LOT 93, LOT 94, LOT 95, LOT 96, LOT 97, LOT 98, LOT 99, LOT 100.

PROJECT: JACOBY HEIGHTS SUBDIVISION  
 PRELIMINARY PARKING PLAN  
 5124 DE JACOBY ROAD, CA 97055

DATE: 02/07/2010  
 DRAWN BY: [Redacted]  
 CHECKED BY: [Redacted]

SCALE: 1" = 40'  
 SHEET NO. 5  
 OF 5

APPROVED BY: [Redacted]

DATE: 02/07/2010

PROJECT LOCATION: 5124 DE JACOBY ROAD, CA 97055

PREPARED BY: [Redacted]

DATE: 02/07/2010

SCALE: 1" = 40'

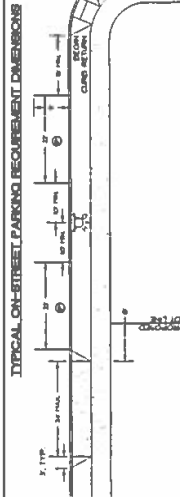
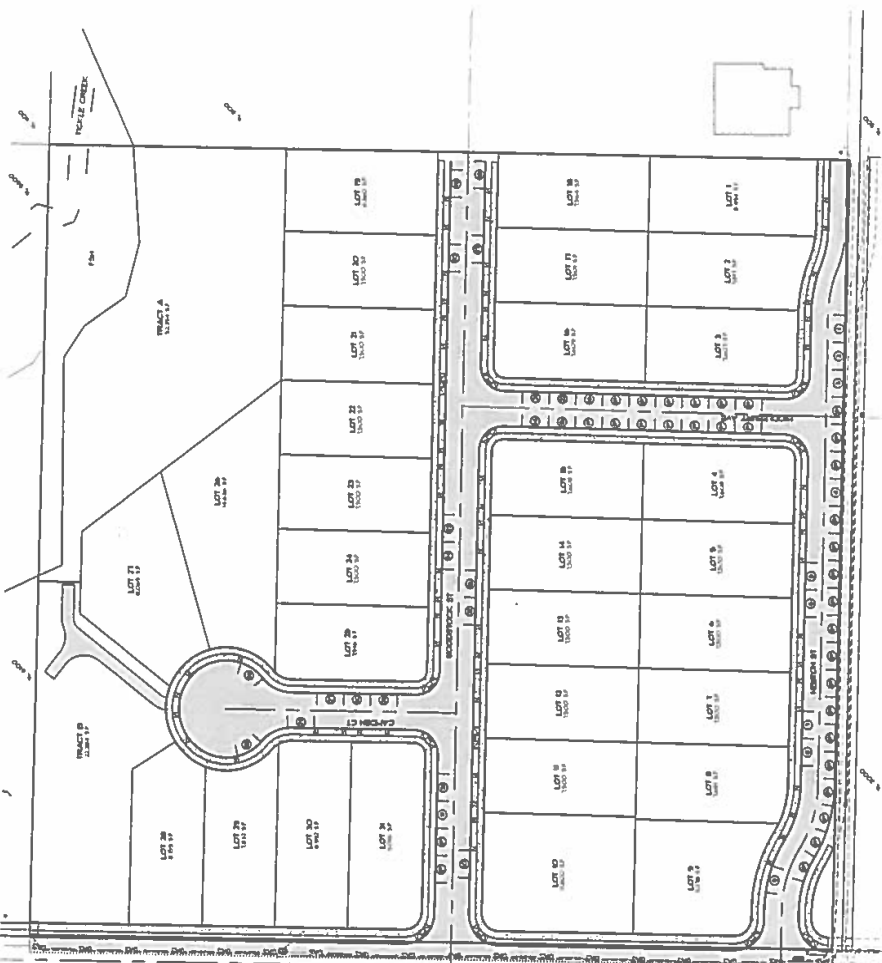
ON-STREET PARKING REQUIREMENTS  
 (PER CITY SPEC.)

REQUIREMENTS FOR EACH SPACE  
 (SEE CITY SPEC.)

REQUIREMENTS FOR EACH LOT

TOTAL NUMBER OF LOTS: 34

TOTAL NUMBER OF ON-STREET PARKING SPACES: 63



LEGEND

--- UNBUILT PROPERTY BOUNDARY LINE  
 --- PROPOSED LOT LINE  
 --- PROPOSED CURB AND SIDEWALK  
 --- PROPOSED DRIVEWAY  
 --- PROPOSED DRIVEWAY TO LOT CENTER  
 --- DRIVEWAY TO LOT CENTER  
 --- DRIVEWAY TO LOT CENTER

①  
 ②  
 ③





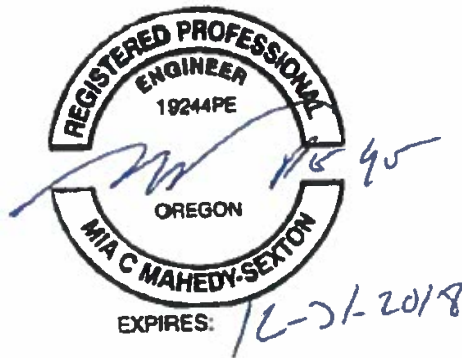
EXHIBIT G

# Geotechnical Report

Gresham – Jacoby Road Subdivision

Sandy, Oregon

Prepared for:  
Cory Knight  
23 February 2018



Rapid  
Soil Solutions LLC  
503-816-3689

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**SUPPORTING DATA**

**Appendix A - Figures**

- Figure 1      Location Plan
- Figure 2      Assessor’s Map
- Figure 3      Preliminary site plan with testing locations

**Appendix B – Soil Logs, Laboratory data**



## **1.0 PROJECT AND SITE DESCRIPTIONS**

Rapid Soil Solutions (RSS) has prepared this geotechnical report, as requested, for the proposed 32-lot subdivision of the Clackamas County parcel currently assigned the street address of 19124 SE Jacoby Road in the unincorporated outskirts of Sandy, Oregon (97055). The site is situated on the eastern side of SE Jacoby Road roughly 1,300 feet south of its intersection with Dubarko Road. It is tucked between sites assigned the street address of 19098 and 19364 Jacoby Road with a shared driveway for 19260, 19264 and 19270 SE Jacoby Road (tucked behind the subject site and adjacent parcels) running adjacent the southern edge of the subject site. West of the subject site are 12 lots of the Cascade Village and Cascade Village No. 5 plats (Cascade Village East Phase I and II). The properties adjacent to the north and west of the subject site are situated within the incorporated area of Sandy. The site can be found in the northeast quarter of Section 24, Township 2-South, Range 4-East (W.M.) in Clackamas County and can be distinguished by the lot number 2300 (TL 24E24A 02300). The site is roughly 0.43 miles east-southeast of Highway No. 172 (Eagle Creek), 0.75 miles southwest of U.S. Highway 26 (Mt. Hood Highway) and is 0.83 miles south of the Proctor Blvd where it diverges from Pioneer Blvd to form two one-way sections of HWY-26 that pass through downtown Sandy. The site is not part of a subdivision. The latitude and longitude of the site are 45.385063 and -122.256340 (45°23'06.2"N, 122°15'22.8"W). The site can be found within the southeastern corner of the Sandy, OR 7.5-minute quadrangle (NE 1/4 of the Boring 15' Quadrangle).

## **2.0 SITE CONDITIONS**

### **2.1 Surface Conditions**

This 9.64-acre subject site is situated along the southeastern edge of the City of Sandy, Oregon at the toe of the Oregon Cascade Range at the foothills of Mount Hood. The site is surrounded on all sides by low-density development. The site and properties north, east and south of the site are situated within the 'low-density' designation of the comprehensive plan for the City of Sandy. The site and those to the east and south are outside the city limits and are zoned by the County as Rural Residential Farm Forest 5-Acres (RRFF5) which is included with a set districts collectively referred to as rural residential and future urban residential zoning districts. The site to the north of the subject site is zoned as 'Single Family Residential' by the City of Sandy, and area intended to implement the Low Density Residential Comprehensive Plan designation by allowing limited development of properties while not precluding more dense future development, as urban services become available.

The properties west of the subject site are zoned low-density residential, providing an urban level of low-density residential development. The sites north, east and south of the subject sites contain single-family residences on lots between 4.00 acres and 10.04 acres. The site to the north of the subject site contains a single-family dwelling constructed in 2008 on a 1.47-acre lot. A section of the land adjacent to the northern edge of the subject site contains a flood slope hazard overlay and is not developed. The properties west of the subject site range in size from 0.13 to 0.11 containing dwellings that were constructed between 2000 and 2002.

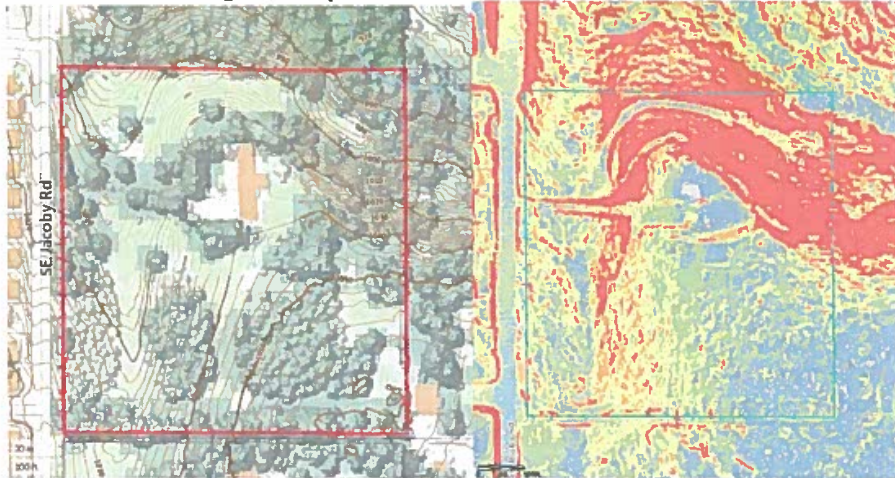
The subject site currently contains one, 2700 square foot, single-family residential dwelling

that was originally constructed in 1966. The site is situated centrally in the northern half of the subject site. The rest of the parcel contains forestland that was recently aggressively thinned. Sections of the parcel have been entirely cleared of trees, while other areas were left with a few individual or clumps of trees. Historical aerial imagery indicates that some of the thinning occurred between 5/2017 and 7/2017 with a majority of the trees harvested after 7/2017 and before 01/2018. The treed areas in the southern half of the parcel appear to have been planted based on their relatively uniform appearance in images taken prior to 2017. The oldest available historical image of the subject site indicates that the southern half of the site was relatively clear of large trees in 1995, and numerous small trees are visible across the southern half of the site in the next available image, taken in 2000. These two early images also depict the northern half of the site as thickly canopied. It appears that between 08/2003 and 08/2005, the trees from the northwestern quarter of the subject site were harvested. Since that image the northeastern quarter of the site appears to have only contained a thin scattering of individual trees. Additionally, some of the trees in the southern half of the site appear to have been removed and not replaced. The northeastern quarter of the site appears to have contained a moderately thick canopy with a mix of evergreen and deciduous trees since the earliest available image (1995).

On site observations indicate that there is flowing water in the north-descending swale-like topographic feature that transects the western half of the subject site. This north-descending depression was observed to contain water that actively flowed across the ground surface, through a culvert under the driveway and to an earthen damn that appears to encourage the surface water to transition to a shallow sub-surface flow. A rock-lined drainage ditch, with at least one small wooden bridge, was observed on the adjacent site. At the time of the site visit this ditch was observed to not contain flowing water, but the existence of the feature speaks to the presence of surface water flowing through the sites. This saturated lowland area includes the entirety of proposed lots 8 and 11 along with large portions of proposed lots 29, 30, 31 and 32.

The site contains a variable amount of slope. The southeastern corner of the subject site is relatively low relief, with slopes modeled by the 5-Ft DEM of Portland Oregon and adjacent areas as falling within the categories of less than 5% (blue) and 5-10% (green). Other areas of the parcel contain slopes of 10-15% (yellow) and 15-20% (orange). The steepest section of the parcel is in the northeastern quarter of the site, where the slopes are descending towards the northwest-flowing Tickle Creek. These slopes, when observed by RSS, appeared irregular. Much of this irregularly appeared to be associated with the scarring produced by the machines that removed the trees from the site. These gouges transecting the hillside appeared to obscure the natural shape of the slopes. The Google Earth DEM indicates that there are slopes of at least 40% on this northeastern quarter of the subject site. The excising conditions map with 1' contours and the proposed lots indicates that lot 20 and 19 have an average slope of 33% below the slope break. This slope regime is also found in the northeastern half of lot 21 and along the eastern edge of lot 26. The existing driveway is presumably constructed on fill where it crosses the swale in the western half of the site, and it contains relatively steep drop-offs on both its northern and southern sides. The slope ascending from the swale to the existing house and lower relief portion of the parcel (southeastern quarter) is greater than 15%, with

some areas exceeding 20% slope.



## 2.2 Regional Geology

Current geologic literature<sup>1 2 3 4 5 6 7 8 9 10</sup> classifies the slopes underlying the subject site as ancient river rock of the Portland Basin. Various workers have further classified the ancient river rock as part of the Springwater Formation (Madin, 2004; Trimble, 1963) and as

1 <http://www.oregongeology.org/geologicmap/>

2 Ma, L., Madin, I.P., Duplantis, S., and Williams, K.J., 2012, Lidar-based surficial geologic map and database of the greater Portland, Oregon, area, Clackamas, Columbia, Marion, Multnomah, Washington, and Yamhill Counties, Oregon, and Clark County, Washington: Oregon Department of Geology and Mineral Industries, Open-File Report O-2012-02, scale 1:8,000.

3 English, J.T., Coe, D.E., and Chappell, R.D., 2013, Channel migration hazard data and maps for the Sandy River, Multnomah and Clackamas Counties, Oregon: Oregon Department of Geology and Mineral Industries, Open-File Report O-2013-10, scale 1:12,000.

4 IMS Burns, W.J., Mickelson, K.A., and Duplantis, S., 2012, Landslide inventory maps of the Sandy quadrangle, Clackamas and Multnomah Counties, Oregon: Oregon Department of Geology and Mineral Industries, Interpretive Map Series 38, scale 1:8,000.

5 Burns, W.J., Mickelson, K.A., Jones, C.B., Pickner, S.G., Hughes, K.L.B., and Sleeter, Rachel, 2013, Landslide hazard and risk study of northwestern Clackamas County, Oregon: Oregon Department of Geology and Mineral Industries, Open-File Report O-2013-08, scale 1:8,000.

6 Schlicker, H.G., and Finlayson, C.T., 1979, Geology and geologic hazards of northwest Clackamas County: Oregon Department of Geology and Mineral Industries, Bulletin 99, scale 1:24,000.

7

Snyder, D.T., 2008, Estimated depth to ground water and configuration of the water table in the Portland, Oregon area: U.S. Geological Survey, Scientific Investigations Report SIR-2008-5059, scale 1:60,000.

8 Trimble, D.E., 1963, Geology of Portland, Oregon and adjacent areas: U.S. Geological Survey, Bulletin 1119, scale 1:62,500.

9 Treasher, R.C., 1942, Geologic map of the Portland area: Oregon Department of Geology and Mineral Industries, Quadrangle Map 9, scale 1:96,000.

10 Madin, I.P., 2004, Geologic mapping and database for the Portland area fault studies: Final report, Clackamas, Multnomah, and Washington Counties, Oregon: Oregon Department of Geology and Mineral Industries, Open-File Report O-04-02, scale 1:100,000.

Pliocene-Pleistocene Gravels (Schlicker & Finlayson, 1979). The site is tucked along the eastern edge of the Portland basin on slopes ascending towards the Oregon Cascade Range.

### *Geologic History*

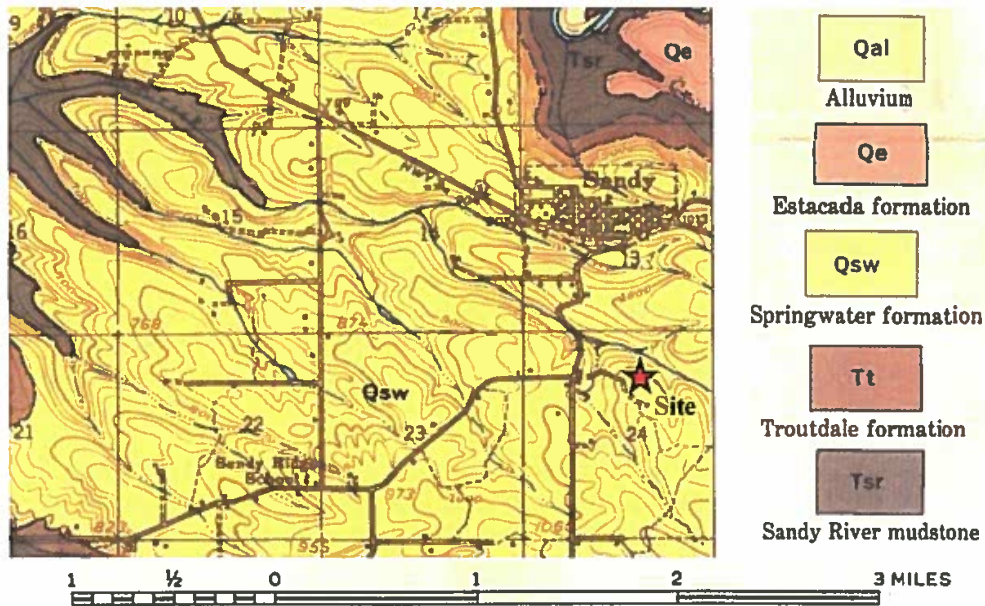
The subject site is generally situated within the forearc basin of the Cascadia subduction system between the Cascade Range (volcanic arc) and the Coastal Range (accretionary/subduction complex). The site is tucked along the eastern edge of the Portland Basin, which is one of several topographic and structural depressions that collectively constitute the Puget-Willamette forearc trough. This topographic and structural basin generally has low topographic relief. The basin formed due to tectonic compressional stress that both initiated the basin's formation and produced prolonged the enlargement of the basin. As the Portland Basin continued to subside during the late Miocene and Pliocene, it filled with continental fluvial and lacustrine sediments that were transported through the Cascade Range by the ancestral Columbia River as well as with locally derived detritus carried in by tributaries draining the surrounding highlands. These sediments were deposited primarily in fluvial environments, mostly by the rivers and streams that traversed the Portland basin as it was developing. This resulted in a thick accumulation of material preserving a complex record of deposition and erosion (aggradation and incision). The modern Columbia River has carved a channel through the current-day basin.

Much of the region was inundated by a series of massive floods at the end of the last ice age. The floodwaters, which reached an elevation of 400 feet above sea level, soured many areas down to bedrock and buried others beneath thick layers of gravel, sand and silt that can be divided into a fine-grained and coarse-grained units. The subject site appears to be above the inundation elevation of these floodwaters and is not draped in a blanket of the associated sediments.

The ancient river rocks of Ma et al (2012) comprises the youngest bedrock in the Portland area, and it typically comprised of cemented and compacted sediments deposited by the ancestral Tualatin, Willamette, Clackamas, Sandy and Columbia Rivers. They include layers of sandstone, mudstone, siltstone, and conglomerate or cemented gravel. In the Tualatin Valley, there are almost 1,000 feet of siltstone, mudstone and sandstone mostly derived from older sedimentary rocks of the Coast Range. These rocks may have been laid down as long ago as 15 million years after the cessation of the Columbia River Basalt lava flows, as recently as 2.5 million years when the Boring volcanic field became active.

The deposits on site are further classified as part of the Springwater Formation. This unit is described as a fluvial conglomerate, volcanoclastic sandstone, siltstone, and debris flows derived from the Cascade Range. The conglomerates within this unit typically consist of well-rounded pebbles, cobbles and boulders of basalt, andesite and dacite with rare exotic metamorphic and plutonic rocks. The matrix material is typically comprised of sand and silt. It is generally massive and profoundly weathered producing a strongly varicolored material with reds, browns, grey-greens and oranges. When un-weathered, the conglomerate is typically grey to brown. Debris flows contain angular to rounded clasts of basalt, andesite and dacite lava, scoria and pumice in a matrix of clay, ash and sand. Sandstones range from fine to coarse grained. The siltstones and mudstones generally consists of quartzo-feldspathic

silt, ash and clay. The unit overlays the Troutdale Formation and some exposures may be a mixture of the two units and the contact appears to be conformable and gradual. Boring Lava commonly overlies or is interbedded with Springwater Formation rocks.



## 2.3 Field Exploration and Subsurface Conditions

### 2.3.1 Field Explorations

Seven (7) hand augur holes were excavated. The locations of the borings are shown on Figure 3 in Appendix A. A GIT (geologist in training) observed and logged the subsurface soils and they were reviewed and written up by a registered professional engineer. Logs detailing materials encountered are in Appendix B. The logs were created using the Unified Soil Classification and Visual Manual Procedure (ASTM-D 2488). Samples were transported to the laboratory ACS Testing of Tigard, Oregon for further classification in seal bags. Please see Appendix B for further laboratory results.

### 2.3.1 Subsurface Conditions

The soil conditions were stiff to very stiff SILT to a depth of 8 feet. There are some locations where the organics are up to 2.5ft thick. Borings had moisture contents ranging from 32.7% to 44%.

### 2.3.2 Groundwater

Groundwater was encountered in HA2 at 9inches.

### 3.0 GEOTECHNICAL DESIGN RECOMMENDATIONS

#### 3.1 Foundation Design

The building foundations may be installed on either engineered fill or firm native sub-grade that is found at a depth of about 2 feet. This depth may be locally variable and should be confirmed by a geotechnical engineer or their representative at the time of construction.

Continuous wall and isolated spread footings should be at least 16 and 24 inches wide, respectively. The bottom of exterior footings should be at least 16 inches below the lowest adjacent exterior grade. The bottom of interior footings should be at least 12 inches below the base of the floor slab.

Footings placed on engineered fill or firm native sub-grade should be designed for an allowable bearing capacity of 2,000 *pounds per square foot (psf)*. The recommended allowable bearing pressure can be doubled for short-term loads such as those resulting from wind or seismic forces.

Based on our analysis the total post-construction settlement is calculated to be less than 1 inch, with differential settlement of less than 0.5 inch over a 50-foot span for maximum column, perimeter footing loads of less than 100 kips and 6.0 kips per linear foot.

Lateral loads on footings can be resisted by passive earth pressure on the sides of the structures and by friction at the base of the footings. An allowable lateral bearing pressure of 100 *pounds per cubic foot (pcf)* below grade may be used. Adjacent floor slabs, pavements or the upper 12-inch depth of adjacent, unpaved areas should not be considered when calculating passive resistance. An angle of internal friction of 28 degrees can be used.

If construction is undertaken during wet weather, we recommend a thin layer of compacted, crushed rock be placed over the footing sub-grades to help protect them from disturbance due to the elements and foot traffic.

#### 3.2 Floor Slabs

Satisfactory sub-grade support for building floor slabs can be obtained from the native sub-grade prepared in accordance with our recommendations presented below. A 6-inch-thick layer of imported granular material should be placed and compacted over the prepared sub-grade. Imported granular material should be crushed rock or crushed gravel that is fairly well graded between coarse and fine, contains no deleterious materials, have a maximum particle size of 1 inch, have less than 5 percent by weight passing the U.S. Standard No. 200 Sieve, and meet OSSC 02630.10 – Dense Graded Aggregate 1”-0”. The imported granular material should be placed in 6-inch-thick lifts and compacted to at least 95 percent of the maximum dry density as determined by American Society for Testing and Materials (ASTM) D 1557. A sub-grade modulus of 125 pounds per cubic inch (pci) may be used to design the floor slab.

Installation of a vapor barrier is required for all the houses built on this lot. It will reduce the potential for moisture transmission through, and efflorescence growth on, the floor slabs. Additionally, flooring manufacturers often require vapor barriers to protect flooring and flooring adhesives and will warrant their product only if a vapor barrier is installed according to their recommendations. The selection and design of an appropriate vapor barrier, if needed, should be based on discussions among members of the design team.

### 3.3 Seismic Design Criteria

The seismic design criteria for this project found herein is based on the USGS Earthquake Hazards Program. A summary of IBC 2012/2015 code section seismic design criterion below: using a Lat of 45.385063 and Long of -122.256340

	<b>Short Period</b>	<b>1 Second</b>
Maximum Credible Earthquake Spectral Acceleration	Ss = 0.764g	S1 = 0.334 g
Adjusted Spectral Acceleration	Sms = 0.913	Sm1 = 0.578
Design Spectral Response Acceleration Perimeters	Sds = 0.608	Sd1 = 0.386

### 3.4 Slopes and Hazards

The Oregon HazVu: Statewide Geohazard Viewer<sup>11</sup> and Metromap<sup>12</sup> were reviewed on 22 January 2017 to investigate mapped geological hazards. This review indicates that the northeastern corner of the parcel overlaps with the Effective FEMA 100 year Floodplain as presented by HazVu where Tickle Creek transects the subject site. The expected earthquake-shaking hazard is classified as 'very strong' with no mapped earthquake liquefaction hazard classification. The nearest fault, mapped by and classified as active by DOGAMI, is a NE-SW oriented fault near Boring, Oregon roughly 6.8 miles northwest of the subject site. Additional faults are likely located closer to the subject site, but they are not mapped. There are no landslides mapped on or adjacent to the subject site. The site is classified as having a landslide susceptibility classification of 'low' (landsliding unlikely) in the southeastern corner of the parcel, 'moderate' (landsliding possible) across most of the parcel and 'high' (landsliding likely) in the northeastern quarter of the subject site. William et al (2013) indicates that the site has a low susceptibility to deep-seated landslides across the subject site. The William et al (2013) shallow-landslide susceptibility map is consistent with the Oregon HazVu map susceptibility values.

<sup>11</sup> <http://www.oregongeology.org/hazvu/>

<sup>12</sup> <http://gis.oregonmetro.gov/metromap/>

## **4.0 CONSTRUCTION RECOMMENDATIONS**

### **4.1 Site Preparation**

Demolition should include removal of existing improvements throughout the project site. Underground utility lines, vaults, basement walls or tanks should be removed or grouted full if left in place. I recommend that soil disturbed during grubbing operations be removed to firm, undisturbed sub-grade. The excavations should then be backfilled with compacted structural fill. On this site only disturb the area in which can be covered with rock during the day. The moisture sensitive SILT soil when exposed to wet weather becomes soft and yielding. See wet weather conditions below.

#### **4.1.1 Proof Rolling**

Following stripping and prior to placing aggregate base course, pavement the exposed sub-grade should be evaluated by proof rolling. The sub-grade should be proof rolled to identify soft, loose, or unsuitable areas. Please give 24 hour notice to observe the proof rolling. Soft or loose zones identified during the field evaluation should be compacted to an unyielding condition or be excavated and replaced with structural fill, as discussed in the *Structural Fill* section of this report.

#### **4.1.2 Wet Weather Conditions**

The near-surface soils will be difficult during or after extended wet periods when the moisture content of the surface soil is more than a few percentage points above optimum. Soils that have been disturbed during site preparation activities, or soft or loose zones identified during probing or proof rolling, should be removed and replaced with compacted structural fill. Track-mounted excavating equipment will be required during wet weather. The imported granular material should be placed in one lift over the prepared, undisturbed sub-grade and compacted using a smooth drum, non-vibratory roller. If construction is undertaken during the wet weather the builder may choose to cement treat the top 12" of sub-grade soil on the site. This will save time over the duration of the project due to the moisture sensitive SILT becoming soft and yielding which will require repeated over excavation and replacement with structural fill. The geotextile fabric can be eliminated if the sub-grade is cement treated.

### **4.2 Excavation**

Subsurface conditions of accessible cleared areas of the project site show predominately SILT to the depth explored (10 feet). Excavations in the upper soils may be readily accomplished with conventional earthwork equipment with smooth faced bucket.

### **4.3 Structural Fills**

Fills should be placed over sub-grade prepared in compliance with Section 4.1 of this report. Material used, as structural fill should be free of organic matter or other unsuitable materials and should meet specifications provided in OSSC, depending upon the application. A discussion of these materials is in the following sections.



As there is a large fill on the site the following below figure shall be followed. It is a diagram of placing fill on a slope. The keyway at the bottom shall be at least 4ft deep and 10ft wide and shall be hard and non-yielding. Prior to placement of any fill RSS or there representative shall inspection this keyway. See below benching figure. Compaction testing is required every 1.5ft and a proof roll on all fill areas.

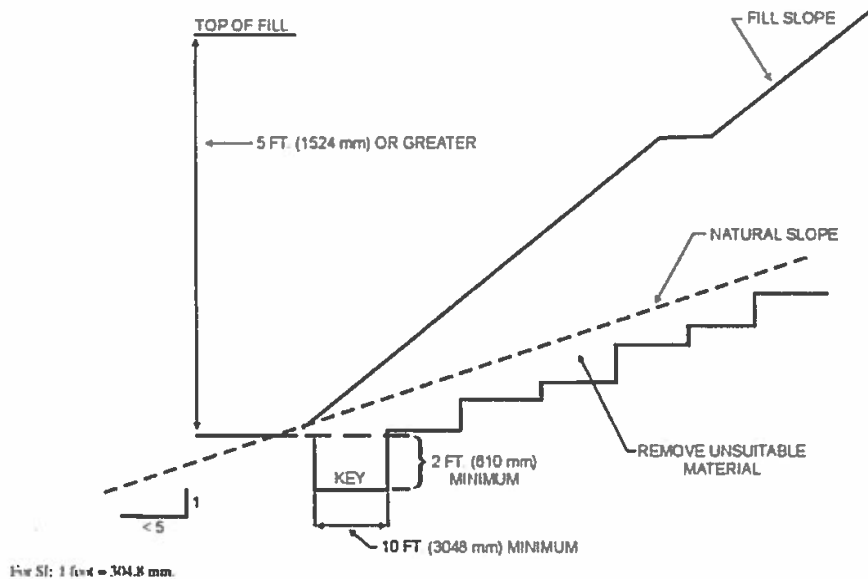


FIGURE J107.3  
BENCHING DETAILS

If there are springs into the fill slope they shall be directed into solid pipes and brought to the drainage swale at the south end of job.

#### 4.3.1 Native

Laboratory testing indicates that the moisture content of the near-surface is greater near the optimum moisture content of the soil required for satisfactory compaction. This is depending on the weather conditions at the time of excavation. See section 4.3.2 for imported granular fill. ASTM T-99 and 95% compaction is required when using native soils.

#### 4.3.2 Imported Granular Fill

The imported granular material must be reasonably well graded to between coarse and fine material and have less than 5% by weight passing the US Standard No.200 Sieve. Imported granular material should be placed in lifts 8 to 12 inches and be compacted to at least 92% of the maximum dry density, as determined by ASTM D 1157. Where imported granular material is placed over wet or soft soil sub-grades, we recommend that a geo-textile serve as a barrier between the sub-

grade and imported granular material. Please supply the engineer with a 5gallon bucket of material 48hours prior to any compaction tests required.

#### **4.3.3 Pavement Base Aggregate**

Imported base aggregate for roads and parking lots should be clean, crushed rock or crushed gravel. The base aggregate should meet the gradation defined in OSSC 02630.10 – Dense Graded Aggregate 1 1/2”-0,” with the exception that the aggregate should have less than 5% passing a US Standard No. 200 Sieve. The base aggregate should be compacted to at least 92% of the maximum dry density, as determined by ASTM D 1557. Please supply the engineer with a 5gallon bucket of material 48hours prior to any compaction tests required.

#### **4.4 Drainage Considerations**

The Contractor shall be made responsible for temporary drainage of surface water and groundwater as necessary to prevent standing water and/or erosion at the working surface. We recommend removing only the foliage necessary for construction to help minimize erosion. Slope the ground surface around the structures to create a minimum gradient of 2% away from the building foundations for a distance of at least 5 feet. Surface water should be directed away from all buildings into drainage swales or into a storm drainage system.

The swales that are placed on the roadway fills shall be lined and then connected into the storm water system.

#### **5.0 CONSTRUCTION OBSERVATIONS**

Satisfactory pavement and earthwork performance depends on the quality of construction. Sufficient monitoring of the activities of the contractor is a key part of determining that the work is completed in accordance with the construction drawings and specifications. I recommend that a geotechnical engineer observe general excavation, stripping, fill placement, and sub-grades in addition to base. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions requires experience. Therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions changes significantly from those anticipated.

#### **6.0 LIMITATIONS**

This report has been prepared for the exclusive use of the addressee, and their architects and engineers for aiding in the design and construction of the proposed development. It is the addressee's responsibility to provide this report to the appropriate design professionals, building officials, and contractors to ensure correct implementation of the recommendations. The opinions, comments and conclusions presented in this report were based upon information derived from our literature review, field investigation, and laboratory testing. Conditions between, or beyond, our exploratory borings may vary from those encountered. Unanticipated soil conditions and seasonal soil moisture variations are commonly encountered and cannot be fully determined by merely taking soil samples or soil borings. Such variations may result in

changes to our recommendations and may require that additional expenditures be made to attain a properly constructed project. Therefore, some contingency fund is recommended to accommodate such potential extra costs.

If there is a substantial lapse of time between the submission of this report and the start of work at the site; if conditions have changed due to natural causes or construction operations at, or adjacent to, the site; or, if the basic project scheme is significantly modified from that assumed, it is recommended this report be reviewed to determine the applicability of the conclusions and recommendations.

The work has been conducted in general conformance with the standard of care in the field of geotechnical engineering currently in practice in the Pacific Northwest for projects of this nature and magnitude. No warranty, express or implied, exists on the information presented in this report. By utilizing the design recommendations within this report, the addressee acknowledges and accepts the risks and limitations of development at the site, as outlined within the report.

**APPENDIX A**

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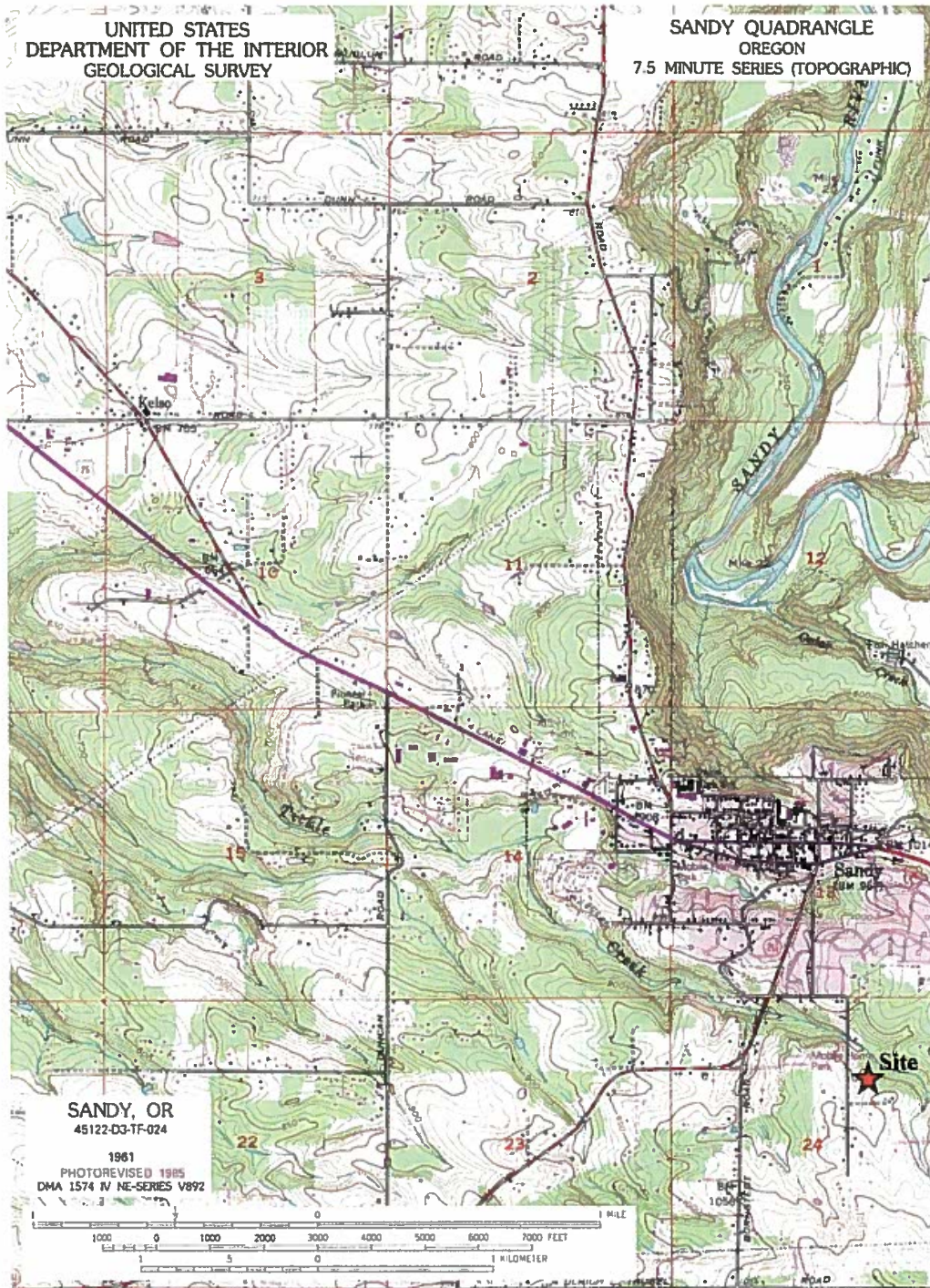


Figure 1: Subject site location on the SE quarter of the Sandy, OR 7.5-minute quadrangle

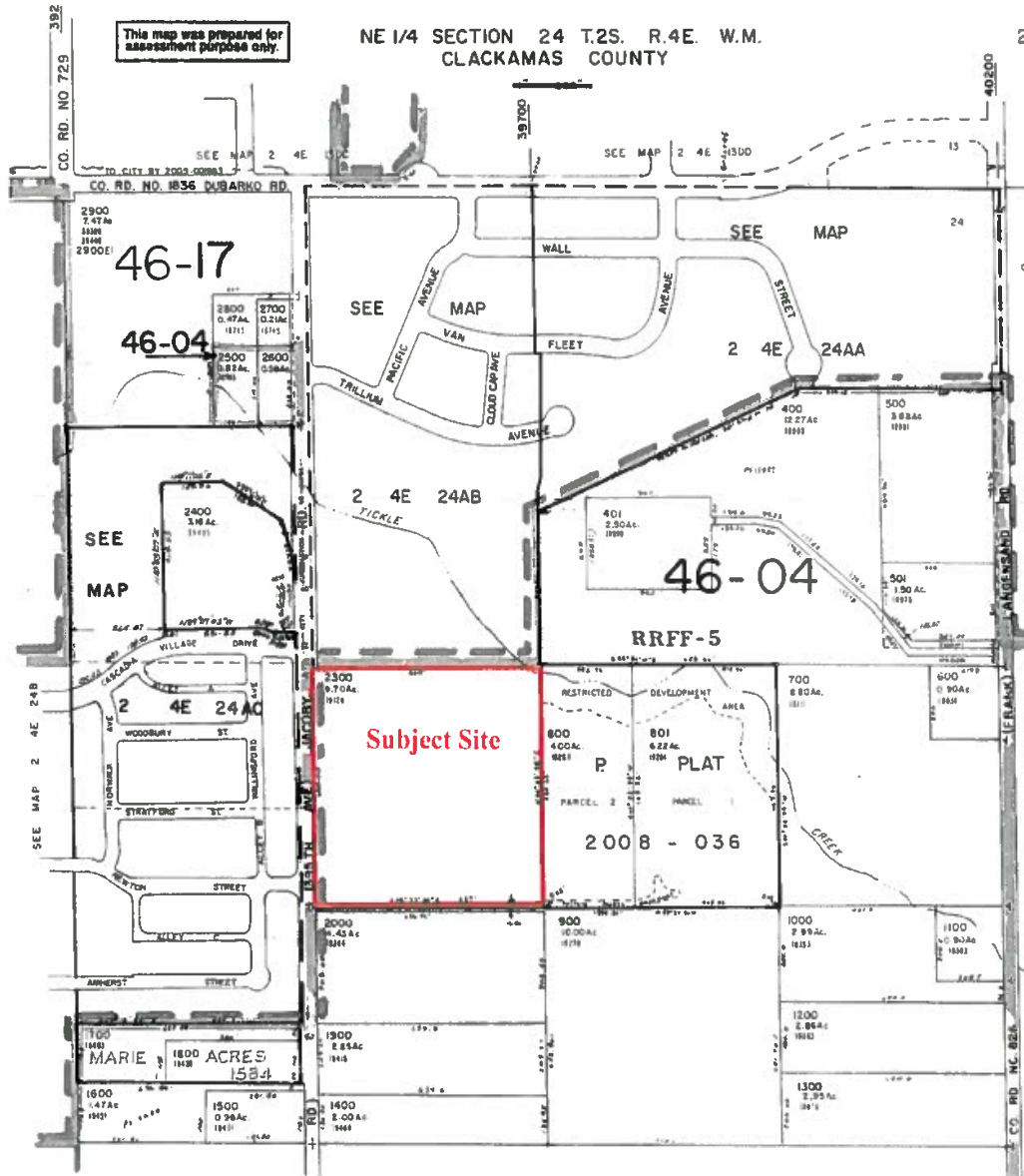


Figure 2: Subject site location on the Clackamas County Assessor's Map

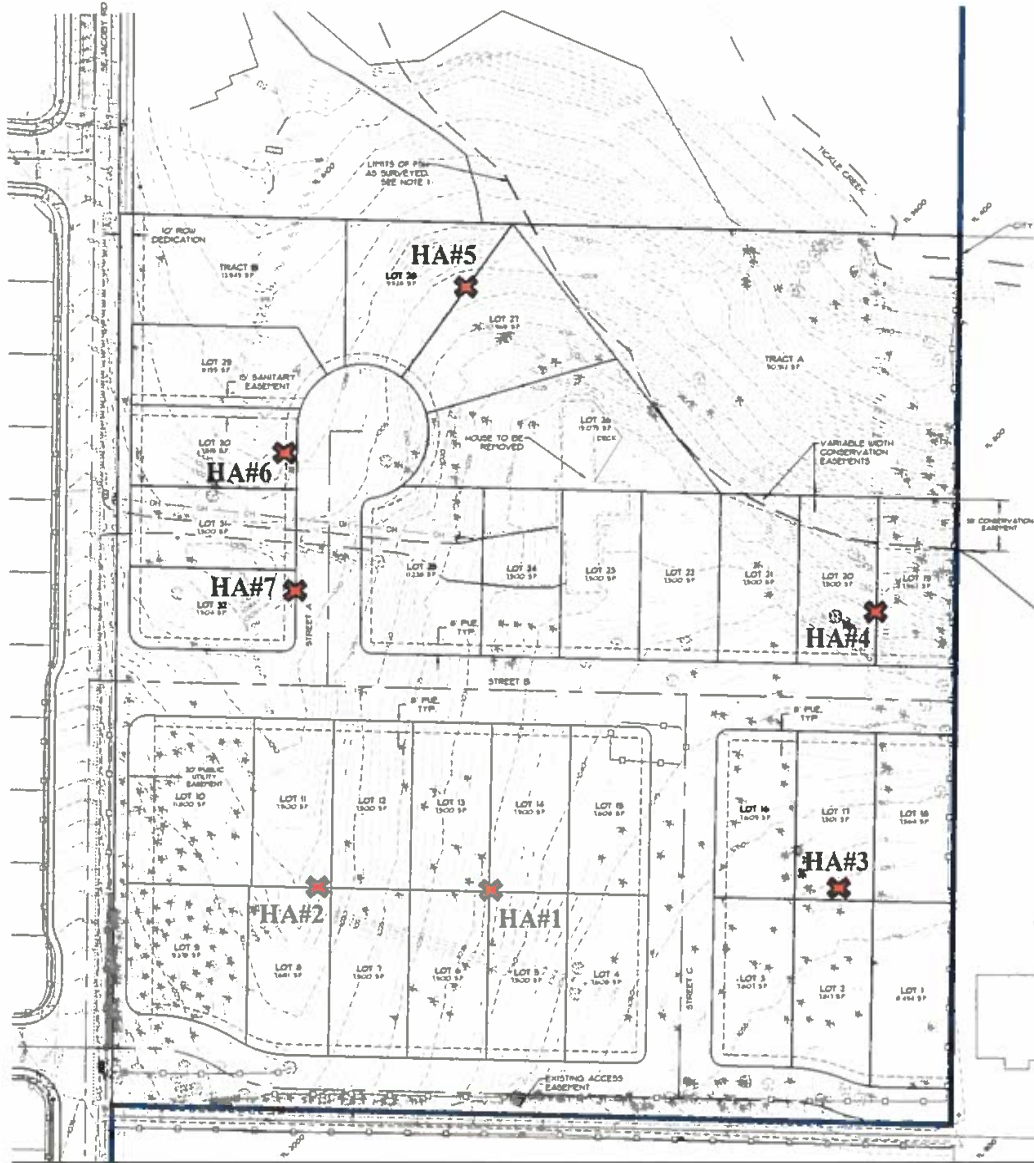


Figure 3: Subject site location, proposed new lots and approximate boring locations

**APPENDIX B**

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**Lab Results**

1 of 3

Project Name: Jacoby Rd - Sandy Subdivision

Sample Date 1/15/18

**Moisture**

Sample number	HA#1	HA#2	HA#3	HA#4	HA#5
1 Date and time in oven	1/16/18 2 30 PM	1/16/18 2 30 PM	1/16/18 2 30 PM	1/16/18 2 30 PM	1/16/18 2 30 PM
2 Date and time out of oven	1/18/18 10 30 AM	1/18/18 10 30 AM	1/18/18 10 30 AM	1/18/18 10 30 AM	1/18/18 10 30 AM
3 Depth (ft)	4	3	4	8	4
4 Tare No.	3	6	7	8	9
5 Tare Mass	234	233	230	233	231
6 Tare plus sample moist	784	1041	1022	983	1080
7 Tare plus sample dry	636	795	815	798	817
8 Mass of water (g)	148	246	207	185	263
9 Mass of soil (g)	402	562	585	565	586
10 Water Content (%)	36.82	43.77	35.38	32.74	44.88

**Atterberg Limit Test**

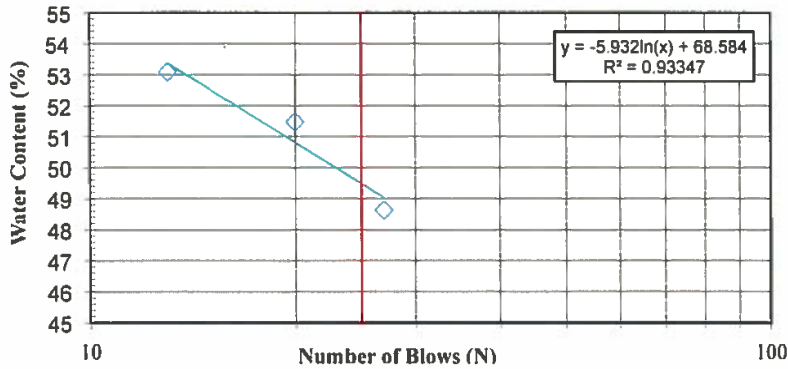
Sample Number: HA#1

Depth: 4'

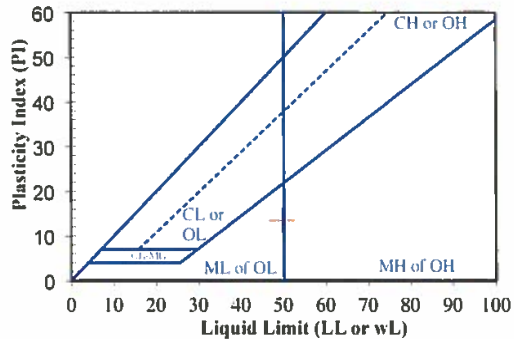
**Liquid Limit**

**Plastic Limit**

	1	2	3	1	2
	D#2.1	D#2.2	D#.23	R#1.1	R#1.2
1 Tare No.					
2 Tare Mass (g)	39.59	39.46	39.3	39.89	38.94
3 Tare Plus Wet Soil (g)	78.34	70.15	71.22	50.81	50.34
4 Tare Plus Dry Soil (g)	65.66	59.72	60.15	47.91	47.33
5 Mass of Water (g)	12.68	10.43	11.07	2.9	3.01
6 Mass of Soil (g)	26.07	20.26	20.85	8.02	8.39
7 Water Content (g)	48.64	51.48	53.09	36.16	35.88
8 No. Blows	27	20	13		



Liquid Limit (%) 49.49  
 Plastic Limit (%) 36.02  
 Plasticity Index (%) 13.47  
 USCS Classification ML/MH



**Lab Results**

2 of 3

Project Name: Jacoby Rd - Sandy Subdivision

Sample Date 1/15/18

**Moisture**

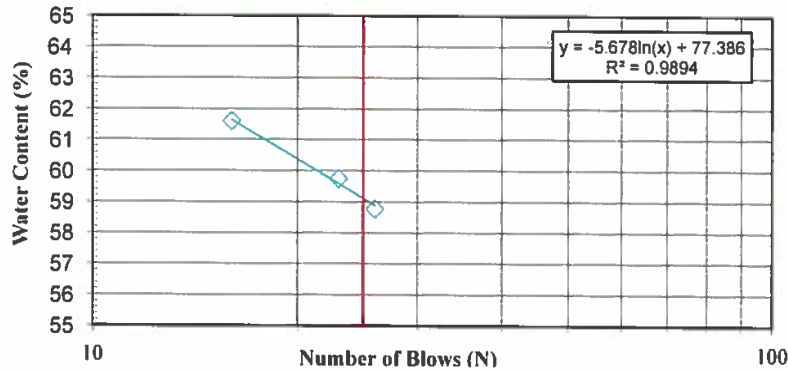
Sample number	HA#7				
1 Date and time in oven	1/16/18 2:30 PM				
2 Date and time out of oven	1/18/18 10:30 AM				
3 Depth (ft)	2				
4 Tare No.	10				
5 Tare Mass	231				
6 Tare plus sample moist	941				
7 Tare plus sample dry	734				
8 Mass of water (g)	207				
9 Mass of soil (g)	503				
10 Water Content (%)	41.15				

**Atterberg Limit Test**

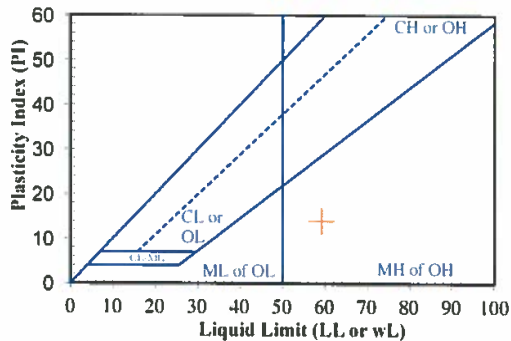
Sample Number: HA#4

Depth: 8'

	Liquid Limit			Plastic Limit	
	D#4.1	D#4.2	D#4.3	R#4.1	R#4.2
1 Tare No.					
2 Tare Mass (g)	39.95	40.46	40	40.68	39.25
3 Tare Plus Wet Soil (g)	72.56	69.55	71.48	52.13	51.55
4 Tare Plus Dry Soil (g)	60.49	58.67	59.48	48.57	47.72
5 Mass of Water (g)	12.07	10.88	12	3.56	3.83
6 Mass of Soil (g)	20.54	18.21	19.48	7.89	8.47
7 Water Content (g)	58.76	59.75	61.60	45.12	45.22
8 No. Blows	26	23	16		



Liquid Limit (%)            59.11  
 Plastic Limit (%)           45.17  
 Plasticity Index (%)        13.94  
 USCS Classification        MH



**Lab Results**

3 of 3

Project Name: Jacoby Rd - Sandy Subdivision

Sample Date 1/15/18

**Moisture**

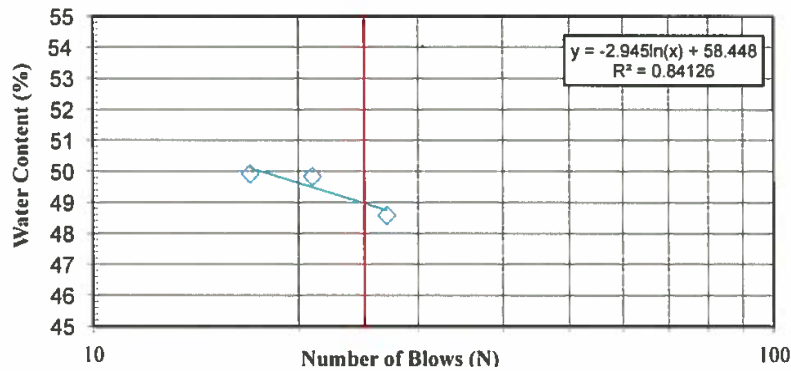
Sample number					
1 Date and time in oven					
2 Date and time out of oven					
3 Depth (ft)					
4 Tare No.					
5 Tare Mass					
6 Tare plus sample moist					
7 Tare plus sample dry					
8 Mass of water (g)					
9 Mass of soil (g)					
10 Water Content (%)					

**Atterberg Limit Test**

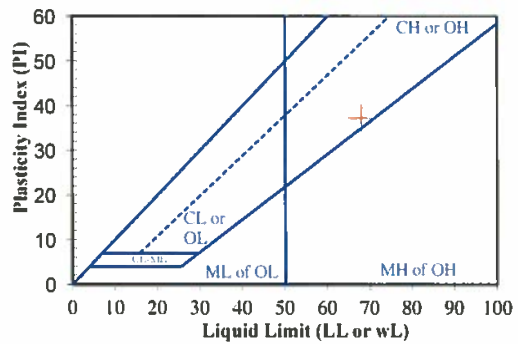
Sample Number: HA#7

Depth: 2'

	Liquid Limit			Plastic Limit	
	D#3.1	D#3.2	D#3.3	R#3.1	R#3.2
1 Tare No.					
2 Tare Mass (g)	39.39	39.5	40.47	39.24	42.3
3 Tare Plus Wet Soil (g)	74.56	75.93	74.27	51.58	53.1
4 Tare Plus Dry Soil (g)	63.06	63.8	63.03	48.69	50.55
5 Mass of Water (g)	11.5	12.13	11.24	2.89	2.55
6 Mass of Soil (g)	23.67	24.3	22.56	9.45	8.25
7 Water Content (g)	48.58	49.92	49.82	30.58	30.91
8 No. Blows	27	17	21		



**Liquid Limit (%)**                      67.93  
**Plastic Limit (%)**                      30.75  
**Plasticity Index (%)**                    37.18  
**USCS Classification**                    CH



# HA#1

Surface Elevation:  
 Boring Date: 1/15/18  
 Boring Location: Sandy, OR  
 Drilling Method: Hand augur

Depth	Remarks	Moisture (%)	Dry Density	Blow Counts	Sample Type	Water Table
0					TP	
						Topsoil and grass
					ML-CL	Damp, orange brown, fine grained, stiff, clayey SILT
					MLCL	Damp to moist, orange brown, stiff to very stiff, clayey SILT
4	36.8					Boring completed at depth of 4ft
7						

SuperLog Clientech Software, USA www.clientech.com  
 File: D:\Users\lms\OneDrive\WORK\2018\Reports\181214\Borehole\BoreholeLog\BoreholeLog.dwg Date: 2/21/2018

## LOG OF BORING

**Rapid Soil Solutions**

Jacoby Road Subdivision  
 Cory Knight

Plate 1

# HA#2

Surface Elevation:  
 Boring Date: 1/15/18  
 Boring Location: Sandy, OR  
 Drilling Method: Hand augur

Depth	Remarks	Moisture (%)	Dry Density	Blow Counts	Sample Type	Water Table
0					TP	
0 - 1					TP	Topsoil and grass, very soft and possible wet for long periods of time
1 - 3		43.8			ML-CL	Mosit to wet, orange brown, fine grained, stiff, clayey SILT, standing water at 9inchs
3	Boring completed at depth of 3R					
4						
5						
6						
7						

## LOG OF BORING

<b>Rapid Soil Solutions</b>	Jacoby Road Subdivision Cory Knight	Plate 1
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SuperLog ChiffTech Borings, LISA www.chifftech.com  
 File: D:\Users\lisa\OneDrive\lisa\WDR\180115\Report\1811\Quarry\Quarry\Subsoil\Subsoil\181521.rpt Date: 2/23/2018

# HA#3

Surface Elevation:  
 Boring Date: 1/15/18  
 Boring Location: Sandy, OR  
 Drilling Method: Hand augur

Depth	Remarks	Moisture (%)	Dry Density	Blow Counts	Sample Type	Water Table
0					TP	Topsoil and grass, very soft and possible wet for long periods of time
1					ML-CL	Mosit, orange brown, fine grained, stiff, clayey SILT with organic's may be old burn pile
2					ML-CL	Mosit, orange brown, fine grained stiff, silty CLAY, trace roots and organics
3						
4	35.4					Boring completed at depth of 4ft
5						
6						
7						

## LOG OF BORING

**Rapid Soil Solutions**

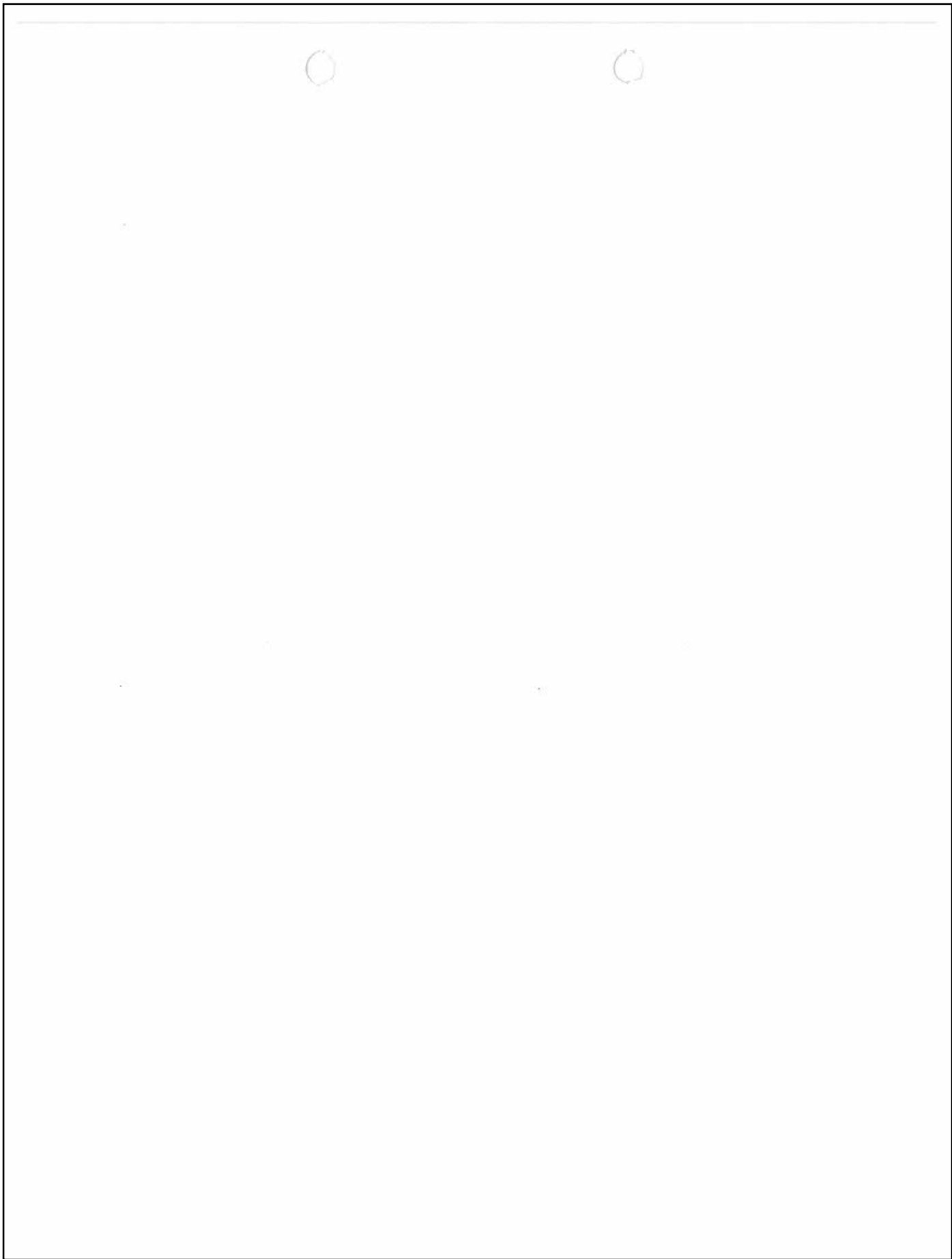
Jacoby Road Subdivision  
 Cory Knight

Plate 1

SuperLog CivilTech Software, USA www.civiltech.com  
 File: D:\Users\lme\Documents\USA WORK\log\Reports\1st Quarter\Geotechnical\Summary sub-01\HA#3.log Date: 2/23/2018

DWT not encountered







# HA#5

Surface Elevation:  
 Boring Date: 1/15/18  
 Boring Location: Sandy, OR  
 Drilling Method: Hand augur

Depth	Remarks	Moisture (%)	Dry Density	Blow Counts	Sample Type	Water Table
0						
0					TP	Organics mixed with SILTS
2					ML-CL	Dry to damp, orange brown to brown, fine grained, stiff, clayey SILT
4	44				ML-CL	Damp to moist, orange brown, fine grained stiff, silty CLAY, trace weathered clasts
4	Boring completed at depth of 4ft					
6						
8						
10						
12						
14						

## LOG OF BORING

<b>Rapid Soil Solutions</b>	Jacoby Road Subdivision Cory Knight	Plate 1
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CMT not recorded

# HA#6

Surface Elevation:  
 Boring Date: 1/15/18  
 Boring Location: Sandy, OR  
 Drilling Method: Hand augur

Depth	Remarks	Moisture (%)	Dry Density	Blow Counts	Sample Type	Water Table
0						
0 - 1.5						
1.5 - 3.0						
3.0 - 14.0						

GWT not encountered

VG Vegetation very soft

ML Dry to damp, rich organic brown, fine grained, stiff, clayey SILT and lots of organics

Boring completed at depth of 3ft

SuperLog Chiftech Software, USA www.chiftech.com File: D:\Users\jacob\OneDrive\Documents\HA#6\HA#6 Log Date: 2/23/2018

## LOG OF BORING

<b>Rapid Soil Solutions</b>	Jacoby Road Subdivision Cory Knight	Plate 1
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# HA#7

Surface Elevation:  
 Boring Date: 1/15/18  
 Boring Location: Sandy, OR  
 Drilling Method: Hand augur

Depth	Remarks	Moisture (%)	Dry Density	Blow Counts	Sample Type	Water Table
0						
0					VG	Vegetation very soft
0					ML	Dry to damp, rich organic brown, fine grained, stiff, clayey SILT and lots of organics
2	41.2					
2						Boring completed at depth of 2ft
4						
6						
8						
10						
12						
14						

## LOG OF BORING

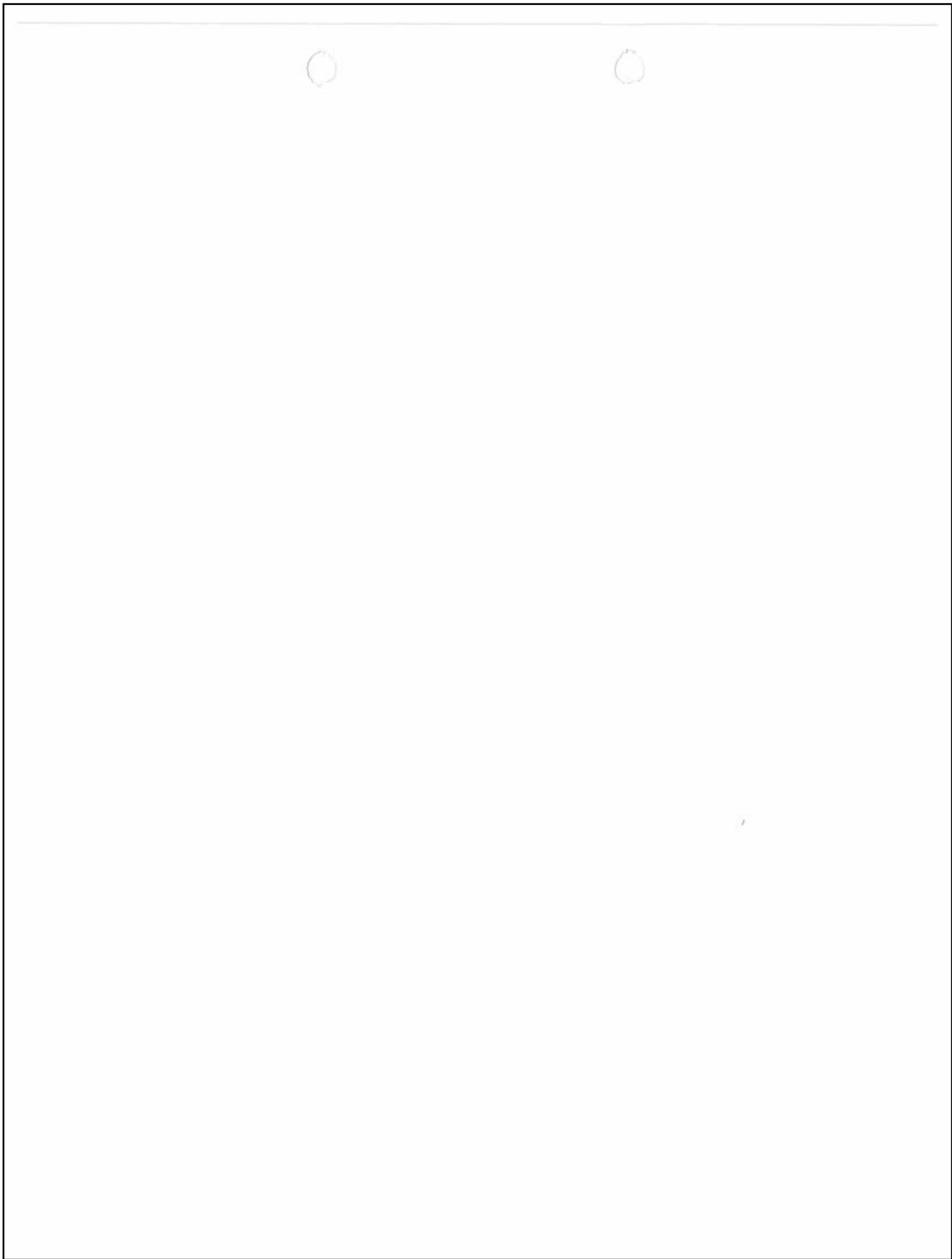
**Rapid Soil Solutions**

Jacoby Road Subdivision  
 Cory Knight

Plate 1

SuperLog Clifftech Software, USA www.clifftech.com  
 File: D:\Users\Wendy\My Documents\Reports\181\Quarry\Geotechnical\Sandy sub-district\MKT.log Date: 2/23/2018

GWTT not encountered



# EXHIBIT H



## Environmental Science & Assessment, LLC

### MEMORANDUM

DATE: May 30, 2018  
TO: Cory Knight  
FROM: Jack Dalton  
RE: Jacoby Road Subdivision – Wetland Determination  
(19124 SE Jacoby Road, Sandy, OR, 97055)

---

This memo provides findings of a wetlands determination conducted by Environmental Science & Assessment, LLC (ES&A) at 19124 SE Jacoby Road in Clackamas County. The 9.64-acre parcel (TL 24E24A02300) is located directly east of SE Jacoby Road (Attachment A). The parcel boundaries and the aerial photo were provided by All county Surveyors and Planners, Inc.

A 31-lot subdivision site is planned for the site. The project developer contracted ES&A to determine the presence of jurisdictional resources on site and whether the site development may potentially impact any of these resources.

#### METHODOLOGY

Two levels of investigation were conducted for the determination. The first involved a review of existing information for the parcel. The second involved an on-site determination by ES&A staff.

Reviewed background data included the following information:

- Aerial Photography (Google Earth 2017);
- LIDAR (Oregon Department of Geology and Mineral Industries [DOGAMI], 2018);
- National Wetland Inventory (US Fish and Wildlife Service [USFWS], 2018);
- Topography (Metro Data Resource Center's MetroMap, 2018);
- Web Soil Survey of Clackamas County, Oregon (Natural Resource Conservation Service [NRCS], 2018).
- ORMAP (Taxmap Explorer, 2018)

Site determination data was collected at two locations on May 24, 2018. The entire site was inspected and any potential wetlands or water features on or adjacent to the parcel were noted. The site slopes at most 10 percent towards the north and the west corner. Data plots were collected in the northern end of the site to determine whether hydrology and soils meet currently recognized wetland criteria.

The wetland areas on the site were identified using methods consistent with the methodology provided in the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (USACE, 2010). This methodology defines criteria for hydrology, soils, and vegetation that determine the jurisdictional status of wetlands.

The data plot locations and any potential wetland boundaries were recorded in the field with field measurements from know points and transferred to base topographical map provided by the client (Attachment A).

The following attachments are included in this memo:

Attachment A: Figures  
Attachment B: Site photographs  
Attachment C: Wetland Determination Data Forms

#### EXISTING CONDITIONS

A shallow swale extends north through the western end of the site. A mapped segment of Tickle Creek is located in the northeast corner of the lot and was noted at the time of the site determination. The creek segment was mapped with the base topographic survey and this area will be protected in an open space tract as part of the proposed site development.

The 9.64-acre parcel at 19124 SE Jacoby Road is currently developed with one single family residence. Cascadia Village subdivision resides across SE Jacoby Road to the west and single-family dwellings reside to the north with rural residential area residing directly south and east of the site (Figure 1).

Site vegetation included a sparse canopy of western red cedar (*Thuja plicata*), big-leaf Maple (*Acer macrophyllum*) and western hemlock (*Tsuga heterophylla*), with red elderberry (*Sambucus racemosa*), and thimbleberry (*Rubus parviflorus*), Himalayan blackberry (*Rubus armeniacus*), western swordfern (*Polystichum munitum*), western brackenfern (*Pteridium aquilinum*), little western bittercress (*Cardamine oligosperma*), prickly lettuce (*Lactuca serriola*) and Siberian spring beauty (*Claytonia sibirica*) in the understory.

Topography on the lot slopes from the southern end of the site (1025 feet elevation) to the northern portion of the lot (984 feet elevation). Two wetland determination data plots (DP-1, DP-2) (Attachment C) were established along the shallow swale (Figure 3) (Attachment A).

Soils mapped on-site are Cazadero silty clay loams, 0 to 7 percent and 12 to 20 percent slopes (Map Units 15B and 15D), and Cottrell silty clay loam, 2 to 8 percent slopes (Map Unit 24B).

Tickle Creek flows from the east, entering the site briefly in the northwest corner and continues northwest to a culvert crossing at Jacoby Road approximately 500 feet north of the site (Metro 2018).

#### *Sensitive Areas*

The swale extends north to south through the site. A culvert at the existing driveway allows seasonal storm flow to pass into the north end of the site. The shallow swale stops approximately 80' south of the north property line. It was concluded that there was no channel morphology and no subsurface (wetland) hydrology and, therefore, no connection to off-site waterway north of the site.

The north end of site, being the lowest point of site, was investigated to determine the presence of any wetland features. The data collected indicate existing conditions in the swale do not meet wetland criteria. A summary of the data is provided below.

Data collected at north end of shallow swale (DP-1) included a variety of plants, soils, and minimal hydrology. In the surrounding area at the data plot there was nipplewort (*Lapsana communis*), velvet grass (*Holcus lanatus*), stickywilly (*Galium aparine*), annual bluegrass (*Poa annua*), fireweed (*Chamerion angustifolium*), Himalayan blackberry, big-leaf Maple, and western red cedar. There was evidence of seasonal flow lines at DP-1 with ponding in pockets, indicating ephemeral channel hydrology only. Soil profile was silt loam down to 13 inches and gravelly loam below to 20 inches. Soil did not meet hydric soil criteria. See Wetland Determination Data Forms in Attachment C.

Data collected north of the existing driveway (DP-2) included sparse western red cedar canopy with sparse weedy cover of nipplewort, velvet grass, bitter dock (*Rumex obtusifolius*) and Himalayan blackberry. There was evidence of seasonal storm ponding at the base of a berm (fill pile) across the swale which backed up the flow north. No defined channel was observed north of the berm and no wetland hydrology conditions extended north of the berm. Soil profile was silt loam down to 13 inches and gravelly loam below to 20 inches. Soil did not meet hydric soil criteria. See Wetland Determination Data Forms in Attachment C.

#### **CONCLUSION**

No evidence of intermittent or perennial flow was found on site. Evidence indicates seasonal ephemeral flow in the swale in west end of site and ponding at a culvert and a berm across channel. No flow or channel is present in the north end of site, thus there is no downstream connection to off-site waters. No wetland soils or hydrology is present, based on the data collected on site.

## REFERENCES

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U.S. Army Corps of Engineers (USACE). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), ed. J.S. Wakeley, R. W. Lichvar, and C.V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

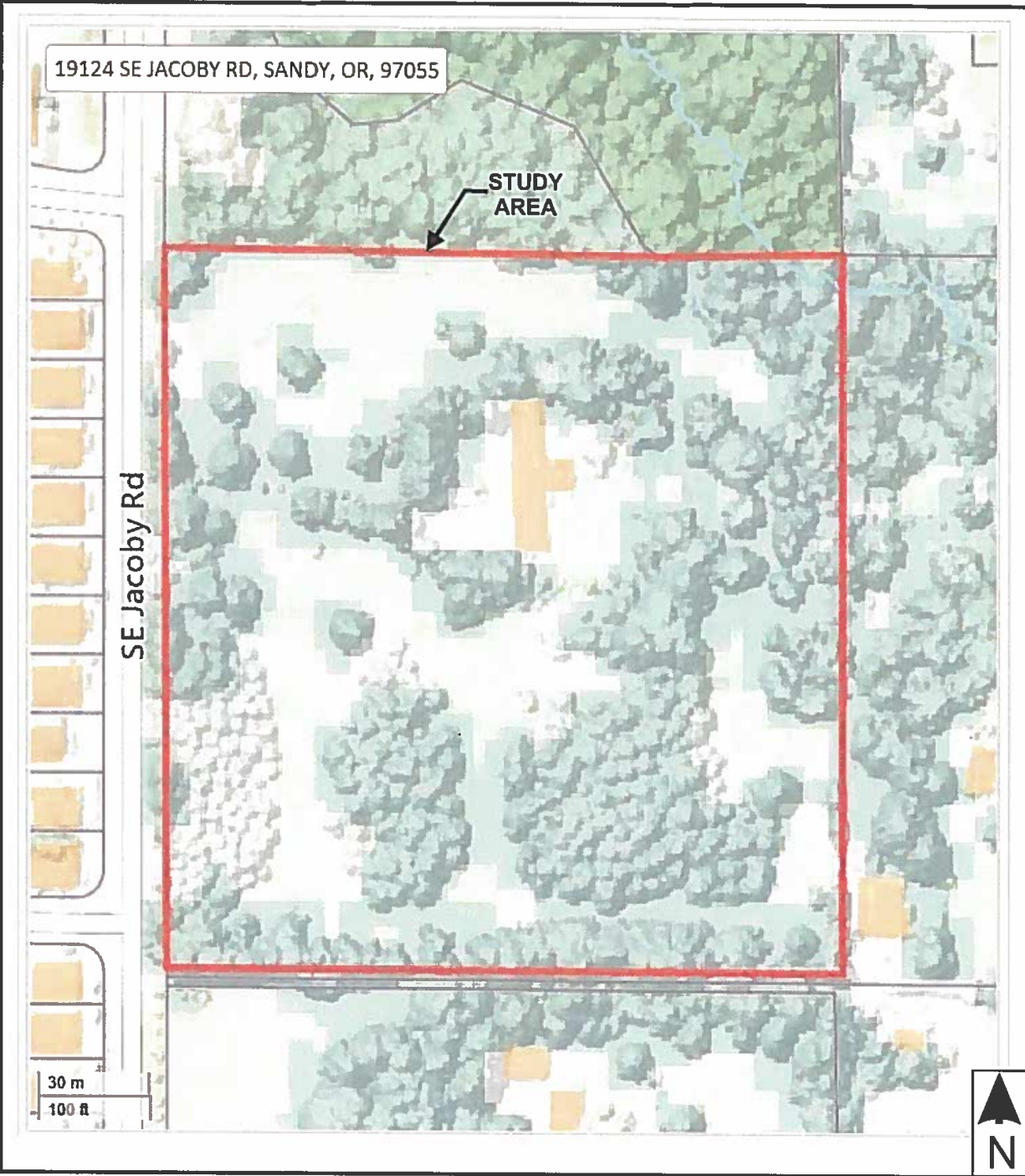
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**ATTACHMENT A: FIGURES**



Source: Metro Data Resource Center. <http://gis.oregonmetro.gov/metromap/>

<p>Environmental Science &amp; Assessment, LLC</p> 	<p>Vicinity Map Jacoby Subdivision Clackamas County, Oregon</p>	<p><b>Figure 1</b></p> <p>Approx. Scale: 1in. = 100 ft.</p>
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Source: [www.ormap.net](http://www.ormap.net)



Environmental  
Science &  
Assessment, LLC

Tax Lot Map  
Jacoby Subdivision  
Clackamas County, Oregon

Not to Scale

Figure 2



Source: [www.ormap.net](http://www.ormap.net)




Environmental  
Science &  
Assessment, LLC

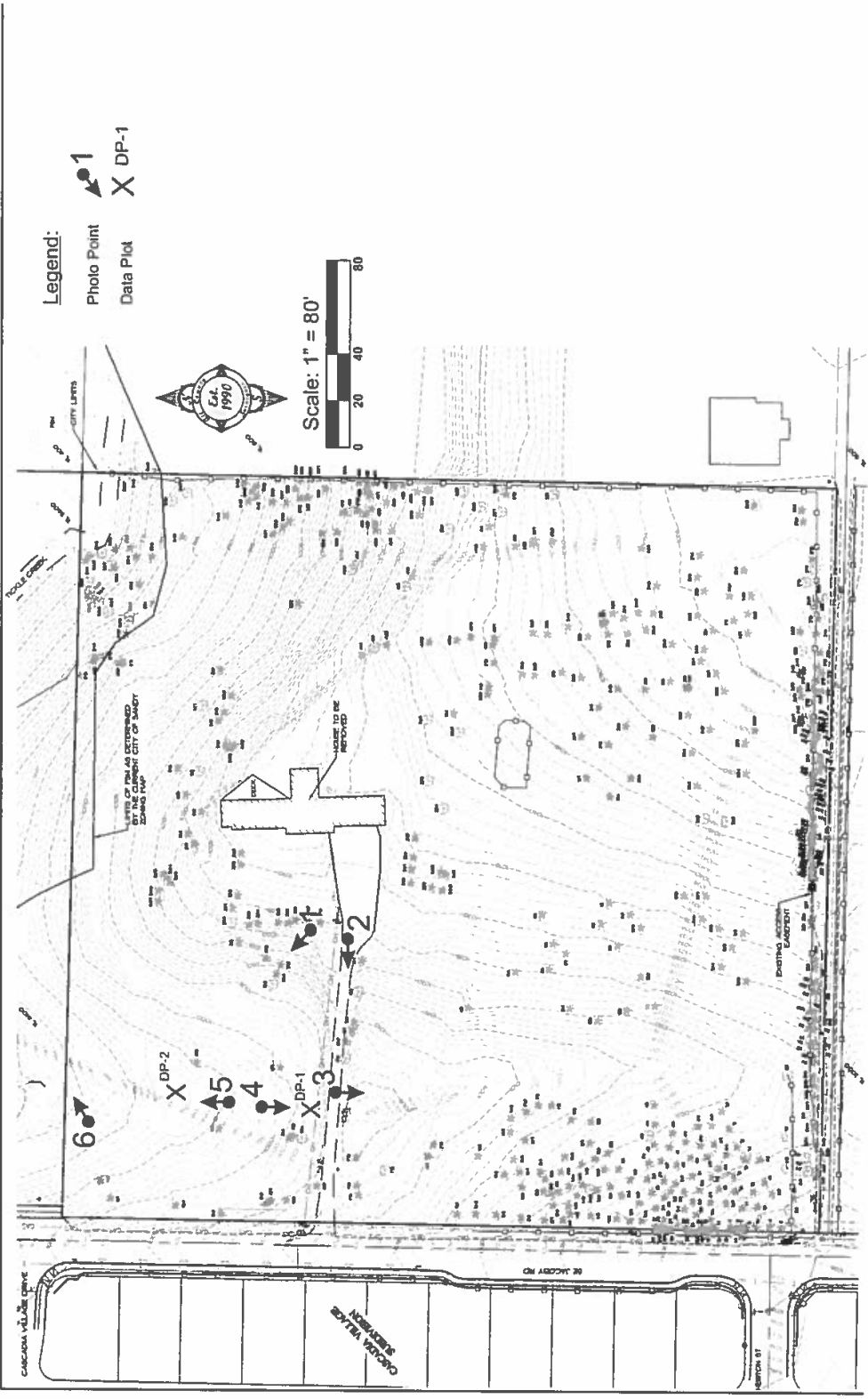
NWI Map  
Jacoby Subdivision  
Clackamas County, Oregon

Approx. Scale:  
1" = 528'

Figure 3



 <p>Environmental Science &amp; Assessment, LLC</p>	<p>NRCS Soil Map Jacoboy Subdivision Clackamas County, Oregon</p>	<p>Not to Scale</p>	<p>Figure 4</p>
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Source: All County Surveyors & Planners, Inc.

**ATTACHMENT B: SITE PHOTOS**



Photo 1: View north of site - site slopes to the north.



Photo 2: View west of driveway in middle of site.



Photo 3: View south from driveway - shallow ephemeral flow channel.





Photo 4: View south of DP-1 north of driveway at the downstream end.



Photo 5: View north of DP-2 at north end of site.



Photo 6: View NE at the north end of site - No defined channel exiting site.

**ATTACHMENT C: WETLAND DETERMINATION DATA SHEETS**

**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

Project/Site: Jacoby Subdivision City/County: Sandy/Clackamas Sampling Date: 05/24/18  
 Applicant/Owner: \_\_\_\_\_ State: OR Sampling Point: DP – 1  
 Investigator(s): Jack Dalton Section, Township, Range: 24, 2S, 4E  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): concave Slope (%): 7.5  
 Subregion (LRR): A-NW Forests & Coasts Lat: 45.385 Long: -122.256 Datum: N/A  
 Soil Map Unit Name: Cazadero silty clay loam, Cottrell silty clay loam NWI classification: N/A  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes _____	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes _____	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes _____	No <input checked="" type="checkbox"/>			

Remarks: Lacks hydric soil conditions. Hydrology evidence of ephemeral flow only.

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>20'x30'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>60</u> (A/B)
1. <u>Thuja plicata</u>	20	<input checked="" type="checkbox"/>	FAC	
2. <u>Acer macrophyllum</u>	10	<input checked="" type="checkbox"/>	FACU	
3. _____				
4. _____				
	<u>30</u>		= Total Cover	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>r = 15'</u> )				
1. <u>Rubus armeniacus</u>	15	<input checked="" type="checkbox"/>	FAC	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
	<u>15</u>		= Total Cover	
Herb Stratum (Plot size: <u>r = 5'</u> )				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Lapsana communis</u>	40	<input checked="" type="checkbox"/>	FACU	
2. <u>Holcus lanatus</u>	25	<input checked="" type="checkbox"/>	FAC	
3. <u>Galium aparine</u>	10	<input type="checkbox"/>	FACU	
4. <u>Chamerion angustifolium</u>	10	<input type="checkbox"/>	NL	
5. <u>Poa annua</u>	5	<input type="checkbox"/>	FAC	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	<u>90</u>		= Total Cover	
Woody Vine Stratum (Plot size: <u>r = 15'</u> )				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____				
	<u>0</u>		= Total Cover	
% Bare Ground in Herb Stratum <u>10</u>				

Remarks: Weedy community. Tree cover sparse along swale.

**SOIL**

Sampling Point: DP - 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	7.5 YR 2.5/2	100						
4-13	7.5 YR 3/2	99	7.5 YR 3/3	1	C	PL	Silt loam	
13-15	7.5 YR 3/2	95	7.5 YR 4/3	5	C	PL	Gravelly loam	
15-20	7.5 YR 3/2	95	7.5 YR 5/6	5	C	PL	Gravelly loam	5%

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)		

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
--	---

Remarks: Soil is well-drained.

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

<b>Field Observations:</b>		<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available

Remarks: Some evidence of surface (ephemeral) flow from seasonal stormwater – not intermittent or perennial flow.

**WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region**

Project/Site: Jacoby Subdivision City/County: Sandy/Clackamas Sampling Date: 05/24/18  
 Applicant/Owner: \_\_\_\_\_ State: OR Sampling Point: DP - 2  
 Investigator(s): Jack Dalton Section, Township, Range: 24, 2S, 4E  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): concave Slope (%): 7.5  
 Subregion (LRR): A-NW Forests & Coasts Lat: 45.385 Long: -122.256 Datum: N/A  
 Soil Map Unit Name: Cazadero silty clay loam, Cottrell silty clay loam NWI classification: N/A  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  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 <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampled Area within a Wetland?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>			
Remarks:					

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>20'x30'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80</u> (A/B)
1. <u>Thuja plicata</u>	10	Y	FAC	
2. _____				
3. _____				
4. _____				
	10	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>r = 15'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Rubus armeniacus</u>	15	Y	FAC	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
	15	= Total Cover		
Herb Stratum (Plot size: <u>r = 5'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> 5 - Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Lapsana communis</u>	10	Y	FACU	
2. <u>Holcus lanatus</u>	10	Y	FAC	
3. <u>Rumex obtusifolius</u>	10	Y	FAC	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	30	= Total Cover		
Woody Vine Stratum (Plot size: <u>r = 15'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. _____	0			
% Bare Ground in Herb Stratum <u>70</u>				

Remarks: Weedy community. Tree cover sparse. No FACW or OBL plants on site. Logging land use.

**SOIL**

Sampling Point: DP - 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	7.5 YR 3/2	100					Silt loam	
6-10	7.5 YR 3/2	99	7.5 YR 3/4	1	C	M	Silt loam	
10-13	7.5 YR 3/2	98	7.5 YR 3/4	2	C	M	Silt loam	
13-16	7.5 YR 3/2	95	7.5 YR 4/6	5	C	PL	Gravelly loam	
16-20	7.5 YR 2.5/2	95	7.5 YR 4/4	5	C	PL	Gravelly loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
--	---

Remarks: Soil is well-drained.

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>		
<b>Primary Indicators (minimum of one required; check all that apply)</b>		<b>Secondary Indicators (2 or more required)</b>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

<b>Field Observations:</b>		
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Ponding in swale at base of berm (fill pile ) from past logging – backs up flow. No channel north of the berm – no defined remnant channel or any wetland hydrology north of DP-2.

**EXHIBIT I**

35  
26  
61  
70  
2015  
FATCO No. 117525

**EASEMENT**

Between

Cory Alan Knight

And

Ian Bird and Kelly Bird

After recording, return to:

Ian Bird and Kelly Bird  
1234 Spinnaker Way  
Sugar Land, TX 77478



**THIS AGREEMENT** made and entered into on February 20, 2008 by and between, Cory Alan Knight, hereinafter called the first party, Ian Bird and Kelly Bird, Husband and Wife, hereinafter called the second party, WITNESSETH:

**WHEREAS:** The first party is the record owner of the following described real property in Clackamas County, State of Oregon, to-wit:

Exhibit "A" attached hereto and made a part hereof

and has the unrestricted right to grant the easement hereinafter described relative to the real estate; and the second party is the record owner of the following described real property in that county and state, to-wit:

Exhibit "B" attached hereto and made a part hereof

**NOW, THEREFORE,** in view of the premises and in consideration of \$0.00 by the second party to the first party paid, the receipt of which is acknowledged by the first party, it is agreed:

The first party hereby grants, assigns and sets over to the second party a private easement for ingress, egress and access, over the following described portion of first party's property, to wit:

**SEE ATTACHED EXHIBITS "C" and "C-1"**

The second party shall have all rights of ingress and egress to and from the real estate (including the right from time to time, except as hereinafter provided, to cut, trim and remove

trees, brush, overhanging branches and other obstructions) necessary for the second party's use, enjoyment, operation and maintenance of the easement hereby granted and all rights and privileges incident thereto.

The second party agrees to save and hold the first party harmless from any and all claims of third parties arising from the second party's use of the rights herein granted.

The period of this easement shall be perpetual, always subject, however, to the following specific conditions, restrictions and considerations:

NONE

During the existence of this easement, maintenance of the easement and costs of repair of the easement, if damaged by natural disasters or other events for which all holders of an interest in the easement are blameless, shall be the responsibility of both parties but only to the extent that the easement is used by both parties. If the easement is used exclusively by the second party, then the responsibility will be solely the second parties. The first party shall hold the second party harmless for such.

During the existence of this easement, holders of an interest in the easement who are responsible for damage to the easement because of negligence or abnormal use shall repair the damage at their sole expense.

In the event suit or action be filed by either of the parties hereto, to enforce any of the terms of this agreement, the parties hereto agree that the prevailing party shall be entitled to reasonable attorney's fees, to be set by the court, including any appeal thereon

This agreement shall bind and inure to the benefit of, as the circumstances may require, not only the parties hereto but also their respective heirs, executors, administrators, assigns, and successors in interest.

In construing this agreement, where the context so requires, the singular includes the plural and all grammatical changes shall be made so that this agreement shall apply equally to individuals and to corporations. If the undersigned is a corporation, it has caused its name to be signed and its seal, if any, affixed by an officer or other person duly authorized to do so by its board of directors.


IN WITNESS WHEREOF, the parties have hereunto set their hands in duplicate on the day and year first written above.

FIRST PARTY:

  
Cory Alan Knight

SECOND PARTY:

  
Ian Bird

  
Kelly Bird

2



STATE OF OREGON )

County of Clatsop )

This instrument was acknowledged before me on February 20, 2008 by

Cory Alan Knight



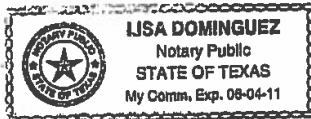
Tiffany Bodington  
Notary Public for Oregon

STATE OF TEXAS )

County of )

This instrument was acknowledged before me on February 21<sup>st</sup>, 2008 by

Ian Bird and Kelly Bird



Lisa Dominguez  
Notary Public for Texas

Exhibit "A"

Part of the Southwest one-quarter of the Northeast one-quarter of Section 24, Township 2 South, Range 4 East of the Willamette Meridian, in the County of Clackamas and State of Oregon, described as follows:

Beginning at an iron pipe at the Northeast corner of a tract of land conveyed to Millard D. Wilder and Virginia Wilder, his wife, by deed recorded September 13, 1944, in Deed Book 331, Page 436; thence East 660.00 feet along the North line of the Southeast one-quarter of the Southwest one-quarter of the Northeast one-quarter of said Section 24; thence North 660.00 feet; thence West 660.00 feet along the South line of that particular tract of land conveyed to George E. Stropa, et ux, by deed recorded November 20, 1944, in Deed Book 335,

Page 105; thence South 660.00 feet to the place of beginning. EXCEPTING THEREFROM the West 20 feet used for road purposes.

Exhibit "B"

A tract of land in the Northeast one-quarter of Section 24, Township 2 South, Range 4 East, of the Willamette Meridian, in the County of Clackamas and State of Oregon, described as follows:

Beginning at a point in the East line of the West one-half of the Southeast one-quarter of the Northeast one-quarter that is South 8.25 feet from the Southwest corner of the Northeast one-quarter of the Southeast one-quarter of the Northeast one-quarter of said Section 24; thence North along the said East line 668.25 feet, more or less, to the Northeast corner of the Northwest one-quarter of the Southeast one-quarter of the Northeast one-quarter of said Section 24; thence West along the North line of said division 660.00 feet, more or less, to the Northwest corner thereof; thence South along the East line of the Northeast one-quarter of the Southwest one-quarter of the Northeast one-quarter of said Section 24, a distance of 660.00 feet, more or less, to the Southeast corner thereof; thence West along the South line of said division 640.00 feet, more or less, to the East line of Dubarko Road (County Road No. 1836); thence South along the Easterly line of said road 8.25 feet to a point; thence East parallel with the North line of said division and the Easterly extension thereof 1,300.00 feet, more or less, to the point of beginning.

TOGETHER WITH and subject to a non-exclusive easement to be used in common with others for ingress, egress and all utility purposes over a tract of land 16.50 feet in width, the North line of which is described as follows:

Beginning at the intersection of the East line of Dubarko Road (County Road No. 1836) with the North line of the Southeast one-quarter of the Southwest one-quarter of said Section 24; thence East along the North line of said division and the Easterly extension thereof to a point that is Easterly 25.00 feet from the East line of said division.

Exhibit "C"

LEGAL DESCRIPTION FOR EASEMENT

A TRACT OF LAND IN THE NORTHEAST QUARTER OF SECTION 24, TOWNSHIP 2 SOUTH, RANGE 4 EAST OF THE WILLAMETTE MERIDIAN, CLACKAMAS COUNTY OREGON, FURTHER DESCRIBED AS FOLLOWS:

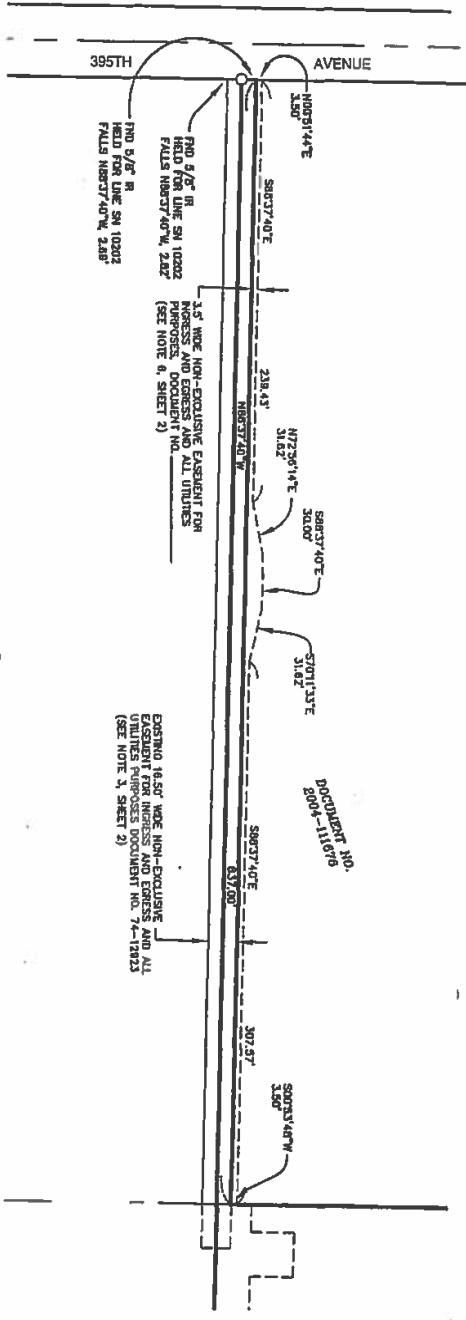
BEGINNING AT THE SOUTHWEST CORNER OF THE LAND DESCRIBED IN DOCUMENT NO. 2004-111676 CLACKAMAS COUNTY DEED RECORDS, SAID POINT BEING ON THE EAST RIGHT OF WAY LINE OF JACOBY ROAD, THENCE NORTH 00°51'44" EAST, ALONG SAID RIGHT OF WAY LINE, A DISTANCE OF 3.50 FEET; THENCE SOUTH 88°37'40" EAST, A DISTANCE OF 239.43 FEET; THENCE NORTH 72°56'14" EAST, A DISTANCE OF 31.62 FEET; THENCE SOUTH 88°37'40" EAST, A DISTANCE OF 30.00 FEET; THENCE SOUTH 70°11'33" EAST, A DISTANCE OF 31.62 FEET; THENCE SOUTH 88°37'40" EAST, A DISTANCE OF 307.57 FEET; THENCE SOUTH 00°53'48" WEST, A DISTANCE OF 3.50 FEET; THENCE NORTH 88°37'40" WEST, A DISTANCE OF 637.00 FEET TO THE POINT OF BEGINNING.

REGISTERED  
PROFESSIONAL  
LAND SURVEYOR

*Dan L. Gilbert*

OREGON  
JULY 11, 2000  
DAN L. GILBERT  
60121

6



REGISTERED  
PROFESSIONAL  
LAND SURVEYOR

*Dani L. Gilbert*

OREGON  
LAND SURVEYOR  
DANI L. GILBERT  
60121

EXPIRES: 06/30/09



PROPOSED ACCESS AND  
UTILITY EASEMENT

**FDG** FIRWOOD DESIGN GROUP

SURVEYING ENGINEERING PLANNING

2001 PINEVIEW BLVD., SUITE C  
BROOK, OREGON 97116  
503.535.5437  
FAX: 503.535.5796

CLATSOP COUNTY CASE FILE NO. 2004-07-14

EXHIBIT C-1

LOCATED IN THE NE CORNER  
1/4 OF SECTION 24  
TOWNSHIP 2 SOUTH, RANGE 4 EAST, MULTNOMAH  
CITY OF SANDY, CLATSOP COUNTY, OREGON  
SCALE: 1" = 60'  
DECEMBER 20, 2007

1	2
---	---

607-034.dwg

(C)

KNOW ALL MEN BY THESE PRESENTS, That David T. Piety

hereinafter called the grantor, for the consideration hereinafter stated, to grantor paid by Arthur Dean Revel and Diane M. Revel (Husband & wife)

hereinafter called the grantee, does hereby grant, bargain, sell and convey unto the said grantee and grantee's heirs, successors and assigns, that certain real property, with the tenements, hereditaments and appurtenances thereunto belonging or appertaining, situated in the County of Clackamas and State of Oregon, described as follows, to-wit:

EXHIBIT "A"

Witness My Hand and Seal of Office this 21st day of May 1954

A tract of land in the Northeast Quarter of Section 24, T. 2 S., R. 4 E. of the W.M., in the County of Clackamas and State of Oregon, described as follows:

Beginning at a point in the East line of the West one-half of the Southeast one-quarter of the Northeast one-quarter tract is South 8.25 feet from the Southwest corner of the Northeast one quarter of the Southeast one quarter of the Northeast one quarter of said Section 24; thence North along the said East line 668.25 feet, more or less, to the Northeast corner of the Northwest one quarter of the Southeast one-quarter of the Northeast one-quarter of said Section 24; thence West along the North line of said division 660.00 feet, more or less, to the Northwest corner thereof; thence South along the East line of the Northeast one-quarter of the Southwest one quarter of the Northeast one-quarter of said Section 24, 660.00 feet, more or less, to the Southeast corner thereof; thence West along the South line of said division 640.00 feet, more or less, to the East line of Dubarko Road (County Road No. 1836); thence South along the Easterly line of said road 8.25 feet to a point, thence East parallel with the North line of said division and the Easterly extension thereof 1300.00 feet, more or less, to the point of beginning.

TOGETHER WITH and subject to a non exclusive easement to be used in common with others for ingress, egress and all utility purposes over a tract of land 16.50 feet in width, the North line of which is described as follows:

Beginning at the intersection of the East line of Dubarko Road (County Road No. 1836) with the North line of the Southeast one-quarter of the Southwest one-quarter of the Northeast one-quarter of said Section 24; thence East along the North line of said division and the Easterly extension thereof to a point that is Easterly 25.00 feet from the East line of said division.



## EXHIBIT J

**Tyler Henderson**

---

**To:** Ray Moore  
**Subject:** RE: 17-199 - Fw: Jacoby Subdivision

**From:** Mike Walker  
**Sent:** Friday, January 5, 2018 1:35 PM  
**To:** Ray Moore  
**Cc:** Thomas Fisher ; Kelly O'Neill  
**Subject:** Jacoby Subdivision

Ray,

Attached please find the pre-design report for the pump station and a capacity analysis of the gravity system downstream of the force main discharge.

We did an analysis of the existing dwelling units in the contributing basin. There are 284 existing dwelling units and assuming build-out of vacant or under-developed properties there will be between 360 and 400 dwelling units at build-out of the area identified in the pre-design report.

Since the pump station, wet well and force main were designed for a total of 525 dwelling units it does not appear that the existing pump station will need to be expanded to accommodate your client's development. However you should address this in the utilities section of your land use submittal narrative.

Please let me know if you have any questions or need more information.

--

Mike Walker

Director of Public Works

City of Sandy

39250 Pioneer Blvd.

Sandy, OR 97055

503-489-2162 V

503-668-8714 F

[www.ci.sandy.or.us](http://www.ci.sandy.or.us)



## EXHIBIT K

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

Tag	Species	Diameter	Remarks	Action	RPZ
1	Douglas fir	8	topped for high voltage wires; hedgerow		8
2	western redcedar	19	viable; hedgerow; pruned for high vottage wires		12
3	casacara buckthorn	9	topped for high voltage wires; hedgerow		8
4	Douglas fir	30	viable; hedgerow; pruned for high vottage wires		20
5	Douglas fir	11	topped for high voltage wires; hedgerow		8
6	Douglas fir	5	topped for high voltage wires; hedgerow		8
7	Douglas fir	5	topped for high voltage wires; hedgerow		8
8	western redcedar	22	topped for high voltage wires; hedgerow		14
9	Douglas fir	8	topped for high voltage wires; hedgerow		8
10	Douglas fir	11	topped for high voltage wires; hedgerow		8
11	western redcedar	22	topped for high voltage wires; hedgerow		14
12	Douglas fir	10	topped for high voltage wires; hedgerow		8
13	Douglas fir	12	topped for high voltage wires; hedgerow		8
14	Douglas fir	7	topped for high voltage wires; hedgerow		8
15	Douglas fir	8	topped for high voltage wires; hedgerow		8
16	Douglas fir	6	topped for high voltage wires; hedgerow		8
17	Douglas fir	5	topped for high voltage wires; hedgerow		8
18	Douglas fir	9	topped for high voltage wires; hedgerow		8
19	Douglas fir	19	topped for high voltage wires; hedgerow		12
20	Douglas fir	19	topped for high voltage wires; hedgerow		12
21	Douglas fir	8	topped for high voltage wires; hedgerow		8
22	Douglas fir	9	topped for high voltage wires; hedgerow		8
23	Douglas fir	7	topped for high voltage wires; hedgerow		8
24	Douglas fir	7	topped for high voltage wires; hedgerow		8

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

25	western redcedar	26	topped for high voltage wires; broken top	16
26	Douglas fir	11	topped for high voltage wires; hedgerow	8
27	Douglas fir	6	topped for high voltage wires; hedgerow	8
28	Douglas fir	9	topped for high voltage wires; hedgerow	8
29	Douglas fir	6	topped for high voltage wires; hedgerow; dead	0
30	Douglas fir	5	topped for high voltage wires; hedgerow	8
31	Douglas fir	6	topped for high voltage wires; hedgerow	8
32	Douglas fir	12	topped for high voltage wires; hedgerow	8
33	Douglas fir	9	viable; hedgerow; pruned for high voltage wires; windthrow potential	8
34	Douglas fir	9	viable; grown in grove	8
35	Douglas fir	6	viable; grown in grove	8
36	Douglas fir	9	viable; grown in grove	8
37	Douglas fir	8	viable; grown in grove	8
38	Douglas fir	12	viable; grown in grove; so-dominant @ 22'	8
39	Douglas fir	9	viable; grown in grove	8
40	Douglas fir	11	viable; grown in grove	8
41	Douglas fir	9	viable; grown in grove	8
42	Douglas fir	12	viable; grown in grove	10
43	sweet cherry	7	invasive species	8
44	Douglas fir	11	viable	8
45	Douglas fir	16	viable	10
46	Douglas fir	11	viable; grown in grove	8
47	Douglas fir	10	viable; grown in grove	8
48	Douglas fir	12	viable; grown in grove	8
49	Douglas fir	8	viable; grown in grove	8

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

50	Douglas fir	9	viable; grown in grove		8
51	Douglas fir	10	viable; grown in grove		8
52	Douglas fir	5	undersize		8
53	Douglas fir	11	viable; grown in grove		8
54	Douglas fir	10	viable; windthrow potential; grown in grove		8
55	Douglas fir	12	viable; grown in grove		8
56	Douglas fir	9	viable; windthrow potential; grown in grove		8
57	Douglas fir	13	viable; grown in grove		8
58	Douglas fir	9	viable; grown in grove		8
59	Douglas fir	11	viable; grown in grove		8
60	Douglas fir	12	viable; grown in grove		8
61	Douglas fir	10	dead		0
62	Douglas fir	8	viable; grown in grove		9
63	Douglas fir	11	viable; grown in grove		9
64	Douglas fir	10	viable; grown in grove		9
65	Douglas fir	9	viable; grown in grove		8
66	Douglas fir	10	viable; grown in grove		8
67	Douglas fir	10	viable; grown in grove		8
68	Douglas fir	14	viable		8
69	Douglas fir	11	viable; grown in grove		8
70	western redcedar	15	viable		10
71	western redcedar	12	viable		9
72	Douglas fir	9	viable; grown in grove		9
73	Douglas fir	14	viable		8
74	red alder	14	co-dominant from base		8

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

75	Douglas fir	14	viable; grown in grove		8
76	Douglas fir	7	viable; grown in grove		8
77	Douglas fir	12	viable; grown in grove		8
78	Douglas fir	8	viable; grown in grove		8
79	Douglas fir	10	viable; grown in grove		8
80	Douglas fir	5	viable; grown in grove		8
81	Douglas fir	9	viable; grown in grove		8
82	Douglas fir	9	viable		8
83	sweet cherry	5	invasive species		8
84	bigleaf maple	12	viable		8
85	Douglas fir	23	viable; dead branches		16
86	bigleaf maple	8	excessive lean		8
87	red alder	14	viable		10
88	red alder	13	viable		8
89	red alder	13	viable		8
90	mountain ash	16	invasive species		10
91	Douglas fir	16	viable; co-dominant @ 12 ft.		10
92	Douglas fir	30	viable; co-dominant @ 3 ft.		20
93	Douglas fir	17	viable; hedgerow		12
94	Douglas fir	16	viable		10
95	American elm	7	viable; hedgerow		8
96	American elm	7	viable; hedgerow; excessive lean; trunk bowed		8
97	American elm	33	viable; hedgerow; 6 co-dominant stems from base		20
98	Douglas fir	4	viable; hedgerow		8
99	American elm	22	dead; 7-inch Douglas fir grows from base		0

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

100	Douglas fir	15	poor taped; low LCR	10
101	Douglas fir	17	viable	12
102	Douglas fir	20	viable	14
103	Douglas fir	19	viable	12
104	Douglas fir	18	viable	12
105	Douglas fir	21	viable	13
106	Douglas fir	17	viable	12
107	Douglas fir	16	viable	10
108	Douglas fir	20	viable	14
109	Douglas fir	19	viable	12
110	Douglas fir	17	viable	12
111	Douglas fir	17	viable	12
112	Douglas fir	18	viable	12
113	Douglas fir	17	viable	12
114	Douglas fir	17	viable	12
115	western redcedar	63	base is hollow; co-dominant stems from base	25
116	Douglas fir	19	viable	12
117	Douglas fir	16	viable	10
118	Douglas fir	19	viable	12
119	Douglas fir	21	viable	14
120	Douglas fir	22	viable	14
121	Douglas fir	17	viable	12
122	Douglas fir	17	viable	12
123	Douglas fir	20	viable; small co-dominant stem	14
124	Douglas fir	17	viable	12

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

125	Douglas fir	15	viable		10
126	Douglas fir	10	viable; grown in grove		8
127	Douglas fir	16	viable; grown in grove		10
128	Douglas fir	9	viable; grown in grove		8
129	Douglas fir	8	viable; grown in grove		8
130	Douglas fir	14	viable; grown in grove		10
131	Douglas fir	7	viable; grown in grove		8
132	Douglas fir	12	viable; grown in grove		8
133	Douglas fir	14	viable; grown in grove		10
134	Douglas fir	9	viable; grown in grove		8
135	Douglas fir	10	viable; grown in grove		8
136	Douglas fir	21	viable; hedgerow; pruned for high voltage wires		14
137	western redcedar	18	viable; hedgerow; pruned for high voltage wires		12
138	Douglas fir	39	viable; hedgerow; pruned for high voltage wires		25
139	Douglas fir	8	viable; grown in grove		8
140	Pacific yew	9	dead		0
141	western redcedar	12	viable; hedgerow		8
142	Douglas fir	16	viable; hedgerow; pruned for high voltage wires		10
143	Douglas fir	9	viable; grown in grove		8
144	Douglas fir	16	viable; hedgerow; pruned for high voltage wires; so-dominant from base		10
145	Douglas fir	11	viable; grown in grove		8
146	Douglas fir	10	viable; grown in grove		8
147	Douglas fir	9	viable; grown in grove		8
148	Douglas fir	11	viable; grown in grove		8
149	Douglas fir	14	viable; grown in grove		10

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

150	Douglas fir	15	viable; grown in grove	10
151	Douglas fir	9	viable; grown in grove	8
152	Douglas fir	7	viable; grown in grove	8
153	Douglas fir	7	viable; grown in grove	8
154	Douglas fir	6	viable; grown in grove	8
155	Douglas fir	9	viable; grown in grove	8
156	Douglas fir	7	viable; grown in grove	8
157	Douglas fir	14	viable; hedgerow; pruned for high voltage wires	10
158	Douglas fir	26	viable; hedgerow; pruned for high voltage wires	16
159	Douglas fir	25	viable; hedgerow; pruned for high voltage wires	16
160	Douglas fir	30	viable; hedgerow; pruned for high voltage wires	20
161	Douglas fir	25	viable; hedgerow; pruned for high voltage wires; co-dominant @ 10 ft.	16
162	Douglas fir	17	viable; hedgerow; pruned for high voltage wires	12
163	Douglas fir	17	viable; grown in grown	12
164	Douglas fir	7	viable; grown in grown	8
165	Douglas fir	23	viable; grown in grown	16
166	Douglas fir	18	viable	12
167	Douglas fir	11	viable	8
168	Douglas fir	9	viable	8
169	Douglas fir	14	viable	10
170	western redcedar	11	viable	8
171	western redcedar	12	viable; co-dominant from base	8
172	western redcedar	17	viable; 3 co-dominant stems from base	12
173	apple	14	orchard pruned @ 18 ft.	8
174	western redcedar	62	viable; co-dominant stems from 45 ft.	25

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

175	western redcedar	47	viable; co-dominant stems from 3 ft.; multiple tops	25
176	western redcedar	38	viable	25
178	Douglas fir	26	viable; trunk swoop; unstable soil	16
179	bigleaf maple	16	viable; large surface root	10
180	Douglas fir	16	viable	10
181	western redcedar	8	viable	8
182	western redcedar	11	viable	8
183	bigleaf maple	14	viable	10
184	Douglas fir	38	viable	25
185	Douglas fir	11	topped for high-voltage wires	8
186	Douglas fir	30	viable; pruned for high-voltage wires	20
187	Douglas fir	17	viable	12
188	Douglas fir	27	viable	18
189	Douglas fir	21	topped for high-voltage wires	14
190	Douglas fir	21	viable; pruned for high-voltage wires	14
191	Douglas fir	28	viable; large surface root to northwest	18
192	Douglas fir	24	viable	16
193	western redcedar	43,23	2 co-dominant stems; large flush cut on trunk @ old inclusion; basal decay; trunk decay	25
194	western redcedar	64	viable; co-dominant stem broken	25
195	Douglas fir	5	undersize; grows from the base of T194	8
196	casacara buckthorn	9	viable	8
197	western redcedar	57	viable; hedgerow	25
198	western redcedar	62	3 co-dominant tops; broken stem; wood borers; loose/shedding bark on root flares	25
199	red alder	15	listed; flagging in top; mechanical damage to trunk	0
200	Douglas fir	28	viable	18

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018



19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

201	western redcedar	15	viable		10
202	Douglas fir	22	viable		14
203	Douglas fir	17	viable; offsite		12
204	casara buckthorn	0	broken		0
205	Douglas fir	4	offsite; tagged #205		8
206	Douglas fir	24	viable; was tagged #205; changed tag to #206		16
207	Douglas fir	16	viable		10
208	Douglas fir	23	viable; hedgerow; size estimated		16
209	Douglas fir	24	viable; hedgerow; size estimated		16
210	Douglas fir	26	viable; hedgerow; size estimated		16
211	American elm	18	viable; hedgerow; co-dominant from base		12
212	American elm	26	viable; hedgerow		16
213	American elm	6	viable; hedgerow		8
214	American elm	6	viable; hedgerow		8
215	Douglas fir	10	viable; hedgerow		8
216	Douglas fir	22	viable; hedgerow		14
218	sweet cherry	9	viable; hedgerow		8
219	Douglas fir	18	viable; hedgerow		12
220	bigleaf maple	8	viable; hedgerow		8
221	Douglas fir	20	viable; hedgerow		12
222	sweet cherry	8	invasive species		8
223	Douglas fir	19	viable; hedgerow		12
224	Douglas fir	19	viable; hedgerow		12
225	western redcedar	26	viable; hedgerow		16
226	bigleaf maple	18	viable; hedgerow; T2002 grows from base		12

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

227	bignone maple	13	viable; hedgerow		10
228	western redcedar	5	undersize		8
229	western redcedar	10	viable; hedgerow		8
230	western redcedar	6	undersize		8
231	Douglas fir	14	viable; hedgerow		8
232	bignone maple	10	viable; hedgerow		8
233	western redcedar	4	undersize		8
234	Douglas fir	3	undersize		8
235	Douglas fir	28	viable; hedgerow		18
236	western redcedar	10	viable; hedgerow		8
237	bignone maple	3	undersize		8
238	bignone maple	4	undersize		8
239	western redcedar	3	undersize		8
240	Douglas fir	17	viable; hedgerow		12
241	bignone maple	7	undersize		8
243	bignone maple	5	undersize		8
244	western redcedar	9	viable; hedgerow		8
245	bignone maple	7	undersize		8
246	Douglas fir	33	viable; dead branches		21
247	Douglas fir	18	viable; hedgerow		12
248	red alder	15	dead		0
249	bignone maple	14	viable; co-dominant from base		8
250	Douglas fir	17	viable; hedgerow		12
251	bignone maple	7	undersize		0
252	bignone maple	3	undersize		0

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

253	bigleaf maple	10	viable; hedgerow	8
254	western redcedar	9	viable; hedgerow	8
255	western redcedar	6	undersize	0
256	Douglas fir	23	viable; hedgerow	16
257	Douglas fir	24	viable; hedgerow	16
258	Douglas fir	17	viable; hedgerow	12
259	western redcedar	6	undersize	0
261	bigleaf maple	3	undersize	0
262	bigleaf maple	10	viable; hedgerow	8
263	Douglas fir	20	viable; hedgerow	14
264	bigleaf maple	10	viable; hedgerow	8
265	western redcedar	5	undersize	0
266	Douglas fir	21	viable; hedgerow	14
267	western redcedar	10	viable; hedgerow	8
268	Douglas fir	18	viable; hedgerow	12
269	bigleaf maple	7	undersize	8
270	western redcedar	6	undersize	8
271	Douglas fir	36	viable; dead branches; 75% LCR	24
272	Douglas fir	41	viable	25
273	Douglas fir	42	viable; dead branches; 75% LCR	25
274	western redcedar	23	viable; co-dominant @ 15ft.	24
275	bigleaf maple	11	viable; hedgerow	8
276	red alder	10	hollow; trunk decay; long cavity	0
277	European birch	5	undersize	8
278	European birch	11	viable	8

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

279	Douglas fir	28	viable; hedgerow	18
280	Douglas fir	26	viable; hedgerow	16
281	Douglas fir	18	viable; hedgerow	12
282	Douglas fir	20	viable; hedgerow	18
283	Douglas fir	23	viable; hedgerow; small wound at 4 ft.	16
284	Douglas fir	21	viable; hedgerow	13
285	Douglas fir	11	viable; hedgerow; mechanical damage to trunk	8
286	bigleaf maple	10	broken top; tear out on base	8
287	Douglas fir	36	viable; hedgerow; large buttress roots	22
288	Douglas fir	33	viable; hedgerow; large buttress roots	20
289	Douglas fir	32	viable; hedgerow	20
290	Douglas fir	30	viable; hedgerow	20
291	western redcedar	11	viable; hedgerow	8
292	Douglas fir	8	viable	8
293	western hemlock	10	viable	8
294	Douglas fir	11	viable	8
295	Douglas fir	33	viable; large buttress roots	22
296	Douglas fir	22	viable; ivy	14
297	Douglas fir	22	viable; ivy	14
298	Douglas fir	23	viable; ivy	16
299	Douglas fir	25	viable; ivy	16
300	Douglas fir	18	viable	12
301	Douglas fir	16	viable	10
302	western hemlock	13	viable	8
303	Douglas fir	8	viable; hedgerow	8

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

304	Douglas fir	16	viable		10
305	Douglas fir	12	viable; hedgerow		8
307	bingleaf maple	7	undersize		8
308	Douglas fir	6	undersize		8
309	Douglas fir	18	viable		12
310	Douglas fir	17	viable		12
311	western redcedar	10	viable		8
312	Douglas fir	16	viable; tagged #312 and #321 in field		10
313	Douglas fir	15	viable		10
314	Douglas fir	19	viable		12
315	Douglas fir	17	viable		12
316	Douglas fir	17	viable		12
317	Douglas fir	17	viable		12
318	Douglas fir	24	viable		16
319	Douglas fir	17	viable		12
320	Douglas fir	32	co-dominant @ 20 ft.; large inclusion; hazardous		0
322	Douglas fir	16	viable		12
323	Douglas fir	17	viable		12
324	western redcedar	11	viable		8
325	Douglas fir	17	viable		12
326	gone	0	gone		0
327	western redcedar	7	undersize		8
328	Douglas fir	17	viable		12
329	Douglas fir	20	viable		14
330	Douglas fir	23	viable		14

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

331	Douglas fir	16	viable		10
332	western redcedar	11	viable		8
333	bigleaf maple	6	undersize		8
334	western redcedar	10	viable		8
335	Douglas fir	15	viable		10
336	Douglas fir	19	viable		12
337	Douglas fir	18	viable		12
338	Douglas fir	16	viable		10
339	western redcedar	11	viable		8
340	western redcedar	14	viable		10
341	Douglas fir	10	viable		8
342	Douglas fir	7	undersize; dead		0
343	sweet cherry	7	undersize; excessive lean		0
344	Douglas fir	9	viable; hedgerow; suppressed		8
345	Douglas fir	16	viable		10
346	Douglas fir	17	viable		12
347	Douglas fir	7	undersize		8
348	Douglas fir	17	viable		12
349	Douglas fir	15	viable		10
350	Douglas fir	12	viable		10
351	Douglas fir	16	viable		10
353	gone	0	gone		0
353	Douglas fir	17	viable		12
354	Douglas fir	15	co-dominant @ 25ft.; windthrow potential		10
355	bigleaf maple	8	viable		8

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

356	Douglas fir	15	viable		10
357	western redcedar	30	large co-dominant stems @ 25 ft.		20
358	Douglas fir	18	viable		12
359	apple	8	orchard pruned		8
360	linden	8	viable		8
361	Douglas fir	19	viable		12
362	bigleaf maple	17	trunk cavity and decay		12
363	bigleaf maple	24	viable; 3 co-dominant stems from base		16
364	apple	10	orchard pruned		8
364	Douglas fir	16	viable		12
365	bigleaf maple	41	viable		25
366	western redcedar	10	viable		8
367	red maple	9	viable		8
368	Douglas fir	9	viable; suppressed		8
369	bigleaf maple	12	viable		8
370	western redcedar	18	viable		12
371	Douglas fir	16	viable		10
372	western redcedar	6	undersize		8
373	western redcedar	8	viable; hedgerow		8
374	Douglas fir	17	viable		12
375	Douglas fir	22	viable		14
376	European birch	9	broken top		8
377	bigleaf maple	11	viable		8
378	western redcedar	8	viable		8
379	western redcedar	12	viable		8

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

380	western redcedar	10	viable		8
381	bignonia maple	34	viable		22
382	Douglas fir	16	viable		10
383	western redcedar	56	viable; co-dominant @ 20 ft.		25
385	Douglas fir	13	viable		8
386	western redcedar	33	trunk decay; basal decay; hollow; broke @ 20 ft.; multiple tops; habitat den in stump		22
387	bignonia maple	14	viable		8
388	bignonia maple	22	viable		14
389	western redcedar	9	viable; grows from nurse log		8
390	western redcedar	23	trunk and stem decay; co-dominant		16
391	western redcedar	22	viable; grows from old stump		14
392	western redcedar	8	viable		8
393	Douglas fir	11	viable		10
394	Douglas fir	10	trunk decay		8
395	Douglas fir	16	viable		10
396	Douglas fir	24	viable; mechanical damage to root flare		16
397	Douglas fir	16	viable		10
398	Douglas fir	16	viable		10
399	western redcedar	18	basal decay; trunk decay		12
400	Douglas fir	42	viable		25
401	bignonia maple	38	mechanical damage to base and buttress roots; multiple tops @ 40'		25
402	Douglas fir	13	viable		8
403	bignonia maple	27	large stem broke; trunk decay		18
404	western redcedar	10	viable; grows from nurse log		8
405	bignonia maple	6	multiple 6-inch stump suckers; basal decay		0

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018



19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

406	western redcedar	29	base is hollow		0
407	Douglas fir	21	viable		14
408	western hemlock	10	viable; wound on trunk		8
409	gone	0	gone		0
410	western redcedar	19	mechanical damage to trunk		12
411	western redcedar	27	mechanical damage to trunk; wood borers		18
412	bigleaf maple	28	viable; co-dominant @ 30'; tear out @ 40'		18
413	western redcedar	35	terminal decline; severe basal decay		0
414	western redcedar	9	viable		8
415	bigleaf maple	21	viable; dead branches		14
416	gone	0	gone		0
417	western redcedar	7	undersize; viable		8
418	Douglas fir	13	viable; poor trunk taper		8
419	western redcedar	12	viable		10
420	western redcedar	9	viable		8
421	western redcedar	10	viable		8
422	western redcedar	8	viable		8
423	western redcedar	9	viable		8
424	bigleaf maple	10	viable		8
425	western redcedar	8	viable		8
426	western redcedar	8	viable		8
427	western redcedar	8	viable		8
428	Douglas fir	7	undersize; mechanical damage to trunk and stem		8
429	western redcedar	9	viable; co-dominant from base		8
430	bigleaf maple	38	co-dominant @ 30 ft.; northern stem broken; woodpeckers @ 20 ft.		25

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

431	red alder	12	viable; 15 degree trunk swoop		10
432	western redcedar	11	viable		8
500	western redcedar	21	dead top; wound on trunk; trunk decay		14
501	western redcedar	21	viable		14
502	Douglas fir	23	viable		16
503	western redcedar	11	viable		8
504	western redcedar	17	viable		12
505	western hemlock	11	trunk decay; long trunk wound		0
506	western redcedar	8	trunk decay; long trunk wound		0
507	western redcedar	10	trunk decay; long trunk wound		0
508	western redcedar	30	viable		20
509	western redcedar	37	viable		25
510	western redcedar	15	viable; suppressed; co-dominant		10
511	bigleaf maple	37	viable; minor wounds on trunk; dead branches		25
512	western redcedar	52	co-dominant from base; basal decay; hollow; hazardous		0
513	western redcedar	14	viable		10
514	western redcedar	19	viable; co-dominant @ 12 ft.		12
515	Douglas fir	34	viable; small wound on trunk; base is swollen		22
516	western redcedar	20	viable		12
517	bigleaf maple	10	viable		8
518	western redcedar	12	viable		8
519	Douglas fir	9	viable		8
520	western hemlock	14	viable; wound on trunk		10
521	western redcedar	18	viable; no tag in field		12
522	western hemlock	11	viable		8

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

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523	western redcedar	18	viable		12
524	western redcedar	42	basal decay; trunk decay for 30 ft.		25
525	western redcedar	15	viable		10
526	western redcedar	8	listed; hung up in T525		8
527	western redcedar	12	viable		8
528	western redcedar	12	viable		8
529	western redcedar	9	viable		8
530	western redcedar	18	viable		12
531	Douglas fir	12	viable; poor trunk taper; windthrow potential		8
532	Douglas fir	9	viable; poor trunk taper; windthrow potential		8
533	Douglas fir	6	viable; suppressed		8
534	Douglas fir	15	viable; poor trunk taper		10
535	western hemlock	13	20-foot trunk scar; poor response growth; windthrow potential		8
536	western hemlock	8	35-foot trunk scar; terminal decline		8
537	western redcedar	17	viable		12
538	western hemlock	10	viable; minor mechanical damage to trunk		8
539	western hemlock	16	viable; grows from nurse stump		10
540	Douglas fir	8	listed; hung up in T541		8
541	red alder	10	viable; trunk swoop		8
542	western hemlock	12	viable		8
543	Douglas fir	8	viable		8
544	Douglas fir	9	viable		8
545	Douglas fir	25	viable		16
546	Douglas fir	18	viable		12
547	red alder	17	listed and self-corrected; excessive lean		12

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

548	western redcedar	47	viable; approx. 2 ft. offsite	25
549	red alder	14	viable; on property line	8
550	red alder	17	viable; at creek	12
551	western red cedar	21	trunk decay	14
552	western red cedar	22	viable	14
553	western red cedar	25	viable	16
554	western red cedar	13	viable	8
555	dead	5	dead	0
556	red alder	6	viable; undersize	9
557	red alder	15	viable	10
558	Douglas fir	5	suppressed; undersize	9
559	red alder	11	viable; at creek	8
560	western red cedar	33	viable; some trunk decay; at creek	22
561	western red cedar	50	viable	25
562	red alder	9	excessive lean; trunk bows 60 ft. to south	9
563	red alder	8	terminal decline	9
564	bignonia maple	24	viable	16
565	red alder	10	viable	9
566	red alder	12	viable	8
567	red alder	12	viable; leans towards site	8
568	bignonia maple	17	viable	12
569	bignonia maple	5	undersize; stump sucker	9
570	western hemlock	7	viable; undersize	8
571	western red cedar	27	wound on trunk; trunk decay	18
573	western redcedar	9	viable	8

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy  
8" and larger

10/23/2018

574	western redcedar	9	viable		8
575	bigleaf maple	32	broken stem; trunk decay; re-trenched		22
1003	red alder	22	viable; added by arborist		14
2000	Douglas fir	15	viable; added by arborist; shares stump with T177; unstable soil		10
2001	Douglas fir	12	viable; added by arborist		8
2002	Douglas fir	9	viable; hedgerow; added by arborist		8
2003	Douglas fir	16	viable; hedgerow; added by arborist		10
2004	bigleaf maple	10	viable hedgerow; added by arborist		8
2005	western redcedar	17	viable; hedgerow		12
2006	western redcedar	10	viable; hedgerow; added by arborist; grows from the base of T263		8
2007	Douglas fir	16	viable; added by arborist		10
3000	bigleaf maple	18	viable; no top; naturally re-trenched; added by arborist		12
3001	red alder	20	off-site; grows over property by 40 ft. listed and self-corrected; added by arborist		14
3002	red alder	15	viable; trunk swoop; grows from base of T534; added by arborist		10
3003	red alder	14	4 ft. off-site; leans over site; added by arborist		8
3004	bigleaf maple	17	2 ft. off-site; added by arborist		12
3005	bigleaf maple	15	viable; listed and self-corrected; added by arborist		10
3006	western redcedar	13	viable; on property line; grows on nurse stump; base is 4.5 ft. high; added by arborist		8
3007	western redcedar	8	viable		9
3008	western redcedar	19	viable; 8 ft. off-site		12
177	Douglas fir	25	viable; shared stump with T2000; unstable soil		16
242A	western redcedar	4	undersize		8
242B	bigleaf maple	6	undersize; dead		0
260A	western redcedar	15	viable; hedgerow		10
260B	bigleaf maple	6	undersize		0

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

19124 Jacoby Rd. Sandy

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8" and larger

572A	western redcedar	15	wound on base; wood borers		10
572B	western redcedar	43	large trunk swoop from base; broken stem; low vigor		25

Field work by Ryan Neumann, PN-5539A on 10/12, 10/15, and 10/17/2018

## EXHIBIT L

CURRAN-McLEOD, INC.  
CONSULTING ENGINEERS

6655 S.W. HAMPTON STREET, SUITE 210  
PORTLAND, OREGON 97223

January 15, 2019

Ms. Emily Meharg  
City of Sandy  
39250 Pioneer Blvd.  
Sandy, OR 97055

**RE: CITY OF SANDY  
JACOBY HEIGHTSD SUBDIVISION (FILE NO. 18-025  
SUB/VAR/FSH/TREE/INT)  
PRELIMINARY REVIEW**

Dear Emily:

We have reviewed the resubmitted preliminary plans and supporting documents for the above noted development and have the following comments:

1. We have reviewed the "Geotechnical Report" prepared by Rapid Soil Solutions, LLC, dated February 23, 2018 and recommend that the developer retains appropriate professional geotechnical services for observation of construction of earthwork and grading activities. The grading setbacks, drainage and terracing should comply with the Oregon Structural Specialty Code (OSSC) requirements and the geotechnical report recommendations and conclusions as indicated in the report. When the grading is completed, a final report should be submitted to the City by the Geotechnical Engineer stating that adequate inspections and testing have been performed on the lots and all of the work is in compliance with the above noted report and the OSSC.
2. A demolition permit shall be obtained from the City of Sandy Building Department prior to demolition of the existing structure on-site.
3. The preliminary plans don't identify any existing domestic or irrigation wells on-site. Any existing well found on-site shall be located, identified, capped, disconnected or abandoned in conformance with OAR 690-220-0030. A copy of the Oregon Water Resources Department (OWRD) abandonment certificate shall be submitted to the City.
4. The preliminary plans don't identify any septic tanks, any on-site sewage disposal system found on-site shall be abandoned in conformance with Clackamas County Water Environment Services (WES) regulations. A copy of the septic tank removal certificate shall be submitted to the City.

PHONE: (503) 684-3478

E-MAIL: [cm1@curran-mcleod.com](mailto:cm1@curran-mcleod.com)

FAX: (503) 624-8247

Mr. Emily Meharg  
January 15, 2019  
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5. We reviewed the preliminary stormwater calculations were provided with this submittal. The calculations are found to meet the water quality/quantity criteria as stated in the City of Sandy Development Code (SDC) 13.18 Standards and the City of Portland Stormwater Management Manual (SWMM) Standards, that were adopted by reference into the Sandy Development Code. However, a detailed final report stamped by a licensed professional shall be submitted for review with the final construction plans.
6. A Wetlands Report outlining the delineated wetlands/ high water level appears to be necessary based on the National Wetland Inventory (NWI) or the Local Wetland Inventory (LWI). The report shall be concurred with by the State of Oregon Division of State Lands (ODSL) and the US Army Corps of Engineers (COE) and the Oregon Department of Fish and Wildlife.
7. FSH Overlay District line at northeast corner of the site should be review by the City of Sandy Planning Department in conformance with Sandy Municipal Code (SDC), section 17.60.30.
8. We reviewed the "Traffic Impact Analysis" prepared by Lancaster Engineering dated June 15, 2018 providing that all intersections are projected to continue operating to acceptable levels of service, the sight distance requirements at the Woodstock Street and Newton Street intersections with Jacoby Road are met.

There are no reported crashes at the intersection of Jacoby and Dubarko Road, or at any of the intersections adjacent to the development. However, the crash rate at the intersection of Dubarko Road and Highway 211 exceeds the 90th percentile criteria and meets the warrants for the addition of left turn lanes as identified in the TSP. This intersection should be addressed by ODOT as soon as possible, but not as a component of this proposed development.

9. The developer's applicant has submitted a variance related to the 400-foot block length standard on Woodstock Street as required by Sandy Development Code (SDC), section 17.100.120(B). Sheet 8 of the preliminary plans provide a street layout and lots configuration on the adjoining properties, given the wetlands/Tickle Creek is located to the north, a stubbed street is not feasible. Extending the block length for approximately 100 feet appears to be reasonable and is compatible with the location of the existing house on the adjacent property to the east.
10. Half Street Improvements should be constructed along the entire site frontage with Jacoby Road to collector street standards to include curbs, sidewalks, street lights, landscaping strip with trees and utilities as appropriate. The improvements shall include an additional 10 feet of right-of-way dedications (60' ROW).



Mr. Emily Meharg  
February 20, 2018  
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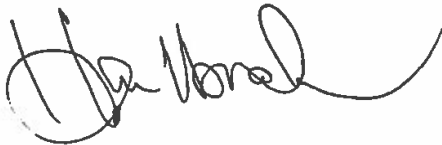
11. All interior streets (Woodstock Street, Camden Court and Middle Berry Avenue) should be constructed to local street standards (28-foot wide paved surface, curbs on both sides, 5-foot planter strips and 5-foot wide sidewalks) in compliance with the City of Sandy Transportation System Plan (TSP), figure 12.
12. 3/4 Improvements should be required on Newton Street to include 28-foot wide paved surface, curbs on both sides, 5-foot planter strips and 5-foot wide sidewalks on the north side of the roadway.
13. The developer's engineer should provide a profile design for a minimum of 200 feet for all future street extensions (Newton Street and Woodstock Street) past the project boundary to ensure future grades can be met.
14. At the eastern terminus of Newton Street, the paved width needs to be a minimum of 20 feet to allow for two ways traffic. This stub appears to be in excess of 150 feet from the nearest intersection and may require a temporary turnaround or lots being sprinkled as required by Sandy Fire District.
15. The plans don't clearly indicate the radius for the proposed cul-de-sac, the minimum paved cul-de-sac radius shall be 48 feet as per the Oregon Fire Code and Metro Code Committee. A review by the Fire Department to confirm compliance will be required.
16. All public sanitary sewer, waterline mains to be a minimum of 8-inches in diameter and a minimum of 12-inches in diameter for storm drains and be extended to the plat boundaries where practical to provide future connections to adjoining properties. All utilities are extended to the plat boundary for future connections.
17. The access to the detention shall be paved or all-weather surface to a minimum of 12-foot in width.
18. The detention pond shall meet the requirements of the 2016 City of Portland StormWater Management Manual (SWWM) for landscaping section 2.4.1 and escape route, section 2.30.

We have no concerns about the proceedings with this project subject to the above stated comments.

Mr. Emily Meharg  
January 15, 2019  
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Very truly yours,

**CURRAN-McLEOD, INC.**

A handwritten signature in black ink, appearing to read "Hassan A. Ibrahim". The signature is fluid and cursive, with a large initial "H" and "I".

Hassan A. Ibrahim, PE

cc: Mr. Mike Walker, City of Sandy

## EXHIBIT M

REPLINGER & ASSOCIATES LLC  
TRANSPORTATION ENGINEERING

January 18, 2019

Ms. Emily Meharg  
City of Sandy  
39250 Pioneer Blvd.  
Sandy, OR 97055

**SUBJECT: REVIEW OF TRANSPORTATION IMPACT ANALYSIS – JACOBY HEIGHTS  
SUBDIVISION**

Dear Emily:

In response to your request, I have reviewed materials submitted in support of the Jacoby Heights Subdivision. The materials consisted of the site plan and the Transportation Impact Analysis (TIA) for the Marshall Ridge Subdivision. The TIA was prepared under the direction of William Farley, PE of Lancaster Engineering. The TIS is dated June 15, 2018.

The TIA describes a proposal to construct a 31-lot subdivision of single-family dwellings. The site is in the southwest part of Sandy, south of Dubarko Road and east of Jacoby Road. The proposed access on Jacoby Road would include an extension of Newton Street and a new access north of Newton Street and south of Cascadia Village Drive.

### Overall

I find the TIA addresses the city's requirements and provides an adequate basis to evaluate impacts of the proposed development.

### Comments

1. **Study Area.** The study addresses the appropriate intersections. It includes analyses of:
  - OR 211 at Dubarko Road
  - Dubarko Road at SE Jacoby Road
  - SE Jacoby Road at New Site Access
  - SE Jacoby Road at Newton Street
2. **Traffic Counts.** The AM and PM peak hour traffic counts were conducted on May 1 and May 2, 2018 at the study area intersections. The engineer adjusted the May traffic counts to account for seasonal variations according to the procedures defined by the Oregon Department of Transportation (ODOT). The counts appear reasonable.
3. **Trip Generation.** The TIA uses trip generation for single-family houses from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*. The site is currently occupied by

Ms. Emily Meharg  
January 18, 2019  
Page 2

one single-family dwelling. The calculations of trip generation were based on 32 additional houses based on a prior site plan. The new site plan indicates one less dwelling. The engineer calculates that the 32 additional houses would produce 23 new AM peak hour trips; 31 PM new peak hour trips; and 292 new daily trips. The calculation of trips generated by the subdivision appears reasonable.

4. **Trip Distribution.** The TIA provided information about trip distribution from the site. The engineer assumed 20 percent of the traffic would travel to and from the north on OR 211; 30 percent would travel to and from the south on OR 211; and 25 percent would travel to and from the west on Dubarko Road west of OR 211; and 25 percent would travel to and from the east on Dubarko Road. Trip distribution patterns were based on existing traffic counts and judgement about likely destinations. All trips to and from the subdivision were assumed to use Jacoby Street to Dubarko Road. The trip distribution seems reasonable.
5. **Traffic Growth.** The TIA uses a 3.2 percent annual increase for OR 211 based on ODOT's Future Volume Tables. For other facilities it uses a 2.0 percent annual growth rated background traffic growth. In addition, the TIA specifically accounts for in-process developments to calculate 2020 background conditions including the nearby Zion Meadows, Marshall Ridge, Mt. View Ridge, and Snowberry Subdivisions. Background volumes were prepared for 2020, the year in which the development is expected to be completed. These assumptions account for future traffic and appear reasonable.
6. **Analysis.** Traffic volumes were calculated for the intersections cited in #1, above. Intersection level-of-service (LOS) and the volume-to-capacity (v/c) ratio were provided. ODOT uses the v/c ratio for its standard of intersection performance. Performance of the intersections was calculated for existing 2018 conditions; 2020 background conditions; and 2020 conditions with the proposed subdivision.

For the intersection of OR 211/Dubarko Road, the engineer indicates that the intersection currently operates at LOS C during both the AM and PM peak hours. By 2020, the intersection's performance will degrade slightly and is calculated to operate at LOS D during both the AM and PM peak hours with or without this development. The poorest performance is predicted during the AM peak hour when the v/c ratio is expected to increase to 0.52. This easily meets ODOT's performance standard.

All three of the other study area intersections is calculated to operate under LOS B or better under all scenarios and will meet city performance standards.

The engineer recommends no mitigation for traffic from this proposal. I concur.

7. **Crash Information.** The TIA provides information on crashes for the most recent available five-year period (2012 through 2016). For the five-year period, 28 crashes were reported at OR 211/Dubarko Road intersection. The engineer reports that 16 occurred prior to the

Ms. Emily Meharg  
January 18, 2019  
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intersection realignment and 12 occurred since completion of the project that changed the approach angle of the intersection. The engineer provided a good summary of crashes including crash types and other characteristics. The most prominent type was angle collisions in which eastbound or westbound motorists failed to yield to traffic on OR 211. The crash rate was calculated to be 1.83 crashes per million entering vehicles, a rate that exceeds the 90<sup>th</sup> percentile rate specified by ODOT in its *Analysis Procedures Manual*. The engineer notes that the high crash rate may indicate the need for improvements and opines that the "installation of the planned turn lanes and traffic signal outlined in the Sandy TSP will likely reduce the crash rate at this intersection."

No crashes were reported at Jacoby Road and Dubarko Road; one was reported at Jacoby Road and Newton Street. Neither location appears to need mitigation for safety issues.

The engineer did not recommend mitigation for any safety issues. I agree that imposing conditions on this subdivision to help address safety issues at OR 211/Dubarko Road is not appropriate.

I recommend continuing to work with ODOT to evaluate and address safety issues at the intersection of OR 211/Dubarko Road and work toward implementation of the intersection improvement project specified in the TSP.

- 8. Site Plan and Access.** The site plan provides for two access points on SE Jacoby Road: an extension of Newton Street, which currently extends west from Jacoby Road; and a new intersection extending into the subdivision from Jacoby Road between Newton Street and Cascadia Village Drive. The site plan also indicates both east-west streets will terminate with stubs for potential connection when land to the east of the proposed subdivision develops.

The new intersection with SE Jacoby Road is proposed to be located approximately 270 feet north of Newton Street and about 380 feet south of Cascadia Village Drive. The intersection location is appropriate.

- 9. Sight Distance.** The engineer analyzed sight distance at the new proposed intersection on Jacoby Road and at Newton Street. For the new intersection, the engineer measured sight distance to be 350 feet to the north and 410 feet to the south. For the Newton Street intersection, he measured sight distance to be 545 feet to the north and 595 feet to the south. These values are far in excess of the requirements for a 25-mph speed zone. The engineer concluded sight distance is adequate. I concur.

- 10. Left-Turn Lane and Signal Warrants.** The engineer analyzed the subject intersections for left-turn lanes using standard methods based on traffic volumes, travel speeds, and lanes.

Ms. Emily Meharg  
January 18, 2019  
Page 4

For the intersection of OR 211 and Dubarko Road, he concluded left-turn lane warrants for northbound and southbound approaches meet warrants under existing conditions. For the intersections of Dubarko/Jacoby, Jacoby/Newton and Jacoby/New site access, he concluded that left-turn lane would not be met for 2020 conditions with the proposed development.

He also analyzed traffic signal warrants at the OR 211 and Dubarko Road intersection for 2020 conditions. The Sandy TSP specifies a traffic signal and left-turn lanes on OR 211, but under projected 2020 traffic volumes he concluded traffic signal warrants would not be met. I concur.

**11. Conclusions and Recommendations.** The engineer concludes that traffic operations will be acceptable with the development without mitigation. Though crash data indicates a concern at the intersection of OR 211 and Dubarko Road, he did not recommend mitigation for safety concerns. I concur with these conclusions.

#### **Conclusion and Recommendations**

I find the TIA meets City requirements. The TIA demonstrates that the development can be accommodated without requiring mitigation to meet adopted operational standards. The intersections that will provide access from the subdivision to Jacoby Road are appropriately located and provide adequate sight distance.

The existence of a higher than average crash rate at the intersection of OR 211 and Dubarko Road and traffic volumes that suggest left-turn lanes are warranted on OR 211 at this location are indicators that the city should continue to work with ODOT for implementation of enhancements at this intersection. The analysis indicates that a traffic signal is not yet warranted but left-turn lanes on both the northbound and southbound approaches on OR 211 are warranted. The need for these improvements is justified based on regional growth of which this development is only a minor component.

If you have any questions or need any further information concerning this review, please contact me at [replinger-associates@comcast.net](mailto:replinger-associates@comcast.net).

Sincerely,



John Replinger, PE  
Principal

JacobyHeightsSubdTIA011819

1/24/2019

City of Sandy Mail - RE: Jacoby Heights Subdivision (File No. 18-025 SUB/VAR/FSH/TREE/INT)



## EXHIBIT N

ly Meharg <emeharg@ci.sandy.or.us>

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### RE: Jacoby Heights Subdivision (File No. 18-025 SUB/VAR/FSH/TREE/INT)

1 message

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**Kristine Hendrix** <Kristine.Hendrix@pgn.com>  
To: "emeharg@ci.sandy.or.us" <emeharg@ci.sandy.or.us>

Wed, Jan 23, 2019 at 2:03 PM

We have reviewed the pre-application description you sent us and we haven't found any conflicts to your project right now.

When the developer is ready to start the project please have them call PGE Service Coordination's at 503-323-6700.



**Mahalo,**

**Kristine Hendrix** | Job Processor

Work Hours 6:30 am to 4:00 pm M – TH & 6:30 am to 10:30 am Fri

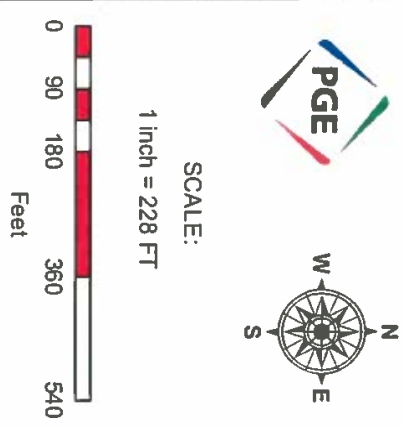
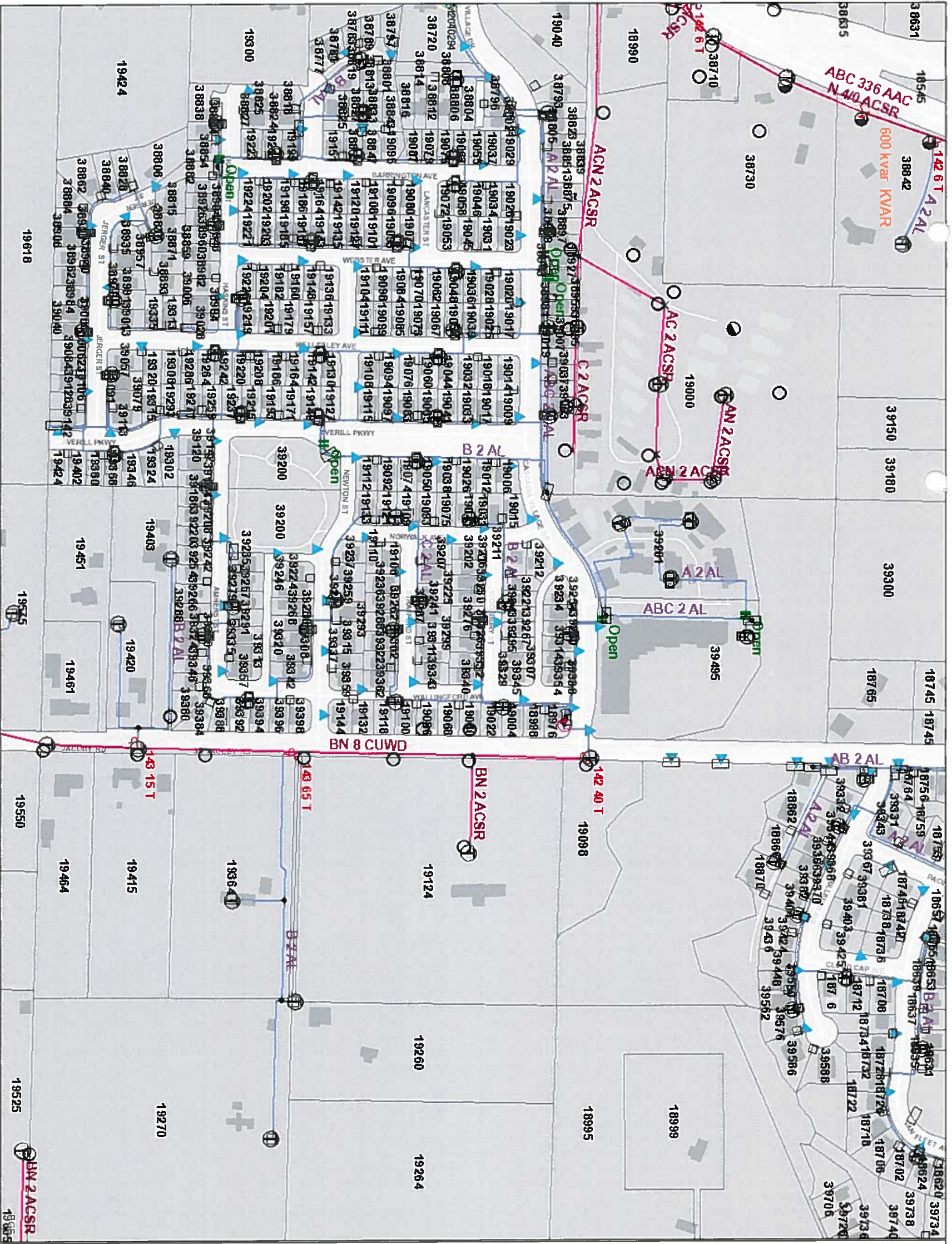
Portland General Electric

1705 NE Burnside, Gresham, OR 97030

| 📞: (503) 669-5214 | 📠: (503) 669-5229 | ✉️ [kristine.hendrix.@pgn.com](mailto:kristine.hendrix.@pgn.com)

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 **19124 Jacoby Road Sandy OR.pdf**  
331K



**PGE**

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# EXHIBIT O

## MEMORANDUM

TO: EMILY MEHARG, ASSOCIATE PLANNER  
FROM: MIKE WALKER, PUBLIC WORKS DIRECTOR  
RE: JACOBY HEIGHTS SUBDIVISION  
DATE: JANUARY 26, 2019

The following are Public Works' comments on the above-referenced application:

### Transportation

The traffic impact analysis and the City Traffic Engineer's review demonstrate that all site access points and analyzed street intersections will meet the City's minimum level of service (LOS) standard at buildout.

The site has approximately 600 LF of frontage on Jacoby Rd., a designated collector. The right-of-way width adjacent to the site is 50 ft. The standard for collector streets is 60 ft. **The applicant shall dedicate 10 ft. of right-of-way along the Jacoby Rd. frontage of the site.**

Two local streets will intersect Jacoby, Woodstock St. and an extension of Newton St. aligning with the existing street of the same name on the west side of Jacoby. The proposed alignment of Newton St. does not conform with the 50 feet of tangent alignment (measured from the curb line extended) required in Section 17.84.50(H)5b Sandy Municipal Code (SMC). **The applicant shall revise the alignment of Newton St. to conform with the standard.**

The applicant is proposing a  $\frac{3}{4}$  street improvement (curb on both sides, 28 ft. wide street with a planter strip and sidewalk on the development site) for Newton St. through the site transitioning to a half-street section at the west line of proposed lot 2. The proposed Newton St. alignment coincides with an existing access easement serving at least two and possibly as many as four existing dwellings to the east. No more than two dwellings may be served by a half-street improvement. As proposed this narrowed section of Newton would serve at least four dwellings and perhaps as many as six. The applicant shall eliminate the proposed curve at the east end of Newton and continue the three-quarter street improvement to the east boundary of the site.

The applicant shall construct a mid-block ADA ramp on the west side of Jacoby opposite Woodstock St. to provide ADA access to the existing sidewalk on the west side of Jacoby and the neighborhood to the west.

The proposed parking plan shows 21 parking spaces on the south side of Newton St. These spaces should not be counted toward meeting the on-street parking requirement since the south side of the street will eventually develop with driveway and/or streets that will eliminate these spaces or prevent the developer of the site to the south from

counting these spaces toward their on-street parking requirement. The applicant shall revise and resubmit the on-street parking plan for staff review and approval prior to final plat approval.

The applicant shall realign the access drive proposed to serve the stormwater facility in Tract A or revise the west line of lot 29 to eliminate remnant of Tract A between the access drive and lot 29. In order to maximize street tree planting areas and prevent conflicts with streetlights, water meters and dry utility facilities, shared driveway approaches may be required in cul-de-sac bulbs. Lot 28 and 29 shall share a driveway approach maximum 24 ft. in width. Lot 26 and 27 shall share a driveway approach maximum 24 ft. in width. The applicant shall grant crossover easements along the common parcel line to lots with shared driveway approaches. The driveway approach for Tract A shall be a maximum of 12 ft. in width.

### **Utilities**

The proposed utility plan shows an 8" sanitary sewer extended south from the existing sewer line in Jacoby Rd. approximately 490 feet to the site. The site will drain to the existing SE sewer pump station. The applicant shall provide a sanitary sewer lateral serving TL 6100 with the sanitary sewer main line extension.

Water service will be provided from a connection to the existing 8" water main at the intersection of Cascadia Village Dr. and Jacoby Rd. There is no other proposed connection to the water distribution system. The applicant shall demonstrate that adequate fire and domestic flow will be available with single point of connection to the water distribution system or connect to the existing 8" water line at the intersection of Newton and Amherst.

Site stormwater will be collected and conveyed to a proposed detention pond located in Tract A. Detained and treated discharge from the detention pond is proposed to be discharged to the adjacent property to the north. The applicant shall demonstrate that pre-development site runoff discharges to this same point and provide information on the dimensions and slope of the existing drainage way.

The plan depicts a 20 ft. wide common public storm and sanitary easement along the west boundary of lots 9 and 10. The City reserves the right to widen this easement depending on the final design depth of the sanitary and storm sewer lines per section 17.84.90(A)2 SMC.

1/28/2019



## EXHIBIT P

/ Meharg <emeharg@ci.sandy.or.us>

### Jacoby Heights subdivision - transit comments?

Andi Howell <ahowell@ci.sandy.or.us>  
To: Emily Meharg <emeharg@ci.sandy.or.us>

Mon, Jan 28, 2019 at 4:25 PM

Yes, Emily, the NW corner as close to Cascadia Village Dr. as possible. Thanks!

**Andi Howell**  
Transit Director

City of Sandy  
16610 Champion Way  
Sandy, OR 97055  
503-489-0925  
Fax: 503-826-0618  
ahowell@ci.sandy.or.us

Sandy Transit Web and Trip Planner



[Quoted text hidden]

EXHIBIT Q

No. 18-025 SUB/VAR/FSH/TREE/INT:

RECEIVED  
FEB 06 2019  
CITY OF SANDY

No more Development  
Keep Sandy a Small  
Town, It's already getting  
to Big! We've lived here over  
30 yrs so stop the madness  
We've seen the changes they are  
not good!

Annette Giltner 503-668-3380  
Your Name Phone Number  
35000 SE Colorado Rd  
Address

**APPLICABLE CRITERIA:** Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.14 Request for Interpretation; 17.18 Processing Applications; 17.22 Notices; 17.30 Zoning Districts; 17.34 Single Family Residential (SFR); 17.56 Hillside Development; 17.60 Flood and Slope Hazard Overlay District; 17.66 Adjustments and Variances; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.82 Special Setbacks on Transit Streets; 17.84 Improvements Required with Development; 17.86 Parkland and Open Space; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access; 17.100 Land Division; 17.102 Urban Forestry; and 15.30 Dark Sky Ordinance.

EXHIBIT R

RECEIVED

FEB 11 2019

No. 18-025 SUB/VAR/FSH/TREE/INT:

CITY OF SANDY

To THE COUNTY/CITY PLANNER FOR THE CITY OF SANDY:

The way I see it there are two main issues facing the city of Sandy

① A lack of foresight and planning for the influx of people moving to the city limits. ② The infrastructure to support said people.

At this point in time, I believe Sandy ought to cease construction of new or additional neighborhoods until they have strengthened the infrastructure to support the residents who are already paying taxes within the city limits. We need a road (either HWY 26) that will move people through Sandy without a back up to Kelso Rd. We need shopping centers on this end (my end) of town so that we don't have to sit in traffic for 25 minutes just to go 2.5 miles to Fred Meyer. We need to build commercially before we continue to build more residential. Sandy continues to operate as a small town without realizing that they are a fully functioning city! Stop pretending and start working to build a city for me and my children. Adding more <sup>houses</sup> ~~homes~~ only exacerbates the frustration of the residents within the city limits. Please do not build houses here - I am not against building houses in the said property, if the infrastructure is in place to support the additional people - which it is clearly not.

Shawn Lorenzen

971.413.4384

Your Name

Phone Number

39343 Stratford Pl SANDY OR 97055

Address

**APPLICABLE CRITERIA:** Sandy Municipal Code: 17.12 Procedures for Decision Making; 17.14 Request for Interpretation; 17.18 Processing Applications; 17.22 Notices; 17.30 Zoning Districts; 17.34 Single Family Residential (SFR); 17.56 Hillside Development; 17.60 Flood and Slope Hazard Overlay District; 17.66 Adjustments and Variances; 17.80 Additional Setbacks on Collector and Arterial Streets; 17.82 Special Setbacks on Transit Streets; 17.84 Improvements Required with Development; 17.86 Parkland and Open Space; 17.92 Landscaping and Screening; 17.98 Parking, Loading, and Access; 17.100 Land Division; 17.102 Urban Forestry; and 15.30 Dark Sky Ordinance.

## EXHIBIT S

RECEIVED  
FEB 12 2019  
CITY OF SANDY

11FEB2019

Dear City Planners,

This is regarding the development of the property 19124 Jacoby Rd file number (18-025  
SUB/VAR/FSH/TREE/INT)

As we are the property directly north of the proposed development and having 1.5 acres of wooded property which borders the Tickle Creek Wetlands, we have the following concerns and would like to know how these will be addressed:

- What type of fence or division will be between our forest property and this new development that will deter trespassing and possible liability to us?
- Where will the sewer come into the neighborhood and will we be required to connect to it at this time?
- Where will the water retention pond be located?
- Does the City spray annually for mosquitos annually around that water retention area?
- We would like to attend this meeting to better understand the requested variances.
- Is there any idea how long we will be subjected to the noise and disturbance of constructing this neighborhood?

Thank you for your consideration of these concerns,

Tim and Cherri Anders

19098 Jacoby Rd

Sandy, Oregon 97055

360-903-0644

2/12/2019

City of Sandy Mail - Development 18-025 SUB/VAR/FSH/TREE/INT



Rebecca Casey <rcasey@ci.sandy.or.us>

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**Development 18-025 SUB/VAR/FSH/TREE/INT**

1 message

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**Tim Anders** <tim.anders@gmail.com>  
To: [planning@ci.sandy.or.us](mailto:planning@ci.sandy.or.us), [emeharg@ci.sandy.or.us](mailto:emeharg@ci.sandy.or.us)

Tue, Feb 12, 2019 at 4:35 PM

This is regarding the development at 19124 Jacoby Rd Sandy OR

Tim Anders

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 **SubdivisionLetter.docx**  
14K

CHAPTER 17.102  
URBAN FORESTRY

EXHIBIT T

17.102.00 INTENT ..... 1  
17.102.10 DEFINITIONS ..... 1  
17.102.20 APPLICABILITY ..... 2  
17.102.30 PROCEDURES AND APPLICATION REQUIREMENTS..... 2  
17.102.40 PERMIT REVIEW ..... 4  
17.102.50 TREE RETENTION AND PROTECTION REQUIREMENTS ..... 4  
17.102.60 TREE REPLANTING REQUIREMENTS ..... 5  
17.102.70 VARIANCES ..... 5  
17.102.80 ENFORCEMENT ..... 5  
17.102.90 APPLICABILITY OF THE OREGON FOREST PRACTICES ACT..... 6  
17.102.100 URBAN FORESTRY FUND ..... 6

**17.102.00 INTENT**

- A. This chapter is intended to conserve and replenish the ecological, aesthetic and economic benefits of urban forests, by regulating tree removal on properties greater than one acre within the Sandy Urban Growth Boundary.
- B. This chapter is intended to facilitate planned urban development as prescribed by the Sandy Comprehensive Plan, through the appropriate location of harvest areas, landing and yarding areas, roads and drainage facilities.
- C. This chapter shall be construed in a manner consistent with Chapter 17.60 Flood and Slope Hazard Overlay District. In cases of conflict, Chapter 17.60 shall prevail.

**17.102.10 DEFINITIONS**

Technical terms used in this chapter are defined below. See also Chapter 17.10, Definitions.

**Urban Forestry Related Definitions:**

- **Diameter at Breast Height (DBH):** The diameter of a tree inclusive of the bark measured 4½ feet above the ground on the uphill side of a tree.
- **Hazard Tree:** A tree located within required setback areas or a tree required to be retained as defined in 17.102.50 that is cracked, split, leaning, or physically damaged to the degree that it is likely to fall and injure persons or property. Hazard trees include diseased trees, meaning those trees with a disease of a nature that, without reasonable treatment or pruning, is likely to spread to adjacent trees and cause such adjacent trees to become diseased or hazard trees.
- **Protected Setback Areas:** Setback areas regulated by the Flood and Slope Hazard Ordinance (FSH), Chapter 17.60 and 70 feet from top of bank of Tickle Creek and 50 feet from top of bank of other perennial streams outside the city limits, within the urban growth boundary.
- **Tree:** For the purposes of this chapter, tree means any living, standing, woody plant having a trunk 11 inches DBH or greater.
- **Tree Protection Area:** The area reserved around a tree or group of trees in which no grading, access, stockpiling or other construction activity shall occur.



- **Tree Removal:** Tree removal means to cut down a tree, 11 inches DBH or greater, or remove 50 percent or more of the crown, trunk, or root system of a tree; or to damage a tree so as to cause the tree to decline and/or die. Tree removal includes topping but does not include normal trimming or pruning of trees.

#### **17.102.20 APPLICABILITY**

This chapter applies only to properties within the Sandy Urban Growth Boundary that are greater than one acre including contiguous parcels under the same ownership.

- A. **General:** No person shall cut, harvest, or remove trees 11 inches DBH or greater without first obtaining a permit and demonstrating compliance with this chapter.
  - 1. As a condition of permit issuance, the applicant shall agree to implement required provisions of this chapter and to allow all inspections to be conducted.
  - 2. Tree removal is subject to the provisions of Chapter 15.44, Erosion Control, Chapter 17.56, Hillside Development, and Chapter 17.60 Flood and Slope Hazard.
- B. **Exceptions:** The following tree removals are exempt from the requirements of this chapter.
  - 1. Tree removal as required by the city or public utility for the installation or maintenance or repair of roads, utilities, or other structures.
  - 2. Tree removal to prevent an imminent threat to public health or safety, or prevent imminent threat to public or private property, or prevent an imminent threat of serious environmental degradation. In these circumstances, a Type I tree removal permit shall be applied for within seven days following the date of tree removal.

#### **17.102.30 PROCEDURES AND APPLICATION REQUIREMENTS**

A person who desires to remove trees shall first apply for and receive one of the following tree cutting permits before tree removal occurs:

- A. **Type I Permit.** The following applications shall be reviewed under a Type I procedure:
  - 1. Tree removal on sites within the city limits under contiguous ownership where 50 or fewer trees are requested to be removed.
  - 2. Removal of a hazard tree or trees that presents an immediate danger of collapse and represents a clear and present danger to persons or property.
  - 3. Removal of up to two trees per year, six inches DBH or greater within the FSH Overlay District as shown on the City Zoning Map and described in Chapter 17.60.
  - 4. Tree removal on sites outside the city limits and within the urban growth boundary and outside protected setback areas.
  - 5. Removal of up to two trees per year outside the city limits within the UGB and within protected setback areas.
- B. An application for a Type I Tree Removal permit shall be made upon forms prescribed by the City to contain the following information:

1. Two copies of a scaled site plan to contain the following information:
    - a. Dimensions of the property and parcel boundaries.
    - b. Location and species of trees 11" DBH or greater to be retained.
    - c. Location and type of tree protection measures to be installed.
  2. A brief narrative describing the project.
  3. Estimated starting and ending dates.
  4. A scaled re-planting plan indicating ground cover type, species of trees to be planted, and general location of re-planting.
  5. An application for removal of a hazard tree within a protected setback area or a tree required to be retained as defined in Chapter 17.102.50 shall also contain a report from a certified arborist or professional forester indicating that the condition or location of the tree presents a hazard or danger to persons or property and that such hazard or danger cannot reasonably be alleviated by treatment or pruning.
- C. Type II Permit. The following applications shall be reviewed under a Type II procedure:
1. Tree removal on sites under contiguous ownership where greater than 50 trees are requested to be removed as further described below:
    - a. Within City Limits: outside of FSH Restricted Development Areas as defined in Chapter 17.60.
- D. An application for a Type II Permit shall contain the same information as required for a Type I permit above in addition to the following:
- a. A list of property owners on mailing labels within 200 feet of the subject property.
  - b. A written narrative addressing permit review criteria in 17.102.40.
- E. Type III Permit. The following applications shall be reviewed under a Type III procedure:
1. Request for a variance to tree retention requirements as specified in Section 17.102.50 may be permitted subject to the provisions of 17.102.70.
- F. An application for a Type III Permit shall contain the same information as required for a Type I permit in addition to the following:
- a. A list of property owners on mailing labels within 300 feet of the subject property.
  - b. A written narrative addressing applicable code sections 17.102.50, 17.102.60, and 17.102.70.

#### **17.102.40 PERMIT REVIEW**

An application for a Type II or III tree removal permit shall demonstrate that the provisions of Chapter 17.102.50 are satisfied. The Planning Director may require a report from a certified arborist or professional forester to substantiate the criteria for a permit.

- A. The Director shall be responsible for interpreting the provisions of this chapter. The Director may consult with the Oregon Department of Forestry in interpreting applicable provisions of the Oregon Forest Practices Act (OAR Chapter 629). Copies of all forestry operation permit applications will be sent to the Oregon Department of Forestry and Department of Revenue. The City may request comments from the Oregon Department of Forestry, the Oregon Department of Fish & Wildlife or other affected state agencies.
- B. Expiration of Tree Removal Permits. Tree removal permits shall remain valid for a period of one year from the date of issuance or date of final decision by a hearing body, if applicable. A 30-day extension shall be automatically granted by the Planning Director if requested in writing before the expiration of the permit. Permits that have lapsed are void.

#### **17.102.50 TREE RETENTION AND PROTECTION REQUIREMENTS**

- A. Tree Retention: The landowner is responsible for retention and protection of trees required to be retained as specified below:
  - 1. At least three trees 11 inches DBH or greater are to be retained for every one-acre of contiguous ownership.
  - 2. Retained trees can be located anywhere on the site at the landowner's discretion before the harvest begins. Clusters of trees are encouraged.
  - 3. Trees proposed for retention shall be healthy and likely to grow to maturity, and be located to minimize the potential for blow-down following the harvest.
  - 4. If possible, at least two of the required trees per acre must be of conifer species.
  - 5. Trees within the required protected setback areas may be counted towards the tree retention standard if they meet these requirements.
- B. **Tree Protection Area:** Except as otherwise determined by the Planning Director, all tree protection measures set forth in this section shall be instituted prior to any development activities and removed only after completion of all construction activity. Tree protection measures are required for land disturbing activities including but not limited to tree removal, clearing, grading, excavation, or demolition work.
  - 1. Trees identified for retention shall be marked with yellow flagging tape and protected by protective barrier fencing placed no less than 10 horizontal feet from the outside edge of the trunk.
  - 2. Required fencing shall be a minimum of six feet tall supported with metal posts placed no farther than ten feet apart installed flush with the initial undisturbed grade.
  - 3. No construction activity shall occur within the tree protection zone, including, but not limited to dumping or storage of materials such as building supplies, soil, waste items, equipment, or parked vehicles.

**C. Inspection.** The applicant shall not proceed with any tree removal or construction activity, except erosion control measures, until the City has inspected and approved the installation of tree protection measures. Within 15 days of the date of accepting an application for a Type I permit, the city shall complete an onsite inspection of proposed activities and issue or deny the permit. Within 15 days of issuing a Type II or Type III permit, the city shall complete an onsite inspection of proposed activities.

For ongoing forest operations, the permit holder shall notify the city by phone or in writing 24 hours prior to subsequent tree removal. The city may conduct an onsite re-inspection of permit conditions at this time.

#### **17.102.60 TREE REPLANTING REQUIREMENTS**

1. All areas with exposed soils resulting from tree removal shall be replanted with a ground cover of native species within 30 days of harvest during the active growing season, or by June 1st of the following spring.
2. All areas with exposed soils resulting from tree removal occurring between October 1 and March 31 shall also be covered with straw to minimize erosion.
3. Removal of hazard trees as defined shall be replanted with two native trees of quality nursery stock for every tree removed.
4. Tree Removal allowed within the FSH Overlay District shall be replanted with two native trees of quality nursery stock for every tree removed.
5. Tree Removal not associated with a development plan must be replanted following the provisions of OAR Chapter 629, Division 610, Section 020-060

#### **17.102.70 VARIANCES**

Under a Type III review process, the Planning Commission may allow newly-planted trees to substitute for retained trees if:

1. The substitution is at a ratio of at least two-to-one (i.e., at least two native quality nursery grown trees will be planted for every protected tree that is removed); and
2. The substitution more nearly meets the intent of this ordinance due to:
  - a. The location of the existing and proposed new trees, or
  - b. The physical condition of the existing trees or their compatibility with the existing soil and climate conditions; or
  - c. An undue hardship is caused by the requirement for retention of existing trees.
  - d. Tree removal is necessary to protect a scenic view corridor.

#### **17.102.80 ENFORCEMENT**

The provisions of Chapter 17.06, Enforcement, shall apply to tree removal that is not in conformance with this chapter. Each unauthorized tree removal shall be considered a separate offense for purposes of assigning penalties under Section 17.06.80. Funds generated as a result of enforcement of this ordinance shall be dedicated to the Urban Forestry Fund established under Section 17.102.100 below.

#### **17.102.90 APPLICABILITY OF THE OREGON FOREST PRACTICES ACT**

The following provisions of the Oregon Forest Practices Act (OAR Chapter 629) are adopted by

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reference for consideration by the City in the review of Forest Operations Plans. Although the Director may seek advice from the Department of Forestry, the Director shall be responsible for interpreting the following provisions.

Division 610 - Reforestation Stocking Standards. Where reforestation is required, the provisions of OAR Chapter 629, Division 610, Section 020-060 shall be considered by the Director, in addition to the requirements of Section 17.102.60.

Division 615 - Treatment of Slash. Slash shall not be placed within the protected setback areas. Otherwise, the Director shall consider the provisions of OAR Chapter 629, Division 615 in determining how to dispose of slash.

Division 620 - Chemical and Other Petroleum Products Rules. The storage, transferring, cleaning of tanks and mixing of chemicals and petroleum products shall occur outside the protected setback areas. Aerial spraying shall not be permitted within the Urban Growth Boundary. Otherwise, the provisions of Chapter 629, Division 620 shall apply.

Division 625 - Road Construction and Maintenance. Forest roads, bridges and culverts shall not be constructed within the protected setback areas, except where permitted within the FSH overlay area as part of an approved urban development. Otherwise, the Director shall consider the provisions of OAR Chapter 629, Division 625 in the review of road, bridge and culvert construction.

Division 630 - Harvesting. Forest harvesting operations, including but not limited to skidding and yarding practices, construction of landings, construction of drainage systems, treatment of waste materials, storage and removal of slash, yarding and stream crossings, shall not be permitted within protected setback areas. Otherwise, the provisions of Chapter 629, Division 630 shall apply.

#### **17.102.100 URBAN FORESTRY FUND CREATED**

In order to encourage planting of trees, the City will create a fund or account to be used for tree planting in rights-of-way, city parks, riparian areas, and other public property. The source of funds will be donations, grants, and any other funds the City Council may designate.