



City of Sandy

Agenda

Planning Commission Meeting
Meeting Location: Virtual via Zoom
Meeting Date: Monday, October 25, 2021
Meeting Time: 6:30 PM

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1. MEETING FORMAT NOTICE

The Planning Commission will conduct this meeting electronically using the Zoom video conference platform. Members of the public may listen, view, and/or participate in this meeting using Zoom. Using Zoom is free of charge. See the instructions below:

- To login to the electronic meeting online using your computer, click this link: <https://us02web.zoom.us/j/87541630765>
- If you would rather access the meeting via telephone, dial +1 346 248 7799. When prompted, enter the following meeting number: 875 4163 0765
- If you do not have access to a computer or telephone and would like to take part in the meeting, please contact City Hall by Thursday October 21 and arrangements will be made to facilitate your participation.

2. ROLL CALL

3. APPROVAL OF MINUTES

3.1. Draft Minutes for September 27, 2021

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[Planning Commission - 27 Sep 2021 - Minutes - Pdf](#)

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

The Commission welcomes your comments at this time. Please see the instructions below:

- If you are participating online, click the "raise hand" button and wait to be recognized.
- If you are participating via telephone, dial *9 to "raise your hand" and wait to be recognized.

5. DIRECTOR'S REPORT

5.1. Director's Report for October 25, 2021

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[Director's Report for October 25, 2021 - Pdf](#)

6. PLANNING COMMISSION DISCUSSION

- 6.1. Planning Commissioner Appointment to Interview Panel 14 - 21
[Planning Commissioner Appointment to Interview Panel Memo - Pdf](#)

7. NEW BUSINESS

- 7.1. ~~21-021 SUB/TREE The Bornstedt Views Subdivision~~ **NOTE: Item has been removed from the October 25, 2021 agenda at the request of the applicant. New hearing date is January 24, 2022.** 22 - 360
[21-021 SUB TREE The Bornstedt Views Subdivision - Commission staff report](#)
[Exhibits A - B - Land Use Application and Narrative](#)
[Exhibit C - Civil Plans - The Bornstedt Views - rcvd 5.6.21](#)
[Exhibit D - Preliminary Storm Drainage Report](#)
[Exhibit E - Traffic Impact Study](#)
[Exhibits F - L Reports and other correspondence](#)
[Exhibits M - S Agency and Public Comments](#)
[Exhibits T - U Marshall Ridge Plat, Ordinance 2019-16](#)
[Exhibit V - Public Comment - Barb Moyer](#)
[Exhibit W - Clackamas County Transportation Comments](#)

8. ADJOURNMENT



MINUTES
Planning Commission Meeting
Monday, September 27, 2021 Virtual via
Zoom 6:30 PM

COMMISSIONERS PRESENT: Donald Carlton, Commissioner, Ron Lesowski, Commissioner, Hollis MacLean-Wenzel, Commissioner, Jerry Crosby, Commissioner, Chris Mayton, Commissioner, Jan Lee, Commissioner, and Steven Hook, Commissioner

COMMISSIONERS ABSENT: None

STAFF PRESENT: Kelly O'Neill, Development Services Director, Emily Meharg, Senior Planner, and David Doughman, City Attorney and Chris Crean, City Attorney

COUNCIL LIAISON ABSENT: Rich Sheldon, Councilor

1. MEETING FORMAT NOTICE

Instructions for electronic meetings.

2. ROLL CALL

3. APPROVAL OF MINUTES

3.1. Draft Minutes for August 23, 2021

Commissioner Maclean-Wenzel requested that the minutes be updated to reflect that Commissioner Maclean-Wenzel did not participate in the interviews for the Comprehensive Plan consultants, just the scoring of the proposals.

Motion: Approve the Planning Commission minutes for August 23, 2021 with the correction.

Moved By: Commissioner Lee

Seconded By: Commissioner Mayton

Yes votes: All Ayes

No votes: None

Abstentions: Maclean-Wenzel, Hook, and Carlton

The motion passed.

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

None

5. DIRECTOR'S REPORT

Development Services Director O'Neill went over the upcoming meetings. The December meeting will likely need to be scheduled on a day other than the 4th Monday of the month.

6. PLANNING COMMISSION DISCUSSION

Commissioner Carlton asked if we'll even need a December meeting. Development Services Director O'Neill stated that at this point it's unknown but, if it occurs, it would likely be the first half of the month. The Commissioners decided to hold the meeting on December 13. Commissioner Maclean-Wenzel asked which commissioner's terms end in December. Director O'Neill believes four commissioner terms will be ending. Jeff Aprati and Senior Planner Meharg will participate in interviewing the candidates. Director O'Neill would like to modify the terms so fewer commissioner's terms end at once. All Commissioner's agreed with modifying the terms so that less turnover is possible.

7. OLD BUSINESS

7.1. Modification to Chapters 17.32 and 17.86 (21-032 DCA):

Chairman Crosby opened the continuation of the public hearing on File No. 21-032 DCA at 6:46 p.m. Crosby called for any abstentions, conflicts of interest, ex-parte contact, challenges to the jurisdiction of the Planning Commission, or any challenges to any individual member of the Planning Commission. No challenges were made, and no declarations were made by the Planning Commission.

Staff Report:

Development Services Director O'Neill presented a brief presentation outlining the parks code updates.

Chairman Crosby asked about the recommendation process and what would happen if the Parks and Trails Advisory Board makes changes after the Planning Commission review and recommendation. Director O'Neill stated that City Council would get a copy of the code edits based on Planning Commission's recommendation and that the Parks Board edits would be contained in a separate memo.

Public Testimony:

None

Staff Recap:

None

Motion: Motion to close the public hearing at 6:58 p.m.

Moved By: Commissioner Carlton

Seconded By: Commissioner Hook

Yes votes: All Ayes

No votes: None

Abstentions: None

Discussion:

Commissioner Carlton asked about primary entrances facing parks in 17.86.20(A) and wanted to know what a residential through lot is. Director O'Neill explained it's a lot with two frontages on parallel streets.

Commissioner Mayton asked if they could get the proposed changes in a word document in the future so they can see the changes without all the track changes. Director O'Neill stated staff could provide a track change and clean version in the future.

Motion: Motion to forward a recommendation of approval to City Council on the proposed code modifications to Chapters 17.32 and 17.86 of the Development Code.

Moved By: Commissioner Carlton

Seconded By: Commissioner Maclean-Wenzel

Yes votes: All Ayes

No votes: None

Abstentions: None

The motion passed at 7:04 p.m.

8. NEW BUSINESS

8.1. 16370 Royal Lane Annexation (21-041 ANN):

Chairman Crosby opened the public hearing on File No. 21-041 ANN at 7:04 p.m. Crosby called for any abstentions, conflicts of interest, ex-parte contact, challenges to the jurisdiction of the Planning Commission, or any challenges to any individual member of the Planning Commission. No challenges were made, and no declarations were made by the Planning Commission.

Staff Report:

Development Services Director O'Neill presented a brief presentation outlining the annexation request and the staff report. O'Neill explained that the City's consultant for the Bell Street extension (HHPR) is the applicant for this annexation on behalf of the property owners.

Applicant Testimony:

Brad Kilby, HHPR
205 SE Spokane Street
Portland, OR 97202

Kilby showed the proposed Bell Street alignment and connection to 362nd and presented a brief presentation outlining the annexation request.

Proponent Testimony:

None

Opponent Testimony:

None

Neutral Testimony:

None

Staff Recap:

O'Neill re-stated the need to survey the FSH as a condition of annexation and agreed that the alignment of Kate Schmitz should be modified to protect the wetland.

Commissioner Carlton asked if both sides of the FSH would be surveyed. O'Neill stated it would be wise to survey the FSH now (i.e., during the planning for Bell Street) so that the connection of Kate Schmitz to Bell Street can be analyzed. O'Neill stated the condition to survey the FSH Overlay boundary should be prior to any road development.

Applicant Rebuttal:

None

Chairman Crosby kept the hearing open for the commissioner's discussion so the applicant could speak if needed.

Discussion:

City Attorney Doughman stated that deferring the FSH survey to prior to construction is okay to condition.

Motion: Motion to close the public hearing at 7:37 p.m.

Moved By: Commissioner Carlton

Seconded By: Commissioner Mayton

Yes votes: All Ayes

No votes: None

Abstentions: None

Motion: Motion to forward a recommendation of approval to the City Council to approve the annexation of 16370 Royal Lane with the conditions as outlined in the staff report and the additional FSH Overlay survey condition.

Moved By: Commissioner Mayton

Seconded By: Commissioner Carlton

Yes votes: Carlton, Lesowski, Maclean-Wenzel, Lee, Hook, Mayton, and Crosby

No votes: None

Abstentions: None

The motion passed at 7:39 p.m.

The Commission took a brief recess.

8.2. **Deer Meadows Subdivision (21-014 SUB/TREE):**

Chairman Crosby opened the public hearing on File No. 21-014 SUB/TREE at 7:44 p.m. Crosby called for any abstentions, conflicts of interest, ex-parte contact, challenges to the jurisdiction of the Planning Commission, or any challenges to any individual member of the Planning Commission. No challenges were made. The following declarations were made by the Planning Commission: Commissioner Hook stated he is a resident near the park and did receive notices for the hearing but that he is not biased and is not abstaining. Commissioner Lee stated she was on the City Council when the previous submittal for the subject site was denied. City Attorney Doughman stated there is not an issue unless Commissioner Lee feels she is biased. Commissioner Lee stated she is not biased.

Chairman Crosby explained that testimony will be timed.

Staff Report:

Development Services Director O'Neill presented a presentation outlining the proposal, public testimony received to date, and the staff recommendation. Staff is recommending denial primarily due to the lack of the Dubarko Road extension, the lack of Deer Pointe Park expansion, the lack of Highway 26

frontage improvements, the lack of pedestrian connectivity from the cul-de-sacs, and the lack of utility extensions along Highway 26.

Applicant Testimony:

Michael Robinson
1211 SW 5th Ave, Suite 1900
Portland, OR 97204

Robinson explained why this application is different from the previous applications and that this is only a subdivision application, not a zone change or comprehensive plan change. Robinson asked that Chairman Crosby close the public hearing tonight but leave the written record open for 14 days for an initial testimony period, 7 additional days for rebuttal, and 7 additional days for the applicant to provide rebuttal. The applicant would extend the 120-clock by 28 days.

Tracy Brown
17075 Fir Drive
Sandy, OR 97055

Brown went over the history of the property, summarized the current application, and provided some responses to the staff recommendation. Brown explained that future development of the R-2 and C-3 lots would be a separate design review application. Brown concluded that the application is a needed housing application and believes it complies with all clear and objective standards. Brown believes some of staff's reasons for denial could be conditions of approval instead.

Mike Ard
21370 SW Langer Farms Parkway, Suite 142
Sherwood, OR 97140

Ard stated the applicant updated their trip count data in response to the City's traffic engineer's comments and gave a brief overview of the updated TIS.

Robinson summarized the application and stated it's a limited land use application and a needed housing application.

Proponent Testimony:

Zoeanna McKenzie
18428 Meadow Ave
Sandy, OR 97055

Ms. McKenzie stated she votes in favor of the application.

Opponent Testimony:

Ashley Yukich
18331 Antler Ave
Sandy, OR 97055

Ms. Yukich agrees with the recommendation to deny the application. The applicant has no concern for public interests. Application seems like it meets the bare minimum amount of effort. Asked if there's been any consideration with putting a traffic light along Highway 26.

Neutral Testimony:

None

Staff Recap:

O'Neill reiterated the applicant's main arguments regarding incorporation of master plans and clear and objective standards and that it's difficult to address as staff since the determinations should likely be made by a higher hearing body or legal counsel. O'Neill stated staff's role is to determine if the proposal meets the development code and that this proposal does not meet numerous sections of the code. O'Neill does not feel the proposal is in the best interest for the City or surrounding neighborhoods. O'Neill thinks that a traffic light was looked at previously for the Highway 26/Dubarko Road/Vista Loop intersection and does not think it was warranted previously with an application that had more trips than the subject application.

Chairman Crosby asked City Attorney Doughman if he had anything to add. City Attorney Doughman reminded the Commission they've heard these arguments from the applicant's attorney in previous applications. Doughman mentioned these arguments are being made across many cities in Oregon and that LUBA has reversed some denials if the basis for denial is on something not clear and objective.

Applicant Rebuttal:

Robinson is disappointed they couldn't find a way through this with staff. Robinson says you can't ignore state law. Robinson reiterated his request to close the public hearing and leave the written record open.

Discussion:

Chairman Crosby requested that they discuss keeping the written record open. Doughman explained any party can request a continuance at the first hearing, which has to be granted by the Commission. The Commission has the option of continuing the hearing to a date certain, or leave the written record open, which is what he recommends. The first period would be 14 days long and

anyone can submit testimony. The second period is 7 days and anyone can submit a rebuttal to anything that was raised in the first 14 days, but can't submit new evidence. The last 7 days is reserved for the applicant to make a final argument. O'Neill stated the additional 14 day window would be posted on Facebook and the City's website to let the public know. O'Neill asked when the City's additional input would be due and Doughman stated it would follow the same timeline, i.e., within the 14 day window. Doughman clarified that the Commission can't make a decision tonight and has to either continue the hearing to a date certain or leave the written record open. Commissioner Maclean-Wenzel wants to know if there's a way to get additional materials by a date certain ahead of the hearing. Doughman said that's essentially what the written record period is. Commissioner Hook wanted to know how the Planning Commission could ask questions during the open record period and Doughman said they can't and to ask the questions tonight. Commissioner Lesowski cautioned the commission to wait to talk about the proposal. Commissioner Mayton anticipates having questions about legal interpretation and wants to know if he can ask Doughman questions during the open record period. Doughman said yes. Commissioner Carlton is interested in knowing what Doughman's response is to the applicant so that the hearing can be more efficient. Doughman said he can prepare a memo prior to the next hearing. Commissioner Lee wants to better understand what the difference is based on needed housing versus other applications. Doughman said he could address that. O'Neill stated a lot of these arguments are legal. Anywhere where Doughman agrees with the applicant that something is not clear and objective or sufficiently incorporated, staff will need a proposed code edit from the City Attorney immediately. Doughman suggested they choose the deliberation date. The commissioners did a straw poll and decided to keep the record open. O'Neill requested the 120 clock be extended to whichever day the deliberation hearing will be in November. Robinson stated he needs to know the deliberation date, but generally doesn't have a problem with a further extension. Robinson asked Doughman if the second 7 day period includes rebuttal with arguments and evidence and Doughman said yes. O'Neill wants Doughman and Robinson to clarify the process so staff can post it to the website. O'Neill mentioned a couple potential dates. The consensus from the Commission for the deliberation on the Deer Meadows subdivision was November 8. Robinson agreed to extend the 120 day clock an additional 14 days for a total extension of 42 days. This would extend the 120 clock to January 5, 2022. Commissioner Lee stated that she can't make the 8th of November, but all other Commissioners stated they can attend.

Motion: Motion to close the public hearing, but keep the record open for 28 days, including the first 14 days for record submittal, following 7 days for

rebuttal, following 7 days for the applicant to make final argument. The motion included reconvening on November 8, 2021 at 6:30 PM.

Moved By: Commissioner Lesowski

Seconded By: Commissioner Mayton

Yes votes: Carlton, Lesowski, Maclean-Wenzel, Lee, Hook, Mayton, Crosby

No votes: None

Abstentions: None

The motion passed at 9:43 p.m.

9. ADJOURNMENT

Motion: To adjourn at 9:46 p.m.

Moved By: Commissioner Hook

Seconded By: Commissioner Mayton

Yes votes: All Ayes

No votes: None

Abstentions: None

The motion passed.

Chairman Crosby adjourned the meeting at 9:46 p.m.



Chair, Jerry Crosby



Planning Director, Kelly O'Neill Jr



Staff Report

Meeting Date: October 25, 2021
From Kelly O'Neill, Development Services Director
SUBJECT: Director's Report for October 25, 2021

BACKGROUND / CONTEXT:

Upcoming meetings (items are tentative):

- **November 8 at 6:30 PM:** 1) Deer Meadows Deliberation
- **November 22 at 6:30 PM:** 1) Sandy Woods II Subdivision; 2) The Pad Townhomes
- **December 13 at 6:30 PM:** Items TBD
- **January 24 at 6:30 PM:** Items TBD

Recent decisions of note:

- **Annexation of 37685 Olson Street:** This annexation was approved by the City Council and is effective on October 20, 2021.
- **Parks and Trails Master Plan:** This master plan was adopted by the City Council. Staff continues to work on related code amendments and has hired the FCS Group and ESA to revise the SDC methodology for parks and revise the fee in-lieu of land dedication.

Applications of note:

- **The Pad Townhomes (21-046 DR/TREE/ADJ/VAR):** This application is for a 10-unit apartment complex to the south of Joe's Donuts and to the north of Fantasy Forest in Meinig Park. Staff deemed the application complete on September 20, 2021.
- **Sandy Woods II Subdivision (21-037 SUB/TREE/VAR):** This application is the second phase of Sandy Woods to the north of Olson Street and south of Kelso Road. The proposal includes 43 lots that are all zoned SFR. Staff deemed the application complete on September 9, 2021.

Other items of note:

- **Comprehensive Plan:** Staff continues to work with 3J Consulting on the scope of work and contract details.
- **Bypass Feasibility Study:** Staff, ODOT, and DKS are putting the finishing touches on the Bypass Feasibility Study with aspirations to release the study in the next few months to the City Council and Planning Commission.
- **TSP Update:** Staff, ODOT, and DKS continue to work on the revised Transportation System Plan (TSP) and are working on a survey to launch this fall.

- **Building Inspector:** The Building Division has contracted with Johnny Vollendroff, a Sandy resident, to assist the Building Official, Terre Gift, with plan review and inspections.



Staff Report

Meeting Date: October 25, 2021

From Emily Meharg, Senior Planner

SUBJECT: Planning Commission Appointment Review Panel

DECISION TO BE MADE:

Four Planning Commissioner's terms will expire on December 31, 2021, resulting in four vacant seats. City staff posted the application on the City's website on September 28, 2021 to solicit applicants for the four vacant seats. Position terms begin on 01/01/2022 and end on 12/31/2025. All applicants seeking appointment to the Planning Commission, whether incumbent members applying for reappointment or new applicants, will undergo the application and interview process outlined in Section 4 of Resolution 2021-07, A Resolution Establishing Standard Procedures for City Boards.

Per Section 4.3, applicants for seats will be interviewed by a panel consisting of three Council Members and the Chair of the applicable Board. In the event the Chair is the applicant, the Vice Chair will serve on the interview panel. In the event both the Chair and Vice Chair are applicants, the Board will select one of its members to serve on the interview panel.

In this case, both the Chair's and Vice Chair's appointments are expiring. If the Chair is not reapplying, the Chair will serve on the interview panel. If the Chair is reapplying but the Vice Chair is not, the Vice Chair will serve on the interview panel. If both the Chair and Vice Chair are reapplying the Planning Commissioners will need to select an alternate member whose term is not expiring to serve on the interview panel. Following the interviews, the interview panel, with the assistance of city staff, will provide appointment recommendations to the City Council.

The following Commissioner's terms expire on December 31, 2021:

Jerry Crosby
Don Carlton
Ron Lesowski
Hollis MacLean-Wenzel

The following Commissioner's terms expire on December 31, 2024:

Jan Lee
Steven Hook
Chris Mayton

RECOMMENDATION:

Staff recommends the Planning Commission select a member to serve on the interview panel for the Planning Commission Appointment.

LIST OF ATTACHMENTS/EXHIBITS:

Resolution 2021-07



NO. 2021-07

A RESOLUTION ESTABLISHING STANDARD PROCEDURES FOR CITY BOARDS

Whereas, the City Council significantly values the input and expertise of its various advisory bodies; and

Whereas, the City Council recognizes the importance of establishing clear policies and procedures to standardize the operations of its various advisory bodies; and

Whereas, the City Council wishes to establish a variety of advisory body classifications to meet the various policy development needs of the City; and

Whereas, the City Council wishes to replace and expand upon the existing advisory body policy document known as "ADMIN 100;"

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Sandy:

SECTION 1: DEFINITIONS

1.1 For the purposes of this Resolution, the term "Board" is intended to apply to all commissions, committees, advisory boards, subcommittees, task forces, and project advisory committees.

SECTION 2: BOARD CATEGORIES

2.1 Each Board will be classified into one of the following categories:

- Statutory Bodies
- Advisory Boards
- Task Forces
- City Council Subcommittees
- Project Advisory Committees

2.2 These categories of Boards will be structured and operate in accordance with the Board Operational Framework, attached herein as Appendix A.

#2021-07

SECTION 3: BOARD SEAT TERMS

3.1 The seat term parameters set forth in this section apply to Statutory Bodies and Advisory Boards.

3.2 Seat terms are four years in length, starting New Year's Day and ending New Year's Eve. (Example: 1/1/2021 through 12/31/2024).

3.3 Seat terms shall exist in two staggered cohorts. Approximately half of the seats on a board are assigned the same term beginning and end date, while the other half share a different term beginning and end date.

3.4 Members appointed to Boards by the City Council are assigned to a specific seat and serve until the expiration of the seat's term. Members appointed to fill vacancies serve for the remainder of the unexpired term.

3.5 Incumbent members may apply for reappointment at the expiration of their existing terms (see Section 4 of this resolution).

3.6 The City Recorder will maintain the official roster of Board seats, terms, and members.

SECTION 4: SEAT VACANCIES

4.1 All applicants seeking appointment to Statutory Bodies and Advisory Boards, whether incumbent members applying for reappointment or new applicants, will undergo the application and interview process outlined in this section.

4.1.1 The City Manager or City Council Members, if selected to serve as Board members, are exempt from the requirements of this section.

4.1.2 The City Council at its discretion may elect to require this process for specific appointments to Boards other than Statutory Bodies and Advisory Boards.

4.2 Prior to the expiration of a seat's term, city staff will proactively publicize the upcoming vacancy and collect applications from interested parties.

4.3 Applicants for seats will be interviewed by a panel consisting of three Council Members and the Chair of the applicable Board. In the event the Chair is the applicant, the Vice Chair will serve on the interview panel. In the event both the Chair and Vice Chair are applicants, the Board will select one of its members to serve on the interview panel.

#2021-07

4.4 Following the interviews, the interview panel, with the assistance of city staff, will provide appointment recommendations to the City Council.

4.5 Appointments will be made by the City Council at a regular public meeting.

SECTION 5: PUBLIC MEETINGS

5.1 All Statutory Bodies and Advisory Boards shall conduct public meetings in accordance with the provisions of Oregon Revised Statutes Chapter 192, and any other public meetings regulations enacted by the State of Oregon.

5.1.1 The City Council at its discretion may also extend this requirement to specific Boards other than Statutory Bodies and Advisory Boards.

SECTION 6: BYLAWS

6.1 All Statutory Bodies and Advisory Boards shall operate under bylaws, in the interest of ensuring structure and consistency.

6.1.1 The Council at its discretion may also extend this requirement to specific Boards other than Statutory Bodies and Advisory Boards.

6.2 Bylaws must be consistent with the Sandy Municipal Code, applicable State laws and regulations, and the provisions set forth in this resolution.

6.3 Unless otherwise stipulated in the Sandy Municipal Code, bylaws must include at least the following:

6.3.1 Meeting attendance requirements

6.3.2 Meeting quorum requirements

6.3.3 Procedures for electing Board officers

6.3.4 Member qualification and/or residency requirements

6.4 Bylaws and amendments thereto must be approved by the City Council before taking effect. Boards may recommend amendments for the Council's consideration.

#2021-07

SECTION 7: MEMBER CONDUCT

7.1 All members of Boards are required to comport themselves in accordance with the City's Boards and Commissions Code of Conduct, originally adopted by the City Council on September 21st, 2020. The Council reserves the authority to make appointment and/or removal decisions based in whole or in part on adherence to the Code of Conduct.

SECTION 8: STAFF AND COUNCIL LIAISONS

8.1 The Mayor may designate a non-voting City Council Liaison to any Board for the purpose of facilitating communication and coordinating policy development.

8.2 The City Manager may designate a non-voting Staff Liaison to any Board for the purpose of providing administrative and logistical support to the body.

8.3 Neither City Council nor Staff Liaisons will be counted toward the constitution of a quorum at any meeting.

SECTION 9: PREEMPTION

9.1 Nothing in this resolution purports to preempt any higher legal authority, including, but not limited to, the Sandy Municipal Code, the Sandy City Charter, Oregon Revised Statutes, or Oregon Administrative Rules.

SECTION 10: REPEAL OF PREVIOUS POLICY

10.1 The City of Sandy Advisory Boards, Commissions and Committee Policy, known as "ADMIN 100," enacted on May 21, 2018, is hereby repealed.

This resolution is adopted by the Common Council of the City of Sandy and approved by the Mayor this 19 day of April 2021



Stan Pulliam, Mayor

ATTEST:

#2021-07



Jeff Aprati, City Recorder

#2021-07

2021-07: APPENDIX A

SANDY BOARD OPERATIONAL FRAMEWORK

Established: April 19, 2021

	Intended Duration	Membership	Seat Terms	Interview / Application Process Required?	Members Appointed By:	Public Meetings Required?	Official Recommendations Made To:	Bylaws Required?	Body Established Through:	Examples
Statutory Bodies	Permanent	Area residents (as prescribed in Bylaws)	4 years / staggered cohorts	Yes	Council motion	Yes	City Council	Yes	Council ordinance	Planning Commission; Budget Committee
Advisory Boards	Permanent	Area residents (as prescribed in Bylaws)	4 years / staggered cohorts	Yes	Council motion	Yes	City Council	Yes	Council resolution	Library Advisory Board; Public Art Advisory Board
Task Forces	Temporary (until specific purpose is fulfilled)	Flexible, based on purpose. Could include residents, staff, and/or up to 3 Councilors (avoid quorum)	Serve indefinitely until/unless resignation, removal, or Board disbanded	No (unless desired by Council)	Council motion or Mayor appointment	No (can be made public if desired)	Mayor, who then communicates it to the Council (public meetings not necessary)	No (can be established if desired by Council)	Council motion	Social Services Task force; Interview Panel for committee appointments
City Council Subcommittees	Temporary (until specific purpose is fulfilled)	Up to 3 City Councilors (avoid quorum)	n/a	n/a	Council motion or Mayor appointment	No (can be made public if desired)	Mayor, who then communicates it to the Council (public meetings not necessary)	No (can be established if desired by Council)	Council motion	Wastewater Project Oversight Committee; Survey Working Group
Project Advisory Committees	Temporary (until specific purpose is fulfilled)	Flexible, based on purpose. Could include residents, staff, and/or up to 3 Councilors (avoid quorum)	n/a	No (unless desired by Council)	City Manager or Mayor	No (can be made public if desired)	City Manager, who then communicates it to the Council (public meetings not necessary)	No (can be established if desired by Council)	City Manager decision	TSP TAC; Parks Master Plan Stakeholder Committee

**PLANNING COMMISSION STAFF REPORT
TYPE III LAND USE PROPOSAL**

This proposal was reviewed concurrently as a Type III subdivision with tree removal. The following exhibits and findings of fact explain the proposal and support the staff recommendation.

DATE: October 15, 2021

FILE NO.: 21-021 SUB/TREE

PROJECT NAME: The Bornstedt Views Subdivision

APPLICANT: Even Better Homes

OWNER: William Bloom

PHYSICAL ADDRESS: 19618 Bornstedt Road

LEGAL DESCRIPTION: T2S R4E Section 24C, Tax Lot 100

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TRANSPORTATION – Chapters 17.84 and 17.10017

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EXHIBITS

Applicant's Submittals:

- A. Land Use Application
- B. Project Narrative (dated May 2021)
- C. Civil Plan Set
 - Sheet C1 - Cover Sheet and Future Street Plan
 - Sheet C2 - Tentative Plat Map
 - Sheet C3 – Topographic Survey
 - Sheet C4 - Tree Inventory List 1
 - Sheet C5 - Tree Inventory List 2
 - Sheet C6 - Tree Inventory List 3
 - Sheet C7 – Tree Retention and Protection Plan
 - Sheet C8 – Street and Utility Plan
 - Sheet C9 – Grading and Erosion Control Plan
 - Sheet C10 – On-Street Parking Plan
- D. Preliminary Storm Drainage Report (dated July 26, 2021)
- E. Traffic Impact Study (dated August 5, 2021)
- F. Arborist Report (dated April 29, 2021)
- G. Stream and Wetland Presence Determination (dated September 30, 2020)
- H. Geotechnical Investigation and Consultation Services (dated May 3, 2021)
- I. Fire Turn Sketch
- J. Email from City Engineer
- K. Letter from Tracy Brown (dated August 17, 2021)
- L. Letter from Michael Robinson (dated September 24, 2021)

Agency Comments:

- M. Fire Marshal (dated September 18, 2021)
- N. Parks and Trails Advisory Board (dated September 20, 2021)
- O. City Transportation Engineer (dated September 27, 2021)
- P. Bonneville Power Administration (email dated September 29, 2021)
- Q. City Public Works Director (dated October 5, 2021)
- R. Fire Marshal follow-up email (dated October 4, 2021)

Public Comments:

- S. Lori Pyles (received October 7, 2021)

Additional Documents Submitted by Staff:

- T. Marshall Ridge Partition Plat 4603
- U. Ordinance 2019-16

FINDINGS OF FACT

GENERAL FINDINGS

1. These findings are based on the applicant's submittals received on May 6, 2021. Staff found the application incomplete on June 3, 2021. On August 17, 2021, the applicant submitted some of the missing information and written notice that no other information will be provided. The applicant further requested that the application be deemed complete effective August 17, 2021 for the purpose of beginning the "120-day clock." Thus, staff found the application complete on August 17, 2021 for the purpose of beginning the "120-day clock."
2. This report is based upon the exhibits listed in this document, including the applicant's submittals, agency comments, and public testimony.
3. The subject site is approximately 12.74 acres. The site is located at 19618 Bornstedt Road.
4. The parcel has a Comprehensive Plan Map designation of Low Density Residential and a Zoning Map designation of Single Family Residential (SFR).
5. The applicant, Mac Even of Even Better Homes, Inc., submitted an application for a 42-lot subdivision on a 12.74-acre parcel located at 19618 Bornstedt Road. The 42 lots range in size from 7,500 square feet to 54,263 square feet. Thirteen (13) of the lots are proposed to gain access from a new street that intersects with Bornstedt Road, and the other 29 lots are proposed to gain access via an extension of Averill Parkway to the south. The applicant is not proposing an east-west street connection between the new street that intersects with Bornstedt Road and Averill Parkway. All lots are proposed to contain either a single-family home or a duplex. The proposal also includes frontage improvements, utility extensions, and removal of 709 trees from the subject property.
6. The applicant submitted the application as a Type II Subdivision and Type II Tree Removal. For an application to be processed under the Type II Subdivision procedure, satisfactory street conditions need to exist and the resulting parcels/lots need to comply with the standards of the zoning district and Chapter 17.100 [Section 17.100.20(C)]. As discussed in detail in Chapter 17.100 of this document, this proposal includes unsatisfactory street conditions and does not comply with many of the standards of the zoning district and Chapter 17.100. Therefore, it does not meet the Type II Subdivision procedure. Section 17.100.20(E) contains the Type III Subdivision requirements and states: "A major partition or subdivision shall be a Type III procedure if unsatisfactory street conditions exist or the resulting parcels/lots do not comply with the standards of the zoning district and this chapter." Because the proposed submittal does not fully comply with the standards of the zoning district and this chapter (i.e., Chapter 17.100), staff determined the proposal shall be reviewed as a Type III Subdivision. In addition, Section 17.12.20 states: "If the Director contemplates persons other than the applicant can be expected to question the application's compliance with the Code, the Director may elevate an application to a Type III review." Based on the public's interest in recent subdivision proposals, including Bull Run Terrace, Deer Meadows, The Views, Cedar Creek Heights, and Bailey (Shaylee) Meadows, and the

fact that the proposal does not comply with multiple code standards, the Director determined that it is likely that “persons other than the applicant can be expected to question the application's compliance with the Code.” Based on these reasons, the Development Services Director elevated this application to a Type III decision to be heard and considered by the Planning Commission. The notice labels provided by the applicant were for the properties within 300 feet of the subject property consistent with a Type II land use application. Staff obtained mailing labels for properties within 500 feet, as required for a Type III review, and sent the notice to property owners within 500 feet of the subject property.

7. Throughout the project narrative (Exhibit B) the applicant failed to submit required information. Instead, on multiple occasions in the narrative the applicant states that the development code is subjective (i.e., not clear and objective) and because the subdivision constitutes a needed housing application the subjective development code language is not applicable. Staff does not agree with the applicant’s interpretation of what constitutes clear and objective and this staff report applies several of the contested section..
8. This subdivision request was submitted on May 6, 2021, prior to the repeal of Planned Developments effective on September 15, 2021. Therefore, code references to Planned Developments may still be mentioned in this staff report.
9. The owner of the subject property submitted an application for annexation in 2018. The annexation was approved by Ordinance 2019-16 (Exhibit U), which included the following four (4) conditions of annexation approval for the subject property:
 - A. Prior to the future development of the subject property the standards and criteria of the Flood & Slope Hazard (FSH) Overlay District (Chapter 17.60) shall be applied to the subject property.
 - B. Prior to the future development of the subject property the Flood & Slope Hazard (FSH) Overlay District map shall be updated to include the subject property.
 - C. Prior to the future development of the subject property the development shall be limited to no more than 43 single family lots or 388 average daily trips.
 - D. Prior to the future development of the subject property an applicant, or representative, shall confirm the conditions associated with Case File No. Z0169-19-HL have been fulfilled.

The fourth condition (Condition D, above) involved a historic root cellar on the subject property that the applicant applied to demolish. Clackamas County approved the request with conditions through Case File No. Z0168-19-HL and the applicant submitted an email from Clay Glassgow at Clackamas County on June 28, 2019 stating that the conditions of approval for Case File No. Z0169-19 had been satisfied. With the adoption of House Bill 2001 and subsequent modifications to the Development Code, the City can no longer restrict development to single family homes but rather must allow duplexes as well. Thus, the limitation for no more than 43 single family lots can’t apply; however, the 388 trip cap still applies. The Flood & Slope Hazard Overlay is also required to be mapped on this property prior to future development.

10. The City of Sandy completed the following notices:

- A. A transmittal was sent to agencies asking for comment on September 14, 2021.
 - B. Notification of the proposed application was mailed to affected property owners within 500 feet of the subject property on September 28, 2021.
 - C. A legal notice was published in the Sandy Post on October 6, 2021.
11. At publication of this staff report, one (1) written public comment was received. Lori Pyles (Exhibit S) expressed concerns about traffic in Cascadia Village and does not want Averill Parkway to extend south to serve the proposed subdivision.
12. As further described below, staff recommends denying the application. However, if the Planning Commission decides to approve it, staff recommends including the proposed conditions of approval described in the findings for the applicable sections.

LAND DIVISION CRITERIA – Chapter 17.100

13. This land use application is for the subdivision of land and therefore is reviewed in compliance with Chapter 17.100.
14. Submittal of preliminary public utility plans and street 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.**
15. On page 1 of the letter from the applicant’s attorney, Michael Robinson, dated September 24, 2021 (Exhibit L) the applicant states that in accordance with ORS 197.307 (4) a local government may apply only clear and objective standards, conditions, and procedures regulating the creation of needed housing. The analysis of land division criteria as follows has been conducted through review of clear and objective standards. Staff’s assessment of this subdivision proposal meets ORS 197.307 (4).
16. The applicant submitted this subdivision and requested it be reviewed as a Type II Subdivision. Section 17.100.20(C) contains the Type II Subdivision requirements and states: “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.” As described in this staff report, the proposed subdivision does not comply with the standards of the zoning district and this chapter (i.e., Chapter 17.100). Therefore, the application cannot be processed as a Type II Subdivision.
17. Section 17.100.20(E) contains the Type III Subdivision requirements and states: “A major partition or subdivision shall be a Type III procedure if unsatisfactory street conditions exist or the resulting parcels/lots do not comply with the standards of the zoning district and this chapter.” Because the proposed submittal includes unsatisfactory street conditions and does not comply with the standards of the zoning district and this chapter (i.e., Chapter 17.100), staff determined the proposal shall be reviewed as a Type III Subdivision. Furthermore, Section 17.100.20(E.1) lists “the land division does not link streets that are stubbed to the boundaries of the property” as a basis for determining unsatisfactory street conditions. Only one street is stubbed directly to the property (Averill Parkway); however, Maple Street is stubbed to Bornstedt Road adjacent to the subject property. The applicant is proposing to extend both Maple Street and Averill Parkway but is not proposing to connect any of the internal streets. Based on the above factors, staff has reason to believe that persons other than the applicant are likely to question compliance with the code since the proposal does not comply with multiple sections of the code. Therefore, the Development Services Director elevated this application to a Type III decision to be heard and considered by the Planning Commission.
18. Section 17.100.60(D) outlines the data requirements for a tentative plat. Section 17.100.60(D.5) requires the applicant to detail existing and proposed right-of-way. The submitted Tentative Plat Map (Exhibit C, Sheet C2) details 30 feet of right-of-way from the centerline of Bornstedt Road to the property line. The Bornstedt Road section (Section B) on the Street and Utility Plan (Exhibit C, Sheet C8) details a 60 foot total right-of-way and a

new right-of-way line on the east side of the road. Based on the partition plat for Marshall Ridge Subdivision (Plat 4603; Exhibit T), Planning and Public Works staff believe the total right-of-way width along the Bornstedt Road frontage of the site varies in width from 83.06 feet at the northern property line to 96.21 feet at the southern property line of the Marshall Ridge Subdivision. Staff requested the chain of title for the property and did not find any evidence of Clackamas County granting the property owner additional right-of-way. The submitted tentative plat map is not accurate and does not adequately detail existing and proposed right-of-way. The Public Works Director (Exhibit Q) states that the tentative plat does not appear to comply with the minimum accuracy requirements in Section 17.100.60(D). Staff finds the application does not meet the submittal requirements of Section 17.100.60(D.5).

19. Section 17.100.60(E)(1) requires subdivisions to be consistent with the density, setback, and dimensional standards of the base zoning district, unless modified by a Planned Development approval. The applicant did not apply for a Planned Development. The SFR zoning district requires that residential development comply with Chapter 17.82. First, the Tentative Plat Map (Exhibit C, Sheet C2) does not include setback lines; however, the Tree Retention and Protection Plan (Exhibit C, Sheet C7) details setbacks for Lots 1-4 and 13 showing the front setback facing the local street (Street A), instead of the Transit Street (Bornstedt Road) as required by Chapter 17.82. Second, the applicant is not proposing a connected street network through the subject property. In addition, the applicant is proposing to stub two streets to the south located approximately 1,000 feet apart from one another. This creates a situation for the property to the south in which the property to the south would either be required to develop with disconnected streets like the subject proposal or required to apply for a variance to block length due to the lack of sufficient stubbed streets to the south. Thus, the subject application is not consistent with Section 17.34.40(C). Third, Section 17.34.30(C) requires a minimum lot frontage of 20 feet, except as allowed by Section 17.100.160, which pertains to public access lanes. Seven of the proposed lots do not meet the 20 foot frontage requirement; thus, the application is not consistent with Section 17.34.30(C). Therefore, this proposal does not meet approval criteria 17.100.60 (E)(1).
20. Sections 17.100.60(E)(2) and 17.100.70 require subdivisions to be consistent with the design standards set forth in this chapter. The proposal is not consistent with Sections 17.100.100 (A), (D), (E), and (F), Section 17.100.110(F), Sections 17.100.120(B) and (D), Section 17.100.130, Section 17.100.150(A), Section 17.100.170, Section 17.100.220(C), and Section 17.100.240. The proposal does not meet approval criteria 17.100.60 (E)(2) as explained in A. through L., below:
 - A. The proposed subdivision does not meet the Street Connectivity Principle of Section 17.100.100(A). By not connecting Maple Street to Street B or providing one or more additional stubbed streets to the south, the subdivision does not provide safe and convenient options for cars, bikes, and pedestrians; does not create a logical, recognizable pattern of circulation; and does not spread traffic over many streets so that key streets such as Averill Parkway are not overburdened. Staff finds the proposal does not meet Section 17.100.100(A).

- B. The proposed street layout does not use a rectangular grid pattern as required by Section 17.100.100(D). Section 17.100.100(D) allows for modifications to the rectangular grid pattern if appropriate to adapt to topography or natural conditions. The applicant submitted a Stream and Wetland Presence Determination (Exhibit G) that concluded there are no longer any streams or wetlands on the site, but did not submit DSL concurrence or the \$1,500 third-party review fee to have the wetland determination peer reviewed. The applicant also submitted a topographic survey (Exhibit C, Sheet C3) that details areas with steep slopes. However, it appears that both an east-west extension Maple Street/Street B connecting through the site and at least one additional north-south street could be achieved without going through the steep areas. Staff finds the proposal does not meet Section 17.100.100(D).
- C. By not connecting Maple Street to Street B or providing one or more additional stubbed streets to the south, the proposed subdivision does not provide a future street plan that promotes a logical, connected pattern of streets as required by Section 17.100.100(E). Staff finds the submitted proposal does not meet Section 17.100.100(E).
- D. The proposed subdivision does not connect Maple Street to Street B or provide a third stubbed street to the south and proposes a cul-de-sac, all of which do not provide connectivity to other streets within the development and to existing and planned streets outside the development as required by Section 17.100.100(F). Furthermore, the proposed streets or street extensions are not 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 as required by Section 17.100.100(F). By not providing a connection between the east and west portions of the site there is no direct access for residents of the western lots (lots 1 - 13) to reach Cascadia Park nor is there direct access for residents of the eastern lots (lots 14 - 42) to reach Bornstedt Park. Staff finds the submitted proposal does not meet Section 17.100.100(F).
- E. Section 17.100.110(F) discourages cul-de-sacs but states: "If deemed necessary, cul-de-sacs shall be as short as possible and shall not exceed 400 feet in length." The applicant includes a measurement for the cul-de-sac at 397 feet; however, the length is measured using the southern curb along Averill Parkway and the northern side of the cul-de-sac. The Public Works Director (Exhibit Q) states that Street B, a cul-de-sac, is 450 feet in length measured from the west right-of-way line of Averill Parkway to the end of the cul-de-sac bulb, which is approximately 50 feet greater than the dimensional standard in Sections 17.100.110(F) and 17.84.50(E.3). Staff also finds that the applicant did not submit sufficient information regarding why a cul-de-sac is needed rather than extending a north-south street. Staff finds the submitted proposal does not meet Section 17.100.110(F).
- F. The applicant did not submit information on block lengths for all blocks. The Site Location and Future Street Plan (Exhibit C, Sheet C1) details block lengths for some blocks, but not all blocks. The narrative (Exhibit B) states the block length standards in Section 17.100.120 are subjective (i.e., not clear and objective) and because the subdivision constitutes a needed housing application the block length standards are not

applicable. The applicant failed to submit information into the record regarding block lengths for all block faces. Based on the Plan Set (Exhibit C), it appears that the east side of Street A exceeds 400 feet. The applicant did not submit information justifying the need for a longer block. In addition, the east side of Averill Parkway already exceeds 400 feet to the north. The applicant is proposing to extend Averill Parkway to the south an additional 350-400 feet before the next proposed intersection, thus exacerbating the existing nonconforming block length. Staff finds the submitted proposal does not meet Section 17.100.120(B).

- G. As stated above, the east side of Averill Parkway already exceeds the block length standard of 400 feet. The applicant is proposing to extend Averill Parkway to the south an additional 350-400 feet before the next proposed intersection, thus exacerbating the existing nonconforming block length. The resulting block length exceeds 600 feet; however, the proposal does not include a pedestrian and bicycle access way as required by Section 17.100.120(D). Staff finds the submitted proposal does not meet Section 17.100.120(D).
- H. Where a subdivision is traversed by a watercourse, drainage way, channel, or stream, the applicant is required to provide a stormwater easement or drainage right-of-way conforming substantially with the lines of a watercourse per Section 17.100.130. Based on the Statewide Wetland Inventory (SWI), the site has both a stream and a wetland. The applicant is proposing a 15-foot-wide public storm drainage easement depicted at the rear of Lots 24 through 27; however, as noted by the Public Works Director (Exhibit Q), it does not collect or convey water from existing or proposed public streets. The applicant submitted a Stream and Wetland Presence Determination (Exhibit G) that concluded there are no longer any streams or wetlands on the site. The Public Works Director states: "If based on the Stream and Wetland Presence Determination there is no seasonal drainage on the site, then there should be no need for a public easement to convey off-site runoff from property outside the City." That being said, the applicant did not provide DSL concurrence nor did the applicant pay the required third-party review fee to have the Stream and Wetland Presence Determination reviewed. Thus, staff does not have enough information to determine that there are no watercourses, drainage ways, channels, or streams on the subject property. Staff finds there is insufficient evidence to determine if the proposal meets Section 17.100.130.
- I. Per Section 17.100.150(A), shared private drives may be approved by the Director either when "direct access to a local street is not possible due to physical aspects of the site, including size, shape, or natural features" or when "the construction of a local street is determined to be unnecessary." The applicant is not proposing an east-west street connecting through the subject property, nor is the applicant proposing sufficient north-south streets stubbed to the property boundaries. The applicant submitted a Stream and Wetland Presence Determination (Exhibit G) that concluded there are no longer any streams or wetlands on the site. The applicant also submitted a Topographic Survey (Exhibit C, Sheet C3) that shows areas of steep slope (25 percent or greater). However, the applicant did not submit any analysis demonstrating that there are any natural features on the site that preclude construction of a gridded street pattern,

including an east-west connecting street and at least one additional north-south street. Staff finds there is not sufficient evidence that direct access to a local street is not possible for the six (6) lots proposed to gain access from a private drive (lots 5 and 6 from Tract B, lots 22 and 23 from Tract C, and lots 29 and 30 from Tract D). Staff finds the proposal does not meet Section 17.100.150(A).

- J. Per Section 17.100.170, flag lots are only allowed “where it can be shown that no other street access is possible to achieve the requested land division.” As stated above, the applicant did not submit any analysis demonstrating why a gridded street pattern, including an east-west connecting street and at least one additional north-south street, cannot be constructed on the subject property. Thus, staff finds there is not sufficient evidence that no other street access is possible for the proposed flag lot (lot 33). Staff finds the proposal does not meet Section 17.100.170.
 - K. Section 17.100.220(C) states: “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 that is of a size to warrant division into not more than two parcels.” As explained in Chapter 17.34 of this document, the applicant is proposing six (6) lots that do not have public street frontage but rather are proposed to gain access from a shared private drive. None of these lots have the required 20 feet of frontage on a public street. Staff finds the proposal does not meet Section 17.100.220 (C).
 - L. Section 17.100.240 pertains to sanitary sewer installation and requires the subdivision to connect to existing mains. As discussed in more detail in Chapter 17.84 of this document, the applicant’s proposal to lump nine private sanitary sewer force mains in a PUE is problematic. Per the Public Works Director (Exhibit Q), **the applicant shall be conditioned to construct gravity sewers draining to the public sewer line in Jerger Street to serve lots 16 to 33.** As proposed, staff finds the proposal does not meet Section 17.100.240.
21. Section 17.100.60(E)(3) requires the proposed street pattern to be connected and consistent with the Comprehensive Plan or official street plan for the City of Sandy. Sandy’s Transportation System Plan (TSP) was adopted by Ordinance 2011-12 as an addendum to the Comprehensive Plan in 2011. At that time, the subject property was not in City limits and was not included in the TSP; thus, consistency with the official street plan cannot be determined for the subject property, with the exception of the Bornstedt Road frontage of the subject property, which was included in the TSP. The Bornstedt Road section (Section B on Exhibit C, Sheet C8) details a 6 foot wide bike lane on Bornstedt Road in conformance with the project B3 on the TSP’s Bicycle System Plan. However, as discussed in Section 17.100.60(D) of this document, the submitted tentative plat map is not accurate and does not adequately detail existing and proposed right-of-way. As proposed, it appears the applicant is proposing to plat lots in the existing Bornstedt Road right-of-way. In addition, the proposed street pattern submitted by the applicant is not connected as required by Section 17.100.60(E)(3). By platting lots in the existing right-of-way and not providing an east-west

street connection or additional north-south streets the subdivision request does not meet approval criteria 17.100.60 (E)(3).

22. Section 17.100.60(E)(4) requires that traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions. The applicant's Traffic Impact Study (Exhibit E) evaluated ADT on local streets and determined the proposed development would result in 396 daily site trips. The TIS conclusions state: "The local streets in the project vicinity currently carry fewer than 1,000 vehicles per day, in accordance with the requirements of the city's development code. Following completion of the proposed development the local streets are projected to continue to carry fewer than 1,000 daily trips. Accordingly, operation of local streets is projected to meet city standards." However, the TIS was based on development of 42-single family homes, as stated on page 13 of the TIS. Due to the requirements of House Bill 2001, a duplex is now allowed as an outright permitted use on any lot that allows a single-family residence. The City is not able to preclude any of the 42 lots from developing with a duplex rather than a single-family home, which could result in up to 84 dwelling units as proposed. Once Senate Bill 458 goes into effect, the 42 duplexes could be divided into separate lots, which has the potential to result in 84 lots. Thus, the TIS should have been based on 42 duplexes and, as submitted, does not provide sufficient evidence that the applicant can meet the standards of Section 17.100.60(E.4). In addition, Ordinance 2019-16 (Exhibit U) included a condition capping the number of average daily trips for this property at 388. The proposal is not in compliance with the conditions of Ordinance 2019-16. The proposal does not meet approval criteria 17.100.60 (E)(4) nor does it meet the average daily trip cap conditioned by Ordinance 2019-16.
23. Section 17.100.60(E)(5) requires that adequate public facilities are available or can be provided to serve the proposed subdivision. City water and stormwater are available or will be constructed by the applicant to serve the subdivision. However, as discussed in more detail in Chapter 17.84 of this document, the applicant's proposal for sanitary sewer for lots 16 to 33 is problematic. Per the Public Works Director (Exhibit Q), **the applicant shall be conditioned to construct gravity sewers draining to the public sewer line in Jerger Street to serve lots 16 to 33**. In addition, the proposal does not meet approval criteria 17.100.60 (E)(5) as explained in A and B, below:
- A. East-west street connection. As explained elsewhere in this staff report, the proposal does not include an east-west street connection through the subject property.
 - B. North-south connections. As explained elsewhere in this staff report the proposal does not propose sufficient north-south streets.
24. Section 17.100.60(E)(6) requires all proposed improvements to meet City standards. A detailed review of proposed improvements is contained throughout this staff report. Staff has identified several aspects of the proposed subdivision improvements requiring additional information or modification by the applicant. Some of the required improvements could be satisfied with conditions of approval, but several of the required improvements can only be satisfied by a substantial modification to the subdivision proposal. The proposed subdivision lacks the following substantial improvements: 1) an east-west connection; 2) sufficient north-

south streets; 3) adequate sanitary sewer; 4) a second fire access; and 5) a connected public street network (the proposal instead relies on private drives, a flag lot, and a cul-de-sac that provide no connectivity). The proposal does not meet approval criteria 17.100.60 (E)(6).

25. Section 17.100.60(E)(7) strives to ensure that a 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. The applicant is not requesting a phased development. The proposal meets approval criteria 17.100.60 (E)(7).

DENSITY CALCULATIONS – Chapter 17.30

26. The total gross acreage for the entire property is 12.74 acres. After removing the proposed right-of-way and proposed stormwater tract, the net site area (NSA) for the subject property is reduced to 10.11 net acres.

NOTE: The density calculations on the subject site do not account for the additional land required to be dedicated for Maple Street to connect to Street B or additional north-south streets. In addition, the Oregon Statewide Wetlands Inventory shows a stream/wetland on the subject property. The applicant did not submit any concurrence from DSL stating that there is no wetland/stream on the property. Therefore, the calculations related to density are based on unreliable assumptions.

27. The subject property is zoned Single Family Residential (SFR); therefore, a minimum of 3 and a maximum of 5.8 units per acre are allowed. The minimum density for the subject area is 10.11 net acres x 3 units/net acre = 30.33 rounded down to 30 units. The maximum density for the subject area is 10.11 net acres x 5.8 units/net acre = 58.64 rounded up to 59 units. The applicant identifies 42 lots, within the density range. However, as noted above, these calculations are based on unreliable assumptions.

ZONING DISTRICTS – Chapter 17.34

28. The applicant proposes constructing 42 single-family dwellings or duplexes as permitted in this zoning district. Section 17.34.30 contains the design standards for this zone. As shown on Sheet C2 of the plan set (Exhibit C), all lots in the proposed subdivision contain at least 7,500 square feet and contain an average lot width of 60 feet as required.
29. Section 17.34.30(C) requires all lots to have a minimum lot frontage of 20 feet, except as allowed by Section 17.100.160. Section 17.100.160 pertains to public access lanes and the applicant is not proposing any public access lanes; thus, all lots are required to have a minimum lot frontage of 20 feet. The applicant is proposing six (6) lots that will take access from three (3) separate shared private drives (Lots 5 and 6, Lots 22 and 23, and Lots 29 and 30); none of these lots have any street frontage. The applicant is also proposing one (1) flag lot (Lot 33), with a 15 foot wide flag. Therefore, the proposal does not meet the minimum lot frontage requirements of Section 17.34.30(C) for seven (7) lots. Shared private drives and flag lots are discussed in further detail in the Land Division section of this document (Chapter 17.100).
30. Section 17.34.40(A) requires that water service be connected to all dwellings in the proposed subdivision. Per the submitted narrative (Exhibit B), the applicant proposes to extend water service to serve all dwellings in the development.
31. Section 17.34.40(B) requires that all proposed dwelling units be connected to sanitary service if service is currently within 200 feet of the site, which it is. As discussed in more detail in Chapter 17.84 of this document, the applicant's proposal to cluster nine private force mains in a single PUE is problematic. Per the Public Works Director (Exhibit Q), **the applicant shall be conditioned to construct gravity sewers draining to the public sewer line in Jerger Street to serve lots 16 to 33 if the application is approved.**
32. Section 17.34.40(C) requires that the location of any real improvements to the property must provide for a future street network to be developed. The applicant's narrative states that a new street network will be constructed to serve each dwelling as required. However, the applicant is not proposing a connected street network through the subject property. In addition, the applicant is proposing to stub two streets to the south located approximately 1,000 feet apart from one another. This creates a situation for the property to the south in which the property to the south would either be required to develop with disconnected streets (inconsistent with the Sandy Development Code) like the subject proposal or required to apply for a block length variance due to the lack of sufficient stubbed streets to the south.
33. Section 17.34.40(D) requires that all dwelling units must have frontage or approved access to public streets. The applicant is proposing six (6) lots that will take access from three (3) separate shared private drives (Lots 5 and 6, Lots 22 and 23, and Lots 29 and 30); none of these lots have any street frontage. The applicant is also proposing one (1) flag lot (Lot 33), with a 15 foot wide flag pole for access. Therefore, the proposal does not meet the minimum lot frontage requirements of Section 17.34.40(D) for seven (7) lots (Lots 4, 6, 22, 23, 29, 30, and 33). Shared private drives and flag lots are discussed in further detail in the Land Division section of this document (Chapter 17.100).

ADDITIONAL SETBACKS AND SPECIAL SETBACKS – Chapters 17.80 and 17.82

34. Chapter 17.80 requires all residential structures to be setback at least 20 feet to collector and arterial streets. Bornstedt Road is classified as a minor arterial. **If the application is approved, all structures on lots abutting Bornstedt Road shall be setback at least 20 feet.**

35. Section 17.82.20(A) requires that all residential dwellings 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. Bornstedt Road is a transit street. **If the application is approved, all residential structures on lots abutting Bornstedt Road shall have their primary entrances oriented to Bornstedt Road.**

36. Section 17.82.20(B) requires that dwellings shall have a primary entrance connecting directly between the transit street and building interior and outlines requirements for the pedestrian route. Section 17.82.20(C) requires that primary dwelling entrances shall be architecturally emphasized and visible from the street and shall include a covered porch at least 5 feet in depth. **If the application is approved, adherence to the design standards in Chapter 17.82 for residential development is required.**

37. The applicant references ORS to claim that Chapter 17.82 is not clear and objective and therefore the design standards in Chapter 17.82 do not have to be followed, but the project narrative (Exhibit B) goes on to state that the applicant intends to orient the homes on Lots 1-4 and 13 towards Bornstedt Road and construct a walkway to the entrance as preferred by the City.

TRANSPORTATION – Chapters 17.84 and 17.100

38. This finding analyzes the Traffic Impact Study (Exhibit E).

- A. The applicant submitted a Traffic Impact Study (Exhibit E) from Ard Engineering, dated August 5, 2021. The study did identify some required mitigation. According to the Traffic Impact Study (TIS), the proposed residential development would generate up to 31 site trips during the morning peak hour, 42 trips during the evening peak hour, and 396 daily site trips. However, the TIS was based on development of 42-single family homes, as stated on page 13 of the TIS. Due to the requirements of House Bill 2001, a duplex is now allowed as an outright permitted use on any lot that allows a single-family residence. The City is not able to preclude any of the 42 lots from developing with a duplex rather than a single-family home. Thus, the TIS should have been based on 42 duplexes and, as submitted, does not provide sufficient evidence that the applicant can meet the standards of Sections 17.100.60(E.4) or 17.84.50(B.4). In addition, Ordinance 2019-16 includes the following condition of annexation approval for the subject property: “Prior to the future development of the subject property the development shall be limited to no more than 43 single family lots or 388 average daily trips.” The proposed subdivision results in 396 daily site trips based on 42 single-family homes, which is not in compliance with the conditions of Ordinance 2019-16.
- B. The City Transportation Engineer (Exhibit O) reviewed the TIS and finds that it meets City requirements. However, the applicant did not submit the required \$1,500 third party review fee. **The applicant shall submit the \$1,500 third party review fee for peer review of the Traffic Impact Study.**
39. Section 17.84.50(E) requires that public streets installed concurrent with development of a site shall be extended through the site to the edge of the adjacent property. The proposed street layout results in two temporary dead-end streets (Averill Parkway and Street A) that will be stubbed to the southern property line of the subject property (Street A is also proposed to stub to the northern property line) and one temporary dead-end street stubbed to the east property line (Street C). The proposal also includes one cul-de-sac. The proposed subdivision does not propose an east-west street connection or sufficient north-south streets and thus fails to install the public street extension of the east-west connection or north-south streets concurrent with development of the site. The proposed subdivision does not meet the standards of Section 17.84.50 (E).
40. The proposed development includes the need to name Street A, Street B, and Street C. As recommended by the Public Works Director, the applicant shall be required to extend Maple Street east through the site to connect to Street B; so Street B would become Maple Street. By extending Maple Street/Street B to the east property line, there may not be a need for Street C. The street names shall be related to the east coast town/college theme.
41. Sections 17.84.509(F and G) require public streets to be improved to City standards along the entire frontage of the property. Per the Public Works Director (Exhibit Q), the street improvements proposed on Tract A and Lots 13, 37, and 38 do not extend to the edge of the adjacent properties as required in Sections 17.84.50(F.1) and 17.84.50(G). **If the application is approved, the applicant shall update the Street Plan to detail street improvements on Tract A and Lot 13, 37, and 38 frontages extending to the property line per Sections**

17.84.50(F.1) and 17.84.50(G). Retaining walls in the right-of-way or slope easements on adjacent parcels may be required to accomplish this. The frontage improvements for Tract A shall be completed prior to final plat approval.

42. Proposed streets do not meet the requirements of 17.84.50(H) as the proposed public street improvements do not provide for the logical extension of an existing street network. The proposed streets also do not meet Section 17.100.100(E) as the subdivision proposal does not promote a logical, connected pattern of streets. **The Public Works Director recommends that the Planning Commission require the extension of Maple Street east through the site to connect to proposed Street B as a logical extension of an existing street network per Section 17.84.50(H).**
43. While Section 17.100.100(C) calls for a rectangular grid pattern the proposed street layout is not a rectangular grid pattern as it incorporates a cul-de-sac and does not include an east-west connection (i.e., connecting Maple Street to Street B) or one or more additional north-south streets that would be needed to meet the block length standard. As proposed, the two north-south streets are located approximately 1,000 feet apart and are not internally connected. Staff finds that the proposed street layout does not represent a logical street pattern.
44. As discussed in Chapter 17.100 of this document, the applicant failed to submit information into the record regarding block lengths for all block faces and therefore staff does not have enough information to determine block lengths. Based on the Plan Set (Exhibit C), it appears that the east side of Street A exceeds 400 feet. The applicant did not submit information justifying the need for a longer block. In addition, the east side of Averill Parkway already exceeds 400 feet to the north. The applicant is proposing to extend Averill Parkway to the south an additional 350-400 feet before the next proposed intersection. Staff finds the submitted proposal does not meet Section 17.100.120(B).

PEDESTRIAN AND BICYCLE IMPROVEMENTS – Chapters 17.84 and 17.100

45. Section 17.84.20(A)(1) requires that all improvements shall be installed concurrently with development or be financially guaranteed. **All lots in the proposed subdivision will be required to install public and franchise utility improvements or financially guarantee these improvements prior to final plat approval.**
46. Section 17.84.30(A)(1) requires that all proposed sidewalks on the local streets will be five feet wide as required by the development code and separated from curbs by a tree planting area that is a minimum of five feet in width.
47. **If the application is approved, six-foot sidewalks shall be constructed along Bornstedt Road as required by Section 17.84.30(A)(2). These frontages shall include 5-foot wide planter strips.**
48. In relation to Section 17.84.30, no pedestrian facilities other than sidewalks have been identified or proposed in the subdivision; however, the proposal does include the required 6 foot wide bike lane identified as project B3 in the TSP. As required by Section 17.84.30(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. As proposed, there is not a direct way for residents of the western lots (lots 1-13) to reach Cascadia Park nor is there a direct way for residents of the eastern lots (lots 14-42) to reach Bornstedt Park. Subsection 17.84.30(B)(2) goes on to elaborate that right-of-way connecting cul-de-sacs passing through unusually long or oddly shaped blocks shall be a minimum of 15 feet wide with eight (8) feet of pavement. The applicant proposes a cul-de-sac but does not propose a pedestrian connection to streets beyond the cul-de-sac as required by Section 17.84.30. The proposal also fails to include a bicycle/pedestrian accessway on the east side of Averill Parkway, which exceeds 600 feet in block length. Therefore, this proposal does not meet the requirements of Section 17.84.30.

PARKING, LOADING, AND ACCESS REQUIREMENTS – Chapter 17.98

49. Section 17.98.10(M) requires that the developer provide a Residential Parking Analysis Plan. This plan identifying the location of parking for the 42 SFR zoned lots is included in Exhibit C, Sheet C10.
50. Section 17.98.20(A) requires that each single-family dwelling unit or duplex is required to provide at least two off-street parking spaces. **Compliance with this requirement will be evaluated during building plan review.**
51. Section 17.98.80(A) requires access from a lower functional order street. If the application is approved, the following conditions shall apply. Per the Public Works Director (Exhibit X), **Vehicle Non-Access Reserve (VNAR) strips shall be depicted on the plat for the Bornstedt Road frontage of Lots 1 through 4 and Lot 13 to comply with Section 17.98.80(A). A VNAR strip shall also be depicted on the plat for the Maple Street frontage of Lots 1 and 13 and the south end of Averill Parkway, south and north ends of Street A, and east end of Street C.**
52. Section 17.98.100 has specifications for driveways. The minimum driveway width for a single-family dwelling is 10 feet and the maximum width is 24 feet wide for a residential driveway approach. Additionally, all driveways shall meet vertical clearance, slope, and vision clearance requirements. Per the Public Works Director (Exhibit Q), **the location, number, and width of all driveway approaches shall not exceed the spacing and dimensional standards in Section 17.98.100.** Staff did not evaluate the driveways on the cul-de-sac as the applicant has not provided sufficient evidence to justify a cul-de-sac. **However, if a cul-de-sac is approved, it shall meet the requirements of Section 17.98.100(G).**
53. Section 17.98.130 requires that all parking and vehicular maneuvering areas shall be paved with asphalt or concrete. As required by Section 17.98.130, **all parking, driveway, and maneuvering areas shall be constructed of asphalt, concrete, or other approved material.**
54. Section 17.98.200 contains requirements for providing on-street parking spaces for new residential development. Per 17.98.200, one on-street parking space at least 22 feet in length has been identified within 300 feet of each of the 42 lots zoned as SFR as required. Exhibit C, Sheet C10 shows that 48 on-street parking spaces have been identified in compliance with this standard. No parking courts are proposed by the applicant.

NOTE: The locations of the lots on the subject site do not account for the additional land required to be dedicated for Maple Street to connect to Street B or additional north-south streets. Therefore, the distances and locations of on-street parking spaces is based on unreliable assumptions.

UTILITIES – Chapters 17.84 and 17.100

55. Section 17.84.60 outlines the requirements of public facility extensions. The applicant submitted a Street and Utility Plan (Exhibit C, Sheet C8) which shows the location of proposed public water, sanitary sewer, and stormwater drainage facilities. **Broadband fiber service shall be detailed with construction plans.**
56. Franchise utilities will be provided to all lots within the proposed subdivision as required in Section 17.84.80. The location of these utilities will be identified on construction plans and installed or guaranteed prior to final plat approval. The applicant does not anticipate extending franchise utilities beyond the site. All franchise utilities other than streetlights shall be installed underground. The developer will make all necessary arrangements with franchise utility providers. **The developer shall install underground conduit for street lighting.**
57. Section 17.84.90 outlines requirements for land for public purposes. The application includes dedication of right-of-way and land for a stormwater detention pond. The proposal does not include land dedicated for an east-west connection or additional north-south streets. Eight-foot-wide public utility easements will be required along all lots adjacent to street rights-of-way for future franchise utility installations. **All easements and dedications shall be identified on the final plat.**
58. As required by Section 17.100.130, eight-foot-wide public utility easements (PUE) are required along all property lines abutting a public right-of-way.
59. Chapter 15.30 contains the City of Sandy’s Dark Sky Ordinance. A lighting plan will be coordinated with PGE and the City as part of the construction plan process and prior to installation of any fixtures as required by Section 17.100.210. The applicant will need to install street lights along all street frontages wherever street lighting is determined necessary. **The locations of these fixtures shall be reviewed in detail with construction plans. Full cut-off lighting shall be required. Lights shall not exceed 4,125 Kelvins or 591 nanometers to minimize negative impacts on wildlife and human health.**
60. Section 17.84.100 outlines the requirements for mail delivery facilities. **The location and type of mail delivery facilities shall be coordinated with the City Engineer and the Post Office as part of the construction plan process.**
61. The Fire Marshal (Exhibit M) reviewed the proposal and provided general comments as well as comments related to fire apparatus access and firefighting water supplies. **Construction documents detailing compliance with fire apparatus access and fire protection water supply requirements shall be provided to Sandy Fire District for review and approval upon building permit submittal. Approved fire apparatus access roadways and an approved water supply for fire protection, either temporary or permanent, shall be installed and operational prior to any combustible construction or storage of combustible materials on site in accordance with OFC Chapter 33. Buildings shall be provided with approved address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property, including monument signs. The address shall be plainly legible and visible**

from the road fronting the property and the same shall be on the dwelling plainly legible and visible when approaching. These numbers shall contrast with their background. Each new fire hydrant installed shall be ordered in an OSHA safety red finish and have a 4-inch non-threaded metal faced hydrant connection with cap installed on the steamer port. The applicant shall adhere to all other requirements of the Sandy Fire District. In a follow-up email (Exhibit R) the Fire Marshal states that if two or more of the 29 eastern lots converted to duplexes then a second means of access to the new development would be required per Appendix D, Section D107.1 of the Fire Code. **If two or more of the 29 eastern lots are converted to duplexes, the applicant shall be required to install a second means of access to the development.** As discussed thoroughly in this document, an east-west street is required for the proposed subdivision to meet the Development Code. This would provide a second fire access as well. **In the event the subdivision is approved as proposed with no secondary fire access, Lots 14-42 shall be protected with an approved automatic fire sprinkler system.**

62. Per the Public Works Director (Exhibit Q), **the applicant shall install all water lines and fire hydrants in compliance with the applicable standards in Section 17.100.230, which lists requirements for water facilities.**
63. The applicant intends to install sanitary sewer lines in compliance with applicable standards in Section 17.100.240. The sanitary sewer plans will be reviewed by the City Engineer and Public Works Director. **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.** The Public Works Director (Exhibit Q) notes that the applicant is proposing at least 18 separate, private pressure mains in the public utility easement adjacent to Street B to serve Lots 16 to 223 and Lots 24 to 33. It is unclear whether the private pressure sewers as proposed will comply with the Oregon Plumbing Specialty Code or Oregon Department of Environmental Quality requirements. The City would not accept private force mains for ownership or maintenance. Grouping as many as nine (9) private force mains into a single PUE with other utilities (power, telecom, gas, fiber, CATV, etc.) is extremely unsafe. If there is a leak on any line or lines there will be no way to identify which line(s) is/are leaking from the surface. There is no method proposed for maintenance or repair of these lines. While as many as nine of the property owners may debate whose line is leaking and who is responsible for repairing a leaking line untreated sewage could continue to pool under the ground and on the surface until the responsible party is identified and the pipe repaired. The applicant could construct a gravity sewer line connecting to the existing public sewer line in Jerger Street to serve lots 16 – 33. There are existing 10-foot wide public utility easements between the lots on the south side of Jerger Street adjacent to Street B that could be used to access the public sewer line in Jerger Street. Plans for public and private sewer collection and conveyance facilities shall be submitted to the Oregon Department of Environmental Quality for review and approval per ORS Chapters 454, 468 and 486B and OAR 340-052 and in particular OAR 340-052-0040(2). **Accordingly, if the Planning Commission approves the application, the applicant is required to construct gravity sewers draining to the public sewer line in Jerger Street to serve lots 16 to 33.**

64. Section 17.100.250(A) details requirements for stormwater detention and treatment. A public stormwater quality and detention facility is proposed as Tract A to be located in the northwest section of the proposed development. **All site runoff shall be detained such that post-development runoff does not exceed the predevelopment runoff rate for the 2, 5, 10 and 25 year storm events. Stormwater quality treatment shall be provided for all site drainage per the standards in the City of Portland Stormwater Management Manual (COP SWMM).**
65. Section 17.100.260 states that all subdivisions shall be required to install underground utilities. **The applicant shall install utilities underground with individual service to each lot.**
66. The Bonneville Power Administration (Exhibit P) reviewed the submitted materials and found no impact to their facilities.

PARKLAND DEDICATION – Chapter 17.86

67. Section 17.86.10 contains a clear and objective formula for determining the amount of land required to be dedicated. The formula is acres = proposed units x (persons/unit) x 0.0043. For the 42 lots, assuming single family homes, acres = 42 x 3 x 0.0043 = 0.54 acres. The applicant is proposing to pay a fee-in-lieu of parkland dedication.

NOTE: The number of dwelling units on the subject site does not account for the additional land required to be dedicated for Maple Street to connect to Street B or additional north-south streets. In addition, the Oregon Statewide Wetlands Inventory shows a stream/wetland on the subject property. The applicant did not submit any concurrence from DSL stating that there is no wetland/stream on the property. Therefore, the calculations related to parkland dedication and fee in-lieu of payment are based on unreliable assumptions.

68. Per Section 17.86.40, at the City's discretion only, the City may accept payment of a fee in lieu of land dedication. 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. The Parks and Trails Advisory Board (Board) met on August 11, 2021. In a memo dated September 20, 2021 (Exhibit N), the Board recommended a fee-in-lieu of parkland dedication given the size of the development, and its proximity to both Bornstedt Park and Cascadia Park.

69. The parks dedication requirement, and therefore any fee in-lieu payment under Section 17.86.40, is based on the impact from the number of people anticipated to live in the units in the subdivision, and a duplex includes two dwelling units, each of which can be occupied by a family (or a number of unrelated persons). Accordingly, each unit of a duplex is treated the same as a separate single-family dwelling for purposes of calculating the amount of land dedicated under Section 17.86.10 or a fee in-lieu payment under Section 17.86.40. However, pursuant to state law (ORS 197.758), each lot is allowed to be developed with a duplex. Thus, to ensure compliance with the standard, **the applicant shall pay a fee-in-lieu of parkland dedication in the amount of \$130,140 (0.54 multiplied by \$241,000) to the City prior to final plat approval, or \$143,100 (0.54 multiplied by \$265,000) if half is deferred to building permit issuance. If the applicant chooses to defer payment, the applicant shall pay \$71,550 prior to recording of final plat and the additional \$71,550 divided by the 42 lots, or \$1,703.57 with each building permit. Additionally, if any lot includes a duplex or is converted to a duplex in the future, the applicant or future property owner shall pay an additional \$3,098.57 (0.54 multiplied by \$241,000 divided by 42) with the building permit for that lot or duplex addition. With this condition, the City finds the application complies with Section 17.86.10.**

URBAN FORESTRY – 17.102

70. Section 17.102.20 contains information on the applicability of Urban Forestry regulations. An Arborist Report prepared by Todd Prager of Teragan & Associates and dated April 29, 2021 is included as Exhibit F. The arborist inventoried all trees 11 inches and greater diameter at breast height (DBH) as required in Section 17.102.50. The inventory of trees proposed to be retained is included in Exhibit C, Sheets C4-C6 and the Tree Retention and Protection Plan is shown in Exhibit C, Sheet C7. The following findings address the tree retention standards and include conditions in the event that the application is approved.
71. The property contains 12.74 acres requiring retention of 38 healthy trees, 11 inches DBH or greater, and likely to grow to maturity ($12.74 \times 3 = 38.22$). The arborist report states that a total of 38 trees are proposed to be retained and 709 trees are proposed to be removed. All 38 of the trees proposed to be retained were evaluated by the project arborist to be in good condition, over 11-inch DBH, and not considered nuisance species. However, the arborist report states that the tree assessment/inventory was completed in July 2020, which was before the wind storms in the fall of 2020 and the ice storm in the winter of 2021, all of which caused significant damage to trees in Sandy. In addition, some of the trees proposed for retention may be located in the future right-of-way needed for Maple Street to extend east and to connect to B Street, or in the future right-of-way of one or more additional north-south streets needed to meet the block length standard. **In order to assess whether the 38 trees proposed for retention are still healthy and in good condition, the applicant shall submit an updated arborist evaluation for the 38 retention trees confirming that they did not suffer any damage during the multiple storms since the original assessment. The applicant shall be required to pay a \$1,500 third-party review fee to have the arborist report/inventory/tree retention plan peer reviewed. The updated arborist report and tree retention plan shall be based on an updated site plan that details the required east-west and north-south street connections.**
72. Five (5) trees proposed for retention are deciduous (bigleaf maples) and the remaining 33 are conifer species (30 Douglas firs, two (2) western hemlocks, and one (1) grand fir). The trees range in size from 11 inches DBH to 50 inches DBH, with one bigleaf maple (Tree #95) specified at 8-, 7-, and 5-inches DBH with multiple leaders at ground level. All trees were in good condition as identified by the project arborist; however, as previously stated, the assessment was done in July 2020, prior to the storms. The applicant is proposing to retain all 38 trees on private, developable lots. Staff has concerns about all of the retention trees being located on developable lots. Based on previous subdivision developments, staff has seen that a number of the trees retained on private lots are either illegally removed once the new homeowner moves in, or the new homeowner applies for a permit to remove the tree expressing concerns about the tree being a hazard tree due to its location in their rear yard and proximity to their house. Rather than create a potential future conflict between tree retention and private homeowners, **staff recommends that a majority of the retention trees be located in a separate private tree retention tract.** This could easily be done for the cluster of trees on Lots 4 and 5 as both those lots are well beyond the minimum lot size required in the SFR zone. Staff also has concerns about whether Trees #351, 353, and 354 will be able to be adequately protected due to the fact that a large portion of their critical root zones are located on the adjacent properties to the north. **After the updated**

inventory/retention plan is completed, if the applicant still proposes counting Trees #351, 353, and 354 towards the minimum retention tree standard, the project arborist shall submit information regarding the percentage of the critical root zone (at 1 foot per 1 inch DBH) that is located on the adjacent properties to the north and whether any portion of the minimum root protection zone (at 0.5 feet per 1 inch DBH) is located on the adjacent properties to the north.

73. The Arborist Report (Exhibit F) provides recommendations for protection of retained trees including identification of the recommended tree protection zone for these trees. The requirements of 17.102.50(B) shall be complied with prior to any grading or tree removal on the site. **The applicant shall install tree protection fencing at the critical root zone of 1 foot per 1-inch DBH to protect the 38 retention trees on the subject property as detailed on Attachment 2 as well as all trees on adjacent properties. The tree fencing shall be installed prior to any development activity on the site, including clearing, tree removal, and erosion control measures, in order to protect the trees and the soil around the trees from disturbance. The applicant shall not relocate or remove the fencing prior to certificates of occupancy. The tree protection fencing shall be 6-foot-tall chain link or no-jump horse fencing supported with metal posts placed no farther than 10 feet apart installed flush with the initial undisturbed grade. The applicant shall affix a laminated sign (minimum 8.5 inches by 11 inches, placed every 75 feet or less) to the tree protection fencing with the following information as recommended by the project arborist: TREE PROTECTION ZONE, DO NOT REMOVE OR ADJUST THE APPROVED LOCATION OF THIS TREE PROTECTION FENCING, Please contact the project arborist if alterations to the approved location of the tree protection fencing are necessary. Todd Prager, Project Arborist – 971-295-4835. No construction activity shall occur within the tree protection zone, including, but not limited to, grading, clearing, excavation, access, stockpiling, or 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 with City staff and the project arborist prior to any tree removal, grading, or other construction activity on the site. Up to 25 percent of the area between the minimum root protection zone of 0.5 feet per 1-inch DBH and the critical root zone of 1 foot per 1-inch DBH may be able to be impacted without compromising the tree, provided the work is monitored by a qualified arborist. The applicant shall retain an arborist on site to monitor any construction activity within the critical root protection zones of the retention trees or trees on adjacent properties that have critical root protection zones that would be impacted by development activity on the subject property.**
74. The Tree Retention and Protection Plan (Exhibit C, Sheet C7) details several trees being removed from within the critical root zones of trees proposed for retention. These include Trees #99, 100, 105, 110, 11, 115, 116, 117, 118, 119, 213, 215, 218, 219, 345, 347, 361, 364, 365, 368, 369, 370, 372, 373, 378, and 380. **Staff recommends Trees #99, 100, 105, 110, 11, 115, 116, 117, 118, 119, 213, 215, 218, 219, 345, 347, 361, 364, 365, 368, 369, 370, 372, 373, 378, and 380 be left as snags rather than completely removed in order to minimize negative impacts to the remaining retention trees. If the applicant does not retain Trees #99, 100, 105, 110, 11, 115, 116, 117, 118, 119, 213, 215, 218, 219, 345, 347,**

361, 364, 365, 368, 369, 370, 372, 373, 378, and 380 as snags, those trees shall be removed in a way that does not harm or damage adjacent trees. Tree removal and/or snag creation shall be completed without the use of vehicles, or heavy equipment in the tree protection zone. Trunks and branches of adjacent trees shall not be contacted during tree removal or snag creation. If Trees #99, 100, 105, 110, 11, 115, 116, 117, 118, 119, 213, 215, 218, 219, 345, 347, 361, 364, 365, 368, 369, 370, 372, 373, 378, and 380 are removed, their removal shall be completed under the supervision of the project arborist and the applicant shall fell the trees to be removed away from the trees to be retained so they do not contact or otherwise damage the trunks or branches of the trees to be retained. The applicant shall submit a post-construction report prepared by the project arborist or other TRAQ qualified arborist to assess whether any of the retention trees were damaged during construction. If retention trees were damaged and need to be replaced, the mitigation ratio shall be 4:1.

75. The Arborist Report (Exhibit F) from Teragan and Associates, Inc. includes recommendations for additional protection measures related to tree removal as well as tree protection recommendations for the trees to be retained. **The applicant shall adhere to all recommendations contained in the arborist report including, but not limited to, the following:**

- Fell the trees to be removed away from the trees to be retained so they do not contact or otherwise damage the trunks or branches of the trees to be retained. No vehicles or heavy equipment shall be permitted within the tree protection zones during tree removal operations.
- The stumps of the trees to be removed from within the tree protection zones shall either be retained in place or stump ground to protect the root systems of the trees to be retained.
- Care will need to be taken to not contact or otherwise damage the crowns of the trees that may extend into the construction area.
- It will be important to reassess and monitor the trees along the newly exposed tree grove edges following site clearing and periodically during construction and after high wind events to ensure they do not pose a high risk. This monitoring should occur for the next two to three storm seasons following site clearing.
- Shift sediment fencing to outside the tree protection zones. If erosion control is required inside the tree protection zones, use straw wattles to minimize root zone disturbance of the trees to be retained.
- Notify all contractors of tree protection procedures. For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection. Hold a tree protection meeting with all contractors to explain the goals of tree protection. Have all contractors sign memoranda of understanding regarding the goals of tree protection. The memoranda should include a penalty for violating the tree protection plan. The penalty should equal the resulting fines issued by the local jurisdiction plus the appraised value of the tree(s) within the violated tree protection zone per the current Trunk Formula Method as outline in the current edition of the Guide for Plant Appraisal

by the Council of Tree & Landscape Appraisers. The penalty should be paid to the owner of the property.

- The project arborist should be notified prior to the cutting of woody roots from trees that are to be retained to evaluate and oversee the proper cutting of roots with sharp cutting tools. Cut roots should be immediately covered with soil or mulch to prevent them from drying out. Trees that have roots cut should be provided supplemental water during the summer months.
- Any necessary passage of utilities through the tree protection zones should be by means of tunneling under woody roots by hand digging or boring with oversight by the project arborist.
- After Construction, carefully landscape the areas within the tree protection zones. Do not allow trenching for irrigation or other utilities within the tree protection zones. Carefully plant new plants within the tree protection zones. Avoid cutting the woody roots of trees that are retained. Do not install permanent irrigation within the tree protection zones unless it is drip irrigation to support a specific planting or the irrigation is approved by the project arborist. Provide adequate drainage within the tree protection zones and do not alter soil hydrology significantly from existing conditions for the trees to be retained. Provide for the ongoing inspection and treatment of insect and disease populations that are capable of damaging the retained trees and plants. The retained trees may need to be fertilized if recommended by the project arborist. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

76. To ensure protection of the required retention trees, the applicant shall record a tree protection covenant specifying protection of trees on the subject property and limiting removal without submittal of an Arborist's Report and City approval. The covenant shall detail the species and locations of the retention trees as well as the critical root zones of each tree at 1 foot per 1 inch DBH.

LANDSCAPING AND SCREENING – Chapter 17.92

77. Section 17.92.10 contains general provisions for landscaping. As required by Section 17.92.10 (C), trees over 25-inches circumference measured at a height of 4.5 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 4.5 feet above grade has roughly an eight-inch diameter at breast height (DBH). Based on the Planning Commission interpretation from May 15, 2019, Subsection 17.92.10(C) does not apply to residential subdivisions. Tree protection fencing and tree retention is discussed in more detail in the Urban Forestry, Chapter 17.102 section of this document. **Per Section 17.92.10(L), all landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing.**
78. Section 17.92.30 states that planting of trees is required for all parking lots with four or more parking spaces, public street frontages, and along private drives more than 150 feet long. The applicant submitted an On-Street Parking Plan (Exhibit C, Sheet C10) that details street trees. The applicant's proposal includes three (3) private drives, one of which is more than 150 feet long (Tract B). The On-Street Parking Plan does not detail trees along Tract B; therefore, the proposal does not meet the requirements of Section 17.92.30. However, as discussed in detail in Section 17.100.150(A) of this document, the applicant also did not submit sufficient evidence to justify the use of private drives. In addition, the proposed lots that gain access from the private drives do not meet the minimum frontage requirements of Section 17.34.30(C). Therefore, Tracts B, C, and D do not meet the code and staff does not support the proposal for private drives. However, **if the application is approved as submitted, street trees shall be planted approximately 30 feet on center in a minimum 5 foot wide planter strip on any private drives more than 150 feet per Sections 17.92.30 and 17.92.10(D).**
79. Section 17.92.30 specifies that street trees shall be chosen from the City-approved list. As required by Section 17.92.30, the development of the subdivision requires medium trees spaced 30 feet on center along all street frontages. Planter strips will be provided along all frontages as required in Section 17.100.290. The submitted On-Street Parking Plan (Exhibit C, Sheet C10) includes a note that states street trees will be planted 30 feet on center. The note also states that species will be determined by City staff at the time of planting. If the Planning Commission approves the application, **the applicant shall submit proposed tree species to City staff for review and approval concurrent with construction plan review. Due to concerns with Asian Longhorn Beetle and Emerald Ash Borer as well as an interest in increasing species diversity, staff are not approving maples or ashes as street trees at this time. To improve species diversity, the applicant shall include at least four (4) different tree genera, with at least two (2) different genera per block face.**

The applicant is proposing to mass grade the buildable portion of the site. This will remove topsoil and will heavily compact the existing soil. To maximize the success of the required street trees, **the applicant shall aerate and amend the soil within the planter strip 15 feet in both directions from where the tree will be planted (or as is feasible based on locations of driveways or street corners) to a depth of 3 feet prior to planting street trees if the application is approved. The applicant shall either amend and aerate the**

planter strip soil at the subdivision stage and install fencing around the planter strips to protect the soil from compaction or shall aerate and amend the soil at the individual home construction phase. The applicant shall submit a letter from the project landscaper confirming that the soil in the planter strips has been aerated and amended prior to planting the trees.

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.

80. 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 (2) years from the date of completion, and shall replace any dead or dying plants during that period.**
81. Section 17.92.50 specifies the types and sizes of plant materials that are required when planting new landscaping. Street trees are typically required to be a minimum caliper of 1.5-inches measured 6 inches from grade. If the application is approved, **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. 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 loosely tied twine or other soft material and shall be removed after one growing season (or a maximum of 1 year).**
82. Section 17.92.60 requires revegetation in all areas that are not landscaped or remain as natural areas. 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. **Exposed soils shall be covered by mulch, sheeting, temporary seeding or other suitable material following grading or construction to maintain erosion control for a period of two (2) years following the date of recording of the final plat associated with those improvements.**

Section 17.92.130 contains standards for a performance bond. 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 planting trees and landscaping during the dry summer months. Consistent with the warranty period in Section 17.92.140, staff recommends a two-year maintenance and warranty period for street trees based on the standard establishment period of a tree. **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 planting within 6 months. The cost of the street trees 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.**

FLOOD AND SLOPE HAZARD (FSH) OVERLAY – Chapter 17.60

83. The subject property was outside City limits when the most recent Flood and Slope Hazard (FSH) mapping was completed and, thus, is not included on the City’s FSH Overlay map. The property was annexed into City limits in 2019 by Ordinance 2019-16, which included the following conditions of annexation approval:

- Prior to the future development of the subject property the standards and criteria of the Flood & Slope Hazard (FSH) Overlay District (Chapter 17.60) shall be applied to the subject property.
- Prior to the future development of the subject property the Flood & Slope Hazard (FSH) Overlay District map shall be updated to include the subject property.

84. The applicant submitted a Stream and Wetland Presence Determination (Exhibit G) prepared by Jason Smith of Castle Rose dated September 30, 2020. The Stream and Wetland Presence Determination concluded the following: “The mapped stream and associated wetland do not exist. No areas with field indicators for wetland hydrology or wetland vegetation were observed. These findings and conclusions are subject to concurrence.” Staff was unable to find any information about Jason Smith or Castle Rose and was not able to confirm their qualifications. The applicant did not submit a \$1,500 third-party review fee to have the Stream and Wetland Presence Determination peer reviewed, nor did the applicant submit concurrence from the Oregon Department of State Lands (DSL). The Oregon Statewide Wetlands Inventory (SWI) identifies both an intermittent stream and a freshwater forested/shrub wetland on the subject property. In addition, page 4 of the Geotechnical Report (Exhibit H) states that the central portion of the site contains an existing seasonal drainage basin and/or tributary to Tickle Creek, indicating that the Geotechnical exploration identified an existing waterway on the subject property. Staff does not have sufficient information regarding streams or wetlands on the site and, therefore, cannot make any determinations about restricted development areas much less proposed development activity (e.g., tree removal, buildings, etc.) within the potential restricted development area. Staff finds that the applicant submitted insufficient evidence related to stream and wetland delineation, did not submit the required third-party review fee, and the conditions of annexation included in Ordinance 2019-16 have not been met. **If the proposal is approved, the applicant shall submit a \$1,500 third party review fee to have the Stream and Wetland Presence Determination peer reviewed and shall submit concurrence from the Oregon Department of State Lands (DSL).**

HILLSIDE DEVELOPMENT AND EROSION CONTROL – Chapters 17.56, 15.44, 8.04, and 17.74

85. The applicant submitted a Geotechnical Report prepared by Redmond Geotechnical Services entitled "Geotechnical Investigation and Consultation Services, Proposed The Bornstedt Views Development Site, Tax Lot No. 100, SE Bornstedt Road and SE Averill Parkway, Sandy (Clackamas County), Oregon" and dated May 3, 2021 (Exhibit H). In addition, the applicant submitted a Topographic Survey (Exhibit C, Sheet C3) that details slopes between 25 and 34.99 percent and slopes 35 percent and greater. The applicant did not submit a third-party review fee to have the Geotechnical Report reviewed by a third-party professional as required by Section 17.56.50(B.2); therefore, staff was unable to have the Geotechnical Report peer reviewed. **If the proposal is approved, the applicant shall submit a \$1,500 third-party review fee so that the Geotechnical Report can be peer reviewed.**
86. Grass seeding shall be completed as required by Section 17.100.300. The submitted preliminary Grading and Erosion Control Plan (Exhibit C, Sheet C9) provides additional details to address erosion control concerns. A separate Grading and Erosion Control Permit will be required prior to any site grading. Erosion control requirements are defined in greater detail in Chapter 15.44 of this document. 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.**
87. **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.**
88. Recent development has sparked unintended rodent issues in surrounding neighborhoods. Prior to development of the site, **the applicant shall have a licensed pest control agent evaluate the site to determine if pest eradication is needed. The result of the evaluation shall be submitted to staff.**
89. Section 17.74.40 specifies, among other things, retaining wall and fence height in front, side, and rear yards. Retaining walls on property in residential zones shall not exceed 4 feet in height in the front yard, 8 feet in height in rear and side yards abutting other lots, and 6 feet in height in side and rear yards abutting a street. The submitted plan set (Exhibit C) does not detail any retaining walls; however, the Geotechnical Report (Exhibit H) includes references to retaining walls. **If retaining walls are proposed, the applicant shall submit additional details on the proposed retaining walls, including height, material, and information on the architectural finish, for staff review and approval.**

RECOMMENDATION

Staff recommends the Planning Commission **deny** the subdivision request primarily due to the following issues:

- 1) The subdivision proposal does not meet subdivision Criteria 17.100.60 (E)(1), (2), (3), (4), (5), and (6).
- 2) The subdivision proposal does not meet all of the conditions of annexation as required by Ordinance 2019-16. Prior to development of the subject property, the following are required:
 - a. The standards and criteria of the Flood & Slope Hazard (FSH) Overlay District (Chapter 17.60) shall be applied to the subject property.
 - b. The Flood & Slope Hazard (FSH) Overlay District map shall be updated to include the subject property.
 - c. The development shall be limited to no more than 388 average daily trips.
- 3) The submitted TIS does not provide sufficient evidence that the applicant can meet the standards of Sections 17.100.60(E.4) or 17.84.50(B.4) based on outright permitted uses on the proposed lots.
- 4) The applicant proposes a cul-de-sac but does not propose a pedestrian connection to streets beyond the cul-de-sac as required by Section 17.84.30.
- 5) The applicant proposes the east side of Street A to exceed 400 feet, which is not in compliance with Section 17.100.120(B).
- 6) The applicant does not propose a bicycle and pedestrian accessway along the east side of Averill Parkway as required by Section 17.100.120(D).
- 7) The applicant proposes a cul-de-sac that exceeds 400 feet and failed to submit evidence detailing the necessity of the cul-de-sac, which is not in compliance with Section 17.100.110(F).
- 8) The tentative plat is not accurate and does not contain the existing and proposed right-of-way and, therefore, does not meet the submittal criteria in Section 17.100.60(D.5). As proposed, it appears the applicant is proposing to plat lots in the existing Bornstedt Road right-of-way.
- 9) The applicant does not propose a logical and connected street pattern as required by Sections 17.100.100(D, E, and F).
 - a. The applicant does not propose to extend an east-west street through the subject property.
 - b. The applicant does not propose sufficient north-south streets.
- 10) The applicant did not submit the required \$1,500 third-party review fee to have four (4) reports/studies peer reviewed by a qualified professional; therefore, staff was unable to adequately review the following submittal items: Traffic Impact Study, Stream and Wetland Presence Determination, Geotechnical Investigation and Consultation Services, Arborist Report.

If the Planning Commission approves the application, staff recommends including the conditions of approval described in this report.



General Land Use Application

EXHIBIT A

1 page

Name of Project:	Bornstedt Views Subdivision
Location or Address:	19618 SE Bornstedt Road

Map & Tax Lot #	T: 2S	R: 4E	Section: 24C	Tax Lot (s): 100
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Request: 42 Lot Type II Subdivision and Type II Tree Removal.

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 (if different than owner) Mac Even (Even Better Homes, Inc.)	Owner William Bloom
Address P.O. Box 2021	Address
City/State/Zip Gresham, OR 97030	City/State/Zip
Email mac@evenbetterhomes.com	Email
Phone 503-348-5602	Phone
Signature Erich Even 3F4F7787E2234D5	Signature William Bloom E8817BBB719E4EC
DocuSigned by: 4/29/2021 11:40 AM PD	DocuSigned by: 4/29/2021 11:40 AM PD

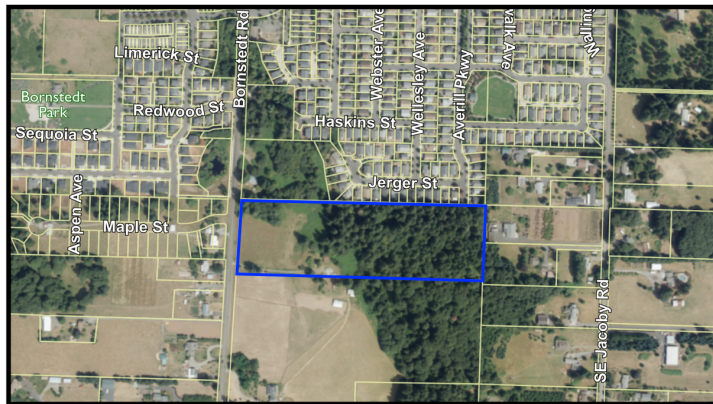
File #: 21-021	Date: 5.6.21	Fee\$:	Planner:
Type of review: Type I <input type="checkbox"/> Type II <input type="checkbox"/> Type III <input type="checkbox"/> Type IV <input type="checkbox"/>			
Has applicant attended a pre-app? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, date of pre-app meeting:			

Development Services Department, 39250 Pioneer Blvd, Sandy, OR 97055, 503.489.2160

EXHIBIT B

Project Narrative For

**The Bornstedt Views Subdivision
19618 SE Bornstedt Road
Sandy, Oregon 97055**



**Prepared by Tracy Brown Planning Consultants, LLC
May 2021**

Project Details

Project Location: East side of Bornstedt Road at 19618 SE Bornstedt Rd.
Legal Description: Map 24E 24C, Tax Lot 100
Zoning District SFR, Single Family Residential
Site Size: 12.739 acres

Applicant

Mac Even
Even Better Homes, Inc.
P.O. Box 2021
Gresham, OR. 97030
Phone: 503-348-5602
Email: mac@evenbetterhomes.com

Representative:

Civil Engineer / Surveyor
Ray Moore, P.E., P.L.S.
All County Surveyors & Planners, Inc.
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
Email: tbrownplan@gmail.com

Geotechnical Engineer

Daniel M. Redmond, P.E., G.E.
Redmond Geotechnical Services, LLC
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Portland, Oregon 97294
Phone: 503-285-0598
Fax: 503-286-7176
Cell: 503-545-9055

Email: RedmondGeotechnicalServices@gmail.com

Environmental Consultant

Jason Smith
Environmental Consulting
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Email: jason@castle-rose.net

Arborist

Todd Praeger
Teragan & Associates
3145 Westview Circle
Lake Oswego, OR. 97034
Phone: 971-295-4835
Email: todd@teragan.com

I. Introduction

The proposed “The Bornstedt Views” subdivision is part of the planned progression of land use planning for this area of Sandy and involves the creation of “Needed Housing” under ORS 197.303(1) and 197.307(4) on land zoned for residential uses within the city limits of Sandy. The applicant is submitting this application requesting land use approval to construct a Type II residential subdivision on the site to include the following:

- 42 lots
- On-street parking
- Installation of public and franchise utilities
- Tree removal and retention
- Fee-in-lieu payment for parkland dedication

II. General Project Description

The project site consists of a single parcel located at Township 2 South, Range 4 East, Section 24C, tax lot 100. The property contains 12.739 acres and a barn and well house located on the site will be removed. The property previously contained a single-family residence that was demolished by a Fire Department practice burn in 2018.

The property is zoned SFR, Single Family Residential and the applicant proposes constructing dwelling types permitted outright in this zone. The parcel fronts Bornstedt Road along its western property line and Averill Parkway on the north. The property is divided into two parts with a moderate to steep sloping area running north-south through the center of the site. The western portion of the site contains steeper grades sloping downward to the east. This area is proposed to include 13 lots (Lots 1 - 13) accessed by a street system off Bornstedt Road. The eastern portion of the property slopes gradually down to the west and is proposed to include 29 lots (Lots 14 - 42) accessed by an extension of Averill Parkway to the north.

A pre-application conference was held with the City to review the project on February 26, 2020. The applicant originally submitted the project as a Planned Development for the pre-application but has been changed to a standard residential subdivision with the current application. Based on input received at this meeting modifications were made to the project layout.

II. Application Approval Requests

The applicant requests the following approvals with this application:

- Type II Subdivision;
- Type II Tree Removal

III. Items Submitted With This Application

Land Use Application

- Notification List and Mailing Labels
- Exhibit A - Project Narrative
- Exhibit B - Storm Drainage Report
- Exhibit C - Arborist Report (4/29/21)
- Exhibit D - Stream and Wetland Determination (9/30/21)
- Exhibit E - Geotechnical Report (5/3/21)
- Exhibit F - Civil Plans (8.5"x 11" and under separate cover)
 - Sheet C1 - Cover Sheet and Future Street Plan
 - Sheet C2 - Tentative Plan Map
 - Sheet C3 - Topographic Survey
 - Sheet C4 - Tree Inventory List 1
 - Sheet C5 - Tree Inventory List 2
 - Sheet C6 - Tree Inventory List 3
 - Sheet C7 - Tree Retention and Protection Plan
 - Sheet C8 - Street and Utility Plan
 - Sheet C9 - Grading and Erosion Control Plan
 - Sheet C10 - On-Street Parking Plan

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>
17.18 -	Processing Applications
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 17.18 - PROCESSING APPLICATIONS

17.18.00 PROCEDURES FOR PROCESSING LAND USE APPLICATIONS

An application shall be processed under a Type I, II, III or IV procedure. The differences between the procedures are generally associated with the different nature of the decisions as described in Chapter 17.12.

When an application and proposed development is submitted, the Director shall determine the type of procedure the Code specifies for its processing and the potentially affected agencies.

If a development proposal requires an applicant to file a land use application with the city (e.g. a design review application) and if there is a question as to the appropriate procedure to guide review of the application (e.g. a Type II versus a Type III design review process), the question will be resolved in favor of the lower type number.

Response: *The applicant has submitted a Type II Needed Housing application in compliance with the clear and objective standards contained in the Sandy Development Code.*

17.18.20 PRE-APPLICATION CONFERENCE

A pre-application conference is required for all Type II, III, and IV applications unless the Director determines a conference is not needed.

Response: *A pre-application conference was held with the City to review the project on February 26, 2020. Based on input received at this meeting modifications were made to the project layout.*

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 developing a 42 lot subdivision in a single phase.*

The subject property contains a gross site area of 12.739 acres. After deducting dedicated rights-of-way and a public stormwater tract, the net site area (NSA) is 10.105 acres. The subject property also does not contain any restricted development areas (RDA) as defined by Chapter 17.60

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 NSA x the required minimum density (10.105 acres x 3 = 30.315 units, rounded to 30 units)

The maximum density is determined by multiplying the NSA x the maximum allowed density (10.105 x 5.8 = 58.609, rounded to 59 units).

As a result of these calculations the density range for the subject property is a minimum of 30 units and a maximum of 59 dwelling units. The proposal includes 42 units in conformance with this section.

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 discussed in Chapter 17.30 above, the proposal to develop 42 lots complies with the density range (30 - 59 units) allowed in the SFR zoning district.

17.34.10 - PERMITTED USES

A. Primary Uses Permitted Outright:

Response: The applicant proposes constructing only uses permitted outright in this zone.

17.34.30 - DEVELOPMENT STANDARDS

Response: As shown on the plan set all lots contain at least 7,500 square feet, are at least 60 feet wide, and can provide minimum setbacks required by this section. Required off-street parking is shown on the plan set and is reviewed in more detail 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 development.

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: A well currently exists on the property and an onsite septic system may exist. These systems 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 however, six lots will gain access from three separate private drives connected to a public street.

17.34.50 - ADDITIONAL REQUIREMENTS

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

Response: The Residential Design Standard of Section 17.90.150, are applicable to residential development.

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

Response: All proposed lots contain greater than 40 feet of street frontage except those lots accessed by a private drive and Lot 33 which is a flag lot.

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: No areas are shown on the city's Zoning Map encumbered by the FSH Overlay District. At the pre-application conference the city requested the applicant provide a wetland study to define the location of restricted development area on the site. As requested, the applicant contracted with an environmental consulting company to complete this study. The study included with the application (Exhibit D) concludes that no wetlands or streams are located on the subject property. The result of this study is there are no FSH Overlay or restricted development areas on the site and no further analysis is required.

CHAPTER 17.80 - ADDITIONAL SETBACKS ON COLLECTOR AND ARTERIAL STREETS

17.80.00 - INTENT

The requirement of additional special setbacks for development on arterial or collector is intended to provide better light, air and vision on more heavily traveled streets. The additional setback, on substandard streets, will protect collector and arterial streets and permit the eventual widening of streets.

Response: Bornstedt Road is identified in the City's Transportation System Plan as a minor arterial.

17.80.10 - APPLICABILITY

These regulations apply to all collector and arterial streets as identified in the latest adopted Sandy Transportation System Plan (TSP). The Central Business District (C-1) is exempt from Chapter 17.80 regulations.

Response: Bornstedt Road is identified in the City's Transportation System Plan as a minor arterial.

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: As shown on submitted plans five lots (Lots 1 - 4 and 13) abut Bornstedt Road, a minor arterial. All structures constructed on these lots will be setback at least 20 feet from this street.

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.

17.82.10 - APPLICABILITY

This chapter applies to all residential development located adjacent to a transit street. A transit street is defined as any street designated as a collector or arterial, unless otherwise designated in the Transit System Plan.

Response: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "adjacent", "to a transit street", "unless otherwise designated in the Transit System Plan" as used in this section are subjective words or not properly incorporated into the Development Code. The proposed development is located adjacent to Bornstedt Road, classified as a minor arterial in the City's Transportation System Plan.

17.82.20 - BUILDING ORIENTATION

A. All residential dwellings 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.

Response: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "primary entrances" and "oriented toward" as used in this section are subjective words. The applicant intends to orient these homes towards this street as preferred by the city.

B. Dwellings shall have a primary entrance connecting directly between the street and building interior. A clearly marked, convenient, safe and lighted pedestrian route shall be provided to the entrance, from the transit street. The pedestrian route shall consist of materials such as concrete, asphalt, stone, brick, permeable pavers, or other materials as approved by the Director. The pedestrian path shall be permanently affixed to the ground with gravel subsurface or a comparable subsurface as approved by the Director.

Response: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "primary entrances" and "clearly marked convenient, and safe", and "comparable subsurface as approved" as used in this section are subjective words. As noted in Subsection A above, the applicant is unsure if compliance with this standard will be problematic. The applicant intends to orient these homes towards this street and construct a walkway to the entrance as preferred by the city.

C. Primary dwelling entrances shall be architecturally emphasized and visible from the street and shall include a covered porch at least 5 feet in depth.

Response: All building entrances will be designed in compliance with Residential Design standards contained in this Code.

D. If the site has frontage on more than one transit street, the dwelling shall provide one main entrance oriented to a transit street or to a corner where two transit streets intersect.

Response: This section is not applicable.

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 development will have public and franchise utility improvements installed or financially guarantee 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 project will be constructed in a single phase.

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 sidewalks on the local streets are proposed to be five feet wide separated from the curb by a landscape strip as required.

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: As shown on submitted plans the sidewalk along Bornstedt Road is proposed to be six-feet wide. This standard is met.

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: All sidewalk improvements will be constructed according to city standards.

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 constructing all sidewalk improvements as required by this section. The applicant is open to the city deciding which of these improvements will need to be completed prior to final plat approval. Sidewalks along 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: As shown on submitted plans all bicycle and pedestrian facilities are located along streets. All facilities are intended to be “safe and convenient” to encourage pedestrian use.

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: No off-street pedestrian facilities are proposed or required.

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

Response: There are no high volume pathways in this development.

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: *All sidewalks except along Bornstedt Road will be five feet wide as required.*

- 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 identified in the City's Transportation System Plan are located 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: *All sidewalks will be extended to the edge of the subject property as required.*

- 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 proposal contains 42 lots less than the 50 lot threshold for this section. No transit improvements have been identified.

- 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. Transportation Impact Study (No Dwellings). For development applications that do not propose any dwelling units, the City may require a transportation impact study that evaluates the impact of the proposed development on the transportation system. Unless the City does not require a transportation impact study, the applicant shall prepare the study in accordance with the following:
1. A proposal establishing the scope of the study shall be submitted for review to the City Traffic Engineer. The scope shall reflect the magnitude of the project in accordance with accepted transportation planning and engineering practices. Large projects shall assess intersections and street segments where the development causes increases of more than 20 vehicles in either the AM or PM peak hours. Once the City Traffic Engineer has approved the scope of the study, the applicant shall submit the results of the study as part of its development application. Failure to submit a required study will result in an incomplete application. A traffic impact study shall bear the seal of a

Professional Engineer licensed in the State of Oregon and qualified in traffic or civil engineering.

2. If the study identifies level-of-service conditions less than the minimum standard established in the development code or the Sandy Transportation System Plan, or fails to demonstrate that average daily traffic on existing or proposed streets will meet the ADT standards established in the development code, the applicant shall propose improvements and funding strategies for mitigating identified problems or deficiencies that will be implemented concurrent with the proposed development.

Response: *The proposal includes dwellings and this section is not applicable.*

- B. Transportation Impact Study (Dwellings). For development applications that propose dwelling units, an applicant must submit a transportation impact study unless the application is exempt from this requirement pursuant to subsection (B)(6), below. Failure to submit the study will result in an incomplete application. A traffic impact study shall bear the seal of a Professional Engineer licensed in the State of Oregon and qualified in traffic or civil engineering. The applicant shall prepare the study in accordance with the following:

Response: *A TPR analysis was performed for the subject property when it was annexed in 2019. This analysis indicated development of the property would have no significant effect on the functioning of Highway 211 with development of 43 lots. The proposed 42 lots is less than the maximum allowed without performing a TPR analysis. The proposed development contains only one street, an extension of Maple Street intersecting Bornstedt Road. The location of this street was analyzed as part of the approval of the Marshall Ridge Subdivision approval across Bornstedt Road from the subject property. No further traffic analysis is required.*

1. The study area must include all existing and proposed site accesses and all existing and proposed streets and intersections where the development adds more than 20 vehicles during any peak hour as determined by using the most recent edition of the Institute of Transportation Engineers Trip Generation Manual. The determination of peak hour vehicle addition shall include the cumulative impact of the proposed development and development on abutting properties that received a certificate of occupancy or recorded a plat within the past 5 years.
2. The study must analyze existing conditions and projected conditions upon completion of the proposed development.
3. The study must be performed for the weekday a.m. peak hour (one hour between 7 a.m. and 9 a.m.) and p.m. peak hour (one hour between 4 p.m. and 6 p.m.). Analysis of other time periods may be required for uses that generate their highest traffic volumes at other times of the day or on weekends.
4. The study must demonstrate that the transportation impacts from the proposed development will comply with the City's level-of-service and average

daily traffic standards and the Oregon Department of Transportation's mobility standard.

5. If the study identifies level-of-service conditions less than the minimum standard established in the development code or the Sandy Transportation System Plan, or fails to demonstrate that average daily traffic on existing or proposed streets will meet the ADT standards established in the development code or fails to meet the Oregon Department of Transportation's mobility standard, the applicant shall propose improvements and funding strategies for mitigating identified problems or deficiencies that will be implemented concurrent with the proposed development.

Response: *As discussed in subsection 6 below, a transportation impact study is not required.*

6. A transportation impact study is not required under this section if:
 - a) The cumulative impact of the proposed development and development on abutting properties that received a certificate of occupancy or recorded a plat within the past 5 years will generate no more than 20 vehicle trips in any weekday a.m. or p.m. peak hour as determined by using the most recent edition of the Institute of Transportation Engineers Trip Generation Manual; or
 - b) The proposed development completed a transportation impact study at the time of annexation within the past 5 years and that study assessed the impact of the same or more dwelling units than proposed under the new land use action; or
 - c) The application only proposes to convert an existing detached single family dwelling to a duplex.

Response: *As noted above, a TPR analysis was completed as part of the application to annex the property in 2018/19. This study is still valid per subsection 6b and a new study is not required.*

- C. Transportation Impact Study (Dwellings) - Discretionary Track. As an alternative to the process outlined in Section 17.84.50(B), an applicant may choose to follow the process in Section 17.84.50(A).

Response: *This section is not applicable.*

- D. 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.*

- E. 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: *All streets are proposed to intersect in a “T” configuration as preferred by this section. No long straight street segments are proposed.*

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 proposed cul-de-sac is 396.73 feet long and is proposed to serve 18 lots in compliance with this standard.*

F. 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 or a private drive.*

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: *Only Bornstedt Road will include 1/2 street improvements as required by the City of Sandy and Clackamas County. All other streets will include full street improvements.*

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: *No 3/4 streets are proposed.*

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: *As noted above only Bornstedt abutting the property will be improved with 1/2 street improvements.*

- G. 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: *All streets are proposed to be extended to the edge of the property as required. A temporary fire apparatus turn-around near the end of each north-south street.*

- H. 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: *No public street improvements will be required beyond the site boundaries.*

- I. 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: *Street names will be determined prior to Final Plat approval.*

- J. 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: *No streets are identified in the City's Transportation System Plan that affect the subject property. All abutting streets are existing and a Future Street Plan is including showing how these street can be extended off the property.*

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

Response: *All new streets are local streets. The steepest street is Street B, west of Averill Parkway with a grade of 11 percent. All streets comply with this standard.*

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: *Bornstedt Road abutting the western boundary of the property is existing. This section is not applicable.*

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 local streets comply 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: *The intersection of local streets with another local street and the intersection of Maple Street with Bornstedt Road all intersect at right angles and contain the minimum straight tangent segment as required.*

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: *All streets are designed in accordance with city standards.*

- K. 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 with 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 the edge of adjacent properties.*

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

Response: *All facilities will be public.*

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 development 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 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 and 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: *The applicant anticipates that all utilities will be placed underground.*

- 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 the 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: *The only utility easement other than PUE's is a 15-foot storm drainage easement to route water entering the site from the site through the site to the proposed stormwater facility.*

- 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 will be 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 public dedication for the purposes in this section is anticipated.
- 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 trails are identified in the TSP or other adopted plans on the 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: No additional public dedications have been identified.
- 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: As noted above, the only easement other than PUE is a 15-foot public storm drainage easement. This easement will be shown 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.

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 adopted Parks Master Plan does not show any parks or trails on the subject property.*

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 public 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 42 lots results in the following formula: 42 (proposed s.f. units) x 3 (persons/unit) x 0.0043 (per person park land dedication factor) = 0.5418 rounded to 0.54 acres.*

17.86.20 - MINIMUM PARKLAND STANDARDS

Land required or proposed for parkland dedication shall be contained within a continuous unit and must be suitable for active use as a neighborhood or mini-park, based on the following criteria:

Response: *The applicant does not propose dedicating any parkland with this development.*

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. 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 as determined by the City Council through a resolution, will constitute a lien against the property payable at the time of sale.

Response: The applicant proposes paying a fee in lieu of parkland dedication in accordance with Subsection 2 of this Section.

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: As previously determined by the Planning Commission, the City's tree protection standards in this section do not apply to residential subdivisions. The regulations of Chapter 17.102, Urban Forestry relevant to this proposal are reviewed below. Landscaping is primarily confined to the proposed stormwater facility and street side landscape planters.

17.92.20 - MINIMUM IMPROVEMENTS - LANDSCAPING AND SCREENING

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

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:
- Location and dimension of required parking spaces as specified in Section 17.98.200.
 - Location of areas where parking is not permitted as specified in Sections 17.98.200(A)(3) and (5).
 - Location and design of parking courts (if applicable).

Response: An On-street Parking Plan as required by this section is included in the plan set as Sheet C10. The proposal complies with this section.

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 included 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: The exact width of proposed driveways have not been determined at this time. All lots will comply with this standard.

- B. A driveway for a single-family dwelling shall have a minimum width of 10 feet.

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

- 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 use permitted in this zone in accordance with the requirements of this section.

- 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.

- G. The sum of the width of all driveway approaches within the bulb of a cul-de-sac as measured in section B above shall not exceed fifty percent of the circumference of the cul-de-sac bulb. The cul-de-sac bulb circumference shall be measured at the curb line and shall not include the width of the stem street. The nearest edge of driveway approaches in cul-de-sacs shall not be located within 15 feet of the point of curvature, point of tangency or point of reverse curvature of the curb return on the stem street.

Acronyms on the next page:

PT = point of tangency

PC = point of curvature

PRC = point of reverse curvature

Response: As shown on Sheet C10, the width of the driveway approaches on the proposed cul-de-sac is 49 percent of the circumference of the cul-de-sac bulb in compliance with this section.

- H. The location and design of any driveway approach shall provide for unobstructed sight per the vision clearance requirements in section 17.74.30. 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 requirements of this section will be considered in placing landscaping in these areas with construction of homes. Clear vision areas will be shown on the Site Plan with each building permit.*

- I. Driveways shall taper to match the driveway approach width to prevent stormwater sheet flow from traversing sidewalks.

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. Clear vision triangles in accordance with Section 17.74.30 are shown on Sheet C10 as required.*

- 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: *An On-Street Parking Plan designed in compliance with the requirements of this section is included with the application package as*

Sheet C10. The proposed 42-lots require 42 on-street parking spaces. As shown on this plan, 48 on-street parking spaces at least 22 feet in length has been identified within 300 feet of each lot in compliance with this section. The proposed plan complies with this standard.

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 proposal is for a Type II "Needed Housing" residential subdivision designed in compliance with applicable standards.*

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: *The proposal is a 90 lot 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 February 26, 2020.*

- 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 are 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: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "consistent with" as used in this section are subjective words. As reviewed in this narrative, the proposed subdivision is designed in compliance with the density, setback, and dimensional standards in the SFR zone. This criterion is met.

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

Response: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "consistent with" as used in this section are subjective words. As discussed in this narrative, the proposed subdivision is consistent with all required design standards in this chapter. This criterion is met.

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

Response: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "connected" and "consistent with" as used in this section are subjective words. All streets confirm with the street pattern and connectivity standards in this code. This criterion is met.

4. Traffic volumes shall not exceed average daily traffic (ADT) standards for local streets as detailed in Chapter 17.10, Definitions.

Response: All streets are short segments and are not expected to exceed ADT standards. This criterion is met.

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

Response: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "adequate" as used in this section are subjective words. There is no indication by City officials that public facilities are not adequate to serve the proposed subdivision.

6. All proposed improvements meet City standards.

Response: As reviewed in this narrative, the proposed improvements in this application comply with City standards.

7. 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 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: The subject property does not contain any of the items identified as "unsuitable" in this section. The subject property is suitable to construct a new residential subdivision.

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 or 211.

17.100.100 - STREETS GENERALLY

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: Access to the western portion of the subject property is from an extension of Maple Street across Bornstedt Road and the eastern portion from an extension of Averill Parkway. These streets create a logical street pattern. The submitted Future Street Plan shows how the proposed street pattern can be extended to serve adjacent properties.

B. Transportation Impact Studies. An applicant is required to prepare and submit a transportation impact study in accordance with the standards of Chapter 17.84 unless those standards exempt the application from the requirement.

Response: As reviewed in Section 17.84.50(B)(6) above, the proposed development does not meet the threshold to trigger preparation of a transportation impact study.

- 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: All proposed streets comply with the requirements of this section.

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

Response: As noted above, the subject property is divided into western and eastern sections separated by steeper slopes. Because of this a street connection between these two sections is not practicable. The street pattern of each of the development area creates a generally rectangular grid pattern adapted to the topographic conditions of the site.

- 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: A future street plan in compliance with this section is included with the plan set as Sheet C1.

- 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.

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: As shown on submitted plans, Maple Street on the subject property is aligned with this street across Bornstedt Road from the development. Averill Parkway on the subject property is an extension of this existing street constructed to the north. As shown on the Future Street Plan all streets are designed as practical to provide connections to abutting properties.

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: The submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "sufficient width" and "appropriate depths" as used in this section are subjective. Because of the unique character of the site with Bornstedt Road, a minor arterial, along the western boundary of the site and moderate slopes to the east, the site does not lend itself to creating blocks with two tiers. The proposal complies with this section.

- 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 submitted application is a "Needed Housing" application pursuant to ORS 197.303(1) and ORS 197.307(4), therefore only objective standards and procedures apply to the application review. The words "unless topographic, natural resource, or other similar physical conditions justify longer blocks" as used in this section are subjective. As shown on submitted plans, all proposed blocks are less than 400 feet in length in compliance with this section.

- 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: No blocks are proposed to exceed 600 feet in length.

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 will be included along all property lines abutting a public right-of-way. In addition, a 15 foot public drainage easement will be created to collect and convey stormwater east of the subject property through the site to the stormwater pond. Because Street A and the extension of Averill Parkway through the site result in temporary dead end

streets, Lots 7/8 and 36/37 are proposed to contain temporary fires apparatus turn-around easements until these street are extended. No other easements for public or private utility purposes are required.

17.100.140 - PUBLIC ALLEYS

Response: No alleys are proposed or required.

17.100.150 - RESIDENTIAL SHARED PRIVATE DRIVES

A shared private drive is intended to provide access to a maximum of two (2) dwelling units.

A. Criteria for Approval

Shared private drives may be approved by the Director when one or more of the following conditions exist:

1. Direct access to a local street is not possible due to physical aspects of the site including size, shape, or natural features.
2. The construction of a local street is determined to be unnecessary.

Response: Three private drives are proposed (Tracts B, C, and D) as shown on submitted plans.

B. Design

1. A shared private drive constructed to city standards shall not serve more than two (2) dwelling units.
2. A shared access easement and maintenance agreement shall be established between the two units served by a shared private drive. The language of the easement and maintenance agreement shall be subject to approval by the Director.
3. Public utility easements shall be provided where necessary in accordance with Section 17.100.130.
4. Shared private drives shall be fully improved with an all weather surface (e.g. concrete, asphalt, permeable pavers) in conformance with city standards. The pavement width shall be 20 feet.
5. Parking shall not be permitted along shared private drives at any time and shall be signed and identified accordingly.

Response: Each private drive is proposed to serve only two lots as allowed. As shown on Sheet C8, all private drives will be constructed in accordance with the requirements of this section.

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: A single flag lot (Lot 33) is proposed. The area of this lot exceeds 7,500 square feet after deducting the area of the pole (10,571 - 1,875 = 8,696 .sq. ft)

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 are designed to intersect abutting streets at right angles. The proposal complies with the requirements of this section.

- 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 proposed streets comply with the standards of 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 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 these 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: *The subdivision contains a logical lot layout and no difficulties in securing building permits to build on any of these lots is anticipated.*

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: *As discussed above, all lots comply with the lot dimension and minimum standards as specified for lots platted within the SFR zoning district.*

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 with the exception of Lot 33 (flag lot) which contains 15 feet of frontage and six lots (Lots 5, 6, 22, 23, and 29, 30) which are proposed to be accessed by private drives. The proposal complies with this section.*

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: *None of the lots contain double frontage as defined by code except Lots 1 - 4, and 13 abutting Bornstedt Road. Because direct access to these lots from Bornstedt Road is not permitted, a double frontage lot configuration is unavoidable.*

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: *All lots are proposed to gain access from a new local street. No direct access to Bornstedt Road, a minor arterial is proposed.*

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: *Response: The applicant intends to install sanitary sewer lines in compliance with applicable standards. As noted above, because of the depth of the existing sewer and the grade of the site, several of the lots (Lots 5,6 and 16-33) as shown on the plan set will require installation of a grinder sump system installed at each of these dwellings to pump sanitary waste from these dwellings to a gravity sewer line in the development.*

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 single stormwater water quality and detention facility (Tract A) is proposed. This facility has been sized and located to accommodate public stormwater generated by the subdivision. A preliminary stormwater report is included with this application 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: *As shown on improvement plans 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: *As shown on submitted plans, sidewalks will be constructed along the east side of Bornstedt Road and on both side of all new streets.*

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 bicycle routes are existing, planned, or proposed on the subject property.*

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. As noted on Sheet C10, the proposed tree species will be selected from the City's approved tree list.

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 provides additional details to address erosion control concerns.

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 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 12.739 acres and the standards of this chapter are applicable to the proposed application. As shown on submitted plans and detailed in the Arborist Report, development of the site requires removal of the majority of the trees on the site. The proposed tree removal and protection plan has been designed in accordance with the standards of this chapter.

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: The subject property contains 12.739 acres requiring retention of three trees, 11 inches and greater DBH ($12.739 \times 3 = 38.217$ rounded down to 38 trees). As stated in this section, trees proposed for retention shall be "healthy and likely to grow to maturity". This section also has a preference for retaining conifer trees over deciduous. The submitted Arborist Report provides a description and quality assessment of each of the trees on the site. As noted on the plan set, the site contains 747 trees, 333 of which meet tree retention requirements. The majority of these trees are located on the eastern portion of the site within proposed building envelopes or roadways. As shown on these plans the applicant is proposing to retain 38 trees, the same number that is required by this section. This standard is met.

- 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: Root protection zones exceeding these tree protection standards for retained trees are shown on submitted plans.

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: The requirements of this section as applicable will be completed with construction of subdivision improvements.

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.

Response: As noted above, the proposed tree retention plan complies with the tree retention requirements of Section 17.102.50 above. A variance to this section has not been requested or is one 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.

V. Conclusion

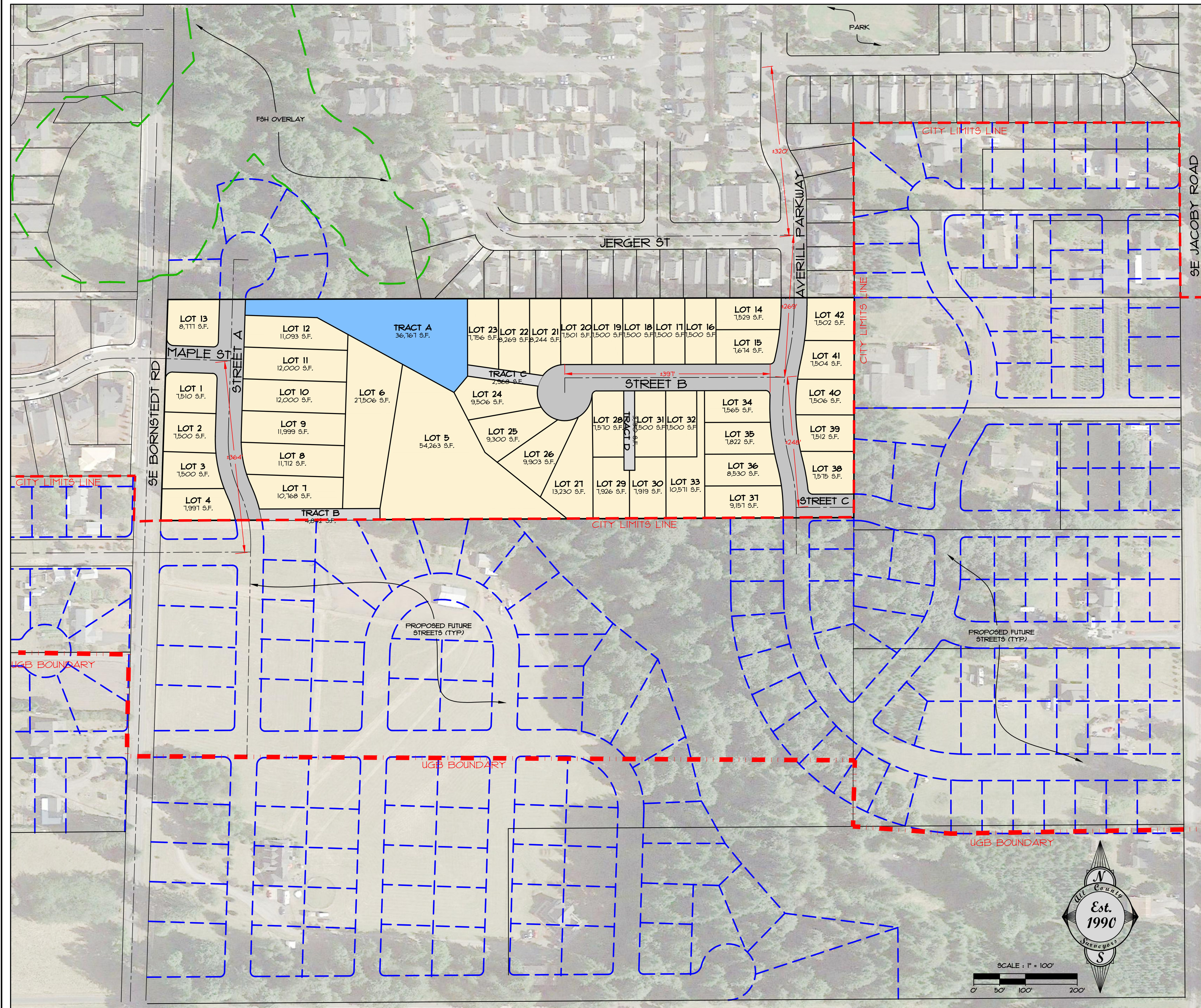
The proposed “The Bornstedt Views” subdivision is part of the planned progression of land use planning for this area of Sandy and involves the creation of “Needed Housing” under ORS 197.303(1) and 197.307(4) on land zoned for residential uses within the city limits of Sandy. The applicant is submitting this application requesting land use approval to construct a Type II residential subdivision on the 12.739 acre site to include the following:

- 42 lots
- Frontage improvements
- On-street parking
- Installation of public and franchise utilities
- Tree removal
- Fee-in-lieu payment for parkland dedication

As reviewed in this narrative and shown on submitted plans and studies including the submitted Arborist Report, Geotechnical Report, and Environmental Review, the proposed subdivision complies with all applicable standards. Given these facts the applicant respectfully requests this application be approved as submitted.

EXHIBIT C "THE BORNSTEDT VIEWS"

A PROPOSED 42 LOT SUBDIVISION, APRIL 2021



SITE LOCATION AND FUTURE STREET PLAN
SCALE: 1" = 100'



SHEET INDEX

Sheet Number	Sheet Title
C1	COVER SHEET AND FUTURE STREET PLAN
C2	TENTATIVE PLAT MAP
C3	TOPOGRAPHIC SURVEY
C4	TREE INVENTORY LIST 1
C5	TREE INVENTORY LIST 2
C6	TREE INVENTORY LIST 3
C7	TREE RETENTION AND PROTECTION PLAN
C8	STREET AND UTILITY PLAN
C9	GRADING AND EROSION CONTROL PLAN
C10	ON-STREET PARKING PLAN

DENSITY CALCULATIONS:

SITE AREA INFORMATION	
Total Site Area =>	554,897.31 SF 12.739 <==== Acres Total
Public ROW =>	77,975.25 SF 1.790 <==== Acres Total
Public Detention Pond Tracts =>	36,767.25 SF 0.844 <==== Acres Total
Private Tracts =>	10,959.90 SF 0.252 <==== Acres Total
Total Net Lot Area =>	429,194.91 SF 9.853 <==== Acres Total
Total Lot Area + Private Tracts =>	440,154.81 SF 10.105 <==== Acres Total

Density Calculations (Based on SFR Zoning)	
Minimum Density =>	3 units/acre
Maximum Density =>	5.8 units/acre
Minimum Required Units =>	30.3 units <==== Minimum Density
Maximum Allowed Units =>	58.6 units <==== Maximum Base Density

PROPOSAL:
THE PROPOSED SUBDIVISION WILL CREATE A TOTAL OF 42 NEW RESIDENTIAL LOTS. THE MINIMUM DENSITY IS 30 LOTS AND THE MAXIMUM IS 59 LOTS.

SITE INFORMATION:
PROPERTY OWNER:
WILLIAM BLOOM
ADDRESS: 19618 SE BORNSTEDT ROAD
TAX LOT 100, MAP 25 4E 24
AREA: 12.139 ACRES (554,897 SF)
ZONING: SFR

PROJECT TEAM:

CLIENT:
EVEN BETTER HOMES, INC.
ATTN: MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5600

PLANNER:
TRACY BROWN PLANNING CONSULTANTS, LLC
ATTN: TRACY BROWN
11075 FIR DRIVE
SANDY, OR 97055
PHONE: (503) 781-0453

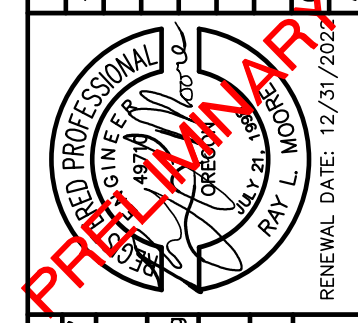
ENGINEER/SURVEYOR:
ALL COUNTY SURVEYORS & PLANNERS, INC.
ATTN: RAY MOORE, PE, PLS
TYLER HENDERSON, EIT
PO BOX 955
SANDY, OR 97055
PHONE: (503) 668-3151

ARBORIST:
TERAGAN & ASSOCIATES, INC.
ATTN: TODD PRAGER
ASCA REGISTERED CONSULTING ARB #597
3145 WESTVIEW CIRCLE
LAKE OSWEGO, OR 97034
PHONE: (911) 235-4835

TRAFFIC ENGINEER:
ARD ENGINEERING
ATTN: MIKE ARD, PE
21310 SW LANGER FARM RD PARKW, SU 142,
SHERWOOD, OR 97140
PHONE: (503) 862-6360

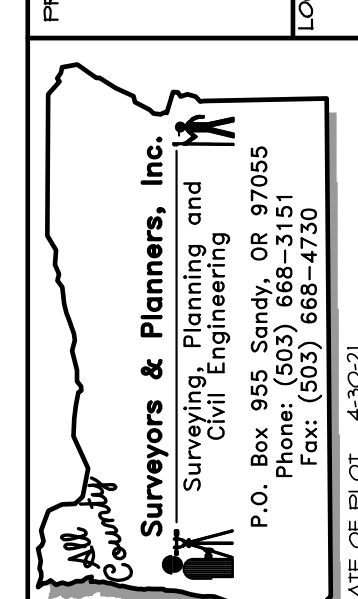
GEOTECHNICAL ENGINEER:
REDMOND GEOTECHNICAL SERVICES
ATTN: DAN REDMOND, GE
PO BOX 20541
PORTLAND, OR 97234
PHONE: (503) 285-0598

BY	REVISION	DATE	NO.



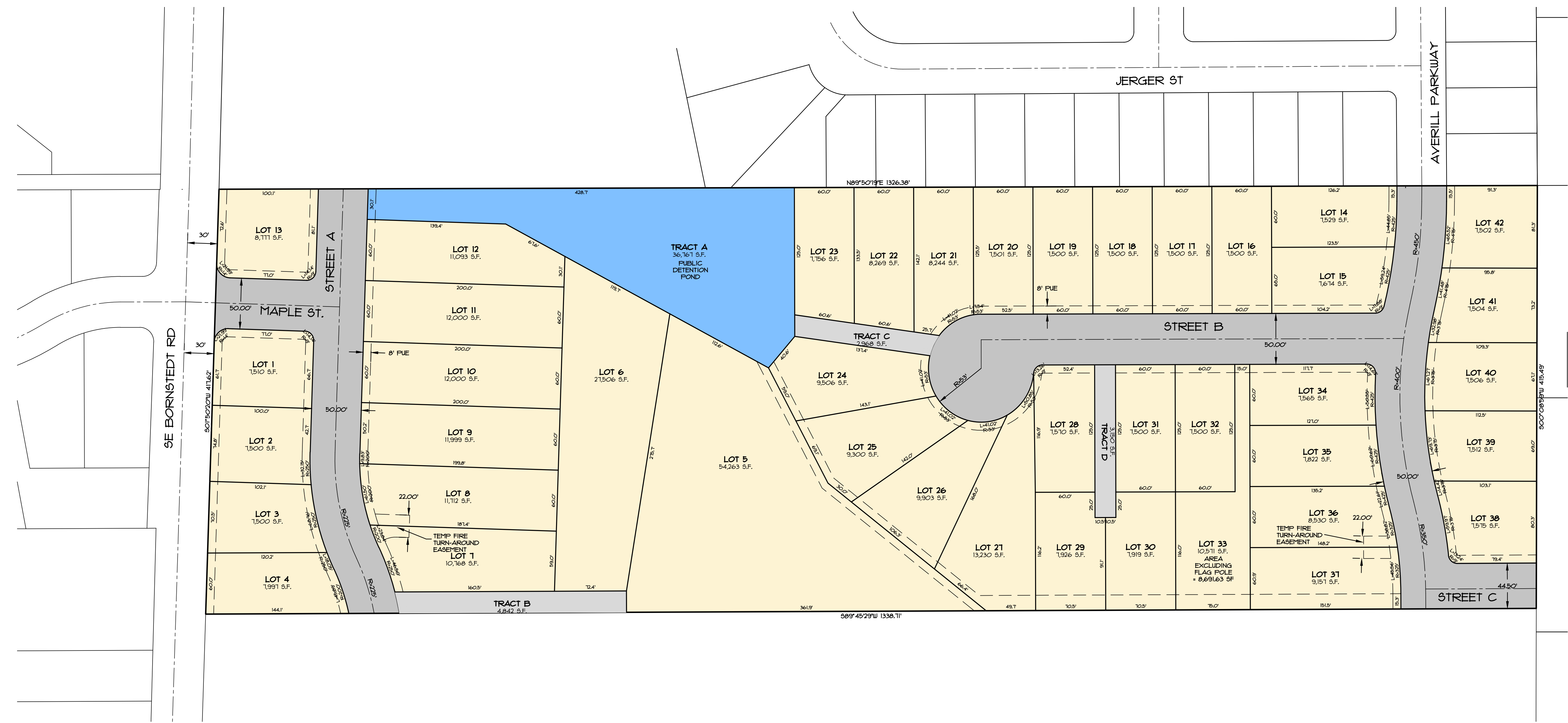
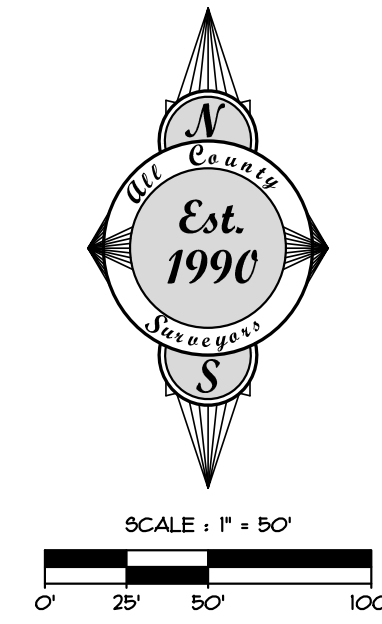
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N/A	1" = 100'	1" = 100'	4-30-21	FILE:19-268 - Planning-SFR.dwg	24	2S	4E	12/21/2021

THE BORNSTEDT VIEWS
COVER SHEET AND FUTURE STREET PLAN
19618 SE BORNSTEDT ROAD, SANDY, OR



CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
PO BOX 2021
GRESHAM, OR 97030
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

DATE OF PLOT: 4-30-21



DATE	NO.	REVISION	BY



SCALE	N/A	VERT.	N/A
HORIZ.	1" = 50'	DATE	4-30-21
FILE#	19-268	PLANNING	SFR.dwg
SECTION	TWP.	RANGE	LEGAL
24	2S	4E	

PROJECT: **THE BORNSTEDT VIEWS**
TENTATIVE PLAT MAP

LOCATION: **19618 SE BORNSTEDT ROAD, SANDY, OR**

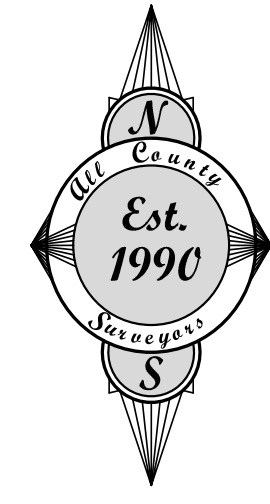
Surveyors & Planners, Inc.
 Surveying, Planning and
 Civil Engineering and
 P.O. Box 855 Sandy, OR 97055
 Phone: (503) 348-5602
 Fax: (503) 668-4730

DATE OF PLOT: 4-30-21

CLIENT: **EVEN BETTER HOMES, INC.**
 MAC EVEN
 P.O. BOX 2021
 PRESERVATION
 PHONE: (503) 348-5602
 EMAIL: macc@evenbetterhomes.com

DESIGNED	RLM
DRAWN	RLM
CHECKED	DLH
APPROVED	RLM
RENEWAL DATE	12/31/2024

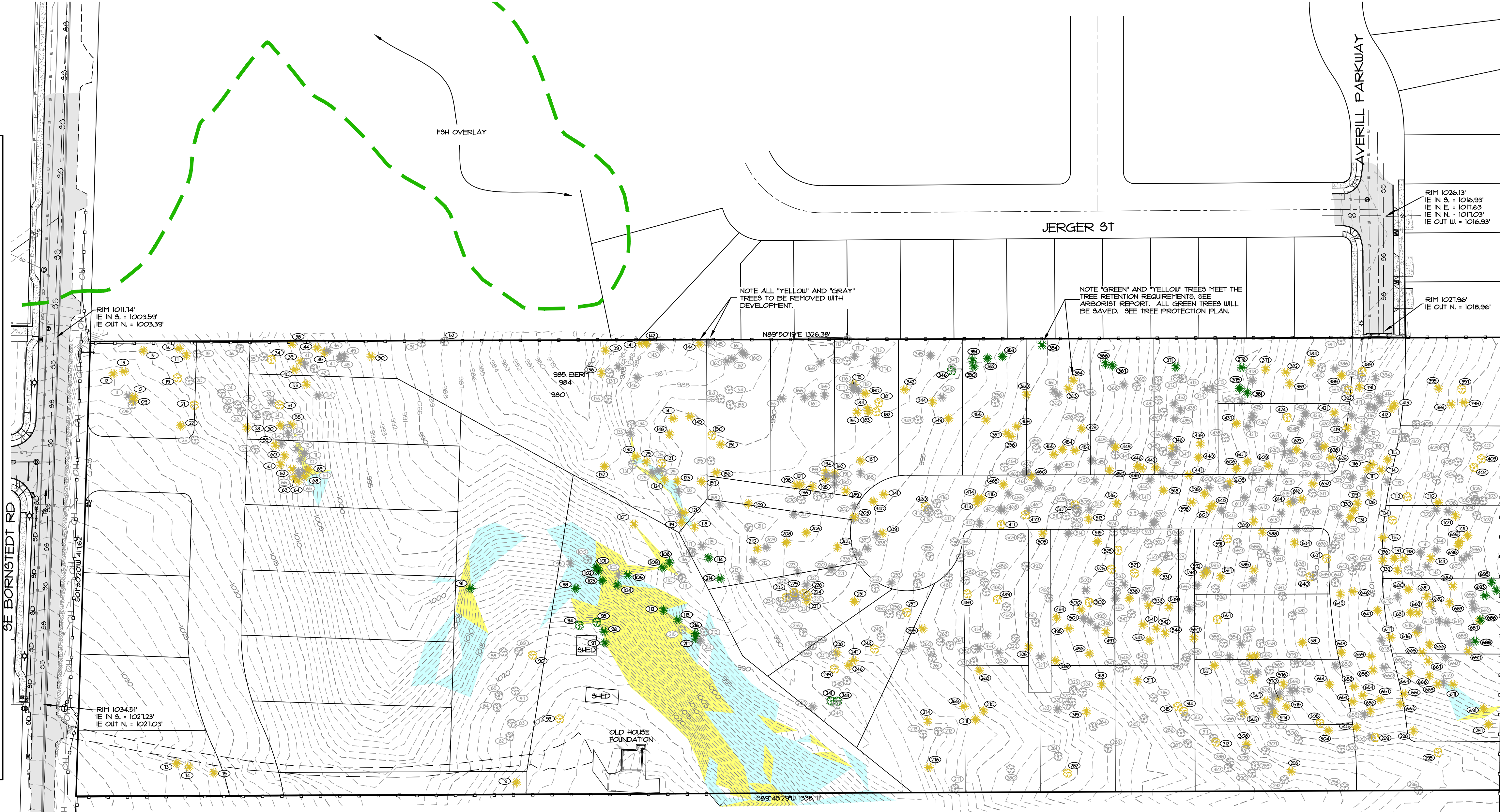
SHEET **C2**
 OF **10**



SCALE: 1" = 50'

LEGEND

- (E) PROPERTY LINE
- (E) LOT LINE
- (E) CL RIGHT OF WAY
- (E) EASEMENT LINE
- (E) 5' GROUND CONTOUR
- (E) 1' GROUND CONTOUR
- (E) BUILDING WALL
- (E) AC PAVEMENT
- (E) SIDEWALK/CONCRETE
- (E) GRAVEL
- (E) CURB & GUTTER
- (E) FENCE
- (E) WATER LINE
- (E) 6" WATER LINE
- (E) 8" WATER LINE
- (E) 12" WATER LINE
- (E) STORM LINE
- (E) SANITARY LINE
- (E) GAS LINE
- (E) TELEPHONE LINE, CAT
- (E) OVERHEAD POWER LI
- FOUND SURVEY MONIPIEN
- (E) STORM MANHOLE
- (E) CATCH BASIN
- (E) WATER METER
- (E) WATER VALVE
- (E) MANHOLE
- (E) GAS VALVE
- (E) LIGHT POLE
- (E) UTILITY POLE
- (E) POLE W/ GUY WIRE
- (E) SIGN
- (E) DECIDUOUS TREE
- (E) CONIFEROUS TREE
- (E) SANITARY LINE
- (E) SANITARY MANHOLE
- (E) STORM LINE
- (E) STORM MANHOLE
- (E) CATCH BASIN
- (E) WATER LINE
- (E) WATER METER
- (E) WATER VALVE
- (E) FIRE HYDRANT
- (E) STREET LIGHT



SLOPE ANALYSIS LEGEND

- SLOPES OF 0-24.99%
- SLOPES OF 25-34.99%
- SLOPES OF 35% AND GREATER

BENCHMARK
ELEVATIONS ARE BASED ON CITY OF SANDY
ELEVATION DATUM

TOPOGRAPHIC SURVEY

SCALE: 1" = 50'

NO.	REVISION	DATE	BY



SCALE	N/A	VERT.	4-30-21
HORIZ.	1" = 50'	DATE	4-30-21
FILE	19-268 - Planning - SFR.dwg	DESIGNED	RLM
LEGAL	TWP. RANGE	DRAWN	RLM
SECTION	24	CHECKED	DLH
		APPROVED	RLM

PROJECT: **THE BORNSTEDT VIEWS TOPOGRAPHIC SURVEY**

Surveyors & Planners, Inc.
 Surveying, Planning and
 Civil Engineering
 P.O. Box 855 Sandy, OR 97055
 Phone: (503) 668-4730
 Fax: (503) 668-4730
 DATE OF PLOT: 4-30-21

CLIENT: **EVEN BETTER HOMES, INC.**
 MAC EVEN
 P.O. BOX 2021
 PRESWAIN
 PHONE: (503) 348-5602
 EMAIL: macc@evenbetterhomes.com

REVISION	NO.	DATE	BY

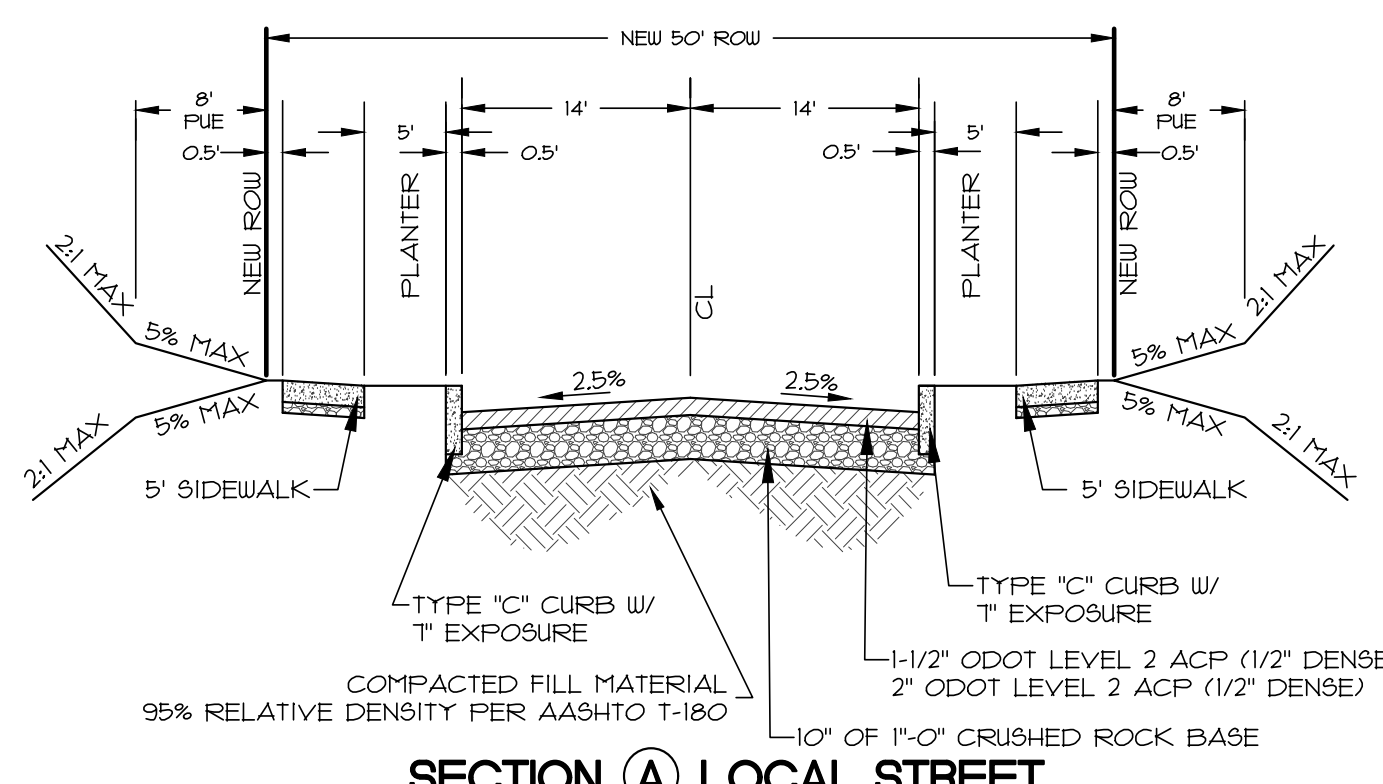
SHEET **C3** OF **10**

TREE TO BE SAVED OR REMOVED										TREE RETENTION										"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.									
TREE NO	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	OPTION	COMMENTS	RETENTION	OPTION	COMMENTS	TREE NO	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	OPTION	COMMENTS	TREE NO	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	OPTION	COMMENTS
1	BITTER CHERRY	PRUNUS EMARGINATA	11	15	GOOD	FAIR	YES	ONE SIDED	YES	ONE SIDED	145	PACIFIC YEW	TAXUS BREVIFOLIA	13	15	GOOD	FAIR	YES	ONE SIDED	146	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	9	GOOD	GOOD	NO	MODERATELY ONE SIDED	
2	BITTER CHERRY	PRUNUS EMARGINATA	11	15	GOOD	FAIR	YES	ONE SIDED	YES	ONE SIDED	147	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	20	GOOD	FAIR	YES	ONE SIDED	148	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	MODERATELY ONE SIDED	
3	BITTER CHERRY	PRUNUS EMARGINATA	9	14	GOOD	FAIR	NO	ONE SIDED	NO	ONE SIDED	149	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	MODERATELY ONE SIDED	150	BIGLEAF MAPLE	ACER MACROPHYLLUM	24	24	GOOD	FAIR	NO	MODERATELY ONE SIDED	
4	BITTER CHERRY	PRUNUS EMARGINATA	1	14	GOOD	FAIR	NO	ONE SIDED	NO	ONE SIDED	151	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	30	GOOD	FAIR	YES	MODERATELY ONE SIDED	152	RED ALDER	ALNUS RUBRA	8	15	GOOD	GOOD	NO	95% DEAD	
5	BITTER CHERRY	PRUNUS EMARGINATA	1	14	GOOD	FAIR	NO	ONE SIDED	NO	ONE SIDED	153	RED ALDER	ALNUS RUBRA	8	15	GOOD	GOOD	YES	ONE SIDED	154	RED ALDER	ALNUS RUBRA	11	15	GOOD	GOOD	YES	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	
6	BITTER CHERRY	PRUNUS EMARGINATA	1	13	GOOD	FAIR	NO	ONE SIDED	NO	ONE SIDED	155	BIGLEAF MAPLE	ACER MACROPHYLLUM	39	25	FAIR	FAIR	NO	ONE SIDED	156	BIGLEAF MAPLE	ACER MACROPHYLLUM	34	32	GOOD	FAIR	YES	MODERATELY ONE SIDED	
7	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	16	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES	157	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	25	GOOD	FAIR	YES	40% LCR	158	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	25	FAIR	FAIR	NO	FORKED/ALEA PINI CONKS AT LOWER TRUNK	
8	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	16	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES	159	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	28	30	GOOD	GOOD	YES	ONE SIDED	160	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	8	GOOD	FAIR	NO	ONE SIDED	
9	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	12	GOOD	FAIR	YES	ONE SIDED	YES	ONE SIDED	161	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	1	1	GOOD	GOOD	NO	ONE SIDED	162	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	GOOD	FAIR	NO	ONE SIDED	
10	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	12	GOOD	FAIR	YES	ONE SIDED	YES	ONE SIDED	163	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	25	GOOD	FAIR	NO	ONE SIDED	164	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	10	GOOD	GOOD	NO	MODERATELY ONE SIDED	
11	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	1	14	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	YES	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	165	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	25	0	VERY POOR	VERY POOR	NO	DEAD	166	BIGLEAF MAPLE	ACER MACROPHYLLUM	36	40	FAIR	FAIR	NO	MULTIPLE LEADERS AT 2; MULTIPLE SCAFFOLD BRANCH FAILURES	
12	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	1	14	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	YES	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	167	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	21	25	FAIR	FAIR	NO	MODERATELY THIN CROWN	168	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	20	FAIR	FAIR	NO	MODERATELY THIN CROWN	
13	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	1	14	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	YES	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	169	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	9	0	VERY POOR	VERY POOR	NO	DEAD	170	RED ALDER	ALNUS RUBRA	26	15	FAIR	FAIR	NO	SIGNIFICANT LEAN, EPICORMIC GROWTH AT LOWER TRUNK	
14	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	20	GOOD	FAIR	YES	CODOMINANT AT 15' WITH INCLUDED BARK	YES	CODOMINANT AT 15' WITH INCLUDED BARK	171	GRAND FIR	ABIES GRANDIS	9	8	FAIR	FAIR	NO	SIGNIFICANT LEAN, EPICORMIC GROWTH AT LOWER TRUNK	172	SCOLLERS WILLOW	SALIX SCOLLERIANA	14	0	VERY POOR	VERY POOR	NO	DEAD, ON PROPERTY LINE	
15	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	11	GOOD	FAIR	YES	MODERATELY ONE SIDED	YES	MODERATELY ONE SIDED	173	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	8	FAIR	FAIR	NO	CODOMINANT AT 4; MODERATELY THIN CROWN	174	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	10	GOOD	FAIR	NO	MODERATELY THIN CROWN	
16	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	18	GOOD	FAIR	YES	MODERATELY ONE SIDED, CODOMINANT AT 20' WITH INCLUDED BARK	YES	MODERATELY ONE SIDED, CODOMINANT AT 20' WITH INCLUDED BARK	175	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	10	POOR	POOR	NO	SUPPRESSED	176	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	10	POOR	POOR	NO	SUPPRESSED	
17	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	9	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER	YES	ONE SIDED, MARGINAL TRUNK TAPER	177	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	8	POOR	POOR	NO	SUPPRESSED, CODOMINANT STEM AT 4' FAILED	178	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	8	POOR	POOR	NO	SUPPRESSED, CODOMINANT STEM AT 4' FAILED	
18	SCOLLERS WILLOW	SALIX SCOLLERIANA	11	9	POOR	POOR	NO	EXTENSIVE TOP FAILURES	NO	EXTENSIVE TOP FAILURES	179	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	10	POOR	POOR	NO	SUPPRESSED	180	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	20	GOOD	FAIR	YES	35% LCR, MARGINAL TRUNK TAPER	
19	BIGLEAF MAPLE	ACER MACROPHYLLUM	29	25	GOOD	FAIR	YES	ONE SIDED	YES	ONE SIDED	181	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	20	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES	182	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	20	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES	
20	BIGLEAF MAPLE	ACER MACROPHYLLUM	16,15,14,40	GOOD	GOOD	FAIR	YES	MULTIPLE LEADERS AT LOWER TRUNK WITH INCLUDED BARK, PAST BRANCH FAILURES WITH DECAY	YES	MULTIPLE LEADERS AT LOWER TRUNK WITH INCLUDED BARK, PAST BRANCH FAILURES WITH DECAY	183	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES	184	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	30	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES	
21	BIGLEAF MAPLE	ACER MACROPHYLLUM	16,15,14,40	GOOD	GOOD	FAIR	YES	MULTIPLE LEADERS AT GROUND LEVEL	YES	MULTIPLE LEADERS AT GROUND LEVEL	185	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	30	GOOD	FAIR	YES	MODERATELY ONE SIDED, PISTOL BUTT	186	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	8	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES	
22	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	39	20	GOOD	FAIR	YES	MODERATELY ONE SIDED	YES	MODERATELY ONE SIDED	187	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	20	GOOD	FAIR	YES	ONE SIDED	188	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	10	GOOD	GOOD	NO	MODERATELY ONE SIDED	
23	SCOLLERS WILLOW	SALIX SCOLLERIANA	12,10	15	VERY POOR	VERY POOR	NO	EXTENSIVE DIEBACK AND DECAY	NO	EXTENSIVE DIEBACK AND DECAY	189	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	20	FAIR	FAIR	NO	MODERATELY ONE SIDED	190	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	20	FAIR	FAIR	NO	MODERATELY ONE SIDED	
24	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	20	FAIR	FAIR	NO	SCAFFOLD BRANCH DIEBACK	NO	SCAFFOLD BRANCH DIEBACK	191	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	20	FAIR	FAIR	NO	MODERATELY ONE SIDED	192	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	8	8	GOOD	GOOD	NO	ONE SIDED, MARGINAL TRUNK TAPER	
25	BIGLEAF MAPLE	ACER MACROPHYLLUM	15,12,10,12	18	GOOD	FAIR	YES	MULTIPLE LEADERS AT GROUND LEVEL, PAST STEM FAILURES AND SCAFFOLD DIEBACK	YES	MULTIPLE LEADERS AT GROUND LEVEL, PAST STEM FAILURES AND SCAFFOLD DIEBACK	193	GRAND FIR	ABIES GRANDIS	21	15	FAIR	POOR	NO	ONE SIDED	194	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	30	GOOD	FAIR	YES	ONE SIDED	
26	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	25	FAIR	FAIR	NO	ONE SIDED, PREVIOUSLY LOST TOP	NO	ONE SIDED, PREVIOUSLY LOST TOP	195	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	30	GOOD	FAIR	YES	ONE SIDED	196	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	30	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES	
27	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	18	FAIR	FAIR	NO	MULTIPLE LEADERS AT 2' WITH INCLUDED BARK, SCAFFOLD BRANCH DIEBACK	NO	MULTIPLE LEADERS AT 2' WITH INCLUDED BARK, SCAFFOLD BRANCH DIEBACK	197	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	20	GOOD	FAIR	YES	ONE SIDED	198	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	20	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES	
28	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	11	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES	NO	OVERTOPPED BY ADJACENT TREES	199	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	40	GOOD	FAIR	YES	MODERATELY ONE SIDED, DECAY POCKET AT LOWER TRUNK	200	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	10	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED	
29	SWEET CHERRY	PRUNUS AVIUM	10,10,8	18	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL, ONE SIDED, LOW VIGOR	NO	MULTIPLE LEADERS AT GROUND LEVEL, ONE SIDED, LOW VIGOR	201	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	8	GOOD	FAIR	NO	ONE SIDED	202	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	8	GOOD	FAIR	NO	ONE SIDED	
30	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	11	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES	NO	OVERTOPPED BY ADJACENT TREES	203	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	30	GOOD	FAIR	YES	ONE SIDED	204	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES	
31	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	20	FAIR	FAIR	NO	ONE SIDED, CODOMINANT AT 5' WITH INCLUDED BARK, SCAFFOLD BRANCH DIEBACK	NO	ONE SIDED, CODOMINANT AT 5' WITH INCLUDED BARK, SCAFFOLD BRANCH DIEBACK	205	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	30	GOOD	FAIR	YES	ONE SIDED	206	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	15	GOOD	FAIR	YES	CODOMINANT AT 12'	
32	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES	NO	OVERTOPPED BY ADJACENT TREES	207	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	21	18	FAIR	FAIR	NO	CODOMINANT AT 10', MODERATELY THIN CROWN	208	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	30	GOOD	FAIR	YES	ONE SIDED	
33	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	10	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES	NO	OVERTOPPED BY ADJACENT TREES	209	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	210	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	30	30	GOOD	FAIR	YES	MODERATELY ONE SIDED, 10' STEM AT 2'	
34	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	10	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES	NO	OVERTOPPED BY ADJACENT TREES	211	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	GOOD	GOOD	NO	ONE SIDED	212	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	9	9	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES	
35	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	18	GOOD	FAIR	YES	MULTIPLE LEADERS, HIGH CROWN	YES	MULTIPLE LEADERS, HIGH CROWN	213	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	20	GOOD	FAIR	YES	ONE SIDED	214	GRAND FIR	ABIES GRANDIS	26	20	GOOD	FAIR	YES	ONE SIDED	
36	BIGLEAF MAPLE	ACER MACROPHYLLUM	16,12,11	23	FAIR	FAIR	NO	MULTIPLE LEADERS AT GROUND LEVEL, SLOUGHING BARK AT LOWER TRUNK	NO	MULTIPLE LEADERS AT GROUND LEVEL, SLOUGHING BARK AT LOWER TRUNK	215	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	10	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES	216	BIGLEAF MAPLE	ACER MACROPHYLLUM	23	35	GOOD	FAIR	YES	ONE SIDED	
37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NUMBER NOT USED	N/A	NUMBER NOT USED	217	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	10	GOOD	FAIR	NO	ONE SIDED	218	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	10	GOOD	FAIR	NO	ONE SIDED	
38	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	18	GOOD	FAIR	YES	35% LIVE CROWN RATIO (LCR), MARGINAL TRUNK TAPER	YES	35% LIVE CROWN RATIO (LCR), MARGINAL TRUNK TAPER	219	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	GOOD	FAIR	NO	ONE SIDED	220	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	10	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES	
39	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	14	GOOD	FAIR	YES	35% LIVE CROWN RATIO (LCR), MARGINAL TRUNK TAPER	YES	35% LIVE CROWN RATIO (LCR), MARGINAL TRUNK TAPER	221	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	10	FAIR	FAIR	NO	ONE SIDED	222	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	0	VERY POOR	VERY POOR	NO	DEAD	
40	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	14	GOOD	FAIR	YES	35% LIVE CROWN RATIO (LCR), MARGINAL TRUNK TAPER	YES	35% LIVE CROWN RATIO (LCR), MARGINAL TRUNK TAPER	223	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	59	30	GOOD	FAIR	YES	ONE SIDED	224	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	29	20	FAIR	FAIR	NO	CODOMINANT AT 3; MODERATELY THIN CROWN	
41	WESTERN RED CEDAR	THUJA PLICATA	14,10	0	VERY POOR	VERY POOR	NO	DEAD	NO	DEAD	225	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	1	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	226	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	1	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	
42	WESTERN RED CEDAR	THUJA PLICATA	15	18	FAIR	FAIR	NO	OVER																					

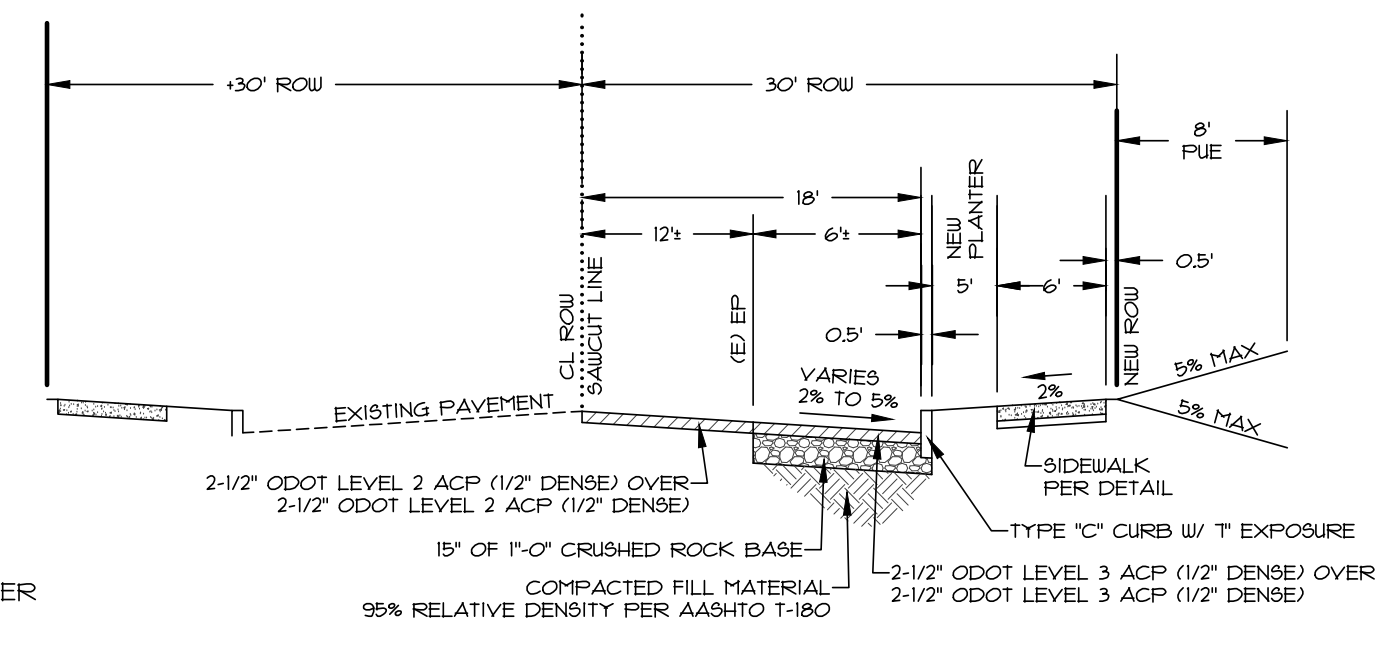
TREE TO BE SAVED OR REMOVED	TREE NO	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	RETENTION OPTION	COMMENTS
280	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	15	POOR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES	
281	BIGLEAF MAPLE	ACER MACROPHYLLUM	25	25	FAIR	FAIR	NO	UNDERSIZED LEAVES	
282	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	8	FAIR	FAIR	NO	ONE SIDED, UNDERSIZED LEAVES	
283	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	31	20	GOOD	FAIR	YES	ONE SIDED	
284	SCOLLERS WILLOW	SALIX SCOLLERIANA	15	8	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY	
285	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	15	GOOD	FAIR	YES	ONE SIDED	
286	SWEET CHERRY	PRUNUS AVIUM	12	8	FAIR	FAIR	NO	UNDERSIZED LEAVES, ONE SIDED	
287	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	28	20	GOOD	FAIR	YES	MODERATELY ONE SIDED	
288	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	32	25	GOOD	FAIR	YES	MODERATELY ONE SIDED	
289	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	20	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 10'	
290	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	1	1	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED	
291	SWEET CHERRY	PRUNUS AVIUM	1	3	VERY POOR	VERY POOR	NO	30% DEAD	
292	BIGLEAF MAPLE	ACER MACROPHYLLUM	30	30	FAIR	FAIR	NO	SIGNIFICANT DECAY AT ROOT CROWN, ONE SIDED	
293	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	23	15	GOOD	FAIR	YES	MODERATELY ONE SIDED	
294	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	26	18	GOOD	FAIR	YES	MODERATELY ONE SIDED	
295	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	GOOD	FAIR	YES	ONE SIDED	
296	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	15	FAIR	FAIR	NO	33% LCR, UNDERSIZED LEAVES, MARGINAL TRUNK TAPER	
297	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	20	FAIR	FAIR	NO	CODOMINANT AT 4' WITH INCLUDED BARK, PAST SCARFOLD BRANCH FAILURES	
298	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	21	25	GOOD	FAIR	YES	60% LCR	
299	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	10	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, TOP FAILED	
300	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	20	GOOD	FAIR	NO	SIGNIFICANT LEAN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	
301	BLACK COTONWOOD	POPULUS TRICHOCARPA	12	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	
302	BIGLEAF MAPLE	ACER MACROPHYLLUM	35	25	GOOD	FAIR	YES	MULTIPLE LEADERS AT LOWER TRUNK WITH INCLUDED BARK	
303	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	20	GOOD	FAIR	NO	CODOMINANT AT 4' WITH INCLUDED BARK, PAST SCARFOLD BRANCH FAILURES	
304	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER	
305	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	25	GOOD	FAIR	NO	MULTIPLE LEADERS AT 2' WITH INCLUDED BARK, ONE SIDED	
306	SWEET CHERRY	PRUNUS AVIUM	6	3	POOR	POOR	NO	SUPPRESSED	
307	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	28	25	GOOD	GOOD	YES	SLEEP IN LOWER TRUNK	
308	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	21	20	GOOD	FAIR	YES	MODERATELY ONE SIDED	
309	RED ALDER	ALNUS RUBRA	8	8	POOR	POOR	NO	THIN CROWN	
310	BIGLEAF MAPLE	ACER MACROPHYLLUM	3	8	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER	
311	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	6	5	FAIR	FAIR	NO	MODERATELY SUPPRESSED, OVERTOPPED BY ADJACENT TREES	
312	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	3	8	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER	
313	RED ALDER	ALNUS RUBRA	8	10	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER	
314	RED ALDER	ALNUS RUBRA	8	9	POOR	POOR	NO	SUPPRESSED	
315	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	28	25	GOOD	FAIR	YES	MODERATELY ONE SIDED	
316	PACIFIC DOGWOOD	CORNUS NUTTALLII	1	2	POOR	POOR	NO	SUPPRESSED	
317	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	FAIR	FAIR	NO	GROWING ON OLD STUMP	
318	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	8	1	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY	
319	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	8	5	GOOD	FAIR	NO	KINK AT LOWER TRUNK	
320	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	8	5	GOOD	FAIR	NO	MODERATELY THIN CROWN	
321	SWEET CHERRY	PRUNUS AVIUM	9	5	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN	
322	SWEET CHERRY	PRUNUS AVIUM	9	5	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN	
323	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	
324	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	
325	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	21	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED	
326	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	21	15	FAIR	FAIR	NO	ONE SIDED, CODOMINANT STEM PREVIOUSLY REMOVED AT LOWER TRUNK	
327	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	19	15	GOOD	FAIR	YES	ONE SIDED	
328	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	41	30	GOOD	FAIR	YES	MODERATELY ONE SIDED	
329	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	41	29	GOOD	FAIR	YES	MODERATELY ONE SIDED	
330	SCOLLERS WILLOW	SALIX SCOLLERIANA	14,10,9	15	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY	
331	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	10	GOOD	FAIR	NO	GROWING ON OLD STUMP	
332	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	8	10	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES	
333	BIGLEAF MAPLE	ACER MACROPHYLLUM	24	25	GOOD	FAIR	YES	ONE SIDED	
334	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	20	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES, GROWING ON OLD STUMP	
335	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	1	10	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES, GROWING ON OLD STUMP	
336	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	16	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES	
337	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	44	20	GOOD	FAIR	YES	ONE SIDED	
338	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	44	25	GOOD	FAIR	YES	ONE SIDED	
339	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	44	25	GOOD	FAIR	YES	ONE SIDED	
340	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	45	20	GOOD	FAIR	YES	MODERATELY ONE SIDED	
341	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	48	20	GOOD	FAIR	YES	MODERATELY ONE SIDED	
342	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	20	GOOD	GOOD	NO	ONE SIDED	
343	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	33	20	GOOD	FAIR	YES	ONE SIDED	
344	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
345	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
346	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
347	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
348	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
349	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
350	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
351	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
352	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
353	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
354	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
355	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
356	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
357	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
358	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
359	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
360	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
361	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
362	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
363	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
364	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
365	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
366	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
367	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
368	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
369	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
370	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
371	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
372	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
373	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
374	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
375	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
376	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
377	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
378	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
379	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
380	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
381	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
382	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
383	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
384	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
385	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
386	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
387	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
388	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
389	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
390	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
391	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
392	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
393	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
394	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
395	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
396	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
397	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
398	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
399	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
400	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
401	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
402	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
403	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
404	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
405	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED	
406	DOUGLAS-FIR	PSEUDOTSUGA HENZIESII	34						

TREE TO BE SAVED OR REMOVED	TREE RETENTION OPTION	"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.					
TREE NO COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	RETENTION OPTION	COMMENTS
576	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	10	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER, 40% LCR
577	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	10	GOOD	FAIR	YES 38% LCR, MARGINAL TRUNK TAPER
578	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	FAIR	FAIR	NO ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
579	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	18	FAIR	FAIR	NO MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK, CO-DOMINANT AT 2' WITH INCLUDED BARK
580	BIGLEAF MAPLE	ACER MACROPHYLLUM	1	10	FAIR	FAIR	NO MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK
581	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	45	30	GOOD	GOOD	YES
582	SCOLLERS BILLOW	SALIX SCOLLERIANA	6	6	POOR	POOR	NO 25% LCR, SIGNIFICANT DIEBACK
583	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	15	GOOD	FAIR	NO ONE SIDED
584	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	15	FAIR	FAIR	NO ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
585	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	20	GOOD	FAIR	YES MODERATELY ONE SIDED
586	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	16	FAIR	FAIR	NO OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
587	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	1	8	GOOD	FAIR	NO ONE SIDED
588	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	18	GOOD	FAIR	YES ONE SIDED, 60% LCR
589	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	30	GOOD	FAIR	YES MODERATELY ONE SIDED
590	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	8	POOR	POOR	NO SUPPRESSED
591	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	20	GOOD	FAIR	YES ONE SIDED
592	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	8	GOOD	FAIR	NO ONE SIDED, OVERTOPPED BY ADJACENT TREES
593	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	20	GOOD	FAIR	YES ONE SIDED, PUSHING AGAINST ADJACENT TREE
594	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	20	GOOD	FAIR	YES ONE SIDED, PUSHING AGAINST ADJACENT TREE
595	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	1	8	GOOD	GOOD	NO OVERTOPPED BY ADJACENT TREES, SUPPRESSED
596	BIGLEAF MAPLE	ACER MACROPHYLLUM	1	5	POOR	POOR	NO ONE SIDED
597	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES ONE SIDED
598	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	43	28	GOOD	FAIR	YES ONE SIDED
599	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	GOOD	FAIR	YES 40% LCR, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
600	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	0	VERY POOR	VERY POOR	NO 29' SNAG
601	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	31	25	GOOD	FAIR	YES ONE SIDED
602	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	20	GOOD	FAIR	YES ONE SIDED
603	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	0	VERY POOR	VERY POOR	NO T SNAG
604	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES 38% LCR, POOR TRUNK TAPER
605	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	15	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
606	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	GOOD	FAIR	YES 40% LCR
607	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	10	GOOD	FAIR	YES OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
608	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	POOR	POOR	NO SUPPRESSED, SIGNIFICANT LEAN, TOP FAILED
609	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	10	GOOD	FAIR	YES MODERATELY ONE SIDED
610	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	0	VERY POOR	VERY POOR	NO DEAD
611	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	0	VERY POOR	VERY POOR	NO DEAD
612	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	8	POOR	POOR	NO EXTENSIVE DIEBACK
613	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	POOR	POOR	NO OVERTOPPED BY ADJACENT TREES, SUPPRESSED
614	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	30	GOOD	FAIR	NO ONE SIDED
615	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	FAIR	FAIR	NO MODERATELY SUPPRESSED
616	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES ONE SIDED
617	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	8	POOR	POOR	NO OVERTOPPED BY ADJACENT TREES, SUPPRESSED
618	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	15	FAIR	FAIR	NO ONE SIDED, BRANCH DIEBACK
619	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	18	GOOD	FAIR	YES 38% LCR, MARGINAL TRUNK TAPER
620	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	0	0	VERY POOR	VERY POOR	NO DEAD 20' SNAG
621	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	12	FAIR	FAIR	NO ONE SIDED, POOR TRUNK TAPER, 25% LCR
622	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	18	GOOD	FAIR	YES OVERTOPPED BY ADJACENT TREES, TWO DEAD LEADERS AT 12'
623	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	15	GOOD	FAIR	YES ONE SIDED, 40% LCR, MARGINAL TRUNK TAPER
624	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	16	FAIR	FAIR	NO MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
625	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	6	FAIR	FAIR	NO MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
626	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	0	VERY POOR	VERY POOR	NO DEAD T SNAG
627	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	14	FAIR	FAIR	YES MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
628	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
629	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES, 40% LCR
630	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	16	POOR	POOR	NO MODERATELY SUPPRESSED, TOP FAILED
631	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	8	FAIR	FAIR	NO MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
632	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES 50% LCR, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
633	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	8	8	POOR	POOR	NO SUPPRESSED, SIGNIFICANT DIEBACK
634	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	18	GOOD	FAIR	YES MODERATELY ONE SIDED
635	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	8	POOR	POOR	NO MODERATELY SUPPRESSED
636	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	0	VERY POOR	VERY POOR	NO DEAD
637	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	16	GOOD	FAIR	YES ONE SIDED, 35% LCR
638	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	12	GOOD	FAIR	YES STEM FAILURE AND DECAY
639	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	12	GOOD	FAIR	NO ONE SIDED, MARGINAL TRUNK TAPER
640	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
641	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	8	FAIR	FAIR	NO OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED, CO-DOMINANT AT 2' WITH INCLUDED BARK
642	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	10	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED
643	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	11	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED
644	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	8	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED
645	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	46	25	GOOD	FAIR	YES ONE SIDED
646	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	20	18	GOOD	FAIR	YES ONE SIDED, 50% LCR
647	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	25	GOOD	FAIR	YES 40% LCR
648	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	25	GOOD	FAIR	YES 40% LCR
649	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	51	25	GOOD	FAIR	YES MODERATELY ONE SIDED
650	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	12	FAIR	FAIR	NO ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
651	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	13	GOOD	FAIR	YES MARGINAL TRUNK TAPER
652	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	15	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
653	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES ONE SIDED, KINKED LOWER TRUNK
654	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	12	FAIR	FAIR	YES CROWN EXTENSION SUPPRESSED BY ADJACENT TREES, MARGINAL TRUNK TAPER
655	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	1	5	POOR	POOR	NO OVERTOPPED BY ADJACENT TREES, SUPPRESSED
656	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES MARGINAL TRUNK TAPER
657	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES MARGINAL TRUNK TAPER
658	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	GOOD	FAIR	YES MARGINAL TRUNK TAPER, 35% LCR
659	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	12	GOOD	FAIR	YES MARGINAL TRUNK TAPER, 40% LCR
660	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	FAIR	FAIR	NO ONE SIDED, LARGE SCAR AT LOWER TRUNK
661	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	18	GOOD	FAIR	YES MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
662	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	12	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
663	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	GOOD	FAIR	NO OVERTOPPED BY ADJACENT TREES
664	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	4	10	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
665	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	18	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
666	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	18	GOOD	FAIR	YES MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
667	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	4	10	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
668	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES ONE SIDED
669	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	18	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
670	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	18	FAIR	FAIR	NO MARGINAL TRUNK TAPER, MODERATELY SUPPRESSED
671	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	20	GOOD	FAIR	YES ONE SIDED
672	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	18	GOOD	FAIR	YES CO-DOMINANT AT 3' WITH INCLUDED BARK, MODERATELY SUPPRESSED
673	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	8	FAIR	FAIR	NO MARGINAL TRUNK TAPER, MODERATELY SUPPRESSED
674	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	12	GOOD	FAIR	NO ONE SIDED
675	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	0	VERY POOR	VERY POOR	NO DEAD
676	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	20	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
677	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	18	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
678	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	GOOD	FAIR	NO ONE SIDED, MARGINAL TRUNK TAPER
679	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	FAIR	FAIR	NO MODERATELY SUPPRESSED, OVERTOPPED BY ADJACENT TREES
680	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	20	GOOD	FAIR	YES CO-DOMINANT AT 2' WITH INCLUDED BARK, MODERATELY SUPPRESSED
681	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	15	GOOD	FAIR	YES 40% LCR, MARGINAL TRUNK TAPER
682	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	14	FAIR	FAIR	NO 33% LCR, POOR TRUNK TAPER
683	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	11	GOOD	FAIR	YES 40% LCR, MARGINAL TAPER
684	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	9	GOOD	FAIR	YES 40% LCR, MARGINAL TAPER, BOUED TRUNK
685	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	20	GOOD	FAIR	YES MODERATELY ONE SIDED
686	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	15	GOOD	FAIR	YES MARGINAL TRUNK TAPER, 40% LCR, PREVIOUS LEADER FAILURE AT 20'
687	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES MODERATELY ONE SIDED
688	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	20	GOOD	FAIR	YES MODERATELY ONE SIDED
689	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	8	FAIR	FAIR	NO OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
690	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	22	GOOD	FAIR	YES MODERATELY ONE SIDED
691	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	9	GOOD	FAIR	YES ONE SIDED
692	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	5	POOR	POOR	NO SUPPRESSED
693	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	20	GOOD	FAIR	YES ONE SIDED
694	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	16	GOOD	FAIR	YES ONE SIDED
695	RED ALDER	ALNUS RUBRA	25	18	GOOD	FAIR	YES ONE SIDED
696	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	8	POOR	POOR	NO SUPPRESSED
697	RED ALDER	ALNUS RUBRA	14	0	VERY POOR	VERY POOR	NO DEAD
698	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	10	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
699	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	12	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
700	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	10	FAIR	FAIR	NO OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
701	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	GOOD	FAIR	YES MODERATELY ONE SIDED
702	RED ALDER	ALNUS RUBRA	5	5	FAIR	FAIR	NO SIGNIFICANT LEAN, THIN CROWN
703	SCOLLERS BILLOW	SALIX SCOLLERIANA	13	18	POOR	POOR	NO SIGNIFICANT LEAN, SIGNIFICANT DECAY
704	RED ALDER	ALNUS RUBRA	6	1	FAIR	FAIR	NO THIN CROWN
705	RED ALDER	ALNUS RUBRA	6	1	FAIR	FAIR	NO THIN CROWN
706	RED ALDER	ALNUS RUBRA	6	5	FAIR	FAIR	NO THIN CROWN, CO-DOMINANT AT 6'
707	WESTERN REDCEDAR	THUJA PLICATA	28	18	GOOD	GOOD	YES
708	WESTERN REDCEDAR	THUJA PLICATA	1	1	GOOD	GOOD	NO SUPPRESSED
709	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	POOR	POOR	NO SUPPRESSED
710	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	52	25	GOOD	GOOD	YES
711	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	FAIR	FAIR	NO EXTREME LEAN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
712	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	12	GOOD	FAIR	YES OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
713	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	30	0	VERY POOR	VERY POOR	NO DEAD
714	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	20	GOOD	FAIR	YES 50% LCR
715	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	9	FAIR	FAIR	YES ONE SIDED, OVERTOPPED BY ADJACENT TREES
716	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	12	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
717	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER, BOUED TRUNK

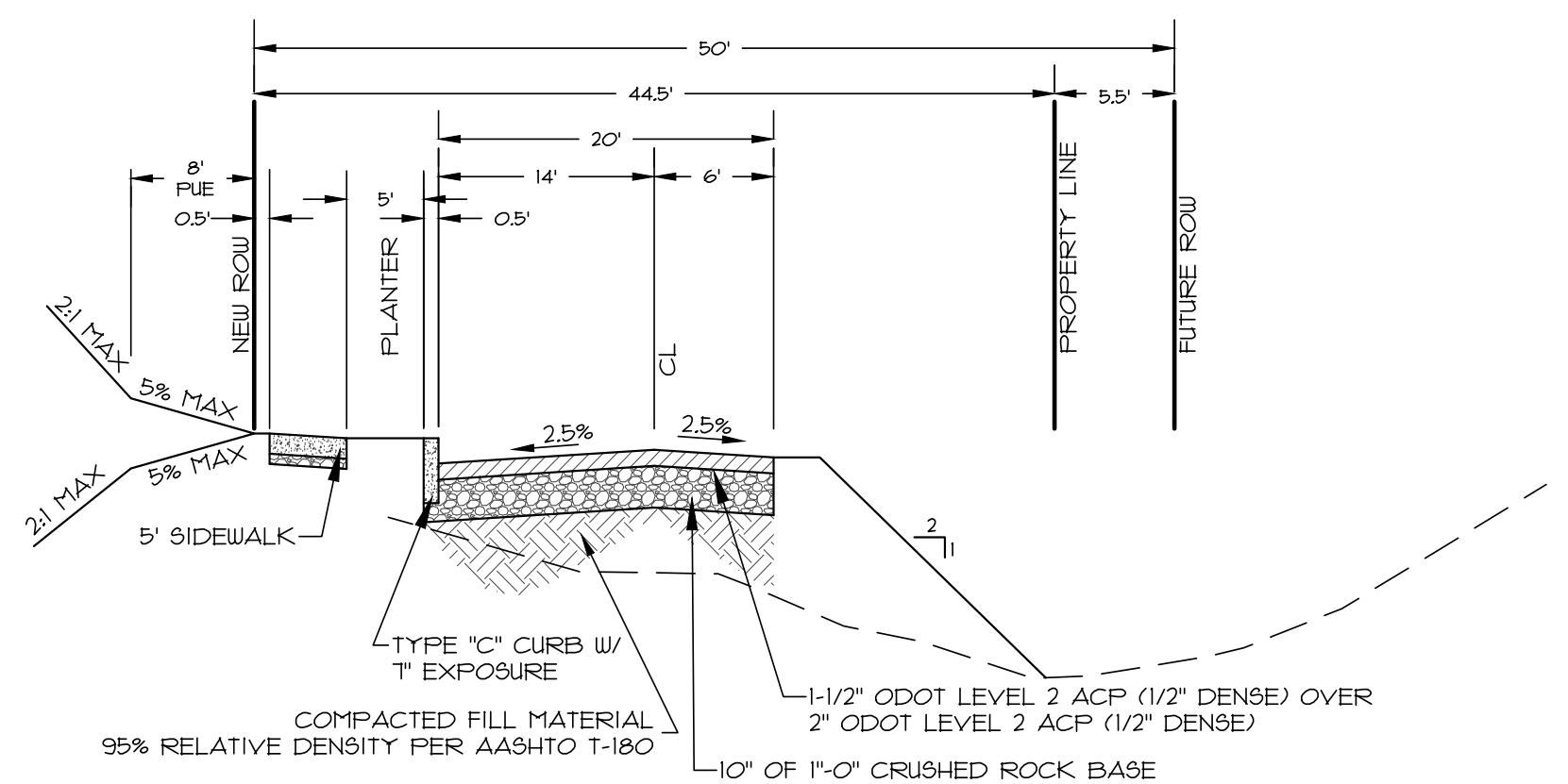
TREE TO BE SAVED OR REMOVED	TREE RETENTION OPTION	"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.					
TREE NO COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	RETENTION OPTION	COMMENTS
118	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	8	POOR	POOR	NO TOP FAILED, SUPPRESSED
119	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	10	FAIR	FAIR	NO ONE SIDED, MARGINAL TRUNK TAPER, KINKED TRUNK, MODERATELY SUPPRESSED
120	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	5	POOR	POOR	NO SUPPRESSED, EXTENSIVE PORRODAEDALEA PINI CONKS
121	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	10	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
122	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	8	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
123	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	8	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, KINKED TRUNK
124	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	10	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER



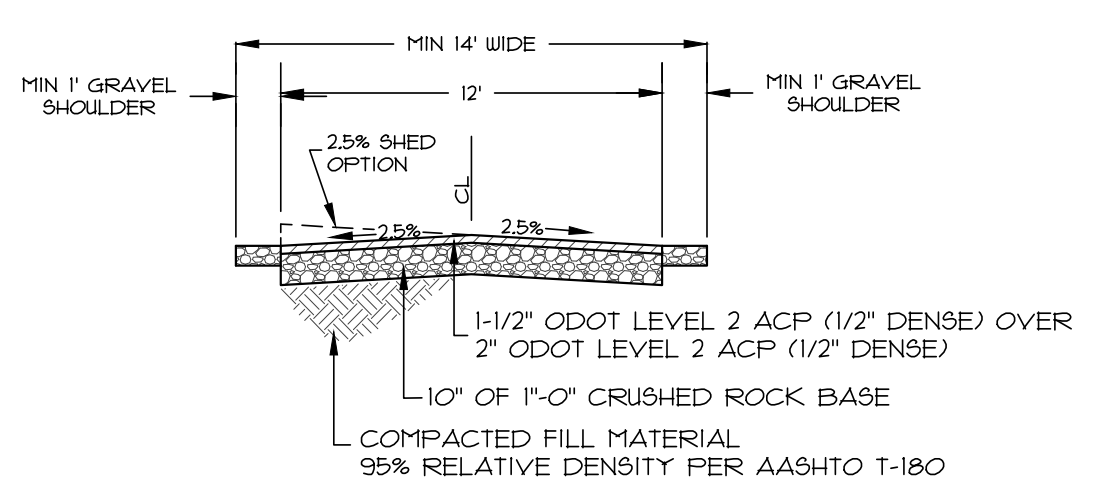
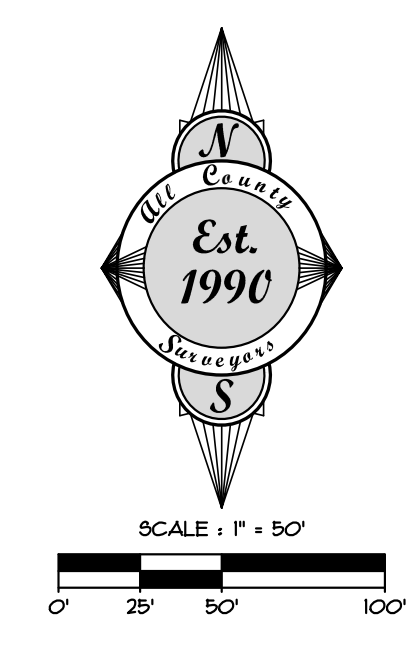
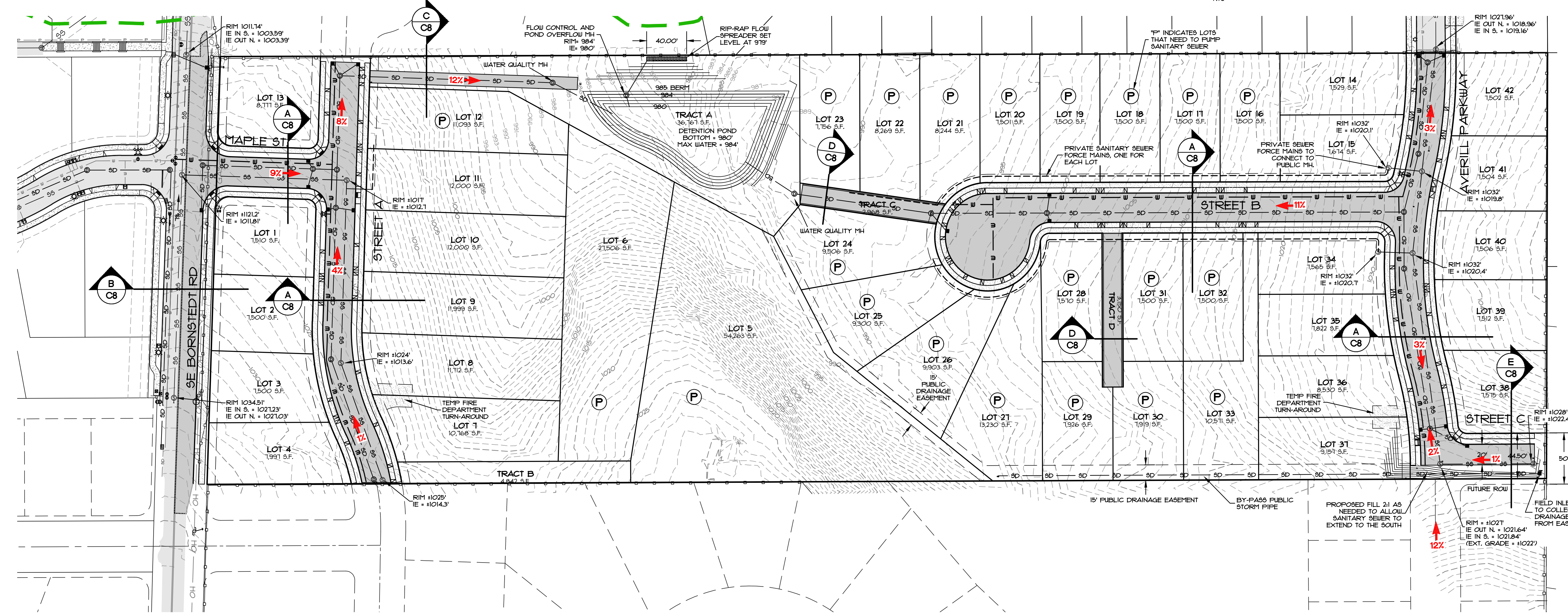
SECTION (A) LOCAL STREET
(PARKING ON BOTH SIDES)
NTS



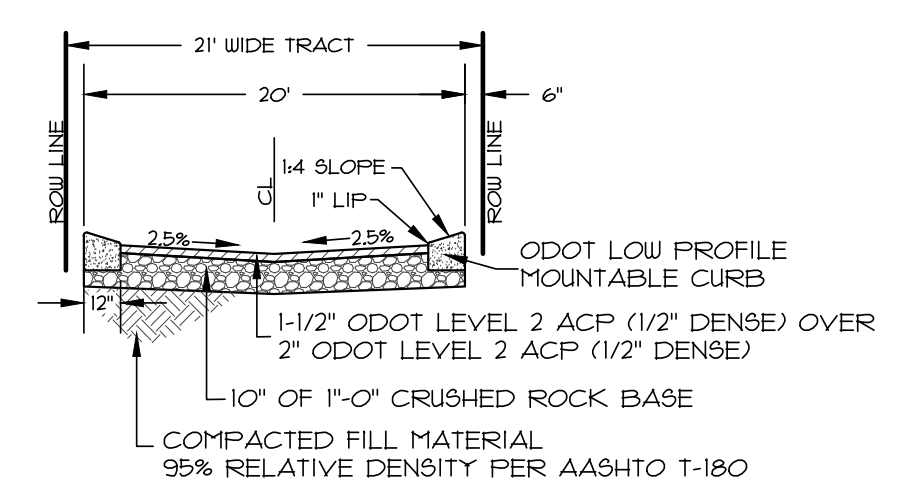
SECTION (B) (MIN 60' ROW)
BORNSTEDT RD.
MINOR ARTERIAL
NTS



SECTION (E) LOCAL STREET
(PARKING ON ONE SIDE)
NTS

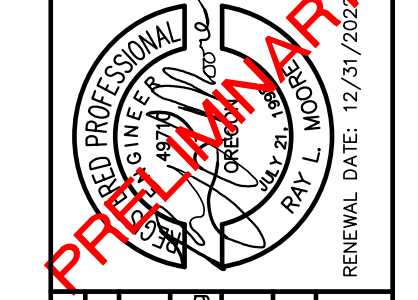


SECTION (C) PUBLIC ACCESS ROAD
NTS



SECTION (D) SHARED PRIVATE DRIVEWAY
(NO PARKING, MAXIMUM 2 LOTS)
NTS

BY		SHEET	C8
REVISION		OF	10
DATE		DESIGNED	RLM
		DRAWN	RLM
		CHECKED	DLH
		APPROVED	RLM

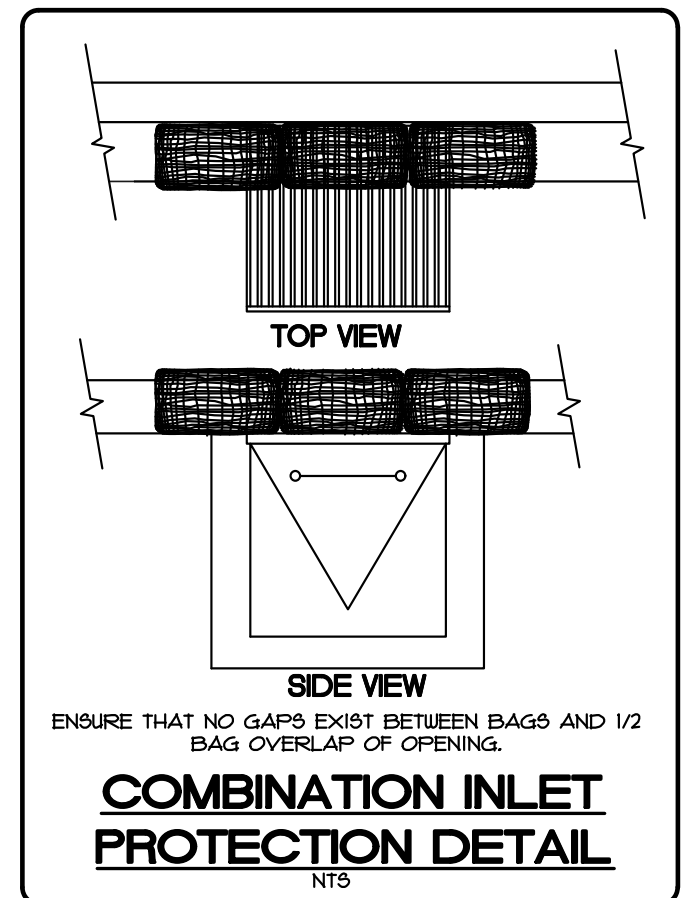
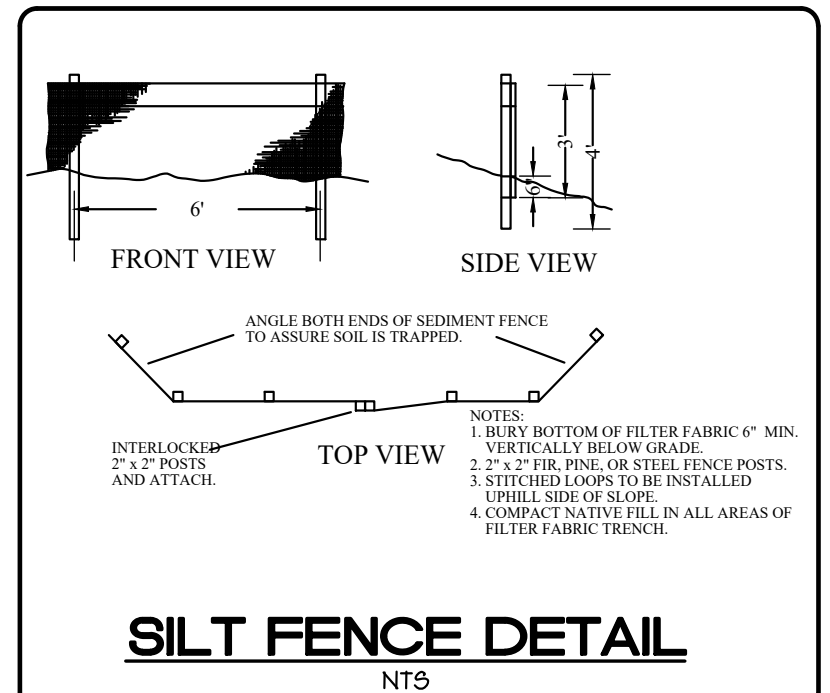
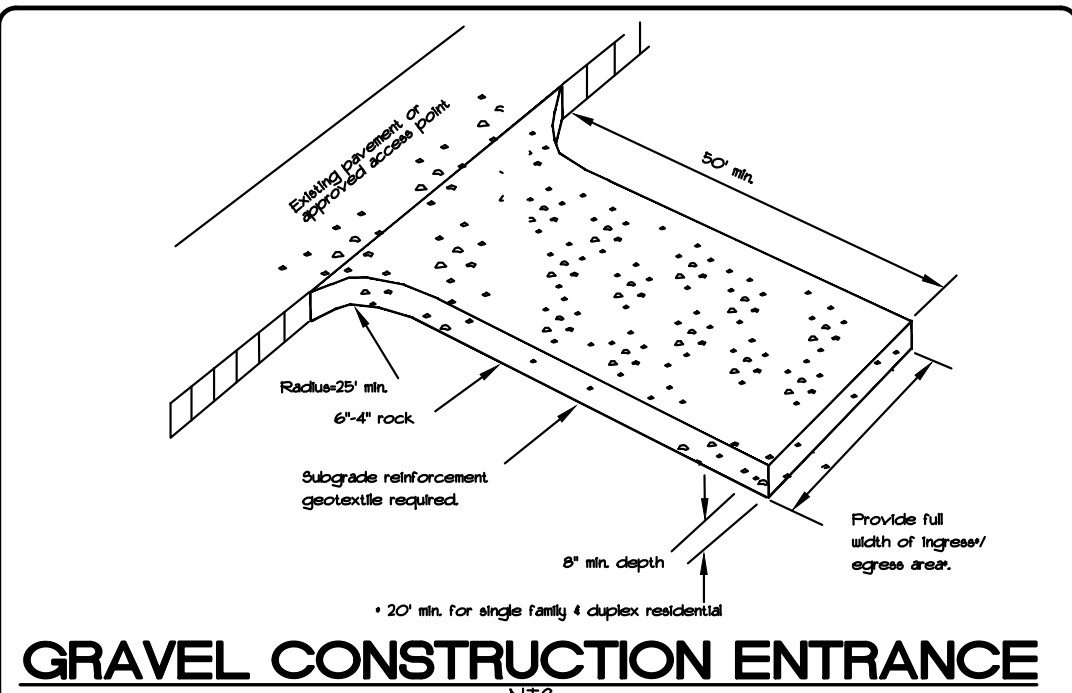
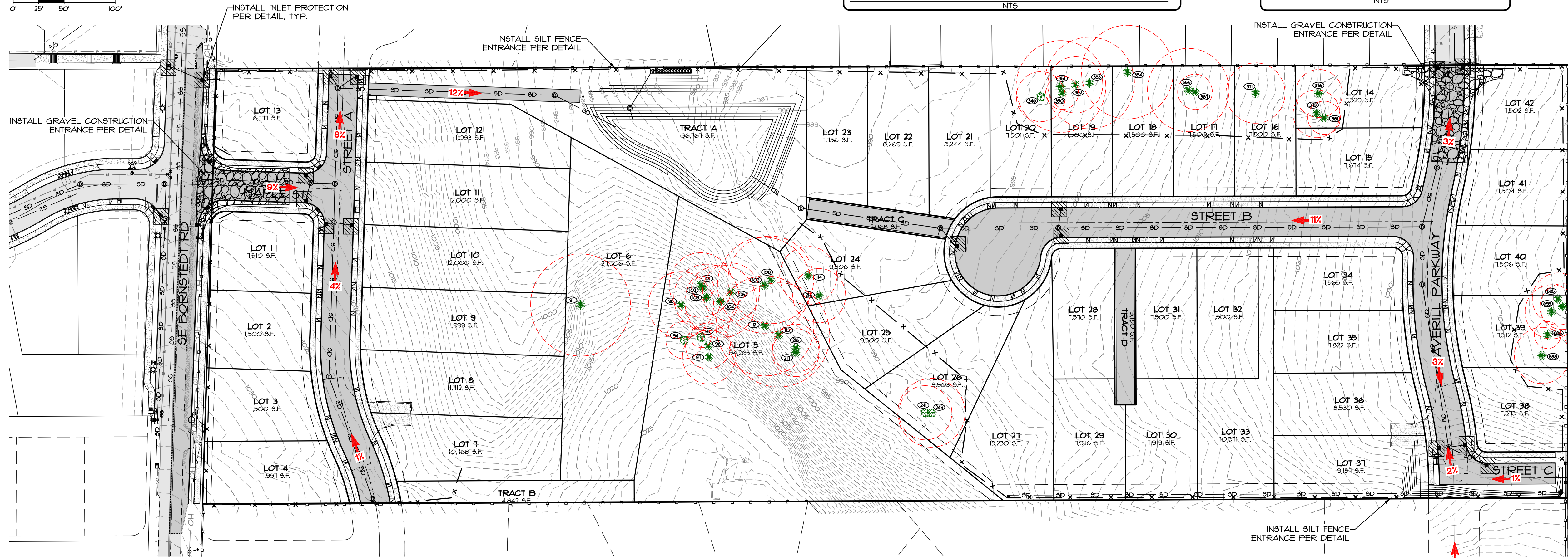


SCALE	N/A	VERT.	1" = 50'
DATE	4-30-21	HORIZ.	1" = 50'
FILE NO.	19-268 - Planning - SFR-404	SECTION	24
LEGAL		RANGE	4E
		TWP.	2S
		SECTION	24

THE BORNSTEDT VIEWS
STREET AND UTILITY PLAN
19618 SE BORNSTEDT ROAD, SANDY, OH

Surveyors & Planners, Inc.
Surveying, Planning and
Civil Engineering
P.O. Box 855 Sandy, OH 44871
Phone: (303) 348-5602
Fax: (303) 668-4730
DATE OF PLOT: 4-30-21

CLIENT:
EVEN BETTER HOMES, INC.
MAC EVEN
P.O. BOX 2021
PRESHAW, OH 43081
PHONE: (503) 348-5602
EMAIL: macc@evenbetterhomes.com



LEGEND

	PROPOSED INLET PROTECTION
	INSTALL SEDIMENT FENCE
	EXISTING GROUND CONTOUR
	PROPOSED FINISH GRADE CONTOUR

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 ENSURE 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 ENSURE 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.

BY	REVISION	SHEET
		C9
		OF 10
DESIGNED: RLM	DRAWN: RLM	CHECKED: DLH
APPROVED: RLM		



SCALE	VERT. N/A	HORIZ. 1" = 50'
DATE	4-30-21	
SECTION	24	
RANGE	25	
LEGAL	4E	

PROJECT: **THE BORNSTEDT VIEWS GRADING AND EROSION CONTROL PLAN**

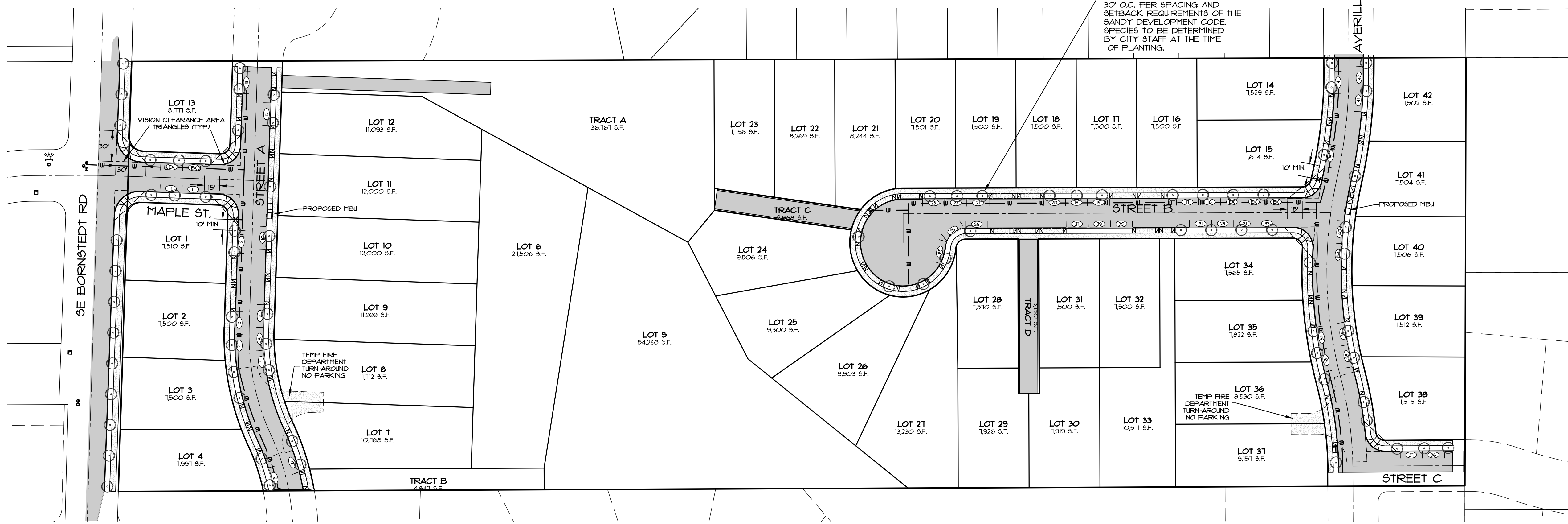
LOCATION: **19618 SE BORNSTEDT ROAD, SANDY, OR**

Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 895 Sandy, OR 97055
Phone: (503) 668-4730
Fax: (503) 668-4730
DATE OF PLOT: 4-30-21

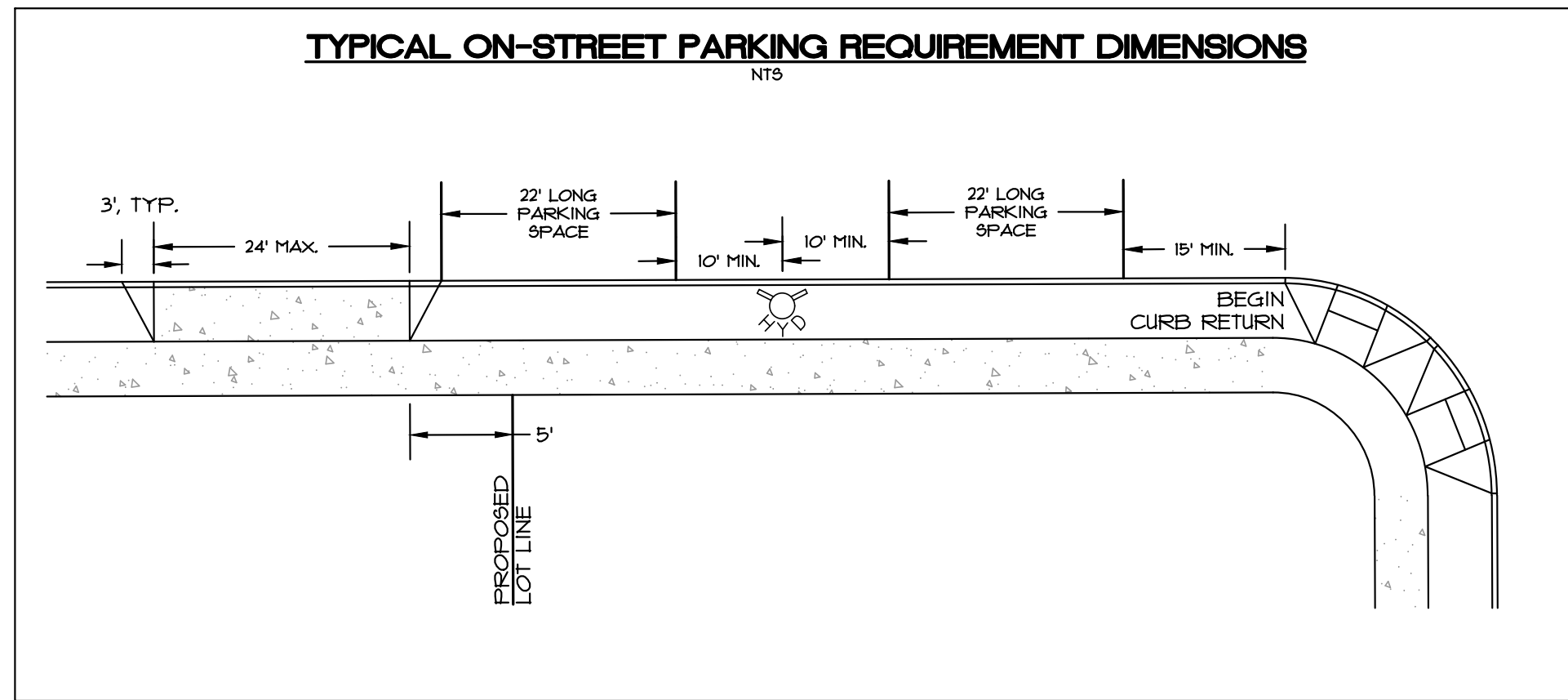
CLIENT: **EVEN BETTER HOMES, INC.**
MAC EVEN
P.O. BOX 2021
PRESHAW
PHONE: (503) 348-5602
EMAIL: macevenbettermhomes.com



SCALE: 1" = 50'

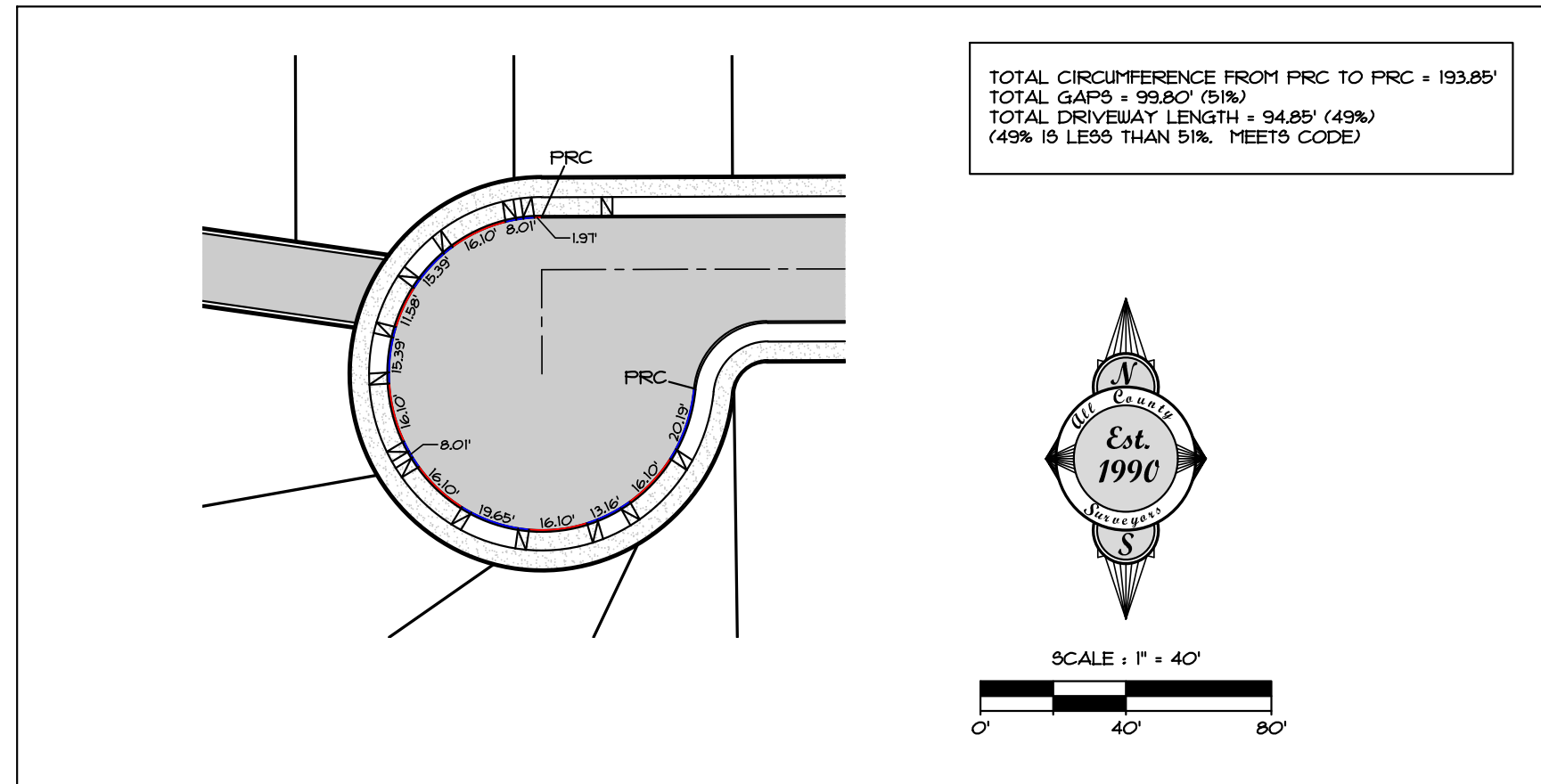


STREET TREES TO BE PLANTED 30' O.C. PER SPACING AND SETBACK REQUIREMENTS OF THE SANDY DEVELOPMENT CODE. SPECIES TO BE DETERMINED BY CITY STAFF AT THE TIME OF PLANTING.



TYPICAL ON-STREET CAR PARKING TOTAL ON-STREET SPACES PROPOSED = 40
MINIMUM REQUIRED = 42

- LEGEND**
- SUBJECT PROPERTY BOUNDARY LINE
 - PROPOSED LOT LINE
 - PROPOSED CURB AND PAVEMENT
 - PROPOSED SIDEWALK
 - PROPOSED UNSTRIPED 22' LONG ON-STREET PARKING SPACE
 - PARKING SPACE NUMBER CORRESPONDING TO LOT NUMBER (EACH SPACE IS WITHIN 300' OF EACH DWELLING)
 - ⊗ PARKING SPACE THAT EXCEEDS THE REQUIREMENT
 - ⊗ PROPOSED FIRE HYDRANT
 - PROPOSED MBU



BY	REVISION	SHEET
		C10
		OF 10
DATE	DESIGNED: RLM	
	DRAWN: RLM	
	CHECKED: DLH	
	APPROVED: RLM	



SCALE	VERT. N/A	HORIZ. 1" = 50'
DATE	4-30-21	
FILE#	19-268 - Planning - STR.dwg	
SECTION	TWP. RANGE	LEGAL
24	2S	4E

PROJECT: **THE BORNSTEDT VIEWS ON-STREET PARKING PLAN**

LOCATION: **19618 SE BORNSTEDT ROAD, SANDY, OR**

Surveyors & Planners, Inc.
 Surveying, Planning and
 Civil Engineering and
 Construction
 P.O. Box 895 Sandy, OR 97055
 Phone: (503) 348-5602
 Fax: (503) 668-4730
 DATE OF PLOT: 4-30-21

CLIENT: **EVEN BETTER HOMES, INC.**
 MAC EVEN
 P.O. BOX 2021
 PRESIDENT
 PHONE: (503) 348-5602
 EMAIL: macc@evenbetterhomes.com

EXHIBIT D

**Preliminary Storm Drainage Report
For: The Bornstedt Views Subdivision**

July 26, 2021

Prepared By:

All County Surveyors and Planners, Inc.
Ray L. Moore, P.E., P.L.S.
P.O. Box 955
Sandy, Oregon 97055
Phone: 503-668-3151
Job #19-268

Prepared For:

Even Better Homes, Inc.
Mac Even
PO Box 2021
Gresham, OR 97030
Phone: 503-348-5602



RENEWAL DATE: 12/31/2022

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Table of Contents

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Detention Sizing Results	3
Water Quality Design	4
Conclusion	4
Existing Conditions Map	Appendix A
Developed Conditions Map	Appendix B
Basin 1 Analysis, Data, and Detention Pond Design	Appendix C
Water Quality Manhole Details	Appendix D

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Project Summary

Purpose

The purpose of this analysis is to

1. Describe existing and proposed site conditions.
2. Provide detention calculations for the 2-yr, 5-yr, 10-yr, and 25-yr storm events.
3. Provide water quality calculations.

Project Location and Description

The Bornstedt Views Subdivision will be constructed in 1 phase. The site is Tax Lot 100, Map 2S 4E 24C, and is approximately 12.7 acres and is located on the east side of SE Bornstedt Road and just south of Jerger Street. Averill Parkway is currently stubbed to the north line of the subject site near the northeast corner.

The site is bisected by a steep ravine running northwest through the site. There are steep slopes on the property (greater than 35%) that will not be developed. The site is currently wooded on the easterly side and a pasture on the west side. This entire site drains to this ravine and then flows north to Tickle Creek. See the Existing Conditions Map in Appendix A.

Proposed Improvements

The proposed 41 lot subdivision will consist of lots 7,500 sf and greater. There will be 12 new lots on the west side of the ravine and 29 lots on the east side. A new detention pond will be constructed in the ravine at the north end of the site. This pond will serve both sides of the development and discharge into the existing drainage way with a rip-rap flow spreader.

The site improvements will include streets, curbs, sidewalks, and utilities. New storm sewer pipes, manholes, and catch basins will be installed to convey storm water to the new public detention systems. See the Developed Conditions Map in Appendix B

The following calculations will demonstrate that the total post-developed release rates from all of the design storm events will not exceed the pre-developed rates as required by the code.

Hydrograph Parameters

Rainfall

The rainfall distribution numbers were taken from the City of Sandy Stormwater Website (<http://www.ci.sandy.or.us/Stormwater/>)

Storm Recurrence Interval	Rainfall (inches)
2 year	3.50
5 year	4.50
10 year	4.80
25 year	5.50

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,C, and D, Cazadero silty clay loam. Hydrologic Group "C"

Areas

Pre-developed area calculations are based on Existing Conditions Map in Appendix A. Post-developed area calculations are based on proposed designs of streets, curbs, and walkways and the proposed homes as shown on Developed Conditions Map in Appendix B.

Basin 1	
Pre-Developed	
Total Area	12.734 ac
Impervious Area	0.130 ac
Pervious Area	12.604 ac
Post-Developed	
Total Area	12.734 ac
Impervious Area	4.791 ac
Pervious Area	7.948 ac

Curve Numbers

Curve Numbers are taken from the 2016 City of Portland Stormwater Management Manual.

Description	CN	Land Use Description
Pre-Developed	70	Woods
Post-Developed Pervious Areas	74	Lawns "Good Condition"
Impervious Areas	98	Buildings, AC, Sidewalks, etc.

Time of Concentration

The times of concentrations (T_c), were assumed for these preliminary calculations.

Basin 1	
Pre-Developed	35 minutes (assumed)
Post-Developed	5 minutes (assumed)

Detention Sizing Results

Hydrographs for the drainage basins 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. The Post-Development flows were routed through the detention facilities and flow control structures were designed to release the water at 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.

Detention System 1 (Sizing Results)

The detention facility for Basin 1 is proposed to be a 4-deep detention pond. **The required storage volume is 35,495-cubic feet. This can be contained in a 4-foot deep pond with a bottom area of 6,464 square feet.** The orifices in the flow control manhole were designed to release the Post-Development Peak-Q's at or below the Pre-Developed Peak-Q's.

See Appendix C for more information and the detailed analysis.

Basin 1, Detention Pond				
Recurrence Interval (years)	Pre-Developed Outflow (cfs)	Developed Outflow (cfs)	Proposed Release Rates (cfs)	Reduction in outflow from Pre-Developed to Proposed
25	4.43	12.47	4.37	1%
10	3.26	10.25	3.24	1%
5	2.79	9.32	2.72	2%
2	1.37	6.36	1.33	3%

Orifice Table		
Detention Pond (Basin 1)		
Orifice	Dia. (inches)	Height (feet)
Bottom	5.51	0
Top	10.45	3.12

A Weir could be used for the top orifice in the flow control structure. See Rectangular, Sharp Crested Weir Calculations in the detailed analysis.

Water Quality Design

CDS Storm Water Treatment Device

Two CDS manholes by Contech Stormwater Solutions will be designed for water quality for this site, one for each drainage basin, see details in Appendix D. The developed impervious area includes AC pavement, sidewalks, and roofs.

The flow (Q) from this runoff was calculated using the rational method ($Q=CIA$) where:

Q = flow (cfs)

C = runoff coefficient = 0.90 for Pavement and Roofs

I = Intensity = 0.2 inches per hour (City of Sandy Water Quality Storm for an "on-line facility")

A = Impervious Area

Basin 1

$Q = (0.90) \times (0.2) \times (4.761) = 0.86$ cfs (total site). Final storm report will detail out the east and west manholes.

The Contech Stormwater Solutions Treatment Device Model CDS2015-4-C has a treatment capacity of 0.7 cfs. Therefore, two of this manholes will work for the entire Basins.

Conclusion

In accordance with the City of Sandy requirements, on-site detention has been designed to maintain existing downstream storm water runoff characteristics and a water quality system has been designed to provide adequate treatment. These calculations demonstrate that the detention and water quality systems are more than adequately sized for the proposed development. Detailed calculations will be completed with the final engineering plans as needed.

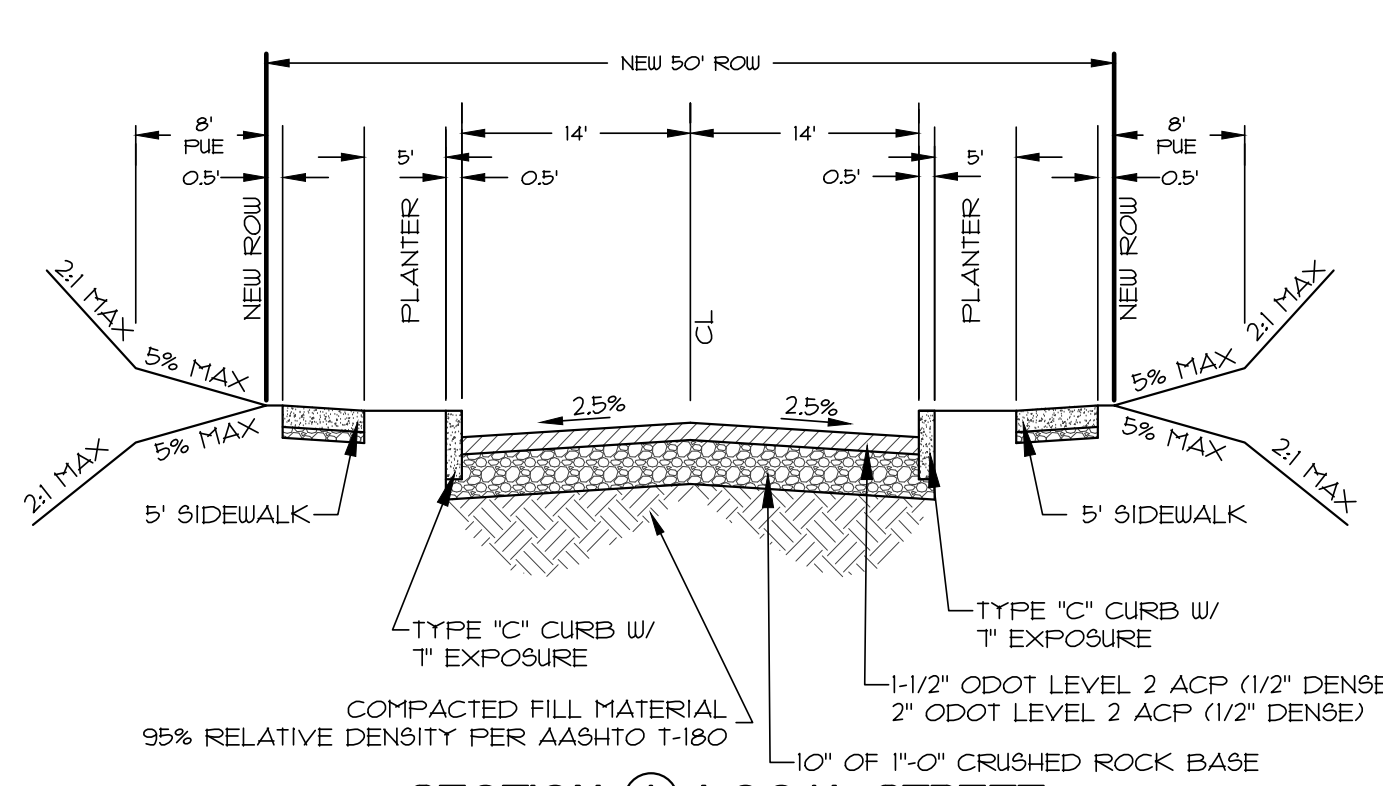
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Appendix A
Existing Conditions Map

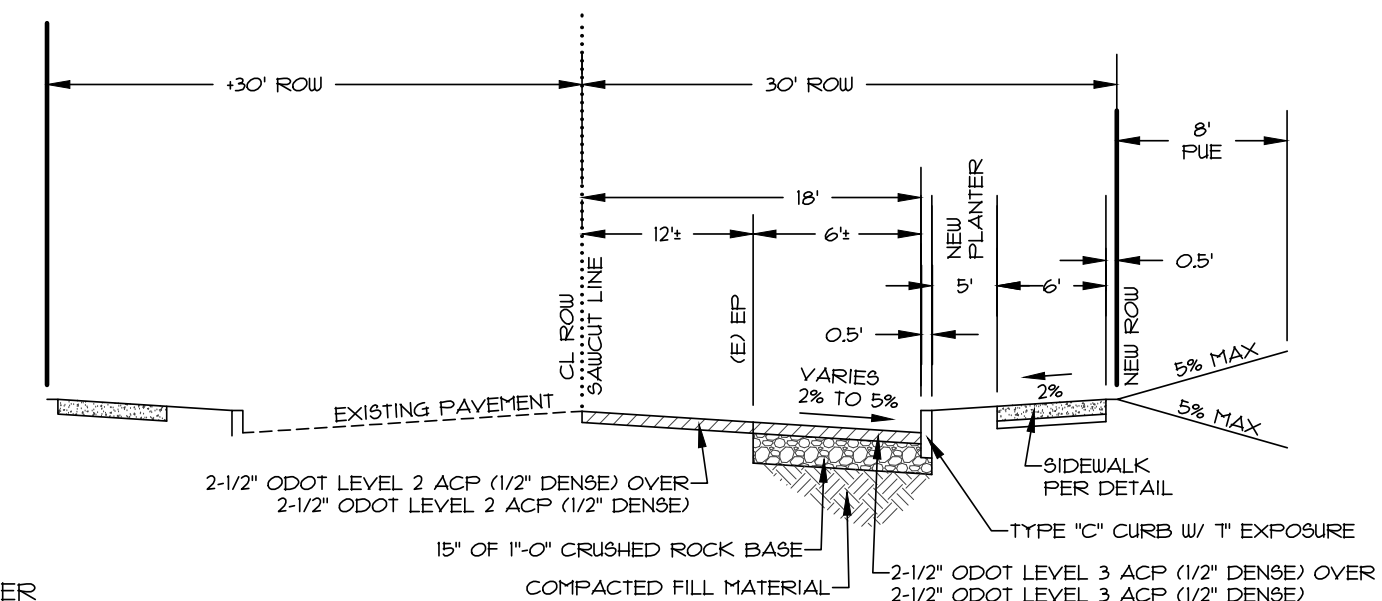
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Appendix B
Developed Conditions Map

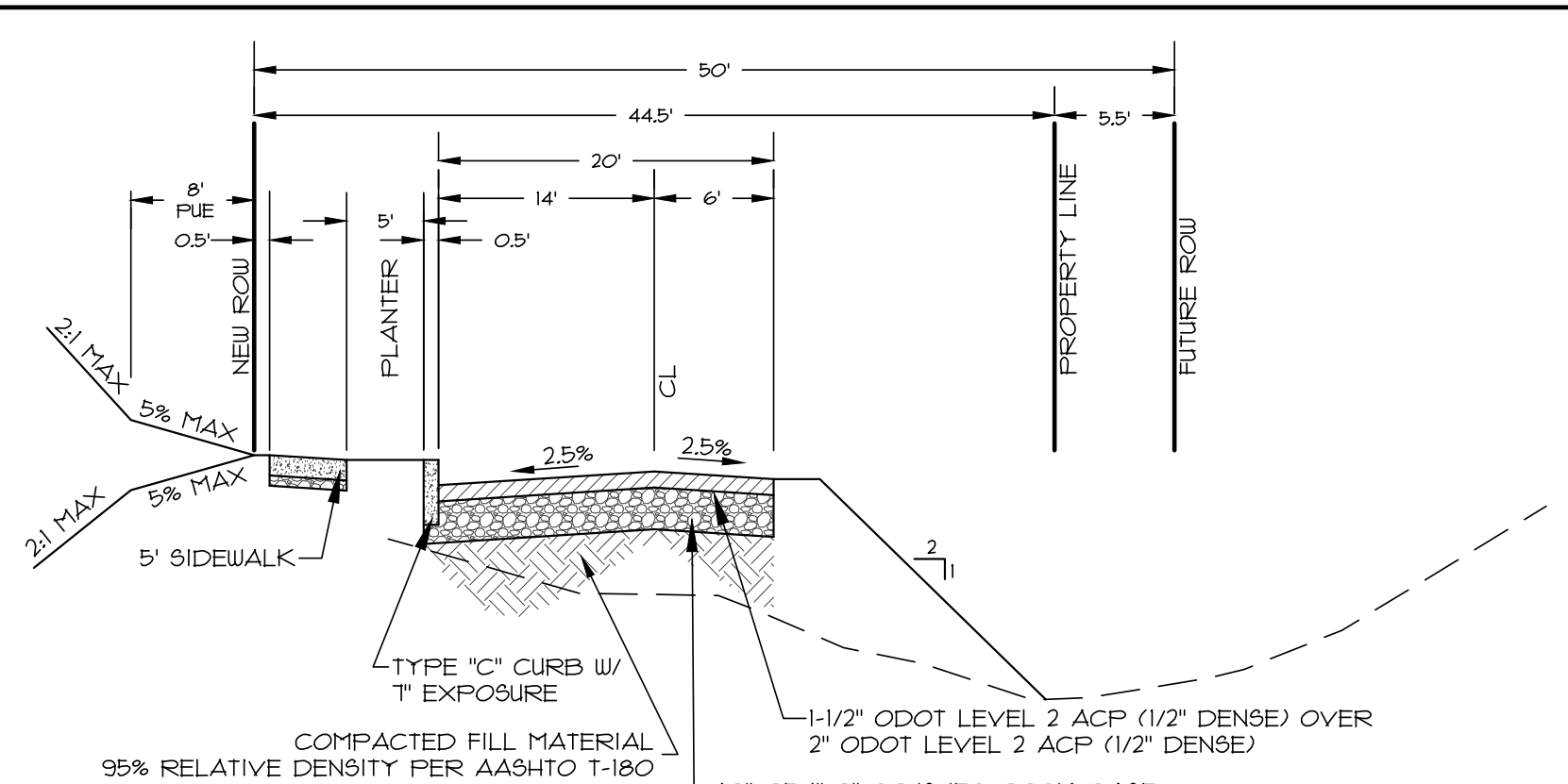
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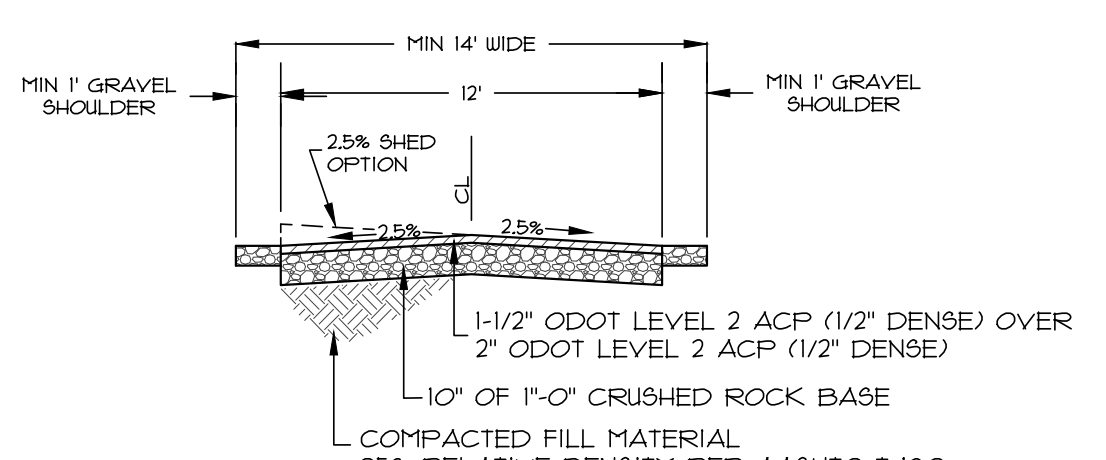
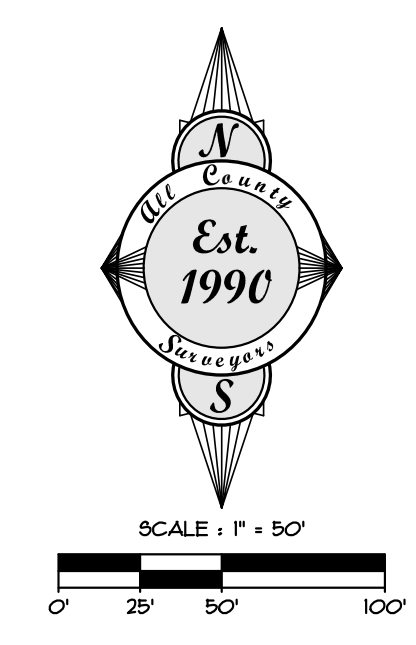
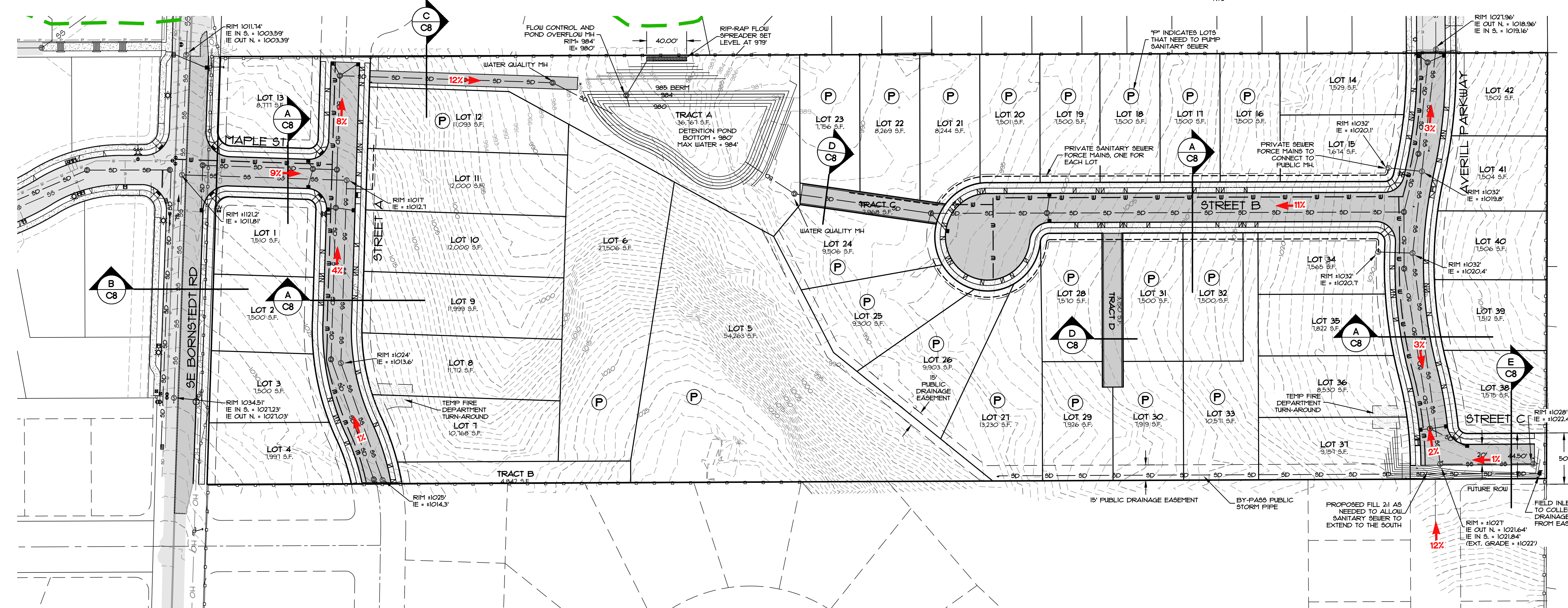
SECTION (A) LOCAL STREET
(PARKING ON BOTH SIDES)
NTS



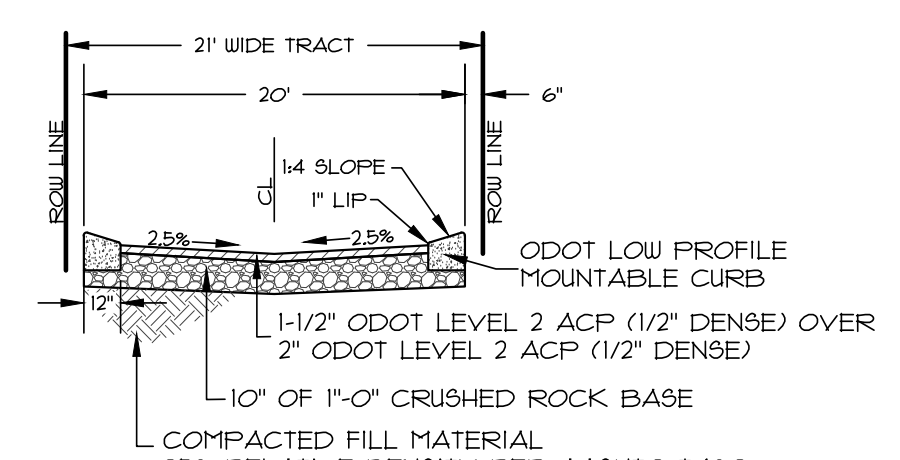
SECTION (B) (MIN 60' ROW)
BORNSTEDT RD.
MINOR ARTERIAL
NTS



SECTION (E) LOCAL STREET
(PARKING ON ONE SIDE)
NTS

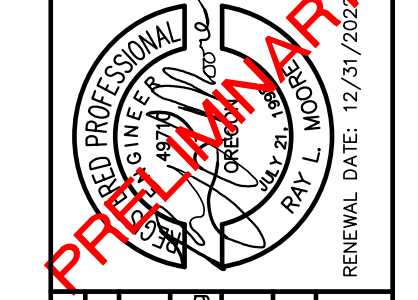


SECTION (C) PUBLIC ACCESS ROAD
NTS



SECTION (D) SHARED PRIVATE DRIVEWAY
(NO PARKING, MAXIMUM 2 LOTS)
NTS

BY		SHEET	C8
REVISION		OF	10
DATE		DESIGNED	RLM
		DRAWN	RLM
		CHECKED	DLH
		APPROVED	RLM



SCALE	N/A	VERT.	1" = 50'
DATE	4-30-21	HORIZ.	1" = 50'
FILE	19-268 - Planning - SFR.dwg		
SECTION	24		
RANGE	4E		
TWP.	2S		
LEGAL			

PROJECT: THE BORNSTEDT VIEWS
STREET AND UTILITY PLAN

LOCATION: 19618 SE BORNSTEDT ROAD, SANDY, OR

Surveyors & Planners, Inc.
Surveying, Planning and
Civil Engineering
P.O. Box 855 Sandy, OR 97055
Phone: (503) 348-5602
Fax: (503) 668-4730
DATE OF PLOT: 4-30-21

CLIENT: EVEN BETTER HOMES, INC.
MAC EVEN
P.O. BOX 2021
PRESHAW
PHONE: (503) 348-5602
EMAIL: macevenbettermhomes.com

Appendix C

Basin 1 Analysis, Data, and Detention Pond Design

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Project Name: The Bornstedt Views - Basin 1 Pond
Hydrograph Analysis Summary

Job # 19-268
 Date: 7/26/2021

Rainfall (year)	Rainfall (inches)
2	3.50
5	4.50
10	4.80
25	5.50
100	0.00

Pre-Developed	
Pervious	
Area =	12.604 acres
CN =	70 na
Impervious	
Area =	0.13 acres
CN =	98 na
Tc =	35 min
Total A =	12.734 acres

Developed	
Pervious	
Area =	7.948 acres
CN =	74 na
Impervious	
Area =	4.761 acres
CN =	98 na
Tc =	5 min
Total A =	12.709 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.

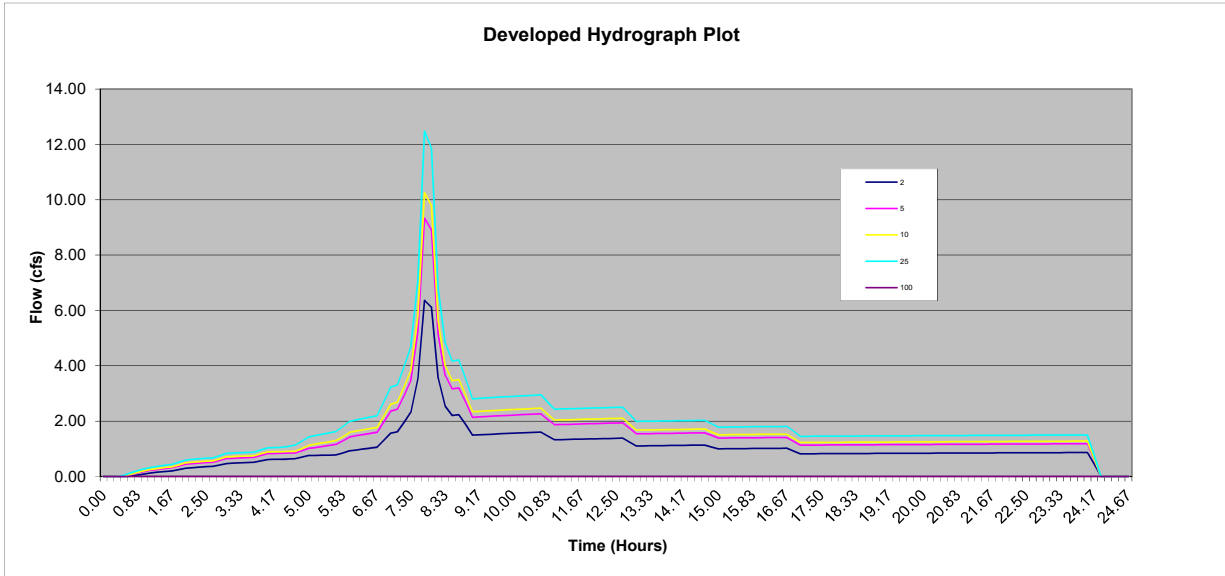
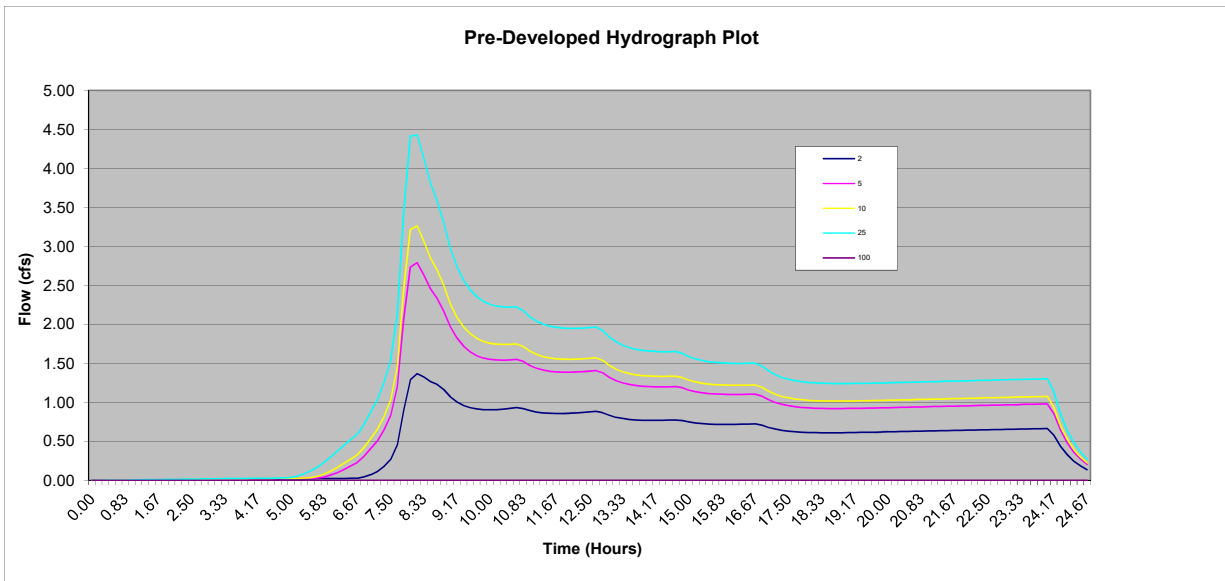
Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	1.37	2.79	3.26	4.43	0.00
Volume	cf =>	47,386	78,180	88,143	112,398	-
Tpeak	min =>	490	490	490	490	10
Tpeak	hr =>	8.17	8.17	8.17	8.17	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	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	0.00	0.00
70	1.17	0.00	0.00	0.00	0.00	0.00
80	1.33	0.00	0.00	0.00	0.01	0.00
90	1.50	0.00	0.01	0.01	0.01	0.00
100	1.67	0.00	0.01	0.01	0.01	0.00
110	1.83	0.00	0.01	0.01	0.01	0.00
120	2.00	0.01	0.01	0.01	0.01	0.00
130	2.17	0.01	0.01	0.01	0.01	0.00
140	2.33	0.01	0.01	0.01	0.01	0.00
150	2.50	0.01	0.01	0.01	0.01	0.00
160	2.67	0.01	0.01	0.01	0.02	0.00
170	2.83	0.01	0.01	0.01	0.02	0.00
180	3.00	0.01	0.01	0.02	0.02	0.00
190	3.17	0.01	0.02	0.02	0.02	0.00
200	3.33	0.01	0.02	0.02	0.02	0.00
210	3.50	0.01	0.02	0.02	0.02	0.00
220	3.67	0.01	0.02	0.02	0.02	0.00
230	3.83	0.01	0.02	0.02	0.02	0.00
240	4.00	0.01	0.02	0.02	0.02	0.00
250	4.17	0.01	0.02	0.02	0.03	0.00
260	4.33	0.02	0.02	0.02	0.03	0.00
270	4.50	0.02	0.02	0.02	0.03	0.00
280	4.67	0.02	0.02	0.02	0.03	0.00
290	4.83	0.02	0.02	0.02	0.03	0.00
300	5.00	0.02	0.02	0.03	0.03	0.00
310	5.17	0.02	0.02	0.03	0.05	0.00
320	5.33	0.02	0.03	0.03	0.08	0.00
330	5.50	0.02	0.03	0.03	0.12	0.00
340	5.67	0.02	0.03	0.05	0.17	0.00
350	5.83	0.02	0.04	0.08	0.23	0.00
360	6.00	0.02	0.07	0.12	0.30	0.00
370	6.17	0.02	0.10	0.17	0.37	0.00
380	6.33	0.02	0.14	0.22	0.45	0.00
390	6.50	0.02	0.18	0.27	0.52	0.00
400	6.67	0.03	0.23	0.33	0.59	0.00
410	6.83	0.04	0.31	0.42	0.71	0.00
420	7.00	0.07	0.40	0.54	0.88	0.00
430	7.17	0.11	0.50	0.65	1.03	0.00
440	7.33	0.18	0.65	0.82	1.25	0.00
450	7.50	0.27	0.83	1.03	1.54	0.00
460	7.67	0.45	1.20	1.46	2.11	0.00
470	7.83	0.90	2.06	2.45	3.43	0.00
480	8.00	1.29	2.73	3.22	4.42	0.00
490	8.17	1.37	2.79	3.26	4.43	0.00
500	8.33	1.33	2.64	3.07	4.13	0.00
510	8.50	1.27	2.46	2.85	3.81	0.00

Developed Hydrographs					
	2	5	10	25	100
Qpeak	6.36	9.32	10.25	12.47	0.00
Volume	92,187	130,544	142,450	170,774	-
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 (min)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00
30	0.00	0.01	0.02	0.04	0.00
40	0.02	0.06	0.08	0.13	0.00
50	0.05	0.13	0.15	0.21	0.00
60	0.09	0.18	0.21	0.28	0.00
70	0.13	0.22	0.25	0.33	0.00
80	0.16	0.26	0.29	0.37	0.00
90	0.18	0.29	0.32	0.40	0.00
100	0.20	0.31	0.35	0.43	0.00
110	0.25	0.38	0.42	0.51	0.00
120	0.30	0.45	0.49	0.60	0.00
130	0.32	0.47	0.51	0.62	0.00
140	0.34	0.49	0.53	0.64	0.00
150	0.35	0.50	0.55	0.66	0.00
160	0.37	0.52	0.56	0.67	0.00
170	0.42	0.58	0.63	0.75	0.00
180	0.47	0.65	0.71	0.83	0.00
190	0.48	0.66	0.72	0.85	0.00
200	0.49	0.67	0.73	0.86	0.00
210	0.50	0.68	0.74	0.86	0.00
220	0.51	0.69	0.75	0.87	0.00
230	0.56	0.76	0.82	0.95	0.00
240	0.61	0.82	0.89	1.03	0.00
250	0.62	0.83	0.89	1.04	0.00
260	0.63	0.84	0.90	1.05	0.00
270	0.63	0.84	0.91	1.09	0.00
280	0.64	0.85	0.91	1.13	0.00
290	0.70	0.93	1.01	1.28	0.00
300	0.76	1.01	1.13	1.43	0.00
310	0.76	1.05	1.17	1.48	0.00
320	0.77	1.08	1.21	1.53	0.00
330	0.77	1.12	1.26	1.58	0.00
340	0.78	1.16	1.29	1.62	0.00
350	0.84	1.29	1.44	1.80	0.00
360	0.93	1.43	1.59	1.99	0.00
370	0.96	1.47	1.64	2.04	0.00
380	0.99	1.52	1.69	2.10	0.00
390	1.02	1.56	1.73	2.15	0.00
400	1.05	1.60	1.77	2.19	0.00
410	1.30	1.97	2.18	2.70	0.00
420	1.56	2.36	2.61	3.22	0.00
430	1.62	2.43	2.68	3.30	0.00
440	1.97	2.94	3.25	3.99	0.00
450	2.34	3.48	3.84	4.71	0.00
460	3.55	5.24	5.78	7.06	0.00
470	6.36	9.32	10.25	12.47	0.00
480	6.12	8.91	9.78	11.86	0.00
490	3.55	5.14	5.64	6.81	0.00
500	2.54	3.66	4.00	4.83	0.00
510	2.20	3.16	3.46	4.17	0.00

Pre-Developed Hydrographs							Developed Hydrographs					
Year	=====>	2	5	10	25	100	2	5	10	25	100	
Qpeak	cfs =>	1.37	2.79	3.26	4.43	0.00	6.36	9.32	10.25	12.47	0.00	
Volume	cf =>	47,386	78,180	88,143	112,398	-	92,187	130,544	142,450	170,774	-	
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)	
1220	20.33	0.62	0.93	1.03	1.25	0.00	0.84	1.16	1.25	1.48	0.00	
1230	20.50	0.63	0.94	1.03	1.26	0.00	0.84	1.16	1.25	1.48	0.00	
1240	20.67	0.63	0.94	1.03	1.26	0.00	0.85	1.16	1.26	1.48	0.00	
1250	20.83	0.63	0.94	1.04	1.26	0.00	0.85	1.16	1.26	1.48	0.00	
1260	21.00	0.63	0.94	1.04	1.26	0.00	0.85	1.16	1.26	1.48	0.00	
1270	21.17	0.63	0.94	1.04	1.26	0.00	0.85	1.16	1.26	1.48	0.00	
1280	21.33	0.63	0.95	1.04	1.27	0.00	0.85	1.17	1.26	1.48	0.00	
1290	21.50	0.64	0.95	1.04	1.27	0.00	0.85	1.17	1.26	1.48	0.00	
1300	21.67	0.64	0.95	1.05	1.27	0.00	0.85	1.17	1.26	1.49	0.00	
1310	21.83	0.64	0.95	1.05	1.27	0.00	0.85	1.17	1.26	1.49	0.00	
1320	22.00	0.64	0.95	1.05	1.28	0.00	0.85	1.17	1.26	1.49	0.00	
1330	22.17	0.64	0.96	1.05	1.28	0.00	0.85	1.17	1.27	1.49	0.00	
1340	22.33	0.65	0.96	1.05	1.28	0.00	0.86	1.17	1.27	1.49	0.00	
1350	22.50	0.65	0.96	1.06	1.28	0.00	0.86	1.17	1.27	1.49	0.00	
1360	22.67	0.65	0.96	1.06	1.28	0.00	0.86	1.17	1.27	1.49	0.00	
1370	22.83	0.65	0.96	1.06	1.29	0.00	0.86	1.17	1.27	1.49	0.00	
1380	23.00	0.65	0.97	1.06	1.29	0.00	0.86	1.18	1.27	1.49	0.00	
1390	23.17	0.65	0.97	1.06	1.29	0.00	0.86	1.18	1.27	1.50	0.00	
1400	23.33	0.66	0.97	1.07	1.29	0.00	0.86	1.18	1.27	1.50	0.00	
1410	23.50	0.66	0.97	1.07	1.29	0.00	0.86	1.18	1.27	1.50	0.00	
1420	23.67	0.66	0.97	1.07	1.30	0.00	0.86	1.18	1.28	1.50	0.00	
1430	23.83	0.66	0.98	1.07	1.30	0.00	0.86	1.18	1.28	1.50	0.00	
1440	24.00	0.66	0.98	1.07	1.30	0.00	0.87	1.18	1.28	1.50	0.00	
1450	24.17	0.58	0.86	0.94	1.14	0.00	0.43	0.59	0.64	0.75	0.00	
1460	24.33	0.44	0.64	0.71	0.85	0.00	0.00	0.00	0.00	0.00	0.00	
1470	24.50	0.33	0.48	0.53	0.64	0.00	0.00	0.00	0.00	0.00	0.00	
1480	24.67	0.25	0.36	0.40	0.48	0.00	0.00	0.00	0.00	0.00	0.00	
1490	24.67	0.18	0.27	0.30	0.36	0.00	0.00	0.00	0.00	0.00	0.00	
1500	24.67	0.14	0.20	0.22	0.27	0.00	0.00	0.00	0.00	0.00	0.00	

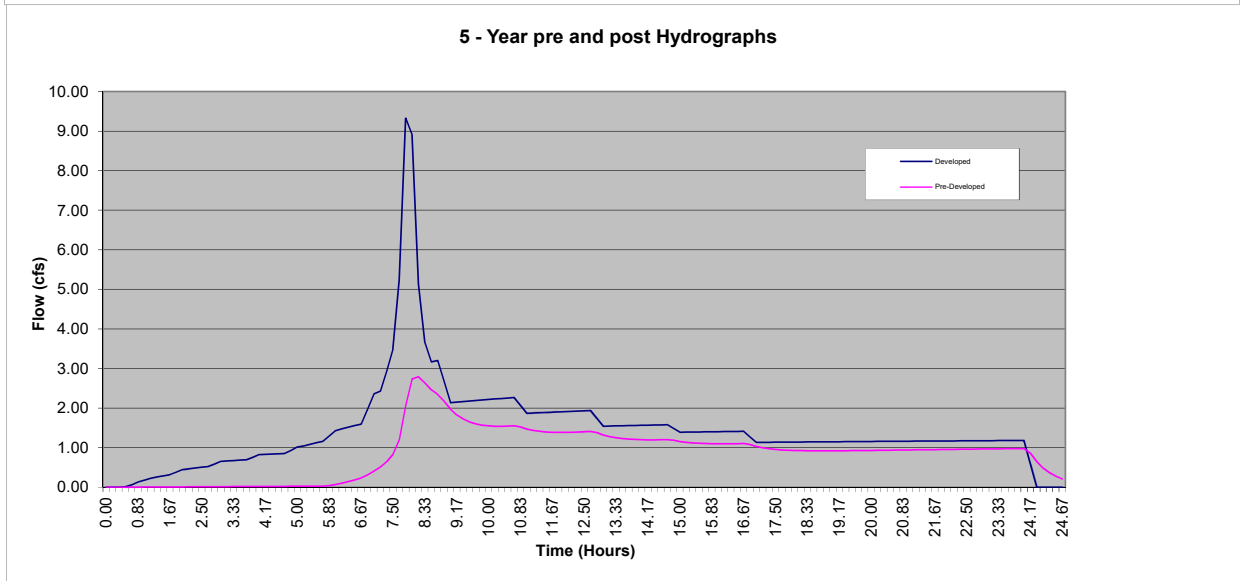
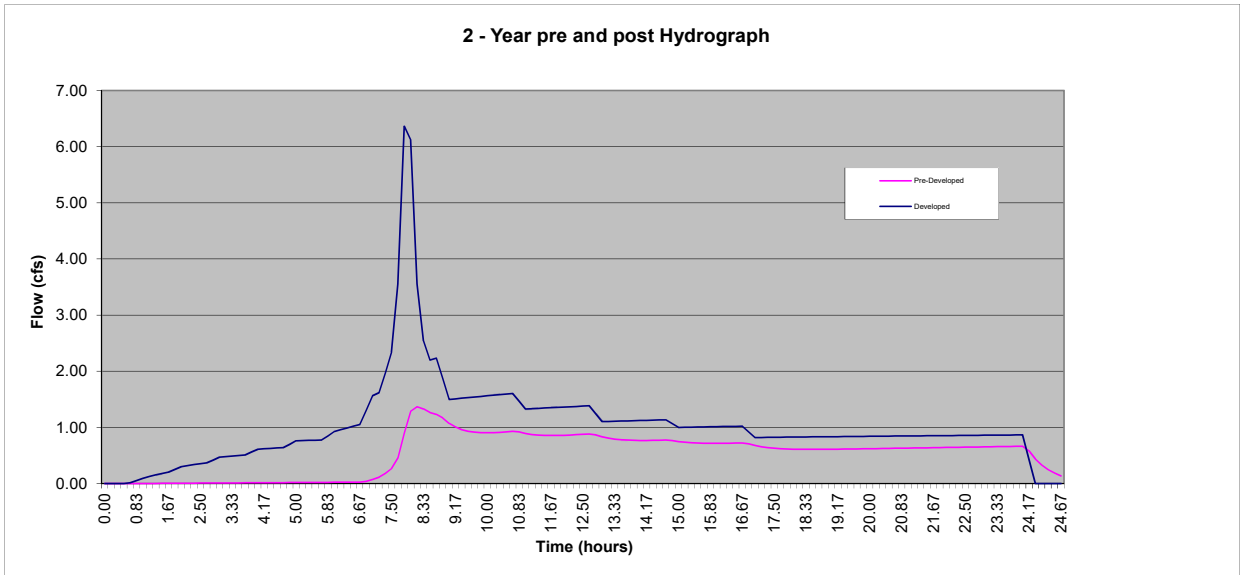
Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	1.37	2.79	3.26	4.43	0.00
Volume	cf =>	47,386	78,180	88,143	112,398	-
Tpeak	min =>	490	490	490	490	10
Tpeak	hr =>	8.17	8.17	8.17	8.17	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	6.36	9.32	10.25	12.47	0.00
Volume	92,187	130,544	142,450	170,774	-
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	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



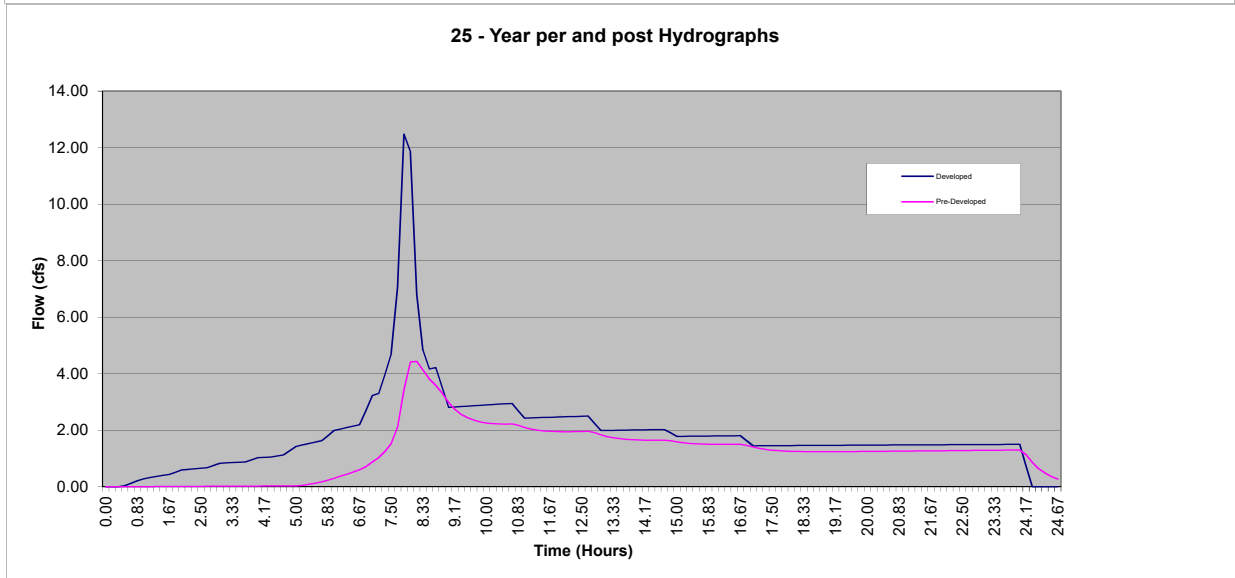
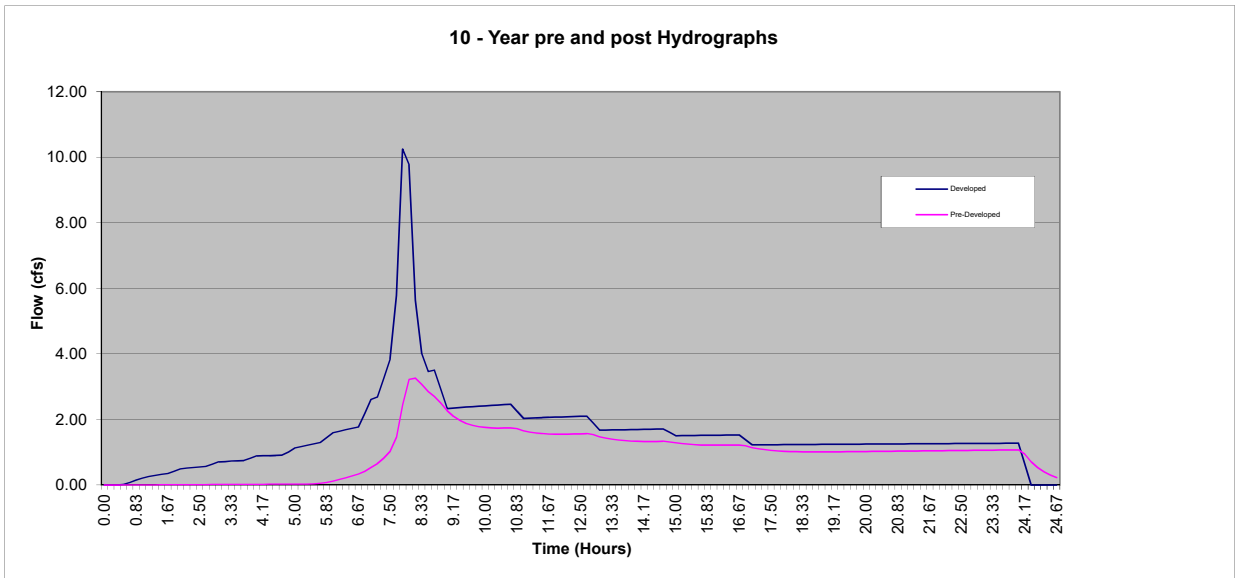
Pre-Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	1.37	2.79	3.26	4.43	0.00
Volume	cf =>	47,386	78,180	88,143	112,398	-
Tpeak	min =>	490	490	490	490	10
Tpeak	hr =>	8.17	8.17	8.17	8.17	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	6.36	9.32	10.25	12.47	0.00
Volume	92,187	130,544	142,450	170,774	-
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	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	1.37	2.79	3.26	4.43	0.00
Volume	cf =>	47,386	78,180	88,143	112,398	-
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	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
	6.36	9.32	10.25	12.47	0.00
	92,187	130,544	142,450	170,774	-
	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)



Project Name: The Bornstedt Views - Basin 1 Pond
Detention System Summary

Job # 19-268
 Date: 7/26/2021

Note: The detention system design is based on the King County Model "Facility Design Routine".

1) Detention Facility Design Input:

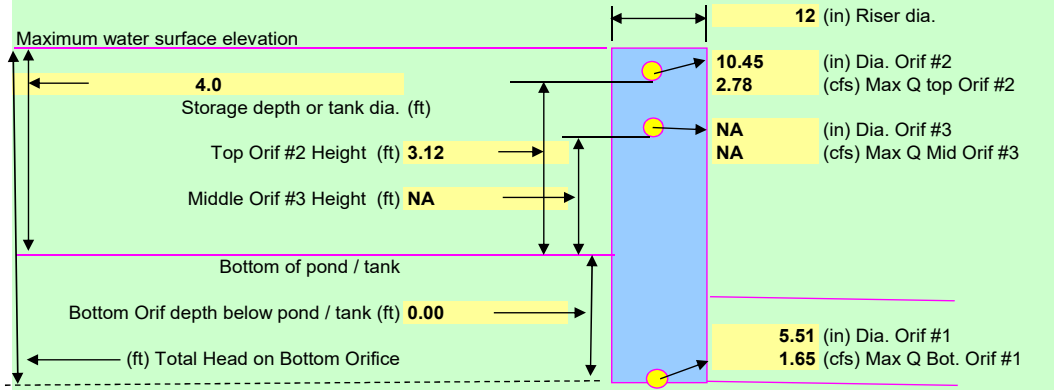
2) Type of facility:	USER	
3) Pond side slopes:	3 NA in USER mode	
4) Pond storage depth:	4 ft (from bottom of pond to overflow)	
5) Vertical permeability	0 min/in	
6) Number of orifices:	2	
7) Riser dia. =>	12 in	
8) Orifice coefficient	0.62 (typically 0.62)	
9) IE - bottom orifice:	0 ft (distance below bottom of pond - Negative #)	
10) Max Q Bottom Orif. #1	1.65 cfs	
11) Top Orif #2 Height =	3.12 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	12.47	4.43	4.37	3.97	35,495
10	10.25	3.26	3.24	3.45	29,864
5	9.32	2.79	2.72	3.29	28,094
2	6.36	1.37	1.33	2.59	20,949
Required Storage =====					35,495

	Bottom Orif.	Middle Orif.	Top Orif.	Optional Weir Design (for top orifice)
Total Q =	1.65	0.00	2.78	1.35 La (ft)
Head (ft) =	4.00	0.00	0.88	154.38 < deg.
Dist. from bottom of pond (ft) =	0.00	NA	3.12	Weir is an option
Orif. Dia. (in) =	5.51	0.00	10.45	

FLOW CONTROL STRUCTURE SCHEMATIC



Project Name: The Bornstedt Views - Basin 1 Pond
Detention Facility Type

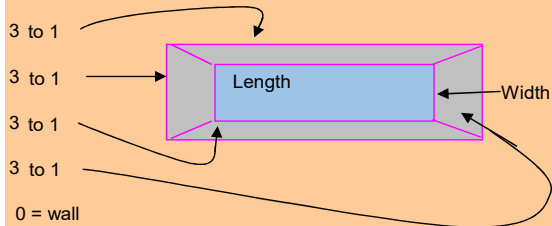
Job # 19-268
Date: 7/26/2021

Detention Facility Type:

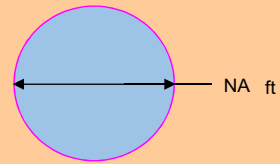
USER

L = NA ft
W = NA ft
D = 4.0 ft
Pond Area = NA sf

DETENTION POND
NA



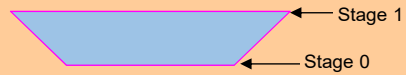
DETENTION TANK
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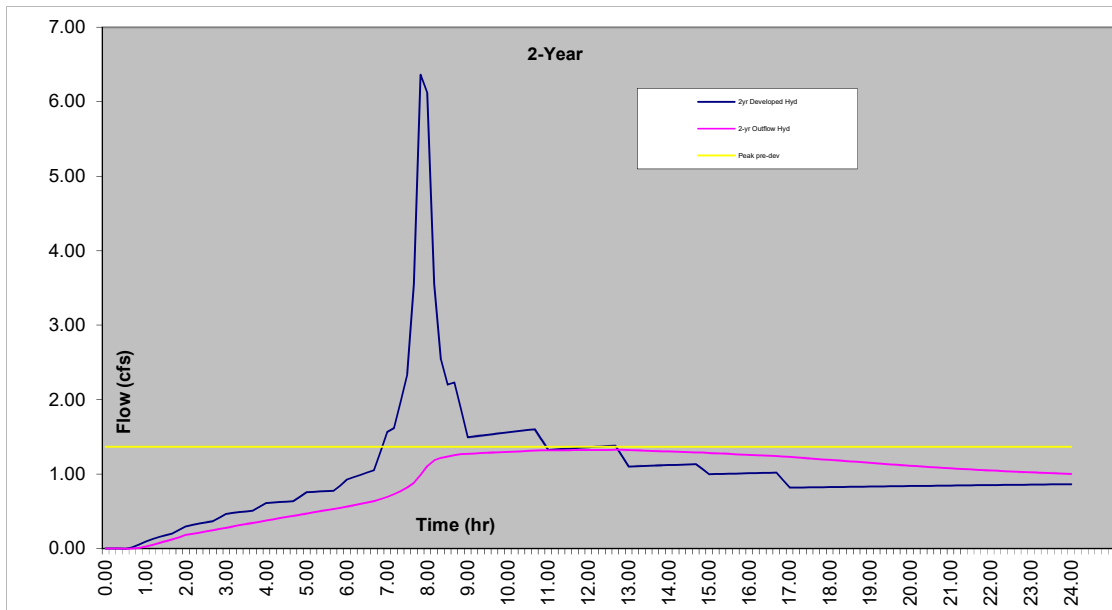
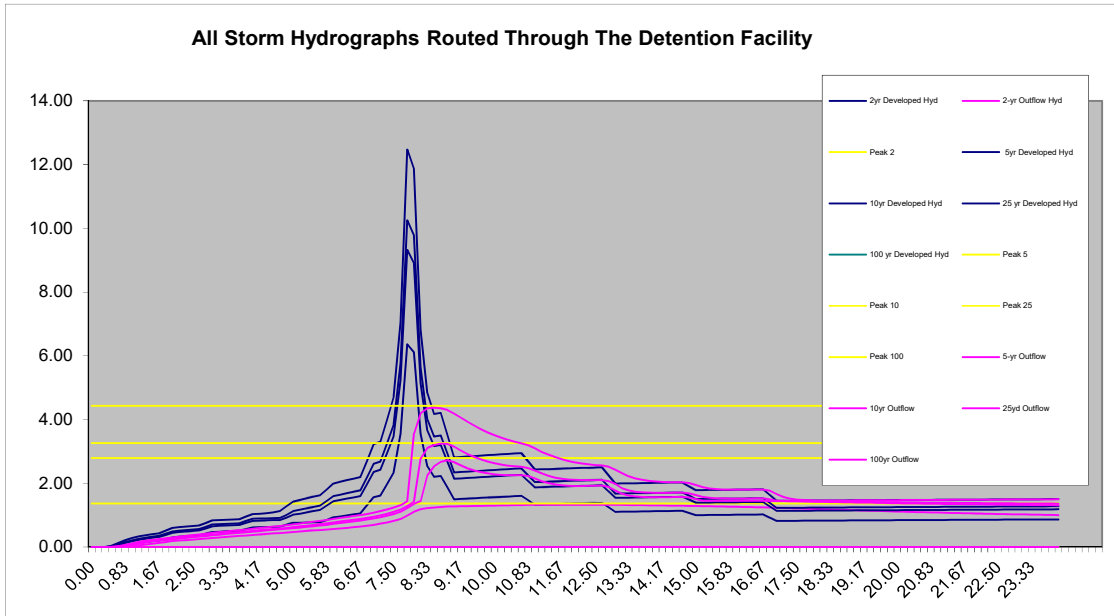


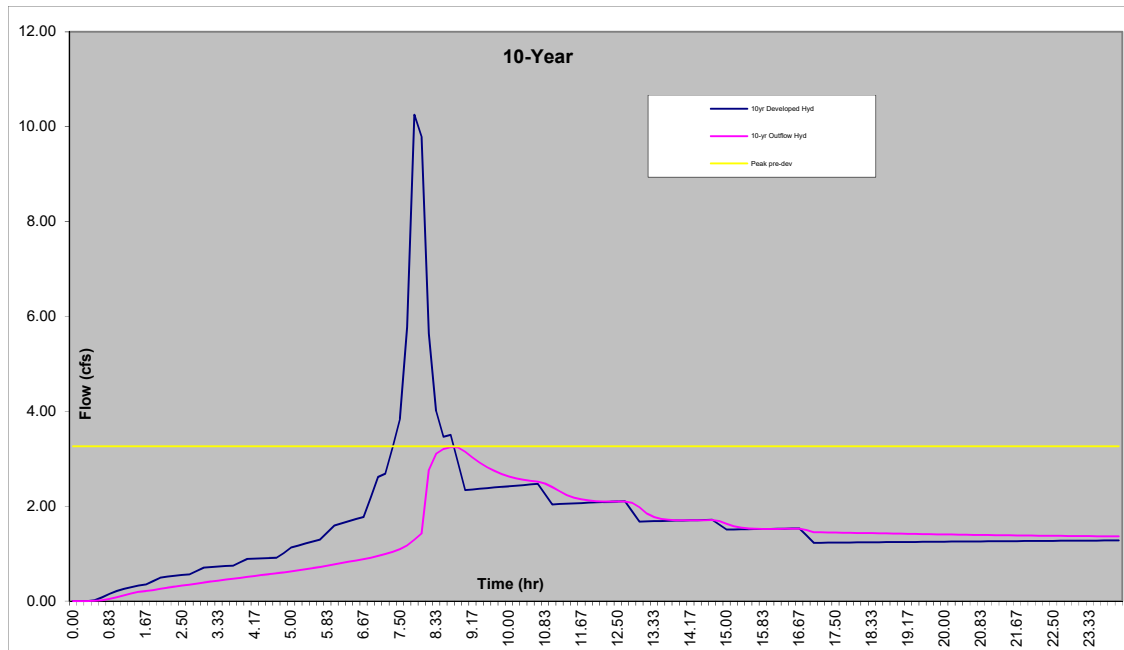
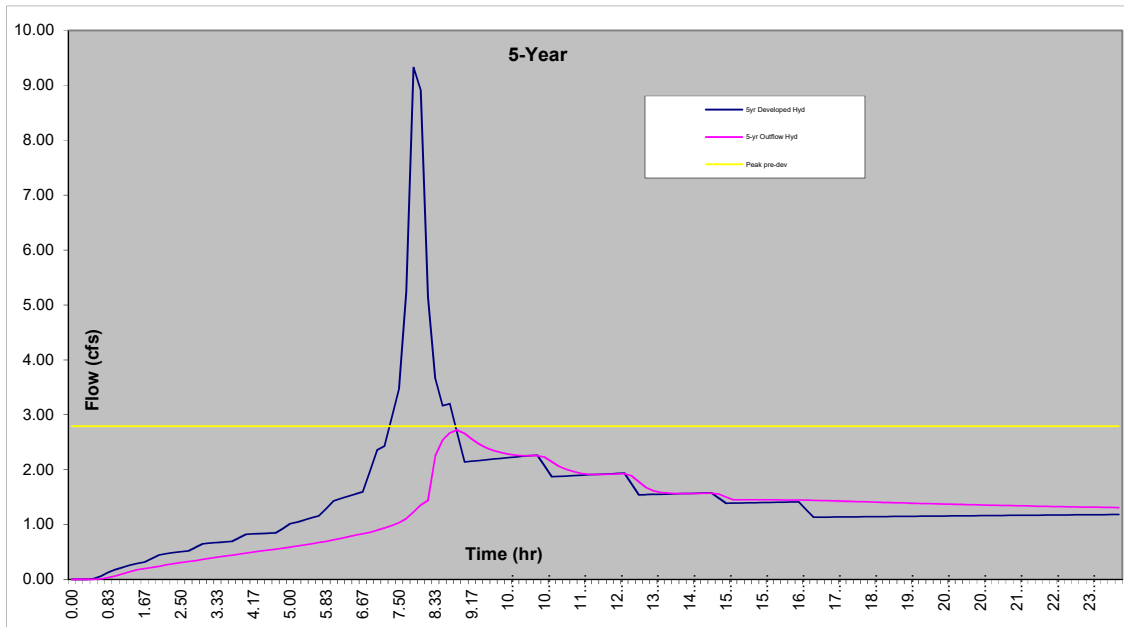
USER DEFINED POND

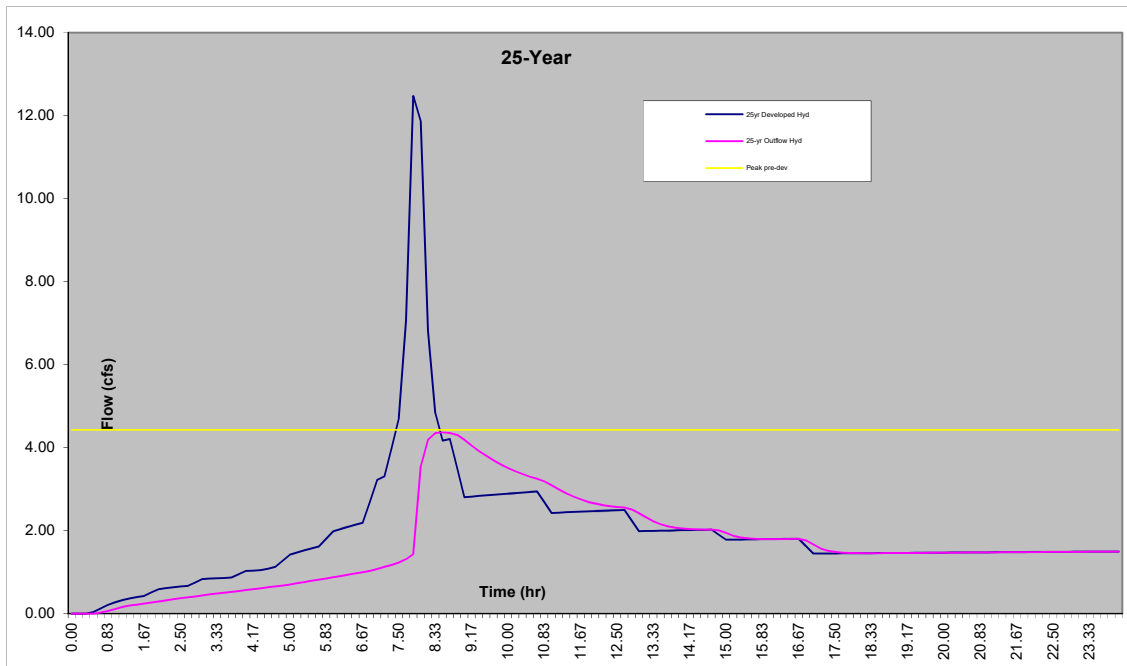
Pond Geometry

Stage (ft)	Area (sf)
0	6,464
1	7,645
2	8,904
3	10,242
4	11,656
5	12,317
6	13,000
7	14,000
8	15,000
9	16,000
10	17,000
11	18,000
12	18,000
13	18,000
14	18,000
15	18,000





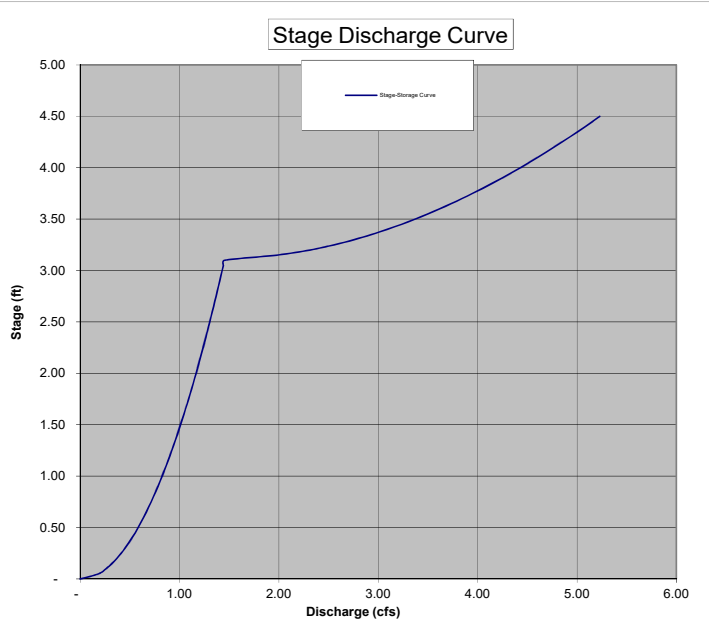
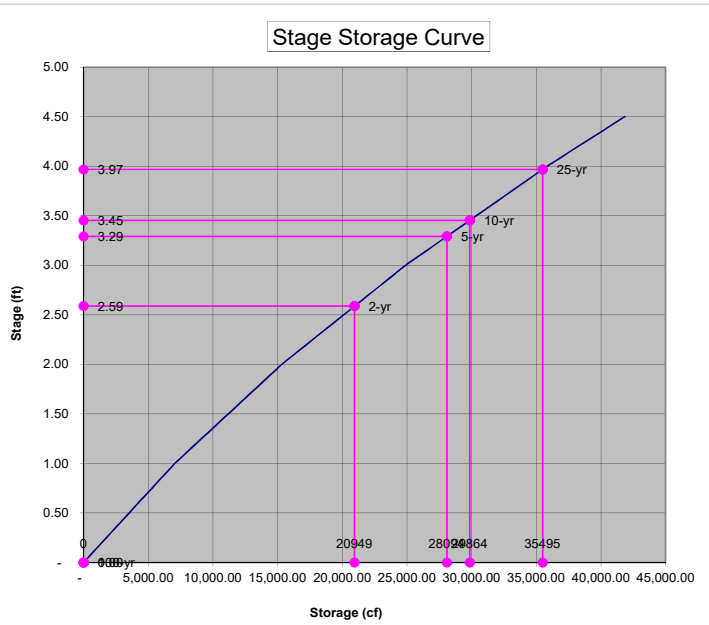




Project Name: The Bornstedt Views - Basin 1 Pond
Stage Storage Summary

Job # 19-268
 Date: 7/26/2021

Stage ft	Storage cf	Discharge cfs
-	-	-
0.05	352.73	0.18
0.10	705.45	0.26
0.15	1,058.18	0.32
0.20	1,410.90	0.37
0.25	1,763.63	0.41
0.30	2,116.35	0.45
0.35	2,469.08	0.49
0.40	2,821.80	0.52
0.45	3,174.53	0.55
0.50	3,527.25	0.58
0.55	3,879.98	0.61
0.60	4,232.70	0.64
0.65	4,585.43	0.67
0.70	4,938.15	0.69
0.75	5,290.88	0.71
0.80	5,643.60	0.74
0.85	5,996.33	0.76
0.90	6,349.05	0.78
0.95	6,701.78	0.80
1.00	7,054.50	0.83
1.05	7,468.23	0.85
1.10	7,881.95	0.87
1.15	8,295.68	0.88
1.20	8,709.40	0.90
1.25	9,123.13	0.92
1.30	9,536.85	0.94
1.35	9,950.58	0.96
1.40	10,364.30	0.98
1.45	10,778.03	0.99
1.50	11,191.75	1.01
1.55	11,605.48	1.03
1.60	12,019.20	1.04
1.65	12,432.93	1.06
1.70	12,846.65	1.08
1.75	13,260.38	1.09
1.80	13,674.10	1.11
1.85	14,087.83	1.12
1.90	14,501.55	1.14
1.95	14,915.28	1.15
2.00	15,329.00	1.17
2.05	15,807.65	1.18
2.10	16,286.30	1.20
2.15	16,764.95	1.21
2.20	17,243.60	1.22
2.25	17,722.25	1.24
2.30	18,200.90	1.25
2.35	18,679.55	1.26
2.40	19,158.20	1.28
2.45	19,636.85	1.29
2.50	20,115.50	1.30
2.55	20,594.15	1.32
2.60	21,072.80	1.33
2.65	21,551.45	1.34
2.70	22,030.10	1.36
2.75	22,508.75	1.37
2.80	22,987.40	1.38
2.85	23,466.05	1.39
2.90	23,944.70	1.40
2.95	24,423.35	1.42
3.00	24,902.00	1.43
3.05	25,449.45	1.44
3.10	25,996.90	1.45
3.15	26,544.35	1.98
3.20	27,091.80	2.31



Stage ft	Storage cf	Discharge cfs
3.25	27,639.25	2.56
3.30	28,186.70	2.76
3.35	28,734.15	2.93
3.40	29,281.60	3.09
3.45	29,829.05	3.23
3.50	30,376.50	3.37
3.55	30,923.95	3.50
3.60	31,471.40	3.62
3.65	32,018.85	3.73
3.70	32,566.30	3.84
3.75	33,113.75	3.95
3.80	33,661.20	4.05
3.85	34,208.65	4.15
3.90	34,756.10	4.25
3.95	35,303.55	4.34
4.00	35,851.00	4.43
4.05	36,450.33	4.52
4.10	37,049.65	4.60
4.15	37,648.98	4.69
4.20	38,248.30	4.77
4.25	38,847.63	4.85
4.30	39,446.95	4.93
4.35	40,046.28	5.01
4.40	40,645.60	5.08
4.45	41,244.93	5.16
4.50	41,844.25	5.23

**Project Name: The Bornstedt Views - Basin 1 Pond
Rectangular, Sharp Crested Weir Calculations**

Job # 19-268
Date: 7/26/2021

Weir Equation: $Q = C(L-0.2H)H^{3/2}$

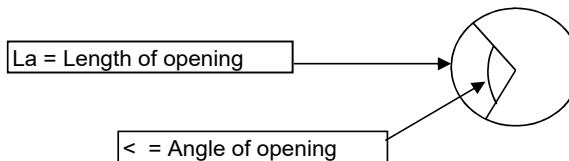
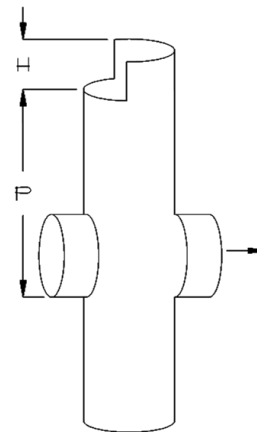
- Q = Flow over weir (cfs)
- C = $3.27 + 0.40 H/P$ (ft)
- L = Adjusted length of weir ($L_a - 0.1H \times 2$) this is to account for side constraints
- L_a = Actual length of weir along pipes interior circumference (ft)
- H = Distance from bottom of weir to maximum head (ft)
- P = Distance from bottom of weir to outfall invert elevation (ft)
- D = Inside riser pipe diameter (in)
- \angle = Angle of opening for weir (maximum 180 degrees)

Given:

Q	2.78	cfs
H	0.88	ft
P	3.12	ft
D	12	in

Find:

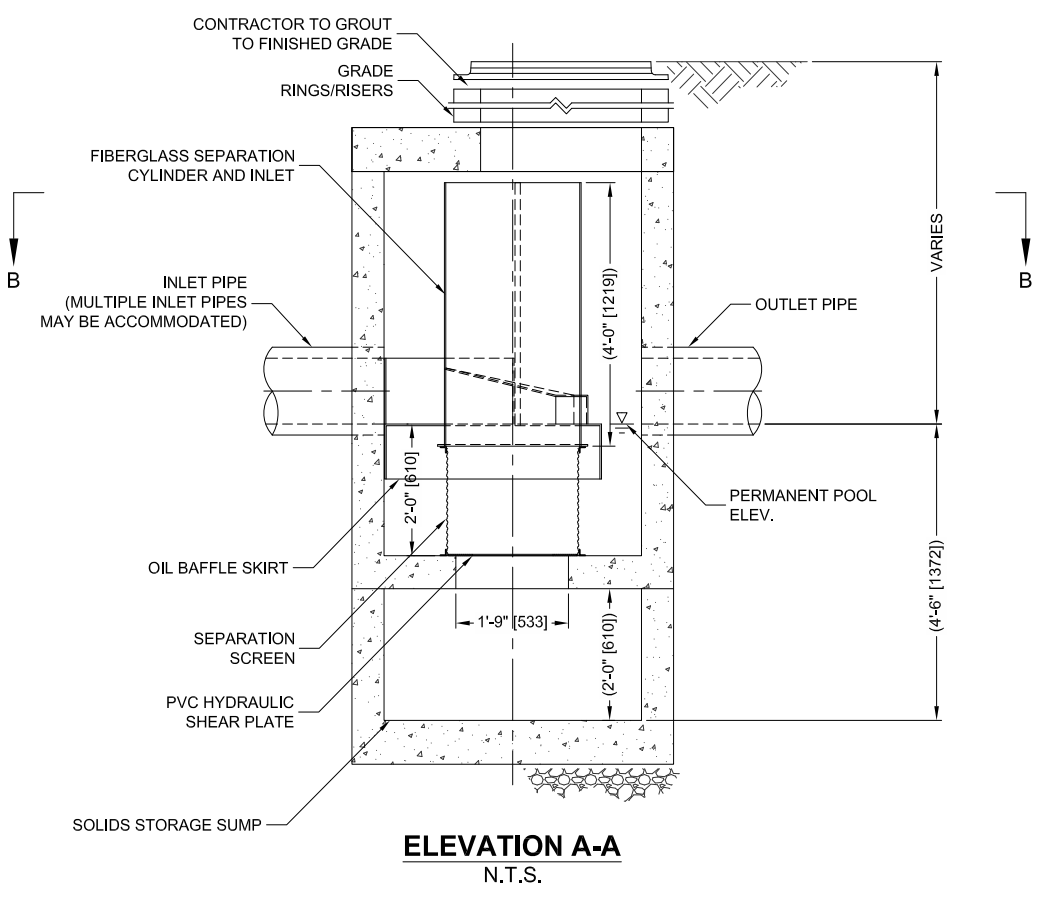
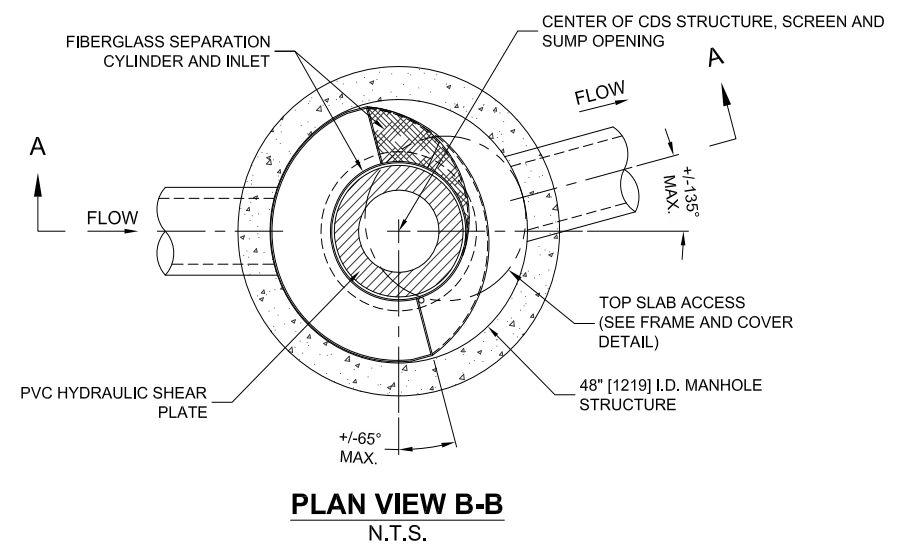
C	3.38	ft
L	1.17	ft
L_a	1.35	ft
\angle	154	degrees



Appendix D
Water Quality Manhole Details

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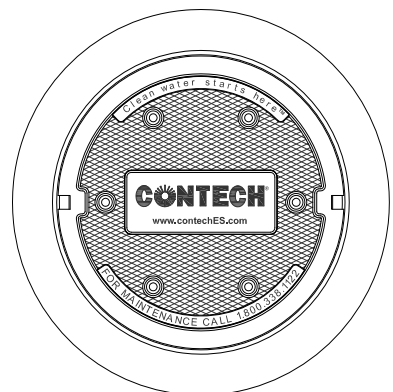
CDS2015-4-C DESIGN NOTES

CDS2015-4-C RATED TREATMENT CAPACITY IS 0.7 CFS [19.8 L/s], OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 10.0 CFS [283 L/s]. IF THE SITE CONDITIONS EXCEED 10.0 [283 L/s] 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 WEIR FOR NJDEP / NJCAT CONFORMING UNITS



SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)	*		
PEAK FLOW RATE (CFS OR L/s)	*		
RETURN PERIOD OF PEAK FLOW (YRS)	*		
SCREEN APERTURE (2400 OR 4700)	*		
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST	WIDTH	HEIGHT	
	*	*	
NOTES/SPECIAL REQUIREMENTS:			
	* PER ENGINEER OF RECORD		

GENERAL NOTES

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
- STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO..
- IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
- CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

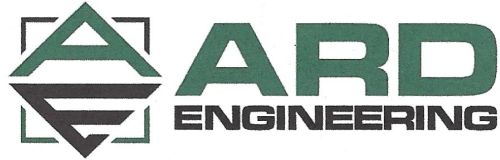
INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH
ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS2015-4-C
ONLINE CDS
STANDARD DETAIL

EXHIBIT E



**BORNSTEDT VIEWS
TRAFFIC IMPACT STUDY**

SANDY, OREGON



EXPIRES: 12/31/2021

PREPARED FOR:
Mac Even

PREPARED BY:
Michael Ard, PE
Ard Engineering

DATE:
August 5, 2021

21370 SW Langer Farms Parkway, Suite 142, Sherwood, OR 97140 - (503)862-6960



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EXECUTIVE SUMMARY

1. A property located east of SE Bornstedt Road, west of SE Jacoby Road and south of Jerger Street is proposed for development with a 42-lot residential subdivision. The proposed development will take access via a new roadway intersecting SE Bornstedt Road and an extension of Averall Parkway from the north into the site.
2. Upon completion of development, the subject property is projected to generate 31 site trips during the morning peak hour, 42 trips during the evening peak hour, and 396 daily trips.
3. Based on the operational analysis, the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road are projected to operate acceptably per ODOT and City of Sandy standards through 2023 either with or without the addition of site trips from the proposed development. The intersection of Highway 211 at Dubarko Road is projected to operate at level of service F during the evening peak hour under year 2023 traffic conditions either with or without the addition of site trips from the proposed development. If the intersection is converted to all-way stop control it is projected to operate at level of service E and with reduced delays for the highest-delay movement as compared to background (no-build) conditions.
4. The local streets in the project vicinity currently carry fewer than 1,000 vehicles per day, in accordance with the requirements of the city's development code. Following completion of the proposed development the local streets are projected to continue to carry fewer than 1,000 daily trips. Accordingly, operation of local streets is projected to meet city standards.
5. Crash data for the most recent five years shows no significant crash trends that may be indicative of design deficiencies for the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road. The crash rate for the intersection of Highway 211 at Dubarko Road is in excess of the 90th percentile crash rate for similar intersections in the state of Oregon. Based on the crash data and the all-way stop control warrant analysis, it is recommended that the Dubarko Road intersection be converted to all-way stop control to improve safety in the site vicinity.
6. Based on the warrant analysis, no new traffic signals or turn lanes are recommended in conjunction with the proposed development.



PROJECT DESCRIPTION & LOCATION

INTRODUCTION

A property located east of SE Bornstedt Road, west of SE Jacoby Road and south of Jerger Street is proposed for development with a 42-lot residential subdivision. The proposed development will take access via a new roadway intersecting SE Bornstedt Road and an extension of Averall Parkway from the north into the site.

This report addresses the impacts of the proposed development on the surrounding street system. An operational and safety analysis was conducted for the proposed site access as well as the intersections of:

- Pioneer Boulevard (US 26 Eastbound) at Highway 211;
- Highway 211 at Dubarko Road; and
- Highway 211 at SE Bornstedt Road.

In addition to the intersection analysis, daily traffic volumes were examined for the local streets in the site vicinity that will be impacted by the proposed development. These included Averall Parkway extending north from the site, and Newton Street which provides a connection to Jacoby Road northeast of the subject property.

The purpose of this analysis is to determine whether the surrounding transportation system is capable of safely and efficiently supporting the proposed use and to identify any necessary improvements and mitigations.

SITE LOCATION AND STUDY AREA DESCRIPTION

The project site has an area of approximately 12.7 acres. It is located on the east side of SE Bornstedt Road, immediately south of Jerger Street and west of Jacoby Road in Sandy, Oregon. The site is surrounded by existing residential development to the north and west, and by low-density residential and agricultural land to the south and east.

Pioneer Boulevard is classified by the Oregon Department of Transportation as a Statewide Highway. In the vicinity of Highway 211 it is also classified as a Freight Route and Special Transportation Area. It is a one-way street which forms the eastbound side of the Highway 26 couplet within the City of Sandy's downtown street grid. It has two eastbound through travel lanes, with additional turn lanes added at major intersections. It has a posted speed limit of 25 mph. An eastbound bike lane is provided on the south side of the roadway, and sidewalks are in place along both sides of the road. On-street parking is generally available on both sides of the roadway within the study area, except where restrictions are needed to accommodate turn lanes.

Oregon Highway 211 is classified by the Oregon Department of Transportation as a District Highway; however, the segment of Highway 211 within the study area has been transferred to operate under the jurisdiction of the City of Sandy, where it is classified as a Major Arterial. It generally has one through travel lane in each direction. It has a posted speed limit of 45 mph at the intersections of Highway 211



at Bornstedt Road and Highway 211 at Dubarko Road. It has a posted speed limit of 40 mph on the south side of Pioneer Boulevard, transitioning to a 25-mph posted speed within the urban street grid on the north side of Pioneer Boulevard. Existing sidewalks are also in place on the vicinity of Pioneer Boulevard.

Dubarko Road is classified by the City of Sandy as a Minor Arterial. It generally has a two-lane cross-section with some added turn lanes at major intersections and bike lanes on each side of the roadway. Partial sidewalks are in place on each side of the roadway adjacent to developed properties. It has a posted residential speed limit of 25 mph.

Bornstedt Road is classified by the City of Sandy as a Minor Arterial. It has a two-lane cross-section, with one through lane in each direction. It has a posted speed limit of 45 mph. Partial sidewalks are in place on both sides of the roadway adjacent to developed properties, and some on-street parking is also available in these areas.

Averill Parkway is classified by the city of Sandy as a Local Street. It has a two-lane cross-section, with one through lane in each direction and no centerline striping. Existing sidewalks and on-street parking are in place on both sides of the roadway. Between Cascadia Village Drive and Newton Street, the roadway is divided into a couplet with the northbound and southbound lanes separated by a linear park space. This park space also has sidewalks in place along its length.

Newton Street is classified by the City of Sandy as a Local Street. It has a two-lane cross-section with one through lane in each direction and no centerline striping. Existing sidewalks and on-street parking are in place on both sides of the roadway.



EXISTING CONDITIONS

The intersection of Pioneer Boulevard/US Highway 26 at Highway 211 is a four-way intersection controlled by a traffic signal. The eastbound approach has a shared left/through lane, an exclusive through lane and a channelized right-turn lane which operates under yield control. The northbound approach has a through lane and an exclusive right-turn lane. The southbound approach has an exclusive left-turn lane and a through lane. All four legs of the intersection have marked crosswalks in place with pedestrian signals.

The intersection of Highway 211 at Dubarko Road is a four-way intersection controlled by stop signs on the eastbound and westbound Dubarko Road approaches. The southbound, eastbound, and westbound approaches each have a shared through/left lane, a bike lane, and a dedicated right-turn lane. The northbound approach has a single, shared lane for all motorized turning movements and a bike lane.

The intersection of Highway 211 at Bornstedt Road is a T-intersection operating under stop control for the northbound Bornstedt Road approach. Through vehicles traveling along Highway 211 are free flowing. The northeast-bound Highway 211 approach has through lane and a short, channelized right-turn lane feeding onto Dubarko Road. The southwest-bound Highway 211 approach has a left-turn lane and a dedicated through lane.

A vicinity map displaying the project site, vicinity streets, and study intersection including lane configurations is provided in Figure 1 on page 9.

TRAFFIC COUNT DATA

Traffic counts were conducted at the study intersections on Wednesday June 9th, 2021 from 7:00 to 9:00 AM and from 4:00 to 6:00 PM. Data was used from the highest-volume hour during each analysis period.

The observed traffic volumes were increased to account for the impacts of the COVID-19 pandemic on traffic volumes in the site vicinity. Based on data from ODOT's Weekly COVID-19 Traffic Reports, traffic volumes along Highway 26 are currently approximately 14.6 percent below the levels that would have otherwise been projected for this corridor in 2021. Similarly, statewide traffic volumes average approximately 9.6 percent lower than would otherwise be projected absent the impacts of the pandemic. Accordingly, the projected year 2021 peak-season traffic volumes were increased by 14.6 percent on Highway 26 and by 9.6 percent for all other roadways to estimate traffic volumes absent the impacts of the continuing pandemic.

Additionally, since the count data was collected during a non-peak period of the year, the observed traffic volumes were adjusted to account for seasonal traffic variations to represent the 30th-highest hour design volumes.

US Highway 26 serves local and commuter traffic as well as trips to and from Mt. Hood and beyond. These trip types would be expected to exhibit very different seasonal variations in travel demands over



the course of the year, since local and commuter traffic volumes are relatively stable regardless of season, while travel volumes to and from Mt. Hood vary significantly based on the season.

To determine the portion of traffic attributable to each of the two primary travel types, data from ODOT's 2019 Highway Volume Tables was utilized. Specifically, the data used was collected at ODOT's Automatic Count Data station 03-006, located 0.30 miles east of Camp Creek Road in Rhododendron, Oregon. This site is located on Highway 26 approximately 21 miles east of SE Vista Loop Drive. Although the distance to the ATR station means the data cannot be used directly, the ATR data provides useful information regarding the variation in traffic volumes traveling to Mt. Hood and beyond during the time of the count data collection as well as during the peak season of the year. Accordingly, this data allows determination of the likely portion of highway traffic that falls into each of the two seasonal variation categories ("commuter" and "recreational summer/winter"), as well as providing information regarding the most appropriate seasonal adjustment factor for the recreational summer/winter traffic.

Based on the data, 8,771 vehicles per day (approximately 877 per hour during the peak hour) travel along Highway 26 to and from Mt. Hood at the Rhododendron permanent count station location during the month of June, with 55 percent westbound and 45 percent eastbound. This volume represents 32.3 percent of the COVID-adjusted eastbound through traffic volumes on Highway 26 at Oregon Highway 211. Accordingly, it is expected that no more than 32.3 percent of the trips traveling along Highway 26 in the project vicinity are traveling to and from destinations beyond the Rhododendron count station. Since the remaining 67.7 percent of through traffic volumes on Highway 26 at Highway 211 never reach Mt. Hood, it was assumed that these traffic volumes represent more typical commuter and local trips.

The ODOT data also showed that 10,810 vehicles were measured per day (approximately 1081 per hour during the peak hour) during the peak-season month of July at the ATR station near Rhododendron. This indicates that the seasonal recreational traffic volumes along the Highway 26 corridor increased by no more than 2,039 vehicles per day (10,810 vehicles per day in August - 8,771 vehicles per day in March). This equates to roughly 204 additional vehicles per hour during the peak hour of the peak recreational season. Accounting for directionality of trips, this is approximately 112 westbound vehicles and 92 eastbound vehicles.

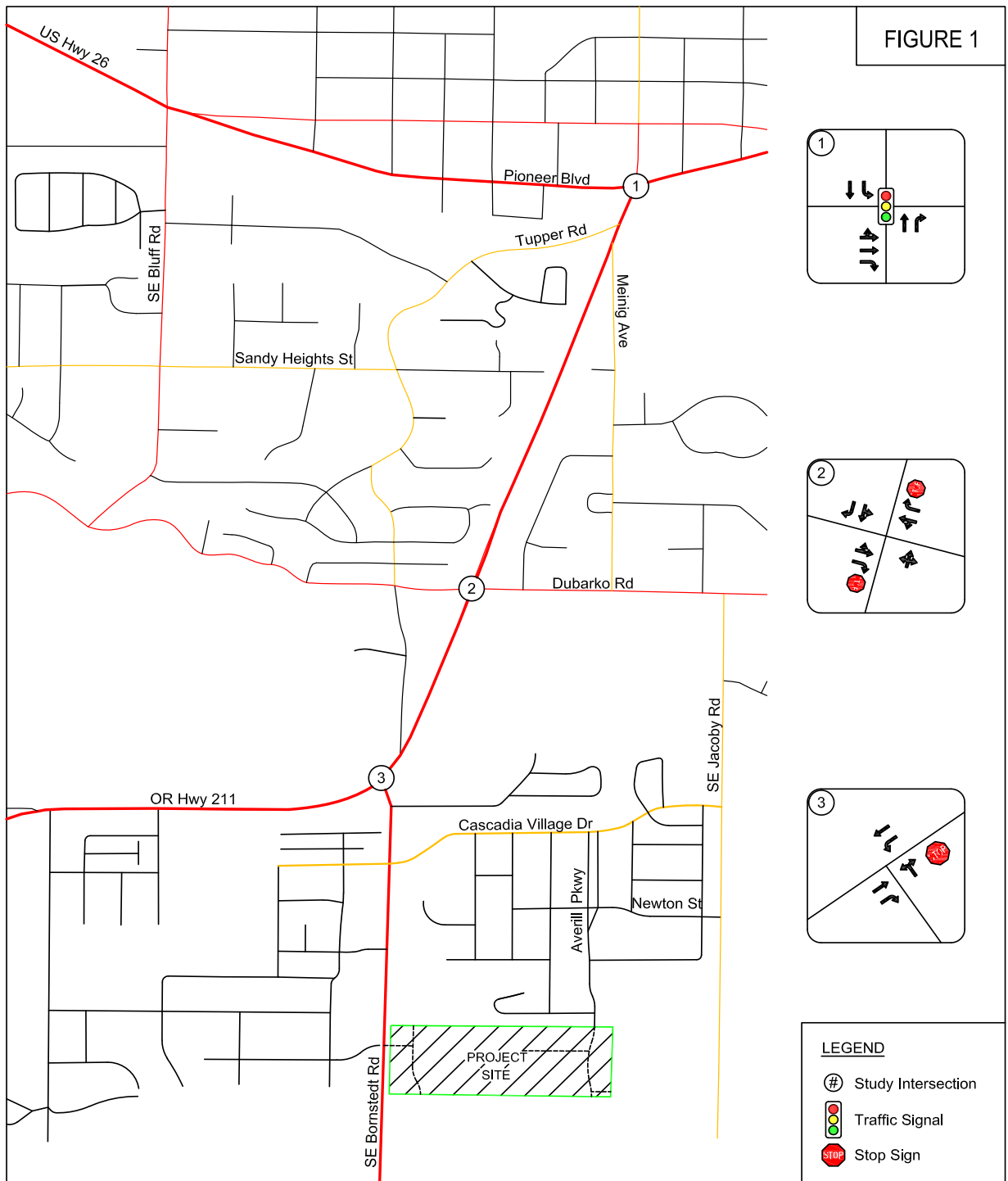
To seasonally adjust the local and commuter traffic volumes, the eastbound through traffic volumes on Highway 26 were reduced by the amount of the assumed seasonal traffic (395 vehicles per hour during the evening peak hour), and a seasonal adjustment of 1.007 was applied to the remaining local and commuter traffic volumes. Following this adjustment, the 395 June eastbound recreational trips and the 92 eastbound recreational peak-season through trips were added to determine the total peak-season traffic volumes. These calculated through traffic volumes represent the anticipated eastbound traffic volumes on Highway 26 immediately east of Highway 211 during the 30th-highest hour in July. The morning peak hour traffic volumes along Highway 26 were then increased by the same overall percentage as the evening peak hour volumes (8.0 percent).

The observed traffic volumes on Highway 211 also had a commuter seasonal adjustment of 1.007 applied to represent peak-season traffic volumes.



In addition to the turning movement count data, daily traffic volume data was collected on Newton Street between Amherst Street and Jacoby Road, and on Averill Parkway at three locations: immediately south of Cascadia Village Drive; immediately south of Newton Street; and immediately south of Amherst Street. Again, the recorded local-street daily traffic volumes were increased by 9.6 percent to account for the impacts of the ongoing pandemic.

Figure 2 on page 10 shows the existing year 2021 traffic volumes for the morning and evening peak hours at the study intersections. The existing traffic volumes for local streets in the site vicinity that would be impacted by the proposed development are provided in Table 2 on page 12.



VICINITY MAP
Study Intersections
Lane Configurations and Traffic Control

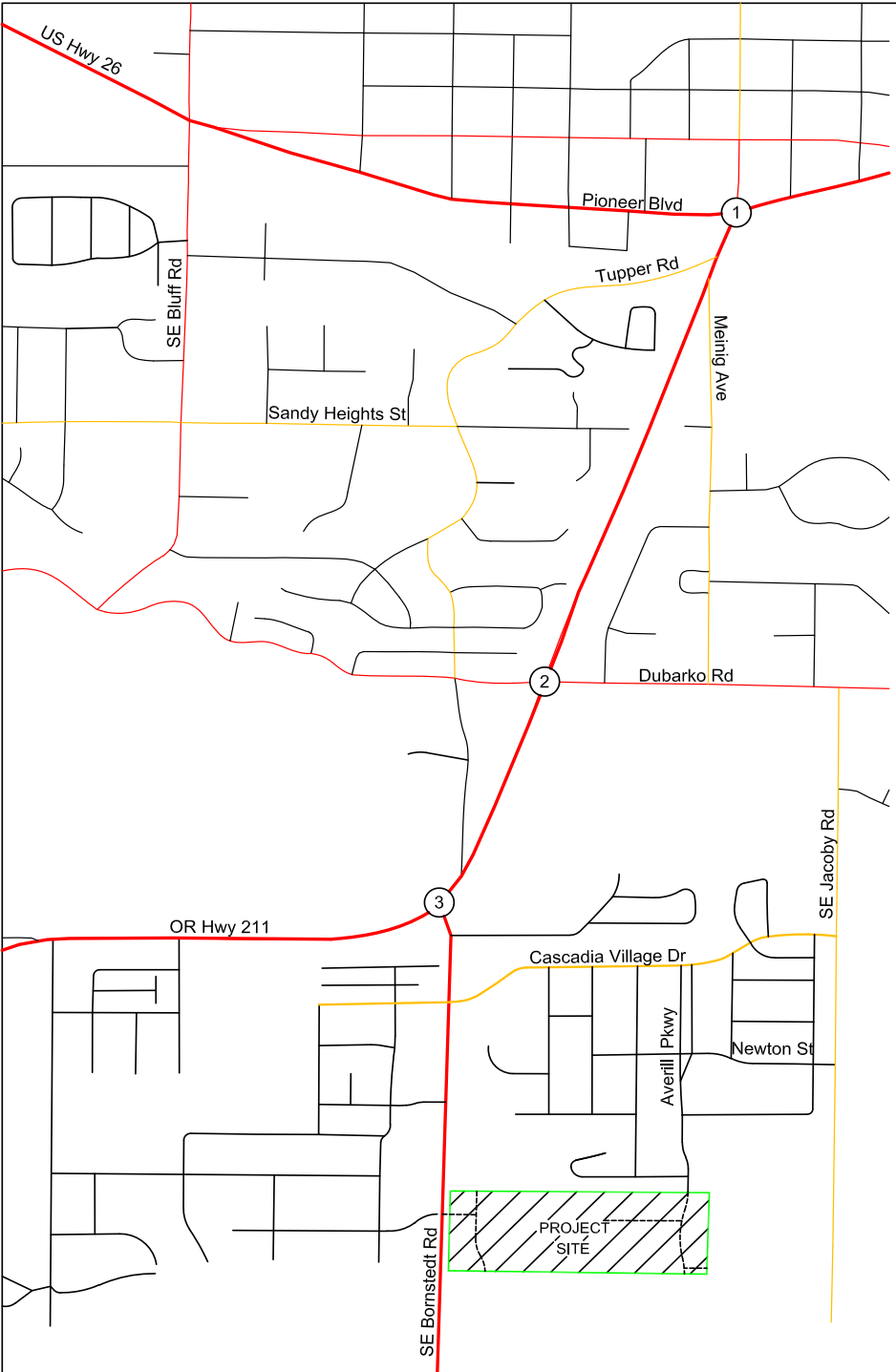


FIGURE 2

AM

①	← 92 ↘ 16	
	34 → 760 → 142 ↓	315 ↑ 116 ↗

PM

①	← 182 ↘ 15	
	60 → 1322 → 372 ↓	298 ↑ 140 ↗

AM

②	↖ 1 ↘ 174 ↙ 8	↖ 46 ↘ 48 ↙ 38
	40 → 10 ↓ 48 ↘	27 → 283 ↑ 11 ↗

PM

②	↖ 16 ↘ 356 ↙ 24	↖ 25 ↘ 38 ↙ 36
	80 → 45 ↓ 43 ↘	71 → 325 ↑ 65 ↗

AM

③	↖ 1669 ↘ 91	↖ 189
	134 → 16 ↓ 15 ↘	70 ↗

PM

③	↖ 238 ↘ 215	↖ 151
	309 → 13 ↓ 12 ↘	52 ↗



TRAFFIC VOLUMES
 2021 Existing 30th-Highest Hour Conditions
 Morning and Evening Peak Hours



OPERATIONAL ANALYSIS

An operational analysis was conducted for the study intersection using Synchro software. The analysis was conducted for the weekday morning and evening peak hours.

The purpose of the existing conditions analysis is to establish how the study area intersections operate currently and allow for calibration of the operational analysis if required.

The results of the operational analysis are reported based on delay, Level of Service (LOS), and volume-to-capacity ratio (v/c). Delays are reported in seconds. Level of service is reported as a letter grade and can range from A to F, with level of service A representing nearly free-flow conditions and level of service F representing high delays and severe congestion. A report of level of service D generally indicates moderately high but tolerable delays, and typically occurs prior to reaching intersection capacity. For the unsignalized study intersection, the v/c represents the portion of the available intersection capacity that is being utilized on the worst intersection approach. A v/c ratio of 1.0 would indicate that the approach is operating at capacity.

The Oregon Department of Transportation requires that the signalized intersection of Highway 26 at Highway 211 operate with a v/c ratio of 0.90 or less during the peak hours.

Intersections operating under the jurisdiction of the City of Sandy are required to operate at level of service D or better. Since Oregon Highway 211 has been transferred to city jurisdiction, this operational standard applies to the intersections of Highway 211 at Dubarko Road and Highway 211 at SE Bornstedt Road.

A summary of the existing conditions operational analysis is provided in Table 1 below. For the signalized intersection of Pioneer Boulevard at Highway 211, the reported delays, levels-of-service, and v/c ratios represent the operation of the overall intersection. For the unsignalized intersections the reported delays, levels-of-service and v/c ratios represent the worst approach lane.

Based on the analysis, the intersections of Highway 26 at Highway 211 and Highway 211 at Bornstedt Road are currently operating acceptably per the respective ODOT and City of Sandy standards. The intersection of Highway 211 at Dubarko Road is currently operating at level of service E for the westbound left/through lane during the evening peak hour. Detailed capacity analysis worksheets are provided in the technical appendix.

Table 1 - Operational Analysis Summary: 2021 Existing Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c	Delay	LOS	v/c
Pioneer Boulevard at Highway 211	23.4	C	0.62	24.2	C	0.76
Highway 211 at Dubarko Road	21.9	C	0.34	35.9	E	0.39
Highway 211 at Bornstedt Road	14.8	B	0.47	20.0	C	0.47



The 24-hour count data collected on Newton Street between Amherst Street and Jacoby Road, and on Averill Parkway immediately south of Cascadia Village Drive; immediately south of Newton Street; and immediately south of Amherst Street was used to determine whether the existing local street segments are currently carrying fewer than 1,000 daily trips. This threshold is identified in the City of Sandy’s Development Code, Section 17.10.30 “Street”, Sub-section E “Local Streets”, which reads in part:

“Average daily traffic (ADT) shall not exceed 1,000 vehicles/day. Proposed projects that result in more than 1,000 ADT on an existing or proposed local street shall be modified to not exceed the 1,000 ADT threshold on the local street or the proposal may be processed through the procedures in Chapter 17.66 of the Sandy Development Code.”

The results of the data collection (including an increase of 9.6 percent to account for COVID-19 impacts on traffic) are summarized in Table 2 below.

Table 2 - Existing Average Daily Traffic on Local Streets

Street Segment	ADT Volume
Newton Street west of Jacoby Road	148
Averill Parkway south of Cascadia Village Drive	300
Averill Parkway south of Newton Street	209
Averill Parkway south of Amherst Street	103

Based on the measured volumes, the local streets that will be impacted by the proposed development are currently operating with average daily traffic volumes well below the limit of 1,000 daily trips.



SITE TRIPS

The proposed subdivision will support development of 42 single-family homes. To estimate the number of trips that will be generated by the potential residential development within the proposed subdivision, trip rates from the *TRIP GENERATION MANUAL, 10th EDITION* were used. Data from land-use code 210, *Single-Family Detached* Housing was used. The trip estimate is based on the number of dwelling units.

A summary of the trip generation calculations is provided in Table 3 below. A detailed trip generation worksheet is also included in the technical appendix.

Table 3 - Site Trip Generation Summary

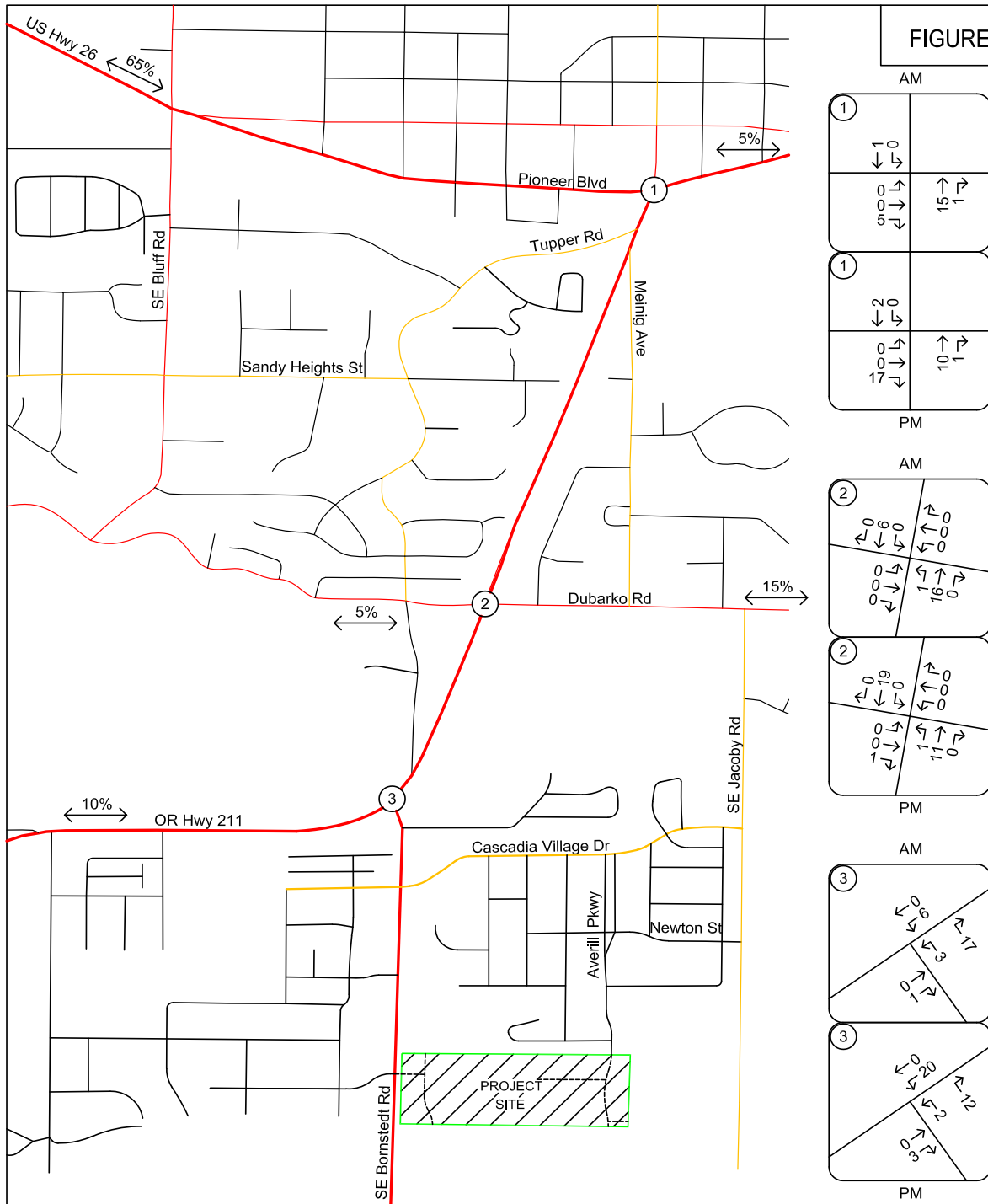
	AM Peak Hour			PM Peak Hour			Daily Total
	In	Out	Total	In	Out	Total	
42 Single-Family Homes	8	23	31	26	16	42	396

TRIP DISTRIBUTION

The directional distribution of primary site trips to and from the project site was estimated based the existing travel patterns in the site vicinity. Overall, 65 percent of site trips are projected to travel to and from the west on Highway 26, 20 percent are projected to travel to and from the east on Highway 26, 10 percent are projected to travel to and from the south on Highway 211, and the remaining 5 percent are projected to travel to and from the west on Dubarko Road. Since the project site is divided by wetlands in the middle, 13 homes will take access via Dubarko Road, while the remaining 29 homes will take access via an extension of Averill Parkway.

The trip distribution percentages and trip assignment for the primary site trips are shown in Figure 3 on page 14.

FIGURE 3



TRAFFIC VOLUMES
 Proposed Development - Site Trips
 Morning and Evening Peak Hours



FUTURE CONDITIONS ANALYSIS

BACKGROUND VOLUMES

To determine the expected impact of site trips on the study area intersections, it is necessary to compare traffic conditions both with and without the addition of the projected traffic from the proposed development. Since the proposed development cannot be constructed and occupied immediately, the comparison is made for future traffic conditions at the time of expected project completion. It is anticipated that the proposed homes can be completed and fully occupied within two years. Accordingly, the analysis was conducted for year 2023 traffic conditions.

Prior to adding the projected site trips to the study intersections, the existing traffic volumes were adjusted to account for background traffic growth over time. Background growth is expected to occur regardless of whether or not the proposed mixed-use development is constructed, and accounts for other developments outside the immediate project area.

Based on data from ODOT's 2039 Future Volume Tables, an annual growth rate of 2.13 percent per year (linear) was calculated for Highway 26 in the project vicinity. For the other turning movements in the project vicinity a growth rate of 2.0 percent per year (exponential) was used to estimate the impacts of overall population growth within the City of Sandy.

In addition to these background growth rates, site trips from approved developments which have not yet been fully completed were added to the background traffic volumes. These "in-process" developments include the Clackamas County Health Clinic, Mt. Hood Senior Living, The Pad, The Views, Shaylee Meadows, Mt. View Ridge, Marshall Ridge, Jacoby Heights, Trimble PD, and the Deer Meadows Subdivision. The projected site trips for these developments are shown in Figure 7 in the attached technical appendix.

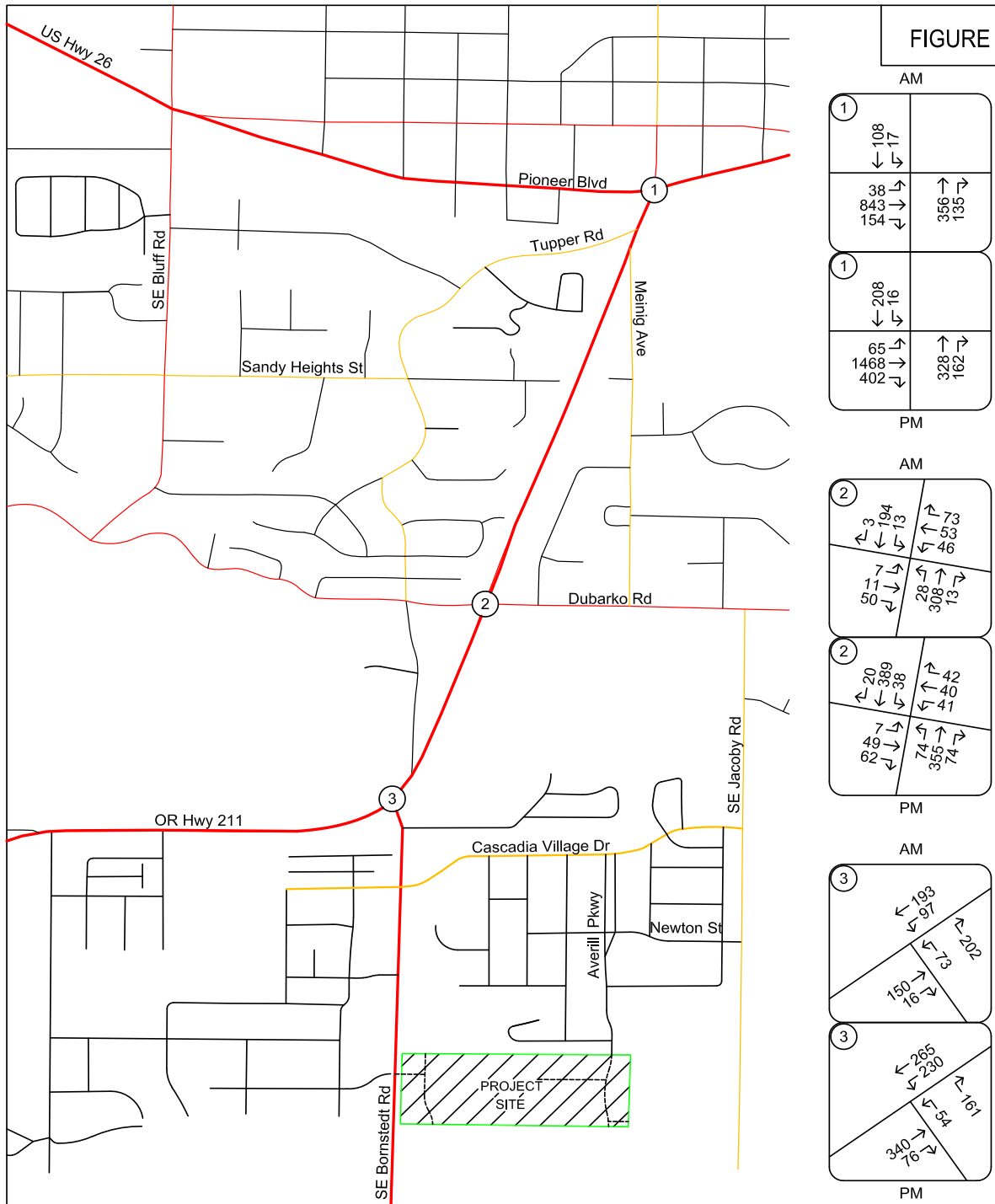
Figure 5 on page 16 shows the projected year 2023 background traffic volumes at the study intersections during the morning and evening peak hours.

BACKGROUND VOLUMES PLUS SITE TRIPS

Peak hour trips calculated to be generated by the proposed development were added to the projected year 2023 background traffic volumes to obtain the year 2023 total traffic volumes following completion of the proposed development.

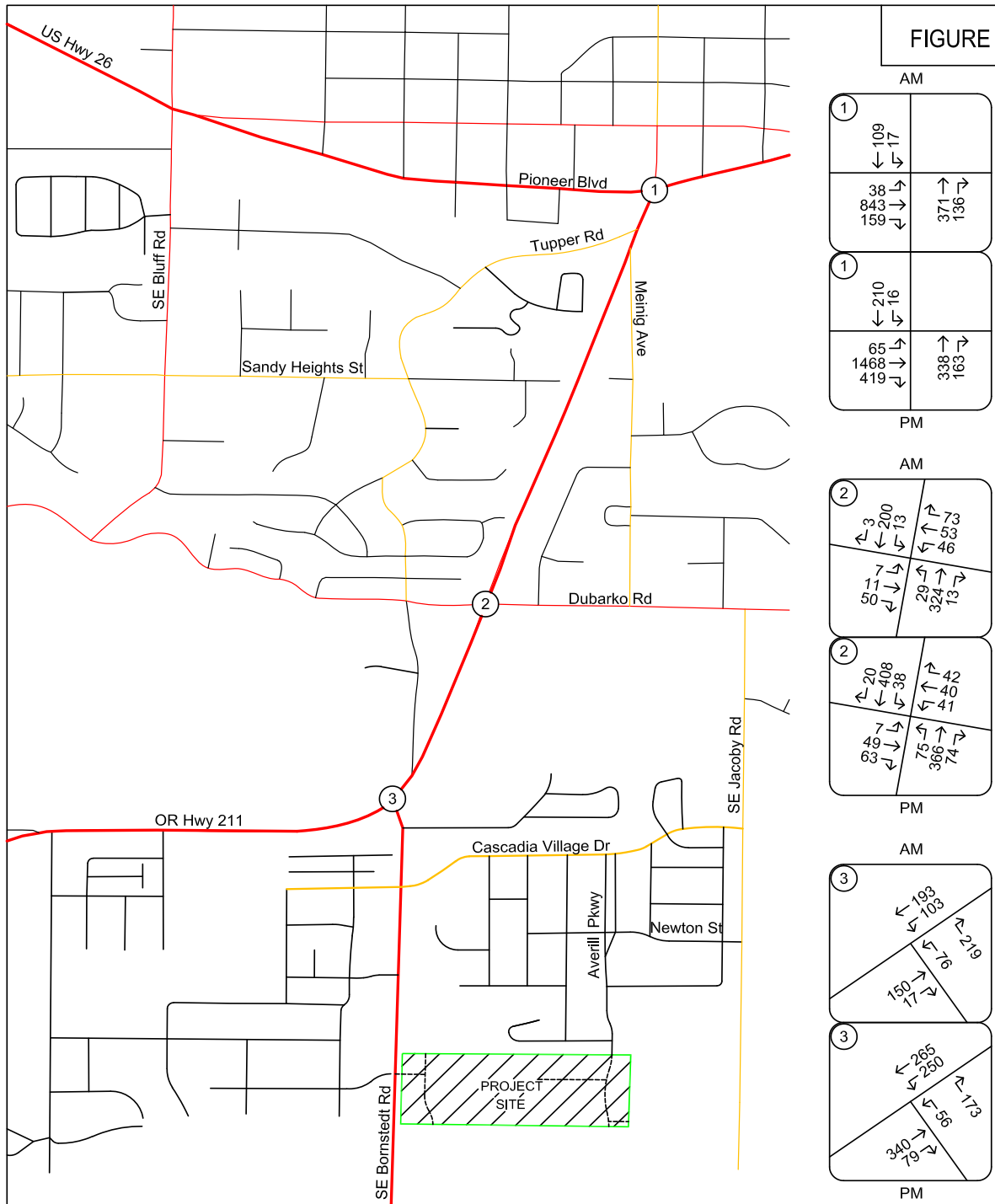
Figure 6 on page 17 shows the projected year 2023 peak hour volumes including both background growth and site trips from the proposed development during the morning and evening peak hours.

FIGURE 4



TRAFFIC VOLUMES
 2023 Background Conditions
 Morning and Evening Peak Hours

FIGURE 5



TRAFFIC VOLUMES
 2023 Background Plus Site Trips
 Morning and Evening Peak Hours



OPERATIONAL ANALYSIS

The future conditions operational analysis was again conducted using Synchro software, with outputs based on the analysis methodologies contained in the *HIGHWAY CAPACITY MANUAL*. The analysis was prepared for the intersection’s morning and evening peak hours.

The results of the future conditions operational analysis are summarized in Table 4 below. Detailed analysis worksheets are included in the technical appendix.

Table 4 - Operational Analysis Summary: Year 2023 Future Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c	Delay	LOS	v/c
Pioneer Boulevard at Highway 211						
2023 Background Conditions	25.9	C	0.70	28.8	C	0.84
2023 Background plus Site	26.7	C	0.71	29.6	C	0.85
Highway 211 at Dubarko Road						
2023 Background Conditions	27.9	D	0.45	55.6	F	0.56
2023 Background plus Site	29.8	D	0.47	63.0	F	0.60
2023 Bkgd plus Site (All-Way Stop)	28.3	D	0.79	47.1	E	0.92
Highway 211 at Bornstedt Road						
2023 Background Conditions	16.5	C	0.52	23.8	C	0.55
2023 Background plus Site	17.5	C	0.56	26.8	D	0.60

Based on the results of the operational analysis, the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road are projected to meet the respective operational standards of the Oregon Department of Transportation and the City of Sandy.

The intersection of Highway 211 at Dubarko Road is projected to operate at level of service F for the westbound left/through lane during the evening peak hour either with or without the addition of site trips from the proposed development. If the intersection is converted to all-way stop control, operation improves to level of service E, with average delays for the highest-delay approach lane reduced from 55.6 seconds to 47.1 seconds, indicating a minor improvement to operation of the worst movement with all-way stop control and the proposed development in place. This improvement would also be expected to reduce the risk of angle and turning-movement collisions at the intersection, as described in the safety analysis section of this report.



LOCAL STREET TRAFFIC VOLUMES

Local street traffic volumes were also examined to determine the projected traffic levels following completion of the proposed development. Site trips to and from the west side of the proposed development (the portion which takes access via Bornstedt Road) will not add to the local street traffic volumes. However, the homes on the east side will add traffic to all of the analyzed street segments. Table 5 below summarizes the projected future traffic levels on the impacted local streets following completion of the proposed development. Based on the analysis, all local streets in the site vicinity will continue to operate with average volumes below 1,000 vehicles per day.

Table 5 - Year 2023 Average Daily Traffic on Local Streets

Street Segment	ADT Volume
Newton Street west of Jacoby Road	198
Averill Parkway south of Cascadia Village Drive	540
Averill Parkway south of Newton Street	449
Averill Parkway south of Amherst Street	334



SAFETY ANALYSIS

CRASH DATA ANALYSIS

Using data obtained from the Oregon Department of Transportation, a review of the five most recent years of available crash history (from January 2015 through December 2019) was performed for the study intersections. The crash data was evaluated based on the number, type, and severity of collisions, as well as the intersection crash rate. Crash rates allow comparison of relative safety risks at intersections with different lane configurations, volumes, and traffic control devices by accounting for both the number of crashes that occur during the study period and the number of vehicles that traveled through the intersection during that period. Crash rates are calculated using the standard assumption that evening peak hour volumes are approximately 10 percent of the average daily traffic volume at an intersection. The crash rates were compared to statewide crash rates for similar intersection types to identify any locations with crash rates in excess of the 90th percentile.

The intersection of Highway 211 at Dubarko Road had 27 reported crashes during the five-year analysis period. These included 16 angle collisions, 4 turning-movement collisions, 4 rear-end collisions, 1 backing collision, 1 sideswipe-overtaking collision, and 1 pedestrian collision. The crashes resulted in one incapacitating injury and no fatalities. There were 10 “non-incapacitating” injuries reported and 19 reports of a “possible injury/complaint of pain”. The incapacitating injury occurred when a westbound driver failed to yield to a southbound vehicle and was struck in the intersection. The pedestrian collision occurred when a southbound pedestrian was struck by a westbound driver that failed to yield right-of-way to the pedestrian crossing, resulting in a report of a possible injury/complaint of pain by the pedestrian. The crash rate for the intersection was calculated to be 1.56 crashes per million entering vehicles. This is above the 90th percentile crash rate of 1.08 crashes per million entering vehicles for rural unsignalized four-way intersections in the state of Oregon.

The Oregon Department of Transportation recently undertook safety improvements at this intersection, including re-alignment of the minor-street approaches to intersect at a 90-degree angle and the addition of some striping and speed feedback signs along the major-street to increase driver awareness of speed. However, the crash data for subsequent years has shown no significant improvement in the crash frequency at this intersection. An examination of the current intersection configuration revealed no significant apparent hazards and adequate sight distance from the minor-street approaches, allowing drivers approaching the highway to select safe gaps when turning onto or crossing the highway.

As described in the Warrant Analysis section of this report below, the intersection currently meets all-way stop control warrants based on crash history. Accordingly, it is recommended that all-way stop control be installed at this intersection. No other safety mitigations are recommended at this time.

The intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road had no reported crashes during the five-year analysis period.

Based on the crash data, the majority of the study intersections are currently operating acceptably with respect to safety. The intersection of Highway 211 at Dubarko Road has a high historical crash rate which recent safety improvements have not significantly improved. It is recommended that



consideration be given to installing all-way stop control at this intersection. No other safety improvements are recommended for the study area intersections at this time.

TRAFFIC SIGNAL AND ALL-WAY STOP CONTROL WARRANTS

Traffic signal warrants were examined for the unsignalized study intersections of Highway 211 at Dubarko Road and Highway 211 at Bornstedt Road. Based on the projected turning movement volumes, traffic signal warrants will not be satisfied for either intersection under any of the analysis scenarios. Accordingly, no new traffic signals are recommended in conjunction with the proposed development.

All-way stop control can be installed where there are “Five or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.” Examination of the crash data shows that there were six angle collisions at the intersection in the most recent year for which complete data is available (2019). Accordingly, installation of all-way stop control is warranted based on crash history.

TURN LANE WARRANTS

Major-street turn lane warrants are primarily based on safety considerations. A major-street left-turn lane provides a refuge for drivers to move out of the through travel lane while waiting for a gap in the opposing through traffic stream prior to turning left. A major-street right-turn lane allows right-turning drivers to decelerate outside the through travel lane prior to turning.

The intersection of Highway 211 at Dubarko Road currently meets ODOT warrants for a northbound left-turn lane and a northbound right-turn lane. However, the need for these turn lanes is not meaningfully related to the proposed development. Further, if all-way stop control is installed at the intersection as recommended based on the safety analysis, the turn lane warrants will no longer be applicable. The need for additional lanes will be dictated by operational considerations rather than safety warrants, since all vehicles will stop prior to entering the intersection.

The intersection of Highway 211 at Bornstedt Road already has a southwest-bound left-turn lane in place. A short, channelized right-turn radius is also provided for the northeast-bound right turn movement. The proposed development will have no significant impact on the need for turn lanes at this intersection.

INTERSECTION SIGHT DISTANCE ANALYSIS

Intersection sight distance was measured for the proposed access location on Bornstedt Road to verify whether the proposed access can operate safely and efficiently. The posted speed limit is 45 mph, requiring a minimum sight distance of 500 feet.

The available intersection sight distances are measured from a position 15 feet behind the edge of the traveled way with a driver’s eye height 3.5 feet above the driveway surface to an oncoming driver’s eye height of 3.5 feet above the surface of the oncoming travel lane. Existing vegetation and an



embankment on the east side of the roadway north of the proposed access currently limit sight distances to the north and south. However, upon development of the subject property and construction of improvements along the site frontage sight distances are projected to be well in excess of 500 feet in each direction.

Based on the detailed analysis, adequate sight distance is available in each direction for safe and efficient operation of the proposed access. No sight distance mitigations beyond clearing of vegetation, leveling the roadside embankment north of the site access, and construction of typical frontage improvements are necessary or recommended.



CONCLUSIONS

Based on the operational analysis, the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road are projected to operate acceptably per ODOT and City of Sandy standards through 2023 either with or without the addition of site trips from the proposed development. The intersection of Highway 211 at Dubarko Road is projected to operate at level of service F during the evening peak hour under year 2023 traffic conditions either with or without the addition of site trips from the proposed development. If the intersection is converted to all-way stop control it is projected to operate at level of service E and with reduced delays for the highest-delay movement as compared to background (no-build) conditions.

The local streets in the project vicinity currently carry fewer than 1,000 vehicles per day, in accordance with the requirements of the city's development code. Following completion of the proposed development the local streets are projected to continue to carry fewer than 1,000 daily trips. Accordingly, operation of local streets is projected to meet city standards.

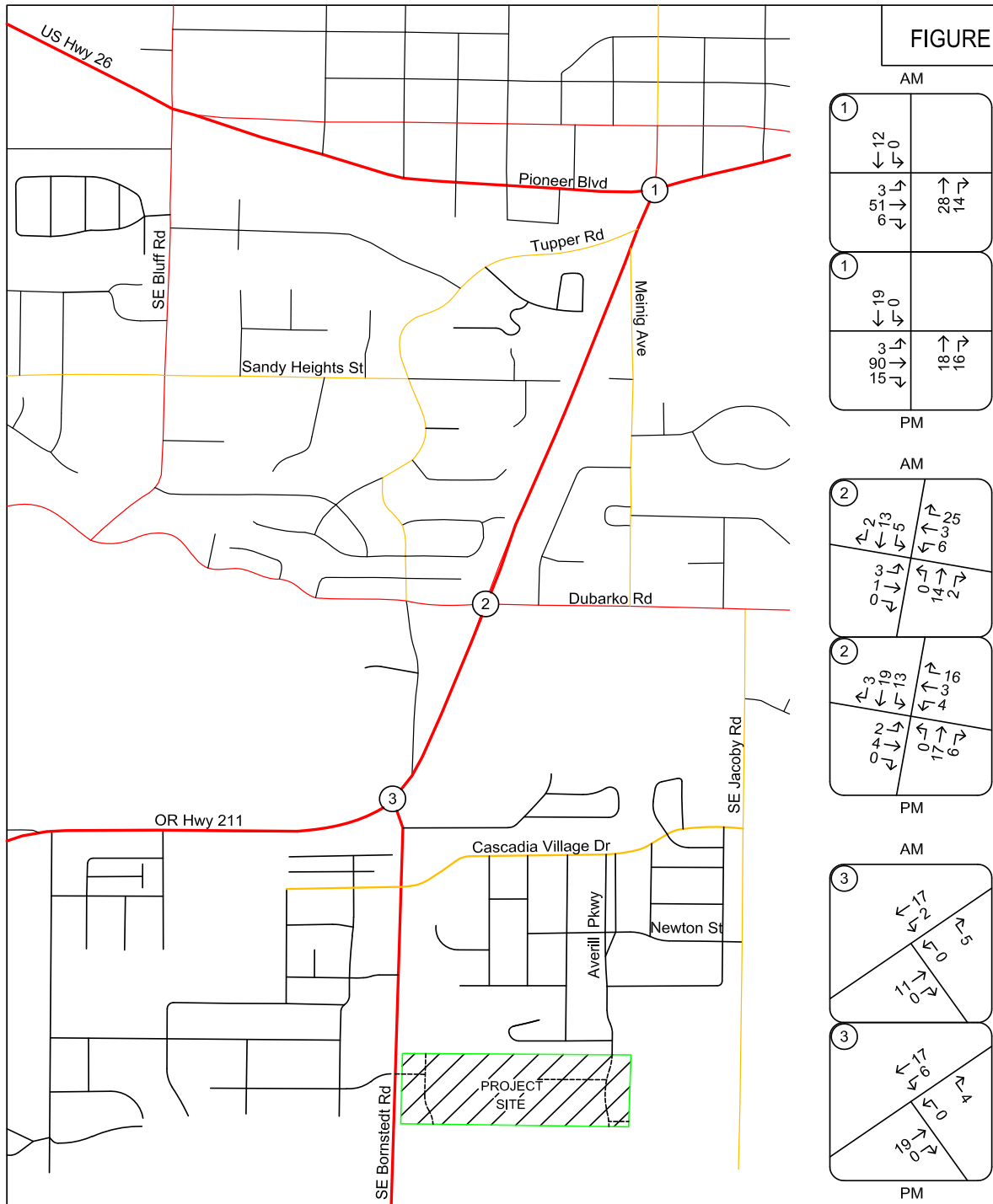
Crash data for the most recent five years shows no significant crash trends that may be indicative of design deficiencies for the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road. The crash rate for the intersection of Highway 211 at Dubarko Road is in excess of the 90th percentile crash rate for similar intersections in the state of Oregon. Based on the crash data and the all-way stop control warrant analysis, it is recommended that the Dubarko Road intersection be converted to all-way stop control to improve safety in the site vicinity.

Based on the warrant analysis, no new traffic signals or turn lanes are recommended in conjunction with the proposed development.



APPENDIX

FIGURE 6



TRAFFIC VOLUMES
 In-Process Development - Site Trips
 Morning and Evening Peak Hours



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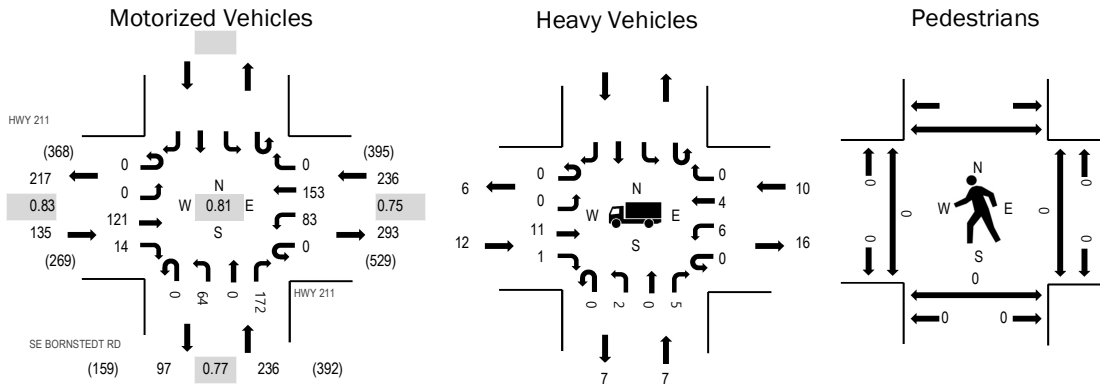
Location: SE BORNSTEDT RD & HWY 211 AM

Date: Wednesday, June 9, 2021

Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:20 AM - 07:35 AM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	8.9%	0.83
WB	4.2%	0.75
NB	3.0%	0.77
SB		
All	4.8%	0.81

Traffic Counts - Motorized Vehicles

Interval Start Time	HWY 211 Eastbound				HWY 211 Westbound			SE BORNSTEDT RD Northbound				Southbound			Total	Rolling Hour	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left			Thru
7:00 AM	0	0	7	0	0	5	16	0	0	4	0	18				50	607
7:05 AM	0	0	2	3	0	3	5	0	0	8	0	12				33	589
7:10 AM	0	0	8	1	0	3	15	0	0	2	0	15				44	586
7:15 AM	0	0	9	1	0	9	14	0	0	8	0	14				55	581
7:20 AM	0	0	14	0	0	6	16	0	0	2	0	20				58	567
7:25 AM	0	0	13	0	0	8	8	0	0	8	0	16				53	532
7:30 AM	0	0	16	0	0	12	18	0	0	8	0	23				77	515
7:35 AM	0	0	10	3	0	10	15	0	0	1	0	10				49	470
7:40 AM	0	0	12	2	0	9	15	0	0	7	0	16				61	460
7:45 AM	0	0	6	3	0	6	7	0	0	5	0	14				41	451
7:50 AM	0	0	12	0	0	5	12	0	0	7	0	7				43	453
7:55 AM	0	0	12	1	0	7	12	0	0	4	0	7				43	447
8:00 AM	0	0	7	2	0	4	4	0	0	4	0	11				32	449
8:05 AM	0	0	8	1	0	0	9	0	0	4	0	8				30	
8:10 AM	0	0	7	2	0	6	12	0	0	4	0	8				39	
8:15 AM	0	0	11	1	0	4	12	0	0	6	0	7				41	
8:20 AM	0	0	9	1	0	1	4	0	0	2	0	6				23	
8:25 AM	0	0	6	2	0	4	16	0	0	2	0	6				36	
8:30 AM	0	0	7	3	0	3	12	0	0	0	0	7				32	
8:35 AM	0	0	10	3	0	6	7	0	0	0	0	13				39	
8:40 AM	0	0	16	1	0	4	10	0	0	5	0	16				52	
8:45 AM	0	0	15	1	0	3	7	0	0	0	0	17				43	
8:50 AM	0	0	7	0	0	8	10	0	0	2	0	10				37	
8:55 AM	0	0	14	0	0	2	11	0	0	8	0	10				45	
Count Total	0	0	238	31	0	128	267	0	0	101	0	291				1,056	
Peak Hour	0	0	121	14	0	83	153	0	0	64	0	172				607	

Location: SE BORNSTEDT RD & HWY 211 AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	2	0	0		2	7:00 AM	0	0	0	0	7:00 AM	0	0	0	0	0	
7:05 AM	0	1	0		1	7:05 AM	0	0	0	0	7:05 AM	0	0	0	0	0	
7:10 AM	2	1	0		3	7:10 AM	0	0	0	0	7:10 AM	0	0	0	0	0	
7:15 AM	0	1	4		5	7:15 AM	0	0	0	0	7:15 AM	0	0	0	0	0	
7:20 AM	1	0	0		1	7:20 AM	0	0	0	0	7:20 AM	0	0	0	0	0	
7:25 AM	2	2	0		4	7:25 AM	0	0	0	0	7:25 AM	0	0	0	0	0	
7:30 AM	2	0	1		3	7:30 AM	0	0	0	0	7:30 AM	0	0	0	0	0	
7:35 AM	0	0	1		1	7:35 AM	0	0	0	0	7:35 AM	0	0	0	0	0	
7:40 AM	0	0	2		2	7:40 AM	0	0	0	0	7:40 AM	0	0	0	0	0	
7:45 AM	2	2	1		5	7:45 AM	0	0	0	0	7:45 AM	0	0	0	0	0	
7:50 AM	1	0	0		1	7:50 AM	0	0	0	0	7:50 AM	0	0	0	0	0	
7:55 AM	0	0	1		1	7:55 AM	0	0	0	0	7:55 AM	0	0	0	0	0	
8:00 AM	2	0	0		2	8:00 AM	0	0	0	0	8:00 AM	0	0	0	0	0	
8:05 AM	2	0	1		3	8:05 AM	0	0	0	0	8:05 AM	0	0	0	0	0	
8:10 AM	0	1	0		1	8:10 AM	0	0	0	0	8:10 AM	0	0	0	0	0	
8:15 AM	1	1	1		3	8:15 AM	0	0	0	0	8:15 AM	0	0	0	0	0	
8:20 AM	2	0	0		2	8:20 AM	0	0	0	0	8:20 AM	0	0	0	0	0	
8:25 AM	0	1	1		2	8:25 AM	0	0	0	0	8:25 AM	0	0	0	0	0	
8:30 AM	1	0	0		1	8:30 AM	0	0	0	0	8:30 AM	0	0	0	0	0	
8:35 AM	1	0	1		2	8:35 AM	0	0	0	0	8:35 AM	0	0	0	0	0	
8:40 AM	0	1	1		2	8:40 AM	0	0	0	0	8:40 AM	0	0	0	0	0	
8:45 AM	0	4	2		6	8:45 AM	0	0	0	0	8:45 AM	0	0	0	0	0	
8:50 AM	0	0	3		3	8:50 AM	0	0	0	0	8:50 AM	0	0	0	0	0	
8:55 AM	0	0	0		0	8:55 AM	0	0	0	0	8:55 AM	0	0	0	0	0	
Count Total	21	15	20		56	Count Total	0	0	0	0	Count Total	0	0	0	0	0	
Peak Hour	12	7	10		29	Peak Hour	0	0	0	0	Peak Hour	0	0	0	0	0	

Location: HWY 211 & DUBARKO RD AM



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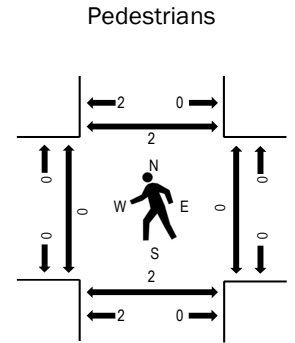
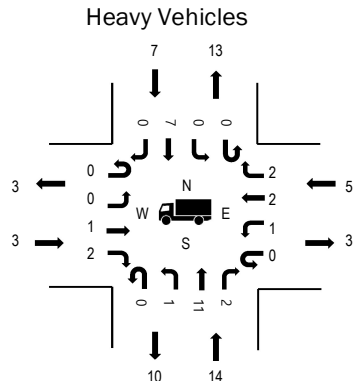
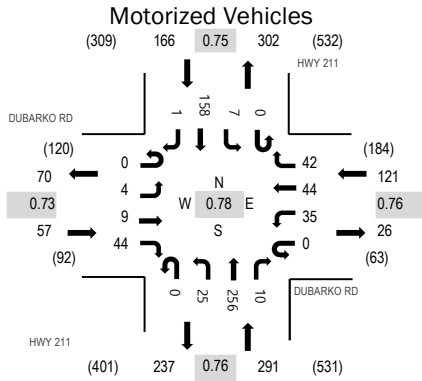
Location: HWY 211 & DUBARKO RD AM

Date: Wednesday, June 9, 2021

Peak Hour: 07:00 AM - 08:00 AM

Peak 15-Minutes: 07:25 AM - 07:40 AM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	5.3%	0.73
WB	4.1%	0.76
NB	4.8%	0.76
SB	4.2%	0.75
All	4.6%	0.78

Traffic Counts - Motorized Vehicles

Interval Start Time	DUBARKO RD Eastbound			DUBARKO RD Westbound			HWY 211 Northbound			HWY 211 Southbound			Total	Rolling Hour				
	U-Turn	Left	Thru	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn			Left	Thru	Right	
7:00 AM	0	1	1	0	0	2	1	2	0	2	19	1	0	0	20	0	49	635
7:05 AM	0	0	1	3	0	2	5	2	0	1	19	0	0	0	4	0	37	617
7:10 AM	0	0	0	4	0	3	4	5	0	4	16	0	0	1	8	0	45	613
7:15 AM	0	0	1	6	0	2	5	4	0	1	22	0	0	0	15	0	56	612
7:20 AM	0	0	1	4	0	6	4	2	0	1	26	0	0	0	13	0	57	596
7:25 AM	0	0	1	3	0	1	6	9	0	2	33	1	0	0	14	0	70	564
7:30 AM	0	1	1	9	0	2	2	3	0	2	22	2	0	0	15	0	59	536
7:35 AM	0	0	0	3	0	4	6	7	0	4	26	4	0	2	19	0	75	514
7:40 AM	0	0	0	2	0	6	3	3	0	1	19	2	0	1	17	1	55	483
7:45 AM	0	2	1	2	0	0	3	1	0	5	22	0	0	1	10	0	47	465
7:50 AM	0	0	0	4	0	3	2	0	0	2	13	0	0	1	9	0	34	485
7:55 AM	0	0	2	4	0	4	3	4	0	0	19	0	0	1	14	0	51	491
8:00 AM	0	2	0	1	0	2	0	3	0	1	15	1	0	0	6	0	31	481
8:05 AM	0	0	2	2	0	0	1	3	0	2	14	1	0	1	7	0	33	
8:10 AM	0	0	0	0	0	3	1	1	0	1	20	1	0	2	15	0	44	
8:15 AM	0	1	2	1	0	3	4	0	0	2	13	2	0	1	11	0	40	
8:20 AM	1	0	0	0	0	1	3	1	0	3	9	0	0	1	5	1	25	
8:25 AM	0	1	1	1	0	1	1	3	0	3	12	1	0	0	18	0	42	
8:30 AM	0	2	2	1	0	3	1	2	0	0	14	0	0	0	12	0	37	
8:35 AM	0	0	2	1	0	0	2	3	0	2	20	1	0	0	12	1	44	
8:40 AM	0	1	0	3	0	2	1	2	0	2	15	3	0	1	6	1	37	
8:45 AM	0	0	2	0	0	1	5	2	0	5	34	4	0	0	14	0	67	
8:50 AM	0	0	1	1	0	1	0	2	0	5	13	0	0	1	16	0	40	
8:55 AM	0	1	3	0	0	3	1	1	0	0	20	1	0	0	11	0	41	
Count Total	1	12	24	55	0	55	64	65	0	51	455	25	0	14	291	4	1,116	
Peak Hour	0	4	9	44	0	35	44	42	0	25	256	10	0	7	158	1	635	

Location: HWY 211 & DUBARKO RD AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	1	2	0	0	3	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	0	1	0	1	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	2	2	1	5	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	2	0	0	2	4	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	2	0	0	2	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	1	0	0	1	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	2	1	1	4	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	0	1	0	1	2	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	0	0	1	1	2	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	3	0	1	4	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	2	2
7:50 AM	0	1	0	0	1	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0	7:55 AM	0	2	0	0	2
8:00 AM	0	0	0	1	1	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	1	0	1	2	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	1	0	0	1	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	0	0	0	1	1	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	0	1	0	1	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	3	0	1	4	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	1	1	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	0	0	1	1	2	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	0	1	1	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	4	1	3	8	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	0	1	2	3	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	3	23	9	19	54	Count Total	0	0	0	0	0	Count Total	0	2	0	2	4
Peak Hour	3	14	5	7	29	Peak Hour	0	0	0	0	0	Peak Hour	0	2	0	2	4

Location: HWY 211 & PIONEER BLVD AM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	8	1	0	1	10	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	10	1	0	0	11	7:05 AM	0	0	0	0	0	7:05 AM	0	2	1	0	3
7:10 AM	5	2	0	0	7	7:10 AM	0	0	0	0	0	7:10 AM	0	0	2	0	2
7:15 AM	7	3	0	0	10	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	9	2	0	1	12	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	8	4	0	1	13	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	8	0	0	2	10	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	8	3	0	1	12	7:35 AM	0	0	0	0	0	7:35 AM	0	0	1	1	2
7:40 AM	8	1	0	0	9	7:40 AM	0	0	0	0	0	7:40 AM	0	0	1	0	1
7:45 AM	9	1	0	1	11	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	8	3	0	0	11	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	9	1	0	2	12	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	5	0	0	1	6	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	8	1	0	0	9	8:05 AM	0	0	0	0	0	8:05 AM	0	0	1	0	1
8:10 AM	3	1	0	0	4	8:10 AM	0	0	0	0	0	8:10 AM	0	0	1	0	1
8:15 AM	5	0	0	1	6	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	10	0	0	0	10	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	6	2	0	1	9	8:25 AM	0	0	0	0	0	8:25 AM	0	0	1	0	1
8:30 AM	10	0	0	0	10	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	10	0	0	0	10	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	11	1	0	1	13	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	8	1	0	1	10	8:45 AM	0	0	0	0	0	8:45 AM	3	3	0	0	6
8:50 AM	6	1	0	0	7	8:50 AM	0	0	0	0	0	8:50 AM	1	1	1	1	4
8:55 AM	9	0	0	0	9	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	188	29	0	14	231	Count Total	0	0	0	0	0	Count Total	4	6	9	2	21
Peak Hour	90	20	0	9	119	Peak Hour	0	0	0	0	0	Peak Hour	0	0	4	1	5

Location: SE BORNSTEDT RD & HWY 211 PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	0	3		3	4:00 PM	0	0	0	0	4:00 PM	0	0	0	0	0	
4:05 PM	0	1	1		2	4:05 PM	0	0	0	0	4:05 PM	0	0	0	0	0	
4:10 PM	0	0	0		0	4:10 PM	0	0	0	0	4:10 PM	0	0	0	0	0	
4:15 PM	0	0	1		1	4:15 PM	0	0	0	0	4:15 PM	0	0	0	0	0	
4:20 PM	2	0	0		2	4:20 PM	0	0	0	0	4:20 PM	0	0	0	0	0	
4:25 PM	0	0	0		0	4:25 PM	0	0	0	0	4:25 PM	0	0	0	0	0	
4:30 PM	1	0	0		1	4:30 PM	0	0	0	0	4:30 PM	0	0	0	0	0	
4:35 PM	0	0	0		0	4:35 PM	0	0	0	0	4:35 PM	0	0	0	0	0	
4:40 PM	1	0	0		1	4:40 PM	0	0	0	0	4:40 PM	0	0	0	0	0	
4:45 PM	0	0	1		1	4:45 PM	0	0	0	0	4:45 PM	0	0	0	0	0	
4:50 PM	0	1	3		4	4:50 PM	0	0	0	0	4:50 PM	0	0	0	0	0	
4:55 PM	0	0	0		0	4:55 PM	0	0	0	0	4:55 PM	0	0	0	0	0	
5:00 PM	1	0	0		1	5:00 PM	0	0	0	0	5:00 PM	0	0	0	0	0	
5:05 PM	2	1	0		3	5:05 PM	0	0	0	0	5:05 PM	0	0	0	0	0	
5:10 PM	1	1	1		3	5:10 PM	0	0	0	0	5:10 PM	0	0	0	0	0	
5:15 PM	1	1	0		2	5:15 PM	0	0	0	0	5:15 PM	0	0	0	0	0	
5:20 PM	0	0	0		0	5:20 PM	0	0	0	0	5:20 PM	0	0	0	0	0	
5:25 PM	1	1	0		2	5:25 PM	0	0	0	0	5:25 PM	0	0	0	0	0	
5:30 PM	1	0	2		3	5:30 PM	0	0	0	0	5:30 PM	0	0	0	0	0	
5:35 PM	1	0	0		1	5:35 PM	0	0	0	0	5:35 PM	0	0	0	0	0	
5:40 PM	0	0	1		1	5:40 PM	0	0	0	0	5:40 PM	0	0	0	0	0	
5:45 PM	1	0	0		1	5:45 PM	0	0	0	0	5:45 PM	0	0	0	0	0	
5:50 PM	0	0	1		1	5:50 PM	0	0	0	0	5:50 PM	0	0	0	0	0	
5:55 PM	0	0	1		1	5:55 PM	0	0	0	0	5:55 PM	0	0	0	0	0	
Count Total	13	6	15		34	Count Total	0	0	0	0	Count Total	0	0	0	0	0	
Peak Hour	9	4	5		18	Peak Hour	0	0	0	0	Peak Hour	0	0	0	0	0	

Location: HWY 211 & DUBARKO RD PM



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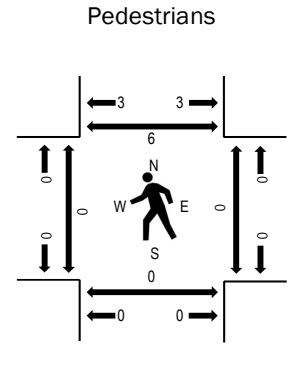
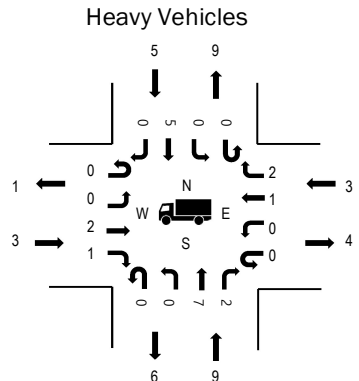
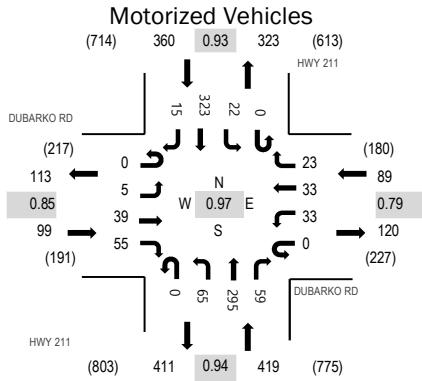
Location: HWY 211 & DUBARKO RD PM

Date: Wednesday, June 9, 2021

Peak Hour: 04:20 PM - 05:20 PM

Peak 15-Minutes: 05:05 PM - 05:20 PM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.0%	0.85
WB	3.4%	0.79
NB	2.1%	0.94
SB	1.4%	0.93
All	2.1%	0.97

Traffic Counts - Motorized Vehicles

Interval Start Time	DUBARKO RD Eastbound				U-Turn	DUBARKO RD Westbound			U-Turn	HWY 211 Northbound			U-Turn	HWY 211 Southbound			Total	Rolling Hour
	U-Turn	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		
4:00 PM	0	0	2	2	0	3	1	0	0	4	22	2	0	0	16	0	52	933
4:05 PM	0	0	5	6	0	1	5	2	0	3	15	3	0	1	38	0	79	949
4:10 PM	0	0	2	6	0	2	3	0	0	3	18	3	0	2	41	2	82	965
4:15 PM	0	1	4	3	0	1	2	8	0	1	23	7	0	1	17	2	70	961
4:20 PM	0	1	4	5	0	5	4	4	0	5	31	4	0	0	23	0	86	967
4:25 PM	0	0	2	4	0	1	3	2	0	5	30	7	0	4	28	1	87	954
4:30 PM	0	1	1	4	0	3	2	1	0	6	17	6	0	1	24	1	67	947
4:35 PM	0	0	5	6	0	3	2	2	0	5	28	8	0	1	31	0	91	961
4:40 PM	0	0	4	2	0	3	7	1	0	7	20	1	0	2	29	3	79	934
4:45 PM	0	0	5	4	0	0	4	2	0	3	19	6	0	1	31	0	75	950
4:50 PM	0	0	3	5	0	4	3	2	0	4	31	4	0	0	26	1	83	937
4:55 PM	0	1	2	2	0	4	1	2	0	5	31	7	0	3	22	2	82	933
5:00 PM	0	0	2	7	0	1	1	1	0	4	21	2	0	2	25	2	68	927
5:05 PM	0	0	5	6	0	1	1	3	0	10	27	3	0	4	33	2	95	967
5:10 PM	0	0	1	7	0	6	4	1	0	4	16	8	0	3	27	1	78	967
5:15 PM	0	2	5	3	0	2	1	2	0	7	24	3	0	1	24	2	76	967
5:20 PM	0	0	4	2	0	4	2	2	0	2	19	7	0	1	30	0	73	967
5:25 PM	0	1	4	4	0	1	3	1	0	11	29	5	0	1	20	0	80	967
5:30 PM	0	2	1	2	0	0	4	6	0	4	19	7	0	2	33	1	81	967
5:35 PM	0	0	1	1	0	1	3	2	0	5	22	3	0	1	24	1	64	967
5:40 PM	0	0	4	8	0	3	6	3	0	4	23	5	0	1	34	4	95	967
5:45 PM	0	1	3	6	0	3	1	3	0	2	15	2	0	1	24	1	62	967
5:50 PM	0	0	2	5	0	0	5	1	0	8	28	3	0	4	23	0	79	967
5:55 PM	0	1	4	5	0	0	5	4	0	4	19	6	0	3	23	2	76	967
Count Total	0	11	75	105	0	52	73	55	0	116	547	112	0	40	646	28	1,860	
Peak Hour	0	5	39	55	0	33	33	23	0	65	295	59	0	22	323	15	967	

Location: HWY 211 & DUBARKO RD PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	1	0	1	2	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	0	0	0	3	3	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	0	1	1	2	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	1	2	0	0	3	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	1	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	1	0	3	4
4:30 PM	0	1	1	0	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	1	0	0	0	1	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	1	1	0	2	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	1	1	4:45 PM	1	0	0	0	1	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	2	2	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	1	1	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	1	0	0	1	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	1	0	0	1	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	1	2	0	1	4	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	3	3
5:20 PM	0	1	0	1	2	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	1	0	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	3	3
5:30 PM	0	2	0	2	4	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	1	0	0	1	5:35 PM	0	0	0	1	1	5:35 PM	0	0	0	1	1
5:40 PM	0	0	0	1	1	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	1	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	1	1	1	0	3	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	4	16	5	15	40	Count Total	1	0	0	1	2	Count Total	0	1	0	10	11
Peak Hour	3	9	3	5	20	Peak Hour	1	0	0	0	1	Peak Hour	0	1	0	6	7

Location: HWY 211 & PIONEER BLVD PM

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	5	1	0	0	6	4:00 PM	0	0	0	0	0	4:00 PM	1	0	0	0	1
4:05 PM	5	0	0	1	6	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	4	0	0	0	4	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	4	1	0	1	6	4:15 PM	0	0	0	0	0	4:15 PM	0	0	2	0	2
4:20 PM	3	0	0	0	3	4:20 PM	0	0	0	0	0	4:20 PM	0	0	1	0	1
4:25 PM	2	3	0	0	5	4:25 PM	0	0	0	0	0	4:25 PM	0	0	1	0	1
4:30 PM	2	1	0	0	3	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	1	1
4:35 PM	2	0	0	0	2	4:35 PM	0	0	0	0	0	4:35 PM	0	1	1	0	2
4:40 PM	2	0	0	0	2	4:40 PM	0	0	0	0	0	4:40 PM	0	1	0	0	1
4:45 PM	3	2	0	0	5	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	1	0	0	2	3	4:50 PM	0	0	0	0	0	4:50 PM	1	1	1	1	4
4:55 PM	4	0	0	1	5	4:55 PM	0	0	0	0	0	4:55 PM	0	1	0	0	1
5:00 PM	1	0	0	1	2	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	1	1	0	0	2	5:05 PM	0	0	0	0	0	5:05 PM	1	1	0	0	2
5:10 PM	3	1	0	1	5	5:10 PM	0	0	0	0	0	5:10 PM	0	1	0	0	1
5:15 PM	4	1	0	0	5	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	1	1	0	1	3	5:20 PM	0	0	0	0	0	5:20 PM	1	0	0	0	1
5:25 PM	2	1	0	0	3	5:25 PM	0	0	0	0	0	5:25 PM	0	2	2	0	4
5:30 PM	4	2	0	1	7	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	1	1
5:35 PM	6	0	0	0	6	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	1	1	0	2	4	5:40 PM	0	0	0	0	0	5:40 PM	0	1	0	0	1
5:45 PM	2	0	0	0	2	5:45 PM	0	0	1	0	1	5:45 PM	0	2	3	0	5
5:50 PM	7	0	0	0	7	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	2	2
5:55 PM	1	1	0	1	3	5:55 PM	0	0	0	0	0	5:55 PM	0	0	1	0	1
Count Total	70	17	0	12	99	Count Total	0	0	1	0	1	Count Total	4	11	12	5	32
Peak Hour	28	9	0	5	42	Peak Hour	0	0	0	0	0	Peak Hour	2	6	4	2	14

Table 1 provides traffic volumes by corridor for weekdays and weekends for the last five weeks of available data, May 31 to July 4, 2021. Corridor volumes are prepared by summing traffic volumes from ATRs across 13 corridors for years 2019, 2020 and 2021⁵.

Overall statewide traffic volumes are close to pre-COVID traffic volumes. For the month of June, statewide average weekday traffic volumes ranged between 5% below and 5% above 2019 pre-COVID conditions, while weekend volumes ranged between 9% below and equal to 2019 levels. Recent forecast news from the Oregon DAS Office of Economic Analysis indicates economic recovery is expected to move faster than past recessions⁶

Table 1. Observed Year-Over-Year Difference in Traffic Volumes by Corridor 2019-2021

Date	Corridor	2021 Volumes		2020 Volumes		2019 Volumes		2021 as % of 2020	
		Average Weekday	Average Weekend	Average Weekday	Average Weekend	Average Weekday	Average Weekend	Weekday Diff	Weekend Diff
Week 23 May 31- June 6, 2021	I-5	558,510	483,914	466,638	356,866	588,873	519,086	20%	36%
	I-205	244,436	204,969	210,138	158,028	269,797	235,467	16%	30%
	I-405	121,681	101,902	103,291	66,692	143,769	119,357	18%	53%
	I-84	367,455	323,293	308,732	238,313	371,031	343,419	19%	36%
	US 97	158,986	135,404	146,823	118,339	168,151	143,367	8%	14%
	US197	3,578	3,120	2,959	2,583	3,325	2,777	21%	21%
	US20	28,808	24,285	23,669	19,012	25,683	24,331	22%	28%
	US26	54,746	48,449	45,634	41,742	52,260	55,722	20%	16%
	US30	13,271	11,148	10,584	9,625	11,896	11,960	25%	16%
	US395	27,000	22,600	25,703	19,130	29,165	21,212	5%	18%
	OR18	20,746	20,537	17,111	19,026	16,663	21,557	21%	8%
OR22	31,732	25,749	28,307	20,870	31,838	27,314	12%	23%	
US101	89,221	76,993	69,722	62,523	85,138	78,636	28%	23%	
Statewide Average		341,488	295,401	287,606	220,203	359,073	318,941	19%	34%
Week 24 June 7-13, 2021	I-5	563,778	506,995	482,153	403,769	604,078	557,050	17%	26%
	I-205	254,111	216,643	217,082	173,873	274,976	241,338	17%	25%
	I-405	130,579	103,765	106,251	67,900	138,162	111,721	23%	53%
	I-84	373,222	336,902	317,742	265,804	371,513	350,983	17%	27%
	US 97	162,982	143,270	151,426	128,987	167,322	144,049	8%	11%
	US197	3,279	3,081	2,875	2,874	3,300	2,984	14%	7%
	US20	26,872	24,396	23,035	21,125	27,478	26,848	17%	15%
	US26	49,816	50,297	44,922	46,867	54,733	59,844	11%	7%
	US30	11,968	11,572	10,544	10,341	12,629	12,870	14%	12%
	US395	28,230	24,050	25,522	19,638	27,868	21,759	11%	22%
	OR18	17,979	20,422	15,673	20,177	18,915	25,441	15%	1%
OR22	32,004	25,896	27,696	23,442	32,686	29,214	16%	10%	
US101	90,358	75,148	68,825	67,046	90,295	84,241	31%	12%	
Statewide Average		346,835	308,995	296,567	246,468	365,312	335,096	17%	25%

⁵ Statewide average values are weighted by pre-COVID traffic volumes in order to monitor relative change in traffic volumes. Without weighting, the higher volume corridors would dominate the results.

⁶ See latest post by OEA: <https://oregoneconomicanalysis.com/2021/07/09/no-permanent-damage-expected/>

Location	US26; MP 46.38; MT. HOOD HIGHWAY NO. 26; 0.30 mile east of Camp Creek Rd (USFS 28)	Site Name	Rhododendron (03-006)
		Installed	August, 1995

HISTORICAL ANNUAL TRAFFIC DATA						
Year	Annual Average Daily Traffic (AADT)	Critical Values as percent of Annual Average Daily Traffic (AADT)				
		Max Day	Max Hour	10th Hour	20th Hour	30th Hour
		2010	8714	207	21.6	19.8
2011	8330	214	24.7	20.0	18.6	18.1
2012	8480	227	24.0	21.0	20.2	19.4
2013	8527	213	23.4	21.1	20.3	19.1
2014	8652	216	23.2	21.1	20.3	19.2
2015	8861	242	21.4	20.3	19.4	18.7
2016	10071	208	22.9	19.6	18.8	17.9
2017	10223	200	19.9	19.1	18.1	17.5
2018	10291	199	20.4	19.5	19.0	18.5
2019	10218	204	20.5	19.5	19.1	18.6

2019 SEASONAL TRAFFIC DATA				
Month	Weekday		Daily	
	Average	% AADT	Average	% AADT
January	8537	84	11650	114
February	7637	75	9937	97
March	7393	72	10238	100
April	6402	63	8476	83
May	7666	75	9670	95
June	8771	86	11100	109
July	10810	106	13605	133
August	10610	104	13497	132
September	8391	82	9937	97
October	6484	63	7998	78
November	5653	55	6971	68
December	7878	77	9535	93

SEASONAL TREND TABLE (Updated: 10/14/2020)											
TREND	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	Seasonal Trend Peak Period Factor
	INTERSTATE URBANIZED	1.1160	1.0605	1.0050	0.9923	0.9796	0.9781	0.9767	0.9615	0.9463	0.9517
INTERSTATE NONURBANIZED	1.4616	1.2645	1.0673	1.0382	1.0092	0.9798	0.9504	0.9005	0.8506	0.8322	0.8139
COMMUTER	1.1492	1.0880	1.0268	1.0014	0.9759	0.9705	0.9650	0.9503	0.9355	0.9470	0.9355
COASTAL DESTINATION	1.2289	1.1242	1.0194	1.0316	1.0437	1.0080	0.9723	0.9347	0.8972	0.8612	0.8159
COASTAL DESTINATION ROUTE	1.4968	1.2858	1.0747	1.0911	1.1076	1.0274	0.9473	0.8941	0.8409	0.7820	0.7205
AGRICULTURE	1.6700	1.4596	1.2492	1.1487	1.0482	0.9747	0.9011	0.8579	0.8146	0.8058	0.7670
RECREATIONAL SUMMER	1.9247	1.6595	1.3942	1.2973	1.2004	1.0517	0.9029	0.8256	0.7484	0.7018	0.6552
RECREATIONAL SUMMER WINTER	1.0135	1.0146	1.0158	1.1492	1.2825	1.1763	1.0700	0.9760	0.8821	0.8005	0.7190
RECREATIONAL WINTER	0.6733	0.7219	0.7704	1.0580	1.3455	1.3746	1.4038	1.2832	1.1625	0.9985	0.6389
SUMMER	1.3901	1.2520	1.1139	1.0620	1.0100	0.9718	0.9336	0.8976	0.8615	0.8457	0.8299
SUMMER < 2500	1.4448	1.2869	1.1289	1.0598	0.9906	0.9480	0.9053	0.8720	0.8387	0.8237	0.8086

* Seasonal Trend Table factors are based on previous year ATR data. The table is updated yearly.

* Grey shading indicates months were seasonal factor is greater than or less than 30%

* February 2019 snow event causing lower seasonal factors

June 1 0.9503
June 15 0.9355

Daily Adjustment 0.001057
June 9 Value 0.941843

Commuter Adjustment =0.941843/0.9355 1.00678

Daily Volume Count Report

Study Name Newton Street west of Jacoby
Location 45.384363067727755 /-122.25832287805528
Roadway Orientation East /West

Site Code 8667515307
Study Date 6/15/2021
Direction

Start Time	6-14-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
	East	West	East	West	East	West	East	West	East	West	East	West	East	West	East	West
12:00 AM				1											0	1
01:00			1	1											1	1
02:00															0	0
03:00															0	0
04:00				1											0	1
05:00			4												4	0
06:00				3											0	3
07:00			1	1											1	1
08:00			2												2	0
09:00			4	3											4	3
10:00			4	6											4	6
11:00			3	3											3	3
12:00 PM			2	5											2	5
01:00			2	8											2	8
02:00			4	5											4	5
03:00			2	6											2	6
04:00			4	8											4	8
05:00			6	7											6	7
06:00			5	13											5	13
07:00			2	4											2	4
08:00			3	5											3	5
09:00			1	4											1	4
10:00			1												1	0
11:00															0	0
Lane	0	0	51	84	0	0	0	0	0	0	0	0	0	0	51	84
Day	0	0	135	135	0	0	0	0	0	0	0	0	0	0	135	135
AM Peak			05:00	10:00											05:00	10:00
Vol.			4	6											4	6
PM Peak			05:00	06:00											05:00	06:00
Vol.			6	13											6	13

Daily Volume Count Report

Study Name Averill Pkwy S of Cascadia (Southbound)
Location 45.385346503017196 /-122.2603799967819
Roadway Orientation South /North

Site Code 4955566172
Study Date 6/15/2021
Direction Southbound

Start Time	6-14-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
	South	North	South	North	South	North	South	North	South	North	South	North	South	North	South	North
12:00 AM																
01:00																
02:00																
03:00																
04:00																
05:00																
06:00			1												1	0
07:00			5												5	0
08:00			8												8	0
09:00			8												8	0
10:00			9												9	0
11:00			2												2	0
12:00 PM			9												9	0
01:00			13												13	0
02:00			7												7	0
03:00			11												11	0
04:00			6												6	0
05:00			20												20	0
06:00			15												15	0
07:00			15												15	0
08:00			11												11	0
09:00			8												8	0
10:00			2												2	0
11:00			1												1	0
Lane	0	0	151	0	0	0	0	0	0	0	0	0	0	0	151	0
Day	0	0	151		0	0	0	0	0	0	0	0	0	0	151	
AM Peak			10:00												10:00	
Vol.			9												9	
PM Peak			05:00												05:00	
Vol.			20												20	

Daily Volume Count Report

Study Name Averill S of Cascadia (Northbound) **Site Code** 6855039561
Location 45.38567367272235 /-122.26087689361204 **Study Date** 6/15/2021
Roadway Orientation North /South **Direction** Northbound

Start Time	6-14-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
	North	South	North	South	North	South	North	South	North	South	North	South	North	South	North	South
12:00 AM															0	0
01:00															0	0
02:00															0	0
03:00															0	0
04:00															0	0
05:00															0	0
06:00			7												7	0
07:00			10												10	0
08:00			12												12	0
09:00			7												7	0
10:00			5												5	0
11:00			10												10	0
12:00 PM			12												12	0
01:00			11												11	0
02:00			7												7	0
03:00			6												6	0
04:00			7												7	0
05:00			7												7	0
06:00			14												14	0
07:00			4												4	0
08:00			1												1	0
09:00			3												3	0
10:00															0	0
11:00															0	0
Lane	0	0	123	0	0	0	0	0	0	0	0	0	0	0	123	0
Day	0	0	123		0	0	0	0	0	0	0	0	0	0	123	
AM Peak			08:00												08:00	
Vol.			12												12	
PM Peak			06:00												06:00	
Vol.			14												14	

Daily Volume Count Report

Study Name Averill S of Newton **Site Code** 1617971870
Location 45.38425073389019 / -122.26118712663511 **Study Date** 6/16/2021
Roadway Orientation South /North **Direction**

Start Time	6-14-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
	South	North	South	North	South	North	South	North	South	North	South	North	South	North	South	North
12:00 AM							2	1							2	1
01:00															0	0
02:00															0	0
03:00								1							0	1
04:00								4							0	4
05:00								4							0	4
06:00							2	2							2	2
07:00							5	7							5	7
08:00							9	9							9	9
09:00							5	7							5	7
10:00							1	5							1	5
11:00							4	6							4	6
12:00 PM							6	6							6	6
01:00						6	3								6	3
02:00						7	7								7	7
03:00						10	4								10	4
04:00						9	7								9	7
05:00						13	5								13	5
06:00						6	7								6	7
07:00						4	5								4	5
08:00						4									4	0
09:00						4									4	0
10:00						1	2								1	2
11:00						1									1	0
Lane	0	0	0	0	0	65	40	34	52	0	0	0	0	0	99	92
Day	0	0	0	0	0	105	86	86	86	0	0	0	0	0	191	191
AM Peak								08:00	08:00						08:00	08:00
Vol.								9	9						9	9
PM Peak						05:00	02:00	12:00 PM							05:00	02:00
Vol.						13	7	6	6						13	7

Daily Volume Count Report

Study Name Averill S of Amherst
Location 45.38348042625627 /-122.26097579816569
Roadway Orientation South /North

Site Code 8553036648
Study Date 6/16/2021
Direction

Start Time	6-14-2021		Tues		Wed		Thurs		Fri		Sat		Sun		Week Average	
	South	North	South	North	South	North	South	North	South	North	South	North	South	North	South	North
12:00 AM							1								1	0
01:00															0	0
02:00															0	0
03:00							1								0	1
04:00							2								0	2
05:00							1								0	1
06:00							1								1	0
07:00							2	4							2	4
08:00							2	2							2	2
09:00							2	3							2	3
10:00								2							0	2
11:00							2	4							2	4
12:00 PM							4	3							4	3
01:00						4	4								4	4
02:00						6	4								6	4
03:00						5	5								5	5
04:00						3	4								3	4
05:00						6	4								6	4
06:00						2	2								2	2
07:00						2	1								2	1
08:00						2									2	0
09:00						2									2	0
10:00						1									1	0
11:00							1								0	1
Lane	0	0	0	0	0	33	25	14	22	0	0	0	0	0	47	47
Day	0	0	0	0	0	58	36	36	94	0	0	0	0	0	94	94
AM Peak								07:00	07:00						07:00	07:00
Vol.								2	4						2	4
PM Peak						02:00	03:00	12:00 PM							02:00	03:00
Vol.						6	5	4	3						6	5



















HCM Signalized Intersection Capacity Analysis
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↑	↔↗					↑	↗	↘	↑	
Traffic Volume (vph)	34	760	142	0	0	0	0	315	116	16	92	0
Future Volume (vph)	34	760	142	0	0	0	0	315	116	16	92	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00	1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frft		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2962	1328					1617	1350	1525	1606	
Flt Permitted		1.00	1.00					1.00	1.00	0.34	1.00	
Satd. Flow (perm)		2962	1328					1617	1350	541	1606	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	38	854	160	0	0	0	0	354	130	18	103	0
RTOR Reduction (vph)	0	0	39	0	0	0	0	0	94	0	0	0
Lane Group Flow (vph)	0	892	121	0	0	0	0	354	36	18	103	0
Confl. Peds. (#/hr)	1								4			
Heavy Vehicles (%)	12%	12%	12%	0%	0%	0%	5%	5%	5%	9%	9%	9%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		49.4	49.4					25.0	25.0	31.6	31.6	
Effective Green, g (s)		49.4	49.4					25.0	25.0	31.6	31.6	
Actuated g/C Ratio		0.55	0.55					0.28	0.28	0.35	0.35	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1625	728					449	375	212	563	
v/s Ratio Prot								c0.22		0.00	c0.06	
v/s Ratio Perm		0.30	0.09						0.03	0.03		
v/c Ratio		0.55	0.17					0.79	0.10	0.08	0.18	
Uniform Delay, d1		13.1	10.1					30.1	24.1	27.6	20.2	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.3	0.5					8.9	0.1	0.2	0.2	
Delay (s)		14.4	10.6					39.0	24.2	27.8	20.4	
Level of Service		B	B					D	C	C	C	
Approach Delay (s)		13.9			0.0			35.0			21.5	
Approach LOS		B			A			D			C	
Intersection Summary												
HCM 2000 Control Delay			20.6									C
HCM 2000 Volume to Capacity ratio			0.62									
Actuated Cycle Length (s)			90.0						13.5			
Intersection Capacity Utilization			49.4%									A
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	760	142	0	0	0	0	315	116	16	92	0
Future Volume (veh/h)	34	760	142	0	0	0	0	315	116	16	92	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1586	1586	1586				0	1486	1486	1627	1627	0
Adj Flow Rate, veh/h	38	854	0				0	354	130	18	103	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	12	12	12				0	5	5	9	9	0
Cap, veh/h	70	1658					0	401	337	126	553	0
Arrive On Green	0.56	0.56	0.00				0.00	0.27	0.27	0.02	0.34	0.00
Sat Flow, veh/h	126	2961	1344				0	1486	1250	1550	1627	0
Grp Volume(v), veh/h	478	414	0				0	354	130	18	103	0
Grp Sat Flow(s),veh/h/ln	1580	1507	1344				0	1486	1250	1550	1627	0
Q Serve(g_s), s	17.2	15.0	0.0				0.0	20.5	7.6	0.0	4.0	0.0
Cycle Q Clear(g_c), s	17.2	15.0	0.0				0.0	20.5	7.6	0.0	4.0	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	885	844					0	401	337	126	553	0
V/C Ratio(X)	0.54	0.49					0.00	0.88	0.39	0.14	0.19	0.00
Avail Cap(c_a), veh/h	885	844					0	537	452	181	759	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.5	12.0	0.0				0.0	31.5	26.8	42.5	20.9	0.0
Incr Delay (d2), s/veh	2.4	2.0	0.0				0.0	12.7	0.7	0.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	5.2	0.0				0.0	8.4	2.2	0.4	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.8	14.1	0.0				0.0	44.2	27.5	43.0	21.1	0.0
LnGrp LOS	B	B					A	D	C	D	C	A
Approach Vol, veh/h		892	A					484			121	
Approach Delay, s/veh		14.5						39.7			24.3	
Approach LOS		B						D			C	
Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		54.9	6.3	28.8				35.1				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		39.0	5.0	32.5				42.0				
Max Q Clear Time (g_c+I1), s		19.2	2.0	22.5				6.0				
Green Ext Time (p_c), s		6.1	0.0	1.7				0.6				
Intersection Summary												
HCM 6th Ctrl Delay			23.4									
HCM 6th LOS			C									
Notes												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: Highway 211 & Dubarko Road

07/13/2021

Intersection												
Int Delay, s/veh	4.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕			↕	↕
Traffic Vol, veh/h	4	10	48	38	48	46	27	283	11	8	174	1
Future Vol, veh/h	4	10	48	38	48	46	27	283	11	8	174	1
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	5	13	62	49	62	59	35	363	14	10	223	1
Major/Minor	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	748	694	227	725	688	374	226	0	0	379	0	0
Stage 1	245	245	-	442	442	-	-	-	-	-	-	-
Stage 2	503	449	-	283	246	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.14	6.54	6.24	4.15	-	-	4.14	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.536	4.036	3.336	2.245	-	-	2.236	-	-
Pot Cap-1 Maneuver	325	363	805	338	367	668	1325	-	-	1169	-	-
Stage 1	752	698	-	591	573	-	-	-	-	-	-	-
Stage 2	545	567	-	720	699	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	247	346	802	292	350	665	1322	-	-	1167	-	-
Mov Cap-2 Maneuver	247	346	-	292	350	-	-	-	-	-	-	-
Stage 1	725	690	-	570	552	-	-	-	-	-	-	-
Stage 2	425	547	-	645	691	-	-	-	-	-	-	-
Approach	EB	WB			NB			SB				
HCM Control Delay, s	11.6	18.1			0.7			0.4				
HCM LOS	B	C										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	1322	-	-	310	802	322	665	1167	-	-		
HCM Lane V/C Ratio	0.026	-	-	0.058	0.077	0.342	0.089	0.009	-	-		
HCM Control Delay (s)	7.8	0	-	17.3	9.9	21.9	10.9	8.1	0	-		
HCM Lane LOS	A	A	-	C	A	C	B	A	A	-		
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.2	1.5	0.3	0	-	-		

HCM 6th TWSC
3: Highway 211 & Bornstedt Road

07/13/2021

Intersection						
Int Delay, s/veh	6.8					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations	Y		↑	↑	Y	↑
Traffic Vol, veh/h	70	189	134	15	91	169
Future Vol, veh/h	70	189	134	15	91	169
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	9	9	4	4
Mvmt Flow	86	233	165	19	112	209
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	598	165	0	0	165	0
Stage 1	165	-	-	-	-	-
Stage 2	433	-	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.14	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.236	-
Pot Cap-1 Maneuver	464	877	-	-	1401	-
Stage 1	862	-	-	-	-	-
Stage 2	652	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	427	877	-	-	1401	-
Mov Cap-2 Maneuver	427	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	600	-	-	-	-	-
Approach	NB	NE	SW			
HCM Control Delay, s	14.8	0	2.7			
HCM LOS	B					
Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT	
Capacity (veh/h)	-	-	683	1401	-	
HCM Lane V/C Ratio	-	-	0.468	0.08	-	
HCM Control Delay (s)	-	-	14.8	7.8	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	2.5	0.3	-	

HCM Signalized Intersection Capacity Analysis
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗					↕	↗	↘	↕	
Traffic Volume (vph)	60	1322	372	0	0	0	0	298	140	15	182	0
Future Volume (vph)	60	1322	372	0	0	0	0	298	140	15	182	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00	0.97					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frft		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3252	1408					1664	1391	1613	1699	
Flt Permitted		1.00	1.00					1.00	1.00	0.34	1.00	
Satd. Flow (perm)		3252	1408					1664	1391	584	1699	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	62	1377	388	0	0	0	0	310	146	16	190	0
RTOR Reduction (vph)	0	0	61	0	0	0	0	0	93	0	0	0
Lane Group Flow (vph)	0	1440	327	0	0	0	0	310	53	16	190	0
Confl. Peds. (#/hr)	2		6						3	3		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		55.0	55.0					20.5	20.5	26.0	26.0	
Effective Green, g (s)		55.0	55.0					20.5	20.5	26.0	26.0	
Actuated g/C Ratio		0.61	0.61					0.23	0.23	0.29	0.29	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1987	860					379	316	180	490	
v/s Ratio Prot								c0.19		0.00	c0.11	
v/s Ratio Perm		0.44	0.23						0.04	0.02		
v/c Ratio		0.72	0.38					0.82	0.17	0.09	0.39	
Uniform Delay, d1		12.2	8.9					33.0	27.9	30.9	25.6	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.3	1.3					12.8	0.3	0.2	0.5	
Delay (s)		14.6	10.1					45.8	28.2	31.1	26.1	
Level of Service		B	B					D	C	C	C	
Approach Delay (s)		13.6			0.0			40.2			26.5	
Approach LOS		B			A			D			C	
Intersection Summary												
HCM 2000 Control Delay			19.5		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				13.5			
Intersection Capacity Utilization			67.2%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↑	↗					↑	↗	↘	↑	
Traffic Volume (veh/h)	60	1322	372	0	0	0	0	298	140	15	182	0
Future Volume (veh/h)	60	1322	372	0	0	0	0	298	140	15	182	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723				0	1527	1527	1709	1709	0
Adj Flow Rate, veh/h	62	1377	0				0	310	146	16	190	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	3	3	0
Cap, veh/h	83	1941					0	348	293	117	506	0
Arrive On Green	0.60	0.60	0.00				0.00	0.23	0.23	0.02	0.30	0.00
Sat Flow, veh/h	138	3214	1460				0	1527	1286	1628	1709	0
Grp Volume(v), veh/h	771	668	0				0	310	146	16	190	0
Grp Sat Flow(s),veh/h/ln	1716	1637	1460				0	1527	1286	1628	1709	0
Q Serve(g_s), s	29.1	24.6	0.0				0.0	17.7	8.9	0.0	7.9	0.0
Cycle Q Clear(g_c), s	29.1	24.6	0.0				0.0	17.7	8.9	0.0	7.9	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1036	988					0	348	293	117	506	0
V/C Ratio(X)	0.74	0.68					0.00	0.89	0.50	0.14	0.38	0.00
Avail Cap(c_a), veh/h	1036	988					0	399	336	178	627	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	12.8	11.9	0.0				0.0	33.7	30.3	43.2	25.1	0.0
Incr Delay (d2), s/veh	4.8	3.7	0.0				0.0	19.6	1.3	0.5	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	9.2	0.0				0.0	8.1	2.7	0.4	3.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.7	15.6	0.0				0.0	53.3	31.6	43.7	25.5	0.0
LnGrp LOS	B	B					A	D	C	D	C	A
Approach Vol, veh/h		1439	A					456			206	
Approach Delay, s/veh		16.7						46.3			27.0	
Approach LOS		B						D			C	
Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		58.8	6.1	25.0				31.2				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		48.0	5.0	23.5				33.0				
Max Q Clear Time (g_c+I1), s		31.1	2.0	19.7				9.9				
Green Ext Time (p_c), s		9.9	0.0	0.8				1.1				
Intersection Summary												
HCM 6th Ctrl Delay			24.2									
HCM 6th LOS			C									
Notes												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: Highway 211 & Dubarko Road

07/13/2021

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕			↕	↕
Traffic Vol, veh/h	5	43	60	36	36	25	71	325	65	24	356	16
Future Vol, veh/h	5	43	60	36	36	25	71	325	65	24	356	16
Conflicting Peds, #/hr	6	0	0	0	0	6	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	1	1	1
Mvmt Flow	5	44	62	37	37	26	73	335	67	25	367	16
Major/Minor	Minor2	Minor1			Major1			Major2				
Conflicting Flow All	969	965	367	993	948	375	383	0	0	402	0	0
Stage 1	417	417	-	515	515	-	-	-	-	-	-	-
Stage 2	552	548	-	478	433	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	232	254	676	223	260	669	1175	-	-	1162	-	-
Stage 1	611	590	-	541	533	-	-	-	-	-	-	-
Stage 2	516	515	-	566	580	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	179	227	676	159	232	665	1175	-	-	1162	-	-
Mov Cap-2 Maneuver	179	227	-	159	232	-	-	-	-	-	-	-
Stage 1	562	574	-	497	490	-	-	-	-	-	-	-
Stage 2	419	473	-	462	564	-	-	-	-	-	-	-
Approach	EB	WB			NB			SB				
HCM Control Delay, s	17.6	29.4			1.3			0.5				
HCM LOS	C	D										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	1175	-	-	221	676	189	665	1162	-	-		
HCM Lane V/C Ratio	0.062	-	-	0.224	0.092	0.393	0.039	0.021	-	-		
HCM Control Delay (s)	8.3	0	-	25.9	10.9	35.9	10.6	8.2	0	-		
HCM Lane LOS	A	A	-	D	B	E	B	A	A	-		
HCM 95th %tile Q(veh)	0.2	-	-	0.8	0.3	1.7	0.1	0.1	-	-		

HCM 6th TWSC
3: Highway 211 & Bornstedt Road

07/13/2021

Intersection						
Int Delay, s/veh	5.7					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations	↔		↑	↗	↘	↑
Traffic Vol, veh/h	52	151	309	73	215	238
Future Vol, veh/h	52	151	309	73	215	238
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	54	157	322	76	224	248
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1018	322	0	0	322	
Stage 1	322	-	-	-	-	
Stage 2	696	-	-	-	-	
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	263	719	-	-	1238	
Stage 1	735	-	-	-	-	
Stage 2	495	-	-	-	-	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	215	719	-	-	1238	
Mov Cap-2 Maneuver	215	-	-	-	-	
Stage 1	735	-	-	-	-	
Stage 2	405	-	-	-	-	
Approach	NB	NE		SW		
HCM Control Delay, s	20	0		4.1		
HCM LOS	C					
Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT	
Capacity (veh/h)	-	-	449	1238	-	
HCM Lane V/C Ratio	-	-	0.471	0.181	-	
HCM Control Delay (s)	-	-	20	8.5	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	2.5	0.7	-	

Trip Generation Calculation Worksheet



Land Use Description: Single-Family Detached Housing
ITE Land Use Code: 210
Independent Variable: Dwelling Units
Quantity: 42 Dwelling Units

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic

Trip Rate: 0.74 trips per dwelling unit
Directional Distribution: 25% Entering 75% Exiting

PM Peak Hour of Adjacent Street Traffic

Trip Rate: 0.99 trips per dwelling unit
Directional Distribution: 63% Entering 37% Exiting

Total Weekday Traffic

Trip Rate: 9.44 trips per dwelling unit
Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

42 Dwelling Units

	Entering	Exiting	Total
AM Peak Hour	8	23	31
PM Peak Hour	26	16	42
Weekday	198	198	396

Data Source: *Trip Generation Manual, 10th Edition*, Institute of Transportation Engineers, 2017

Site id	HWY	MP	DIR	HS	Description	2017	2018	2019	2039	RSQ
1760	026	9.96	1		0.09 mile east of SE 174th Avenue, west city limits of Gresham		20100		20900	MODEL
26003	026	14.36	1		Gresham Automatic Traffic Recorder, Sta. 26-003, 0.18 mile southeast of SE Powell Valley Road		33400		42900	MODEL
1774	026	14.80	1		0.05 mile south of SE Palmquist Road		28500		36100	MODEL
1775	026	18.30	1		0.05 mile northwest of SE Haley Road		25600		37100	MODEL
1776	026	19.24	1		0.30 mile northwest of Clackamas-Boring Highway (OR212)		25500		36900	MODEL
22590	026	20.60	1		0.50 mile northwest of SE Kelso Road		30300		43400	MODEL
1777	026	21.40	1		0.30 mile southeast of SE Kelso Road		30300		42500	MODEL
1778	026	22.72	1		0.02 mile northwest of SE 362nd Drive, west city limits of Sandy		33700		47300	MODEL
1779	026	23.85	1		0.02 mile west of Bluff Road		33300		47100	MODEL
1780	026	23.89	1		0.02 mile east of Bluff Road		15700		22400	MODEL
1781	026	24.02	1		0.02 mile west of Beers Avenue		16200		23100	MODEL
1782	026	24.35	1		0.05 mile west of Eagle Creek-Sandy Highway (OR211)		16000		23400	MODEL
1783	026	24.42	1		0.02 mile east of Eagle Creek-Sandy Highway (OR211)		12400		17700	MODEL
1784	026	24.59	1		0.02 mile west of Ten Eyek Road		12500		17800	MODEL
1785	026	23.89	2		0.02 mile east of Bluff Road		16600		23300	MODEL
1786	026	24.04	2		0.02 mile west of Beers Avenue		18300		25600	MODEL
1787	026	24.36	2		0.05 mile west of Eagle Creek-Sandy Highway (OR211)		15900		22700	MODEL
1788	026	24.40	2		0.02 mile east of Eagle Creek-Sandy Highway (OR211)		13700		19200	MODEL
1789	026	24.61	2		0.02 mile west of Ten Eyek Road		12600		17600	MODEL
1790	026	25.10	1		0.02 mile west of Langensand Road		20700		29200	MODEL
1791	026	25.66	1		0.10 mile east of Vista Loop Drive		23500		32900	MODEL
1792	026	26.76	1		0.10 mile west of SE Firwood Road		19000		26600	MODEL
1793	026	26.93	1		0.07 mile east of SE Firwood Road		17800		25200	MODEL
1794	026	29.66	1		0.23 mile west of Wagoneer Loop Drive (East Jct.)		16500		23400	MODEL
1795	026	34.87	1		0.10 mile west of E Sleepy Hollow Drive		15000		21500	MODEL

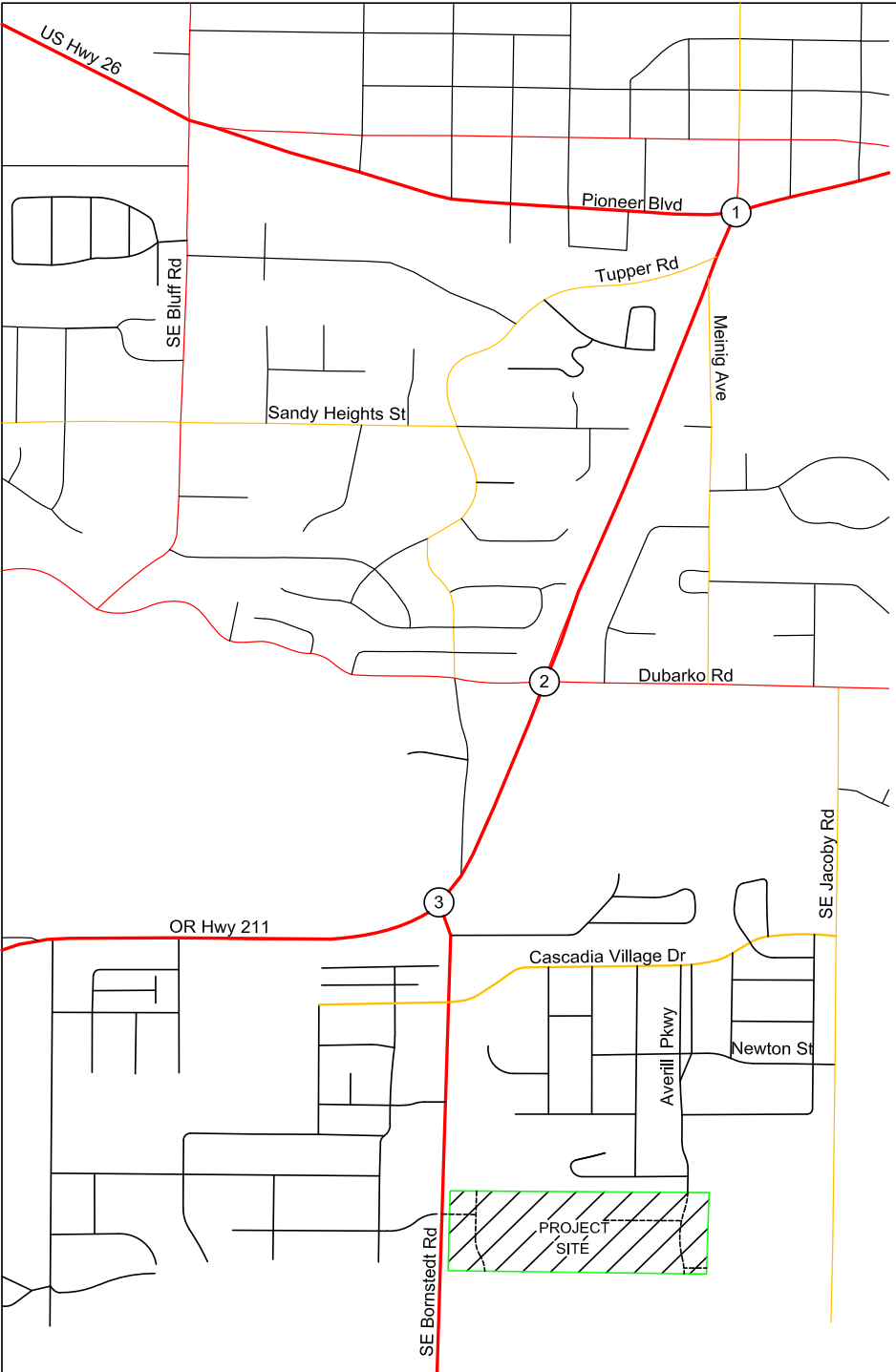
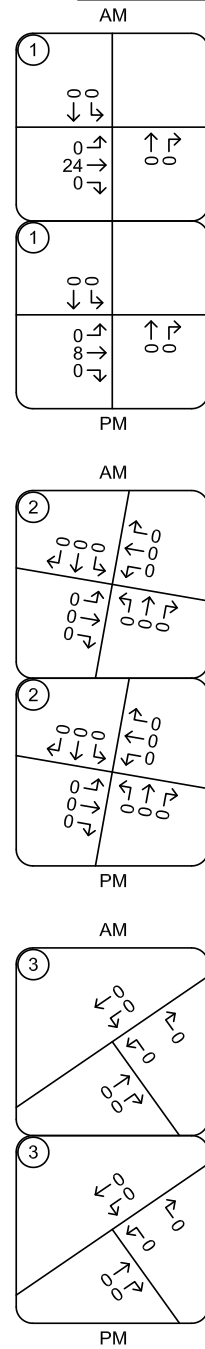


FIGURE 7



TRAFFIC VOLUMES
Clackamas County Health Clinic - Site Trips
Morning and Evening Peak Hours

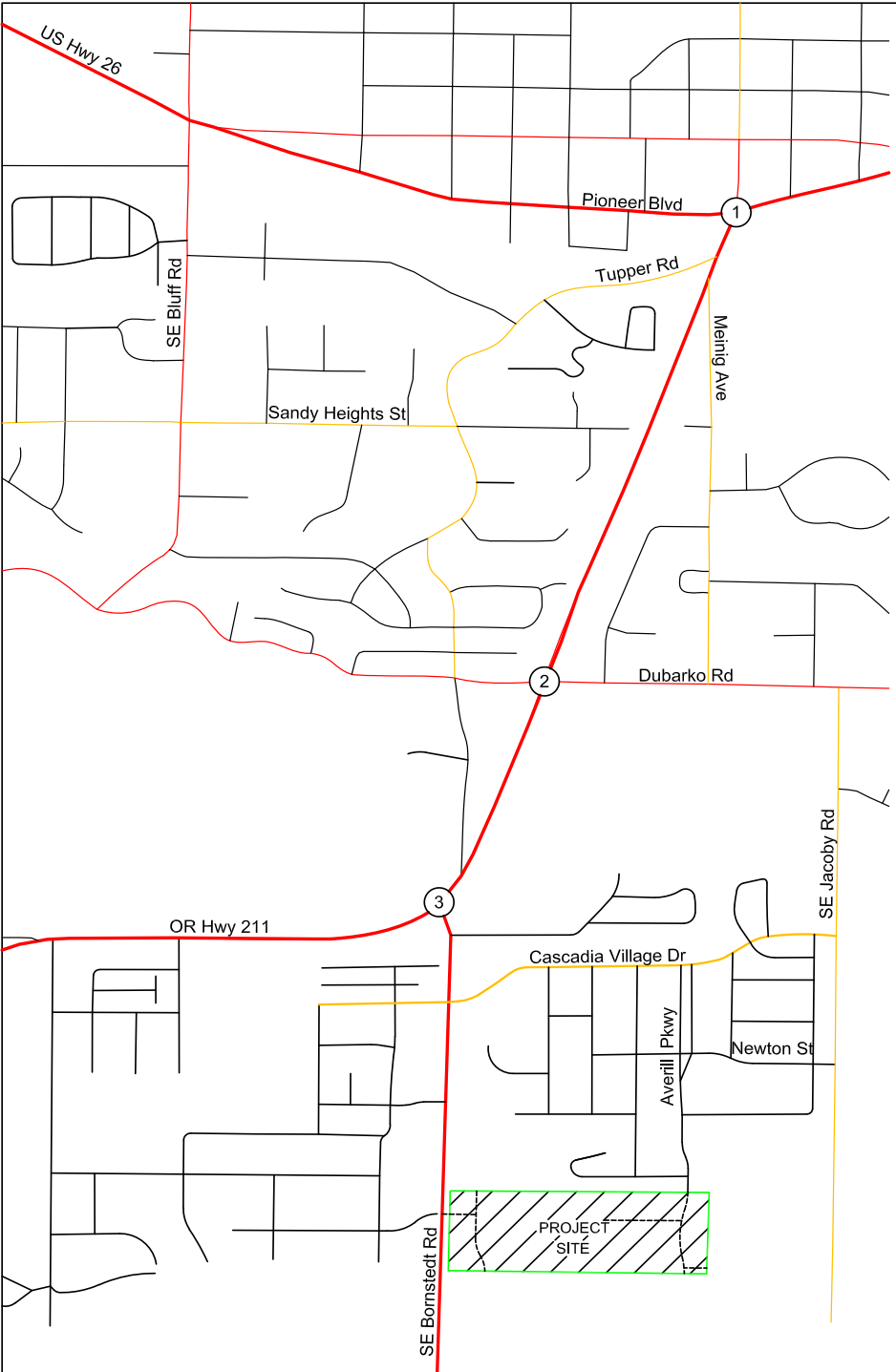
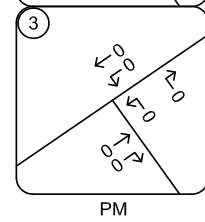
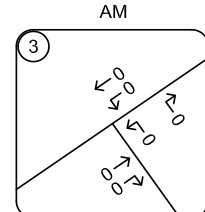
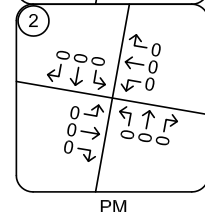
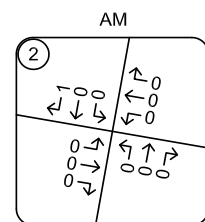
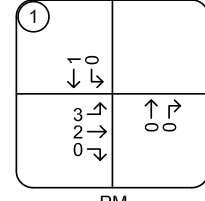
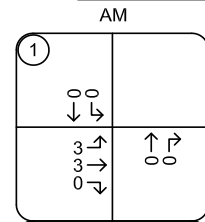


FIGURE 8



TRAFFIC VOLUMES
 Mt. Hood Senior Living Development - Site Trips
 Morning and Evening Peak Hours

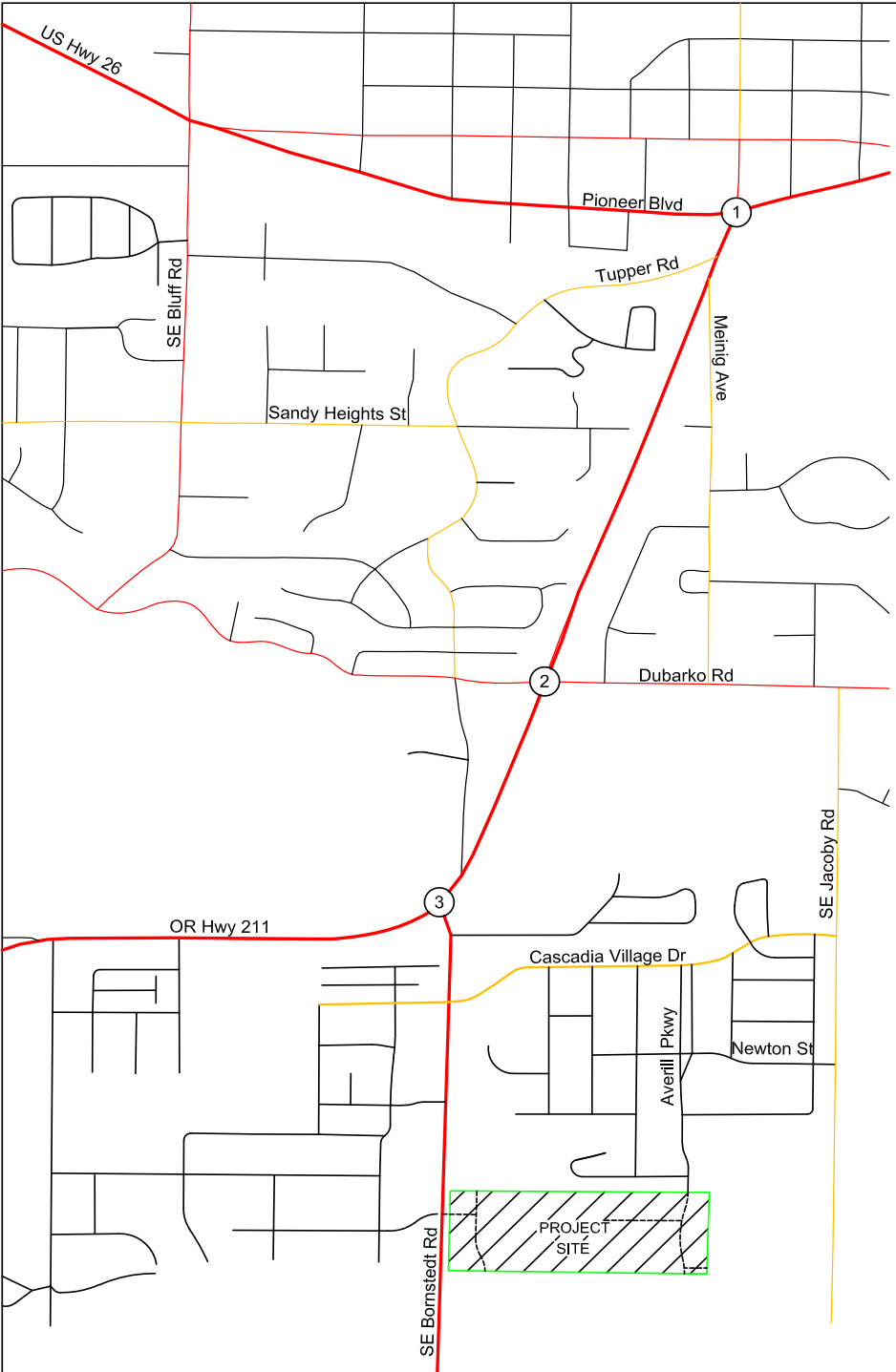
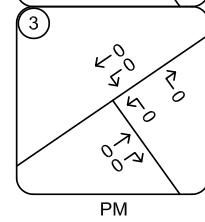
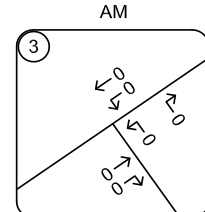
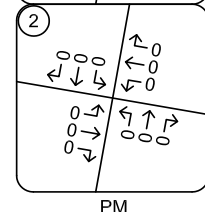
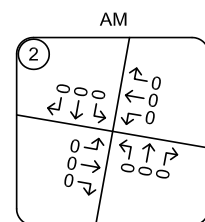
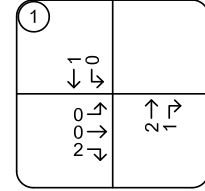
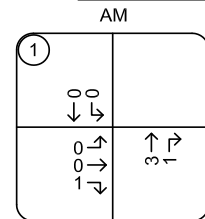


FIGURE 9



TRAFFIC VOLUMES
 The Pad Development - Site Trips
 Morning and Evening Peak Hours

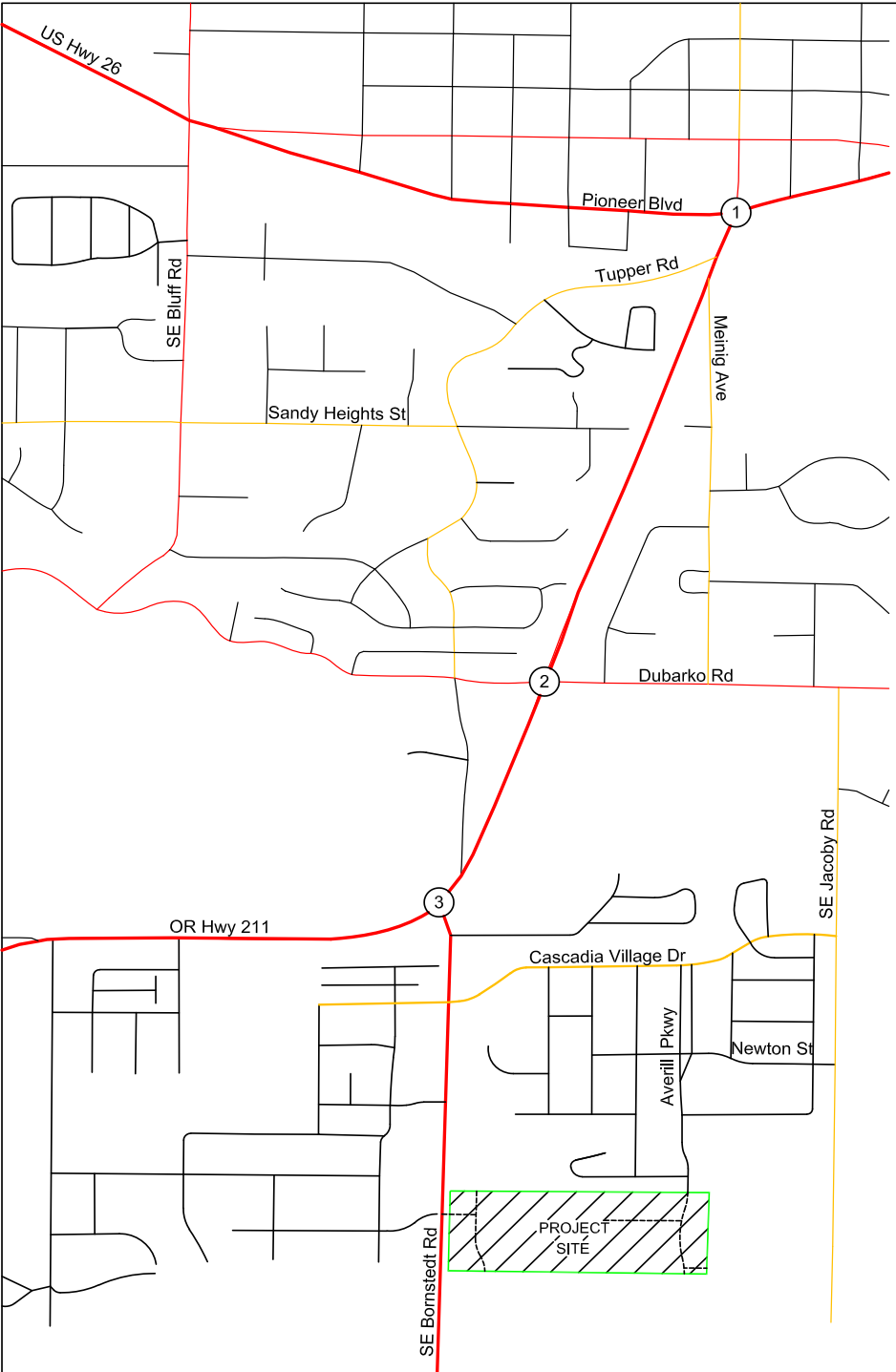
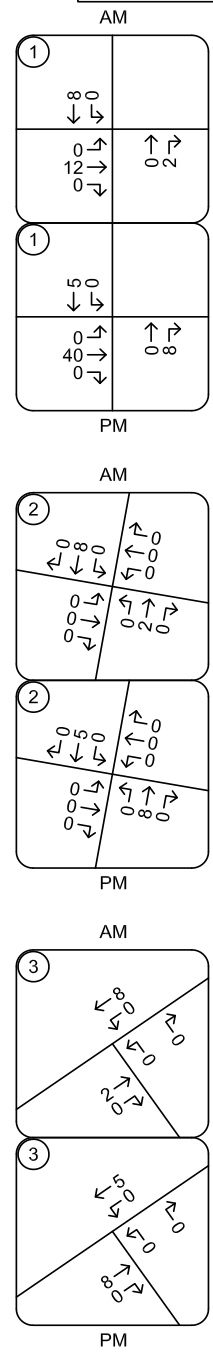
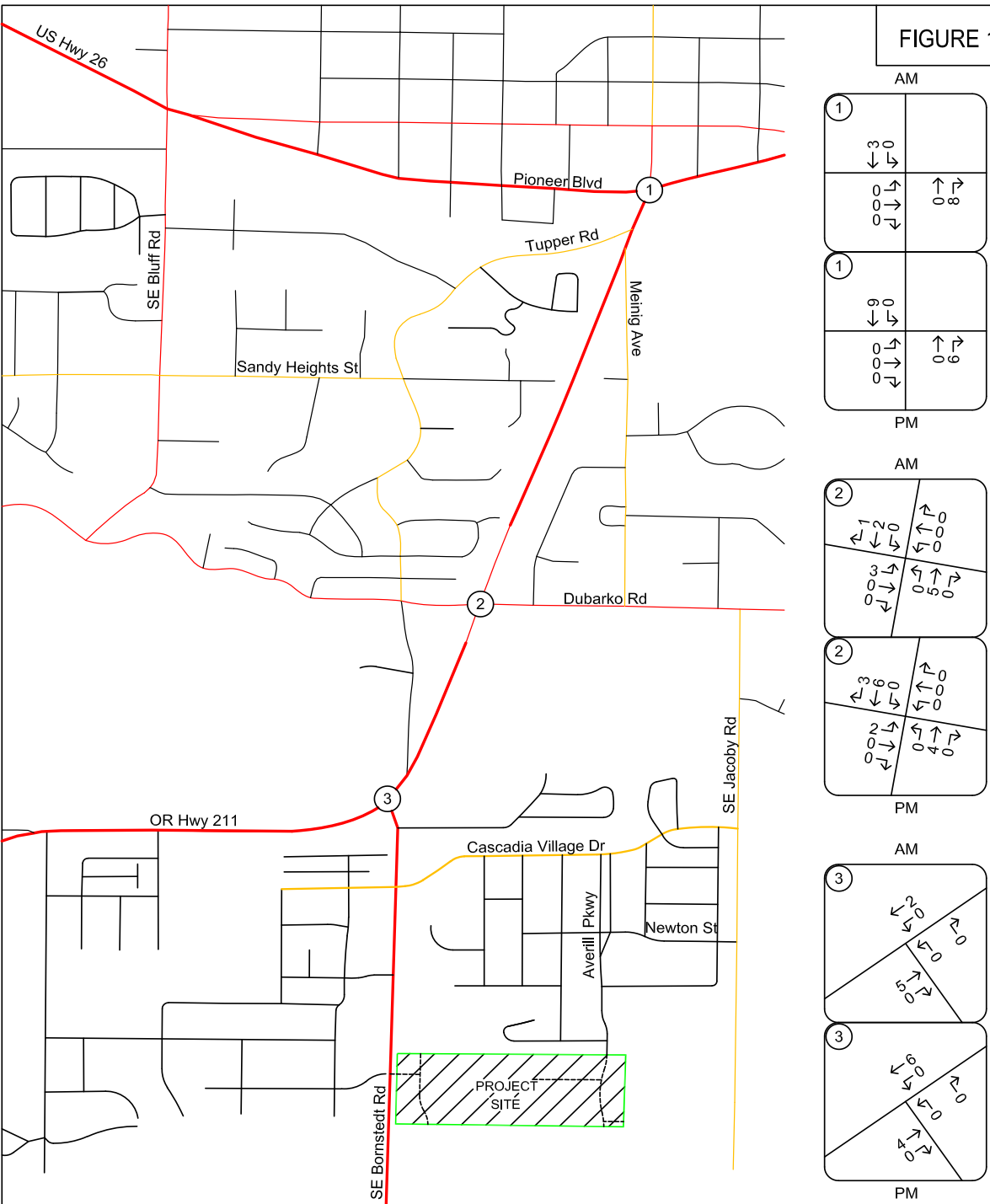


FIGURE 10



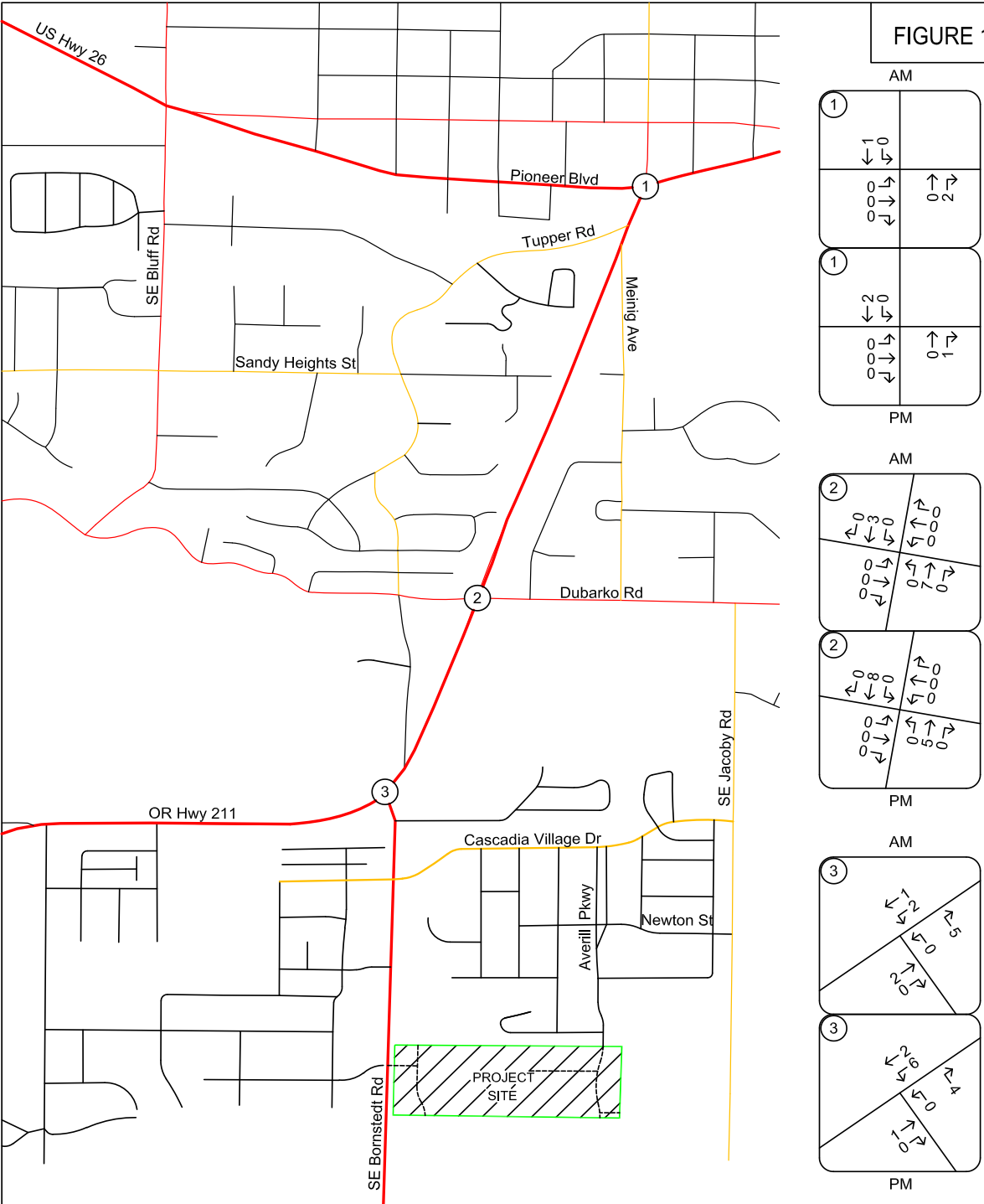
TRAFFIC VOLUMES
 The Views - Site Trips
 Morning and Evening Peak Hours

FIGURE 11



TRAFFIC VOLUMES
 Shaylee Meadows - Site Trips
 Morning and Evening Peak Hours

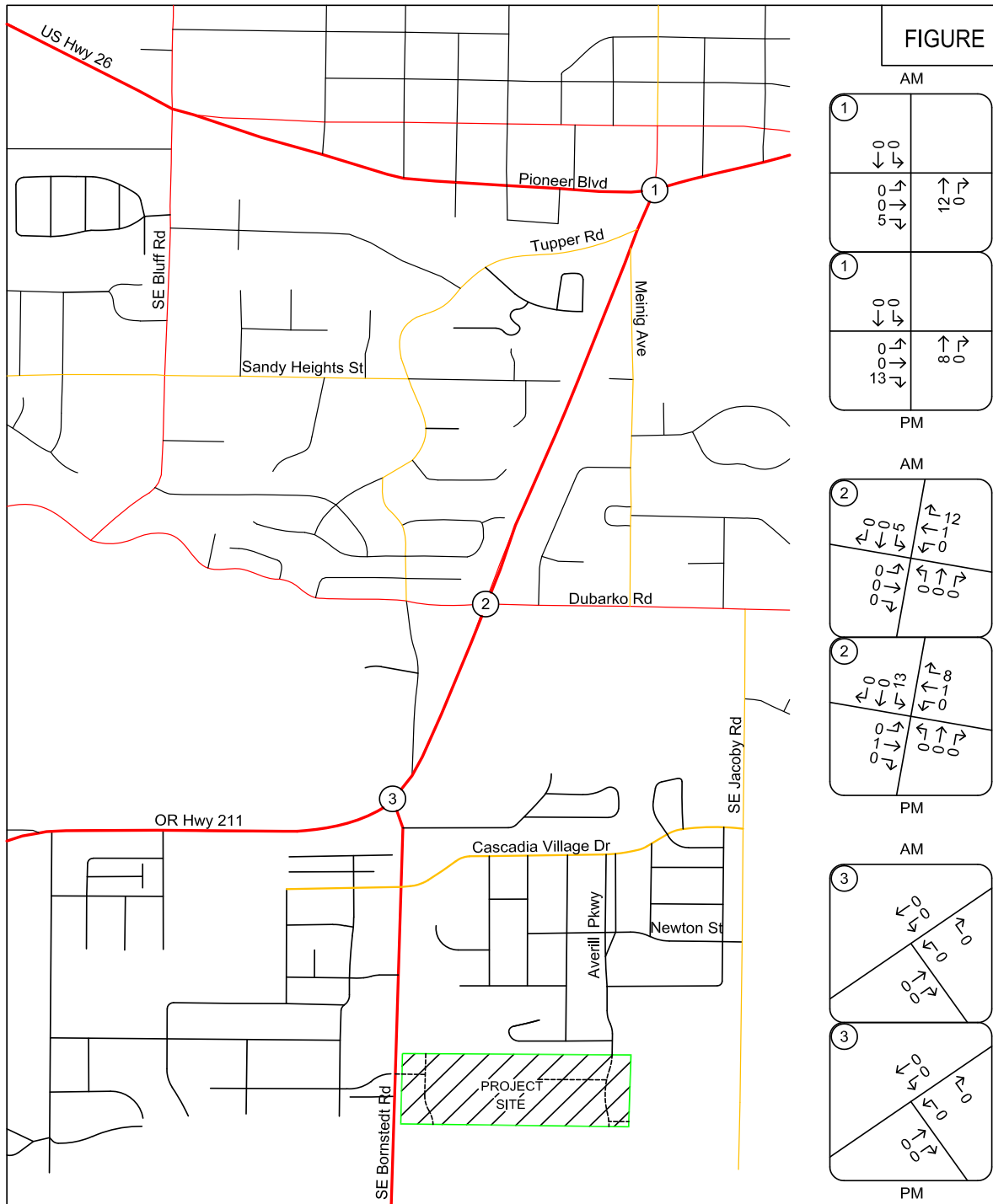
FIGURE 12



TRAFFIC VOLUMES
 Mt. View Ridge / Marshall Ridge - Site Trips
 Morning and Evening Peak Hours

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FIGURE 13



TRAFFIC VOLUMES
 Jacoby Heights - Site Trips
 Morning and Evening Peak Hours

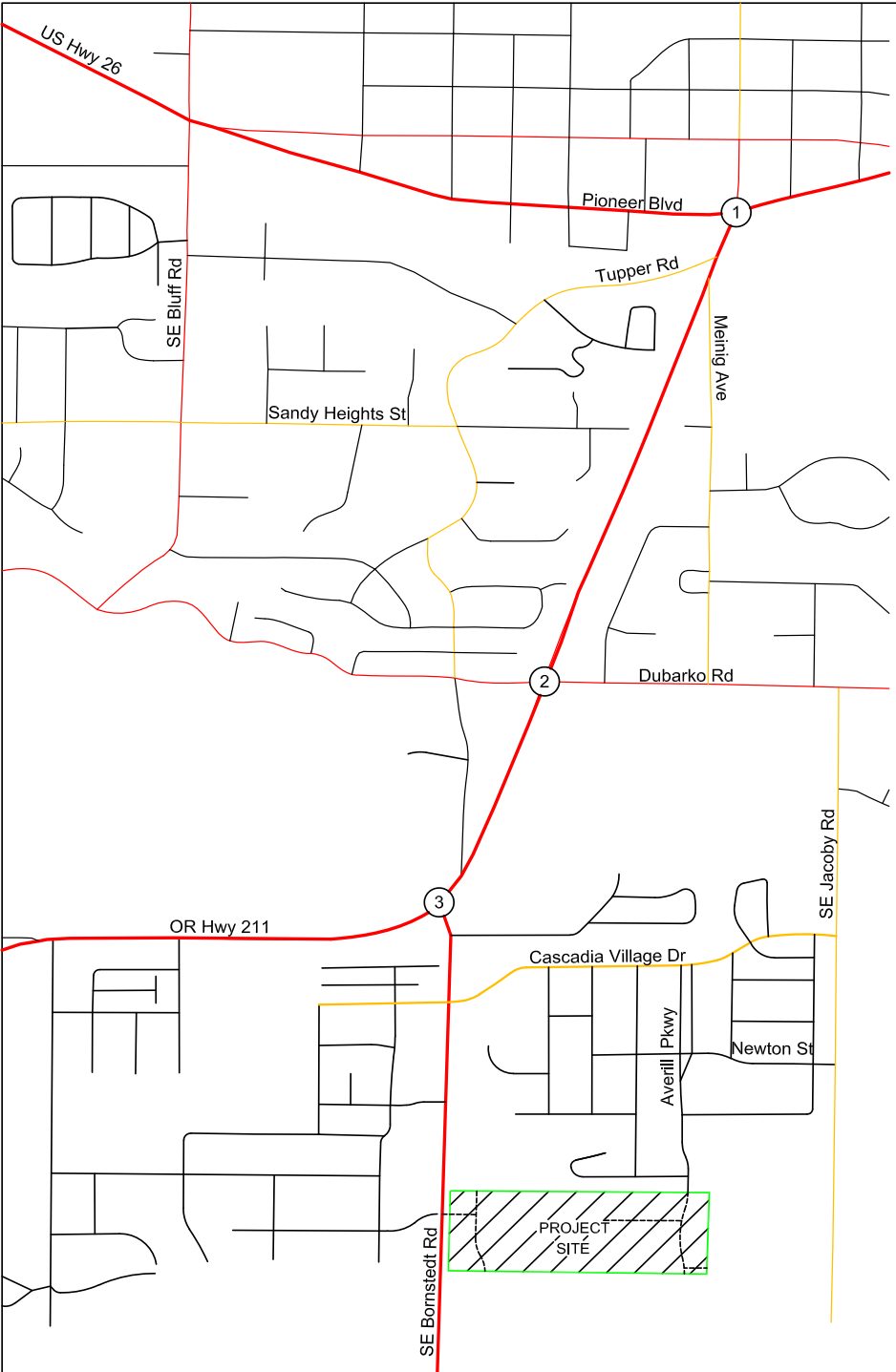
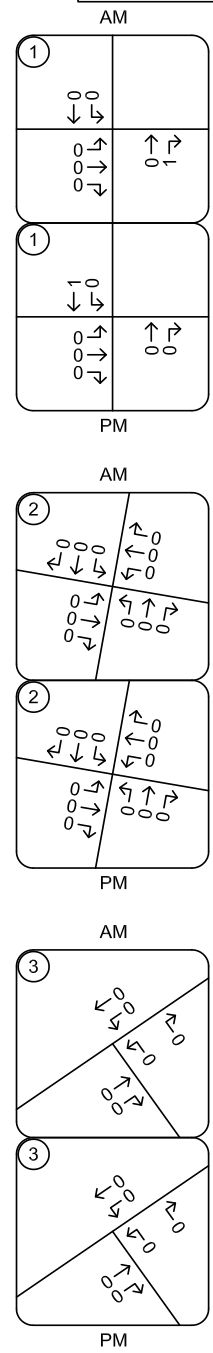


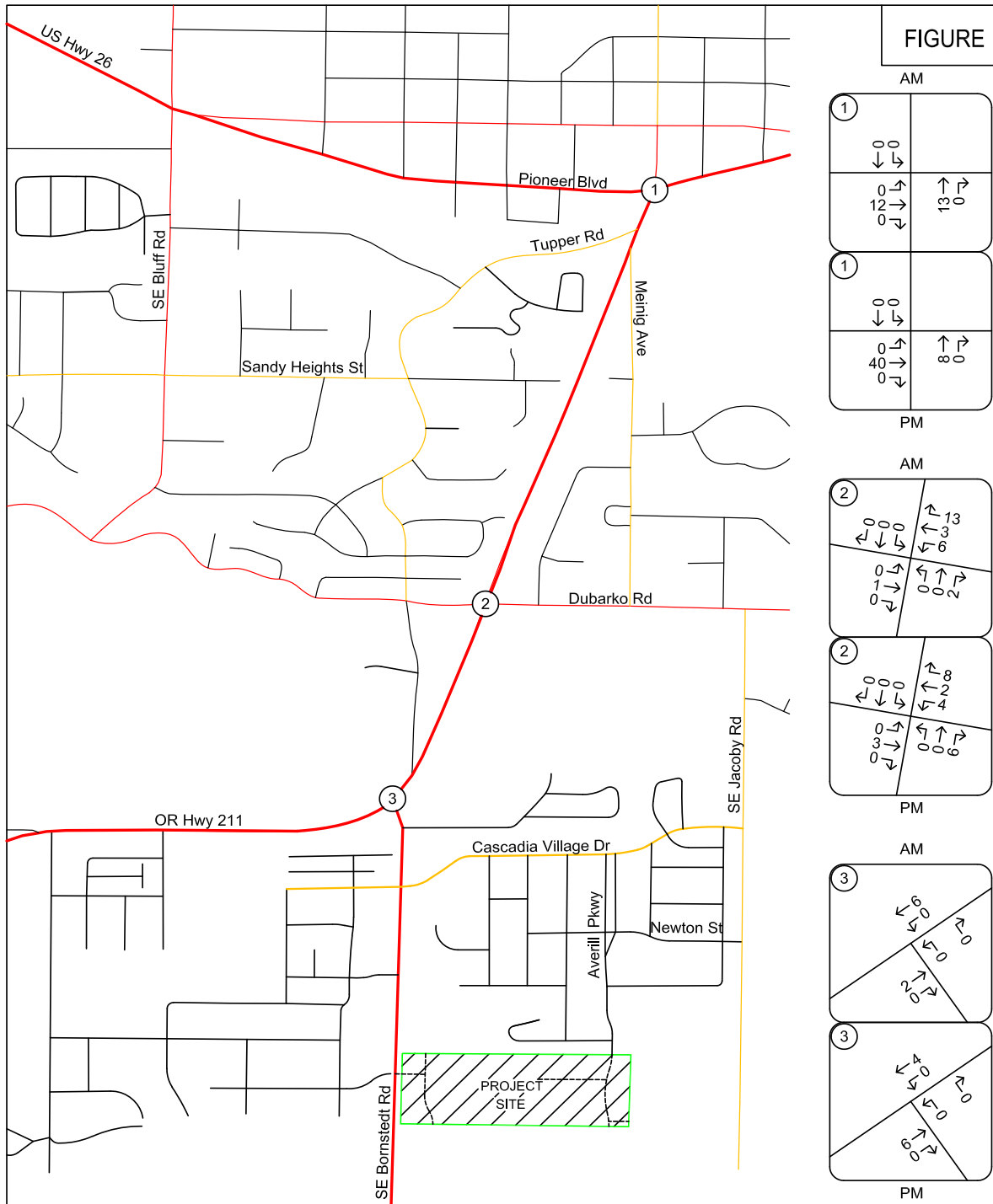
FIGURE 14



TRAFFIC VOLUMES
 Trimble PD - Site Trips
 Morning and Evening Peak Hours

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FIGURE 15



TRAFFIC VOLUMES
 Deer Meadows - Site Trips
 Morning and Evening Peak Hours

HCM Signalized Intersection Capacity Analysis
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↑	↔↗					↑	↗	↘	↑	
Traffic Volume (vph)	38	843	154	0	0	0	0	356	135	17	108	0
Future Volume (vph)	38	843	154	0	0	0	0	356	135	17	108	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00	1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frft		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2962	1328					1617	1350	1525	1606	
Flt Permitted		1.00	1.00					1.00	1.00	0.30	1.00	
Satd. Flow (perm)		2962	1328					1617	1350	483	1606	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	43	947	173	0	0	0	0	400	152	19	121	0
RTOR Reduction (vph)	0	0	40	0	0	0	0	0	100	0	0	0
Lane Group Flow (vph)	0	990	133	0	0	0	0	400	52	19	121	0
Confl. Peds. (#/hr)	1								4			
Heavy Vehicles (%)	12%	12%	12%	0%	0%	0%	5%	5%	5%	9%	9%	9%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		47.4	47.4					27.0	27.0	33.6	33.6	
Effective Green, g (s)		47.4	47.4					27.0	27.0	33.6	33.6	
Actuated g/C Ratio		0.53	0.53					0.30	0.30	0.37	0.37	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1559	699					485	405	204	599	
v/s Ratio Prot								c0.25		0.00	c0.08	
v/s Ratio Perm		0.33	0.10						0.04	0.03		
v/c Ratio		0.64	0.19					0.82	0.13	0.09	0.20	
Uniform Delay, d1		15.1	11.2					29.3	22.9	27.8	19.1	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.0	0.6					10.9	0.1	0.2	0.2	
Delay (s)		17.1	11.8					40.2	23.1	28.0	19.3	
Level of Service		B	B					D	C	C	B	
Approach Delay (s)		16.3			0.0			35.5			20.5	
Approach LOS		B			A			D			C	
Intersection Summary												
HCM 2000 Control Delay			22.4		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				13.5			
Intersection Capacity Utilization			54.3%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↑	↗					↑	↗	↘	↑	
Traffic Volume (veh/h)	38	843	154	0	0	0	0	356	135	17	108	0
Future Volume (veh/h)	38	843	154	0	0	0	0	356	135	17	108	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1586	1586	1586				0	1486	1486	1627	1627	0
Adj Flow Rate, veh/h	43	947	0				0	400	152	19	121	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	12	12	12				0	5	5	9	9	0
Cap, veh/h	68	1568					0	444	374	126	602	0
Arrive On Green	0.53	0.53	0.00				0.00	0.30	0.30	0.02	0.37	0.00
Sat Flow, veh/h	128	2959	1344				0	1486	1251	1550	1627	0
Grp Volume(v), veh/h	530	460	0				0	400	152	19	121	0
Grp Sat Flow(s),veh/h/ln	1580	1507	1344				0	1486	1251	1550	1627	0
Q Serve(g_s), s	21.4	18.6	0.0				0.0	23.2	8.7	0.0	4.6	0.0
Cycle Q Clear(g_c), s	21.4	18.6	0.0				0.0	23.2	8.7	0.0	4.6	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	837	799					0	444	374	126	602	0
V/C Ratio(X)	0.63	0.58					0.00	0.90	0.41	0.15	0.20	0.00
Avail Cap(c_a), veh/h	837	799					0	537	452	180	759	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.0	14.3	0.0				0.0	30.3	25.2	42.5	19.3	0.0
Incr Delay (d2), s/veh	3.6	3.0	0.0				0.0	16.1	0.7	0.5	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	6.7	0.0				0.0	9.8	2.5	0.4	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	17.3	0.0				0.0	46.4	25.9	43.1	19.5	0.0
LnGrp LOS	B	B					A	D	C	D	B	A
Approach Vol, veh/h		990	A					552			140	
Approach Delay, s/veh		18.0						40.8			22.7	
Approach LOS		B						D			C	
Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		52.2	6.4	31.4				37.8				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		39.0	5.0	32.5				42.0				
Max Q Clear Time (g_c+I1), s		23.4	2.0	25.2				6.6				
Green Ext Time (p_c), s		6.2	0.0	1.7				0.7				
Intersection Summary												
HCM 6th Ctrl Delay			25.9									
HCM 6th LOS			C									
Notes												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: Highway 211 & Dubarko Road

07/13/2021

Intersection												
Int Delay, s/veh	6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕			↕	↕
Traffic Vol, veh/h	7	11	50	46	53	73	28	308	13	13	194	3
Future Vol, veh/h	7	11	50	46	53	73	28	308	13	13	194	3
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	9	14	64	59	68	94	36	395	17	17	249	4

Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	844	771	253	804	767	408	255	0	0	414	0	0
Stage 1	285	285	-	478	478	-	-	-	-	-	-	-
Stage 2	559	486	-	326	289	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.14	6.54	6.24	4.15	-	-	4.14	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.536	4.036	3.336	2.245	-	-	2.236	-	-
Pot Cap-1 Maneuver	280	327	778	299	330	639	1293	-	-	1134	-	-
Stage 1	716	670	-	565	552	-	-	-	-	-	-	-
Stage 2	508	546	-	682	669	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	190	309	775	253	312	637	1291	-	-	1132	-	-
Mov Cap-2 Maneuver	190	309	-	253	312	-	-	-	-	-	-	-
Stage 1	689	657	-	544	531	-	-	-	-	-	-	-
Stage 2	364	525	-	601	656	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13	21	0.6	0.5
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1291	-	-	248	775	281	637	1132	-	-
HCM Lane V/C Ratio	0.028	-	-	0.093	0.083	0.452	0.147	0.015	-	-
HCM Control Delay (s)	7.9	0	-	21	10.1	27.9	11.6	8.2	0	-
HCM Lane LOS	A	A	-	C	B	D	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.3	2.2	0.5	0	-	-

HCM 6th TWSC
3: Highway 211 & Bornstedt Road

07/13/2021

Intersection						
Int Delay, s/veh	7.2					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations	Y		↑	↑	Y	↑
Traffic Vol, veh/h	73	202	150	16	97	193
Future Vol, veh/h	73	202	150	16	97	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	9	9	4	4
Mvmt Flow	90	249	185	20	120	238

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	663	185	0	0	185
Stage 1	185	-	-	-	-
Stage 2	478	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.14
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.236
Pot Cap-1 Maneuver	425	855	-	-	1378
Stage 1	844	-	-	-	-
Stage 2	622	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	388	855	-	-	1378
Mov Cap-2 Maneuver	388	-	-	-	-
Stage 1	844	-	-	-	-
Stage 2	568	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	16.5	0	2.6
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	648	1378	-
HCM Lane V/C Ratio	-	-	0.524	0.087	-
HCM Control Delay (s)	-	-	16.5	7.9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	3.1	0.3	-

HCM Signalized Intersection Capacity Analysis
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗					↕	↗	↘	↕	
Traffic Volume (vph)	65	1468	402	0	0	0	0	328	162	16	208	0
Future Volume (vph)	65	1468	402	0	0	0	0	328	162	16	208	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00	0.97					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frft		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3252	1408					1664	1391	1613	1699	
Flt Permitted		1.00	1.00					1.00	1.00	0.30	1.00	
Satd. Flow (perm)		3252	1408					1664	1391	513	1699	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	68	1529	419	0	0	0	0	342	169	17	217	0
RTOR Reduction (vph)	0	0	64	0	0	0	0	0	83	0	0	0
Lane Group Flow (vph)	0	1597	355	0	0	0	0	342	86	17	217	0
Confl. Peds. (#/hr)	2		6						3	3		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		53.4	53.4					21.1	21.1	27.6	27.6	
Effective Green, g (s)		53.4	53.4					21.1	21.1	27.6	27.6	
Actuated g/C Ratio		0.59	0.59					0.23	0.23	0.31	0.31	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1929	835					390	326	181	521	
v/s Ratio Prot								c0.21		0.00	c0.13	
v/s Ratio Perm		0.49	0.25						0.06	0.03		
v/c Ratio		0.83	0.43					0.88	0.26	0.09	0.42	
Uniform Delay, d1		14.6	10.0					33.2	28.1	31.0	24.8	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.3	1.6					19.3	0.4	0.2	0.5	
Delay (s)		18.9	11.5					52.5	28.5	31.3	25.3	
Level of Service		B	B					D	C	C	C	
Approach Delay (s)		17.4			0.0			44.6			25.8	
Approach LOS		B			A			D			C	
Intersection Summary												
HCM 2000 Control Delay			23.1		HCM 2000 Level of Service					C		
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			90.0		Sum of lost time (s)				13.5			
Intersection Capacity Utilization			73.1%		ICU Level of Service				D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↑	↔↑					↑	↔↑	↔↑	↑	
Traffic Volume (veh/h)	65	1468	402	0	0	0	0	328	162	16	208	0
Future Volume (veh/h)	65	1468	402	0	0	0	0	328	162	16	208	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723				0	1527	1527	1709	1709	0
Adj Flow Rate, veh/h	68	1529	0				0	342	169	17	217	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	3	3	0
Cap, veh/h	80	1890					0	372	313	113	534	0
Arrive On Green	0.59	0.59	0.00				0.00	0.24	0.24	0.02	0.31	0.00
Sat Flow, veh/h	136	3216	1460				0	1527	1286	1628	1709	0
Grp Volume(v), veh/h	856	741	0				0	342	169	17	217	0
Grp Sat Flow(s),veh/h/ln	1716	1637	1460				0	1527	1286	1628	1709	0
Q Serve(g_s), s	36.9	30.7	0.0				0.0	19.6	10.3	0.0	9.0	0.0
Cycle Q Clear(g_c), s	36.9	30.7	0.0				0.0	19.6	10.3	0.0	9.0	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1008	962					0	372	313	113	534	0
V/C Ratio(X)	0.85	0.77					0.00	0.92	0.54	0.15	0.41	0.00
Avail Cap(c_a), veh/h	1008	962					0	382	322	173	608	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.3	14.0	0.0				0.0	33.2	29.7	43.3	24.4	0.0
Incr Delay (d2), s/veh	8.9	6.0	0.0				0.0	26.8	1.7	0.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.6	12.0	0.0				0.0	9.6	3.2	0.4	3.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.1	20.0	0.0				0.0	60.0	31.4	43.9	24.9	0.0
LnGrp LOS	C	B					A	E	C	D	C	A
Approach Vol, veh/h		1597	A					511			234	
Approach Delay, s/veh		22.2						50.6			26.2	
Approach LOS		C						D			C	
Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		57.4	6.2	26.4				32.6				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		49.0	5.0	22.5				32.0				
Max Q Clear Time (g_c+I1), s		38.9	2.0	21.6				11.0				
Green Ext Time (p_c), s		7.4	0.0	0.2				1.2				

Intersection Summary

HCM 6th Ctrl Delay	28.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: Highway 211 & Dubarko Road

07/13/2021

Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕			↕	↕
Traffic Vol, veh/h	7	49	62	41	40	42	74	355	74	38	389	20
Future Vol, veh/h	7	49	62	41	40	42	74	355	74	38	389	20
Conflicting Peds, #/hr	6	0	0	0	0	6	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	1	1	1
Mvmt Flow	7	51	64	42	41	43	76	366	76	39	401	21

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1083	1073	401	1103	1056	410	422	0	0	442	0	0
Stage 1	479	479	-	556	556	-	-	-	-	-	-	-
Stage 2	604	594	-	547	500	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	194	219	647	188	224	639	1137	-	-	1123	-	-
Stage 1	566	553	-	514	511	-	-	-	-	-	-	-
Stage 2	484	491	-	519	541	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	136	190	647	122	195	635	1137	-	-	1123	-	-
Mov Cap-2 Maneuver	136	190	-	122	195	-	-	-	-	-	-	-
Stage 1	515	528	-	468	465	-	-	-	-	-	-	-
Stage 2	372	447	-	404	517	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22	40.4	1.2	0.7
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1137	-	-	181	647	150	635	1123	-	-
HCM Lane V/C Ratio	0.067	-	-	0.319	0.099	0.557	0.068	0.035	-	-
HCM Control Delay (s)	8.4	0	-	33.9	11.2	55.6	11.1	8.3	0	-
HCM Lane LOS	A	A	-	D	B	F	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.3	0.3	2.8	0.2	0.1	-	-

HCM 6th TWSC
3: Highway 211 & Bornstedt Road

07/13/2021

Intersection						
Int Delay, s/veh	6.3					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations	Y		↑	↑	Y	↑
Traffic Vol, veh/h	54	161	340	76	230	265
Future Vol, veh/h	54	161	340	76	230	265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	56	168	354	79	240	276
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1110	354	0	0	354	0
Stage 1	354	-	-	-	-	-
Stage 2	756	-	-	-	-	-
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	232	690	-	-	1205	-
Stage 1	710	-	-	-	-	-
Stage 2	464	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	186	690	-	-	1205	-
Mov Cap-2 Maneuver	186	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Approach	NB	NE		SW		
HCM Control Delay, s	23.8	0		4.1		
HCM LOS	C					
Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT	
Capacity (veh/h)	-	-	411	1205	-	
HCM Lane V/C Ratio	-	-	0.545	0.199	-	
HCM Control Delay (s)	-	-	23.8	8.7	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	3.2	0.7	-	



















HCM Signalized Intersection Capacity Analysis
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↑	↔↗					↑	↗	↖	↑	
Traffic Volume (vph)	38	843	159	0	0	0	0	371	136	17	109	0
Future Volume (vph)	38	843	159	0	0	0	0	371	136	17	109	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00	1.00					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frft		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		2962	1328					1617	1350	1525	1606	
Flt Permitted		1.00	1.00					1.00	1.00	0.29	1.00	
Satd. Flow (perm)		2962	1328					1617	1350	461	1606	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	43	947	179	0	0	0	0	417	153	19	122	0
RTOR Reduction (vph)	0	0	42	0	0	0	0	0	96	0	0	0
Lane Group Flow (vph)	0	990	137	0	0	0	0	417	57	19	122	0
Confl. Peds. (#/hr)	1								4			
Heavy Vehicles (%)	12%	12%	12%	0%	0%	0%	5%	5%	5%	9%	9%	9%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		46.9	46.9					27.6	27.6	34.1	34.1	
Effective Green, g (s)		46.9	46.9					27.6	27.6	34.1	34.1	
Actuated g/C Ratio		0.52	0.52					0.31	0.31	0.38	0.38	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1543	692					495	414	198	608	
v/s Ratio Prot								c0.26		0.00	c0.08	
v/s Ratio Perm		0.33	0.10						0.04	0.03		
v/c Ratio		0.64	0.20					0.84	0.14	0.10	0.20	
Uniform Delay, d1		15.5	11.5					29.2	22.6	28.0	18.8	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.1	0.6					12.3	0.2	0.2	0.2	
Delay (s)		17.6	12.2					41.5	22.7	28.2	19.0	
Level of Service		B	B					D	C	C	B	
Approach Delay (s)		16.7			0.0			36.5			20.2	
Approach LOS		B			A			D			C	
Intersection Summary												
HCM 2000 Control Delay			23.0									C
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			90.0						13.5			
Intersection Capacity Utilization			55.2%									B
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	843	159	0	0	0	0	371	136	17	109	0
Future Volume (veh/h)	38	843	159	0	0	0	0	371	136	17	109	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1586	1586	1586				0	1486	1486	1627	1627	0
Adj Flow Rate, veh/h	43	947	0				0	417	153	19	122	0
Peak Hour Factor	0.89	0.89	0.89				0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	12	12	12				0	5	5	9	9	0
Cap, veh/h	67	1538					0	459	387	125	619	0
Arrive On Green	0.52	0.52	0.00				0.00	0.31	0.31	0.02	0.38	0.00
Sat Flow, veh/h	128	2959	1344				0	1486	1252	1550	1627	0
Grp Volume(v), veh/h	530	460	0				0	417	153	19	122	0
Grp Sat Flow(s),veh/h/ln	1580	1507	1344				0	1486	1252	1550	1627	0
Q Serve(g_s), s	21.8	19.0	0.0				0.0	24.2	8.7	0.0	4.5	0.0
Cycle Q Clear(g_c), s	21.8	19.0	0.0				0.0	24.2	8.7	0.0	4.5	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	821	783					0	459	387	125	619	0
V/C Ratio(X)	0.65	0.59					0.00	0.91	0.40	0.15	0.20	0.00
Avail Cap(c_a), veh/h	821	783					0	537	452	179	759	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.6	14.9	0.0				0.0	29.9	24.5	42.6	18.7	0.0
Incr Delay (d2), s/veh	3.9	3.2	0.0				0.0	17.6	0.7	0.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	6.9	0.0				0.0	10.3	2.5	0.4	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.5	18.1	0.0				0.0	47.4	25.1	43.2	18.8	0.0
LnGrp LOS	B	B					A	D	C	D	B	A
Approach Vol, veh/h		990	A					570			141	
Approach Delay, s/veh		18.9						41.4			22.1	
Approach LOS		B						D			C	
Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		51.3	6.4	32.3				38.7				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		39.0	5.0	32.5				42.0				
Max Q Clear Time (g_c+I1), s		23.8	2.0	26.2				6.5				
Green Ext Time (p_c), s		6.1	0.0	1.6				0.7				
Intersection Summary												
HCM 6th Ctrl Delay			26.7									
HCM 6th LOS			C									
Notes												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

HCM 6th TWSC
2: Highway 211 & Dubarko Road

07/13/2021

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕			↕	↕
Traffic Vol, veh/h	7	11	50	46	53	73	29	324	13	13	200	3
Future Vol, veh/h	7	11	50	46	53	73	29	324	13	13	200	3
Conflicting Peds, #/hr	2	0	2	2	0	2	2	0	2	2	0	2
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	9	14	64	59	68	94	37	415	17	17	256	4
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	873	800	260	833	796	428	262	0	0	434	0	0
Stage 1	292	292	-	500	500	-	-	-	-	-	-	-
Stage 2	581	508	-	333	296	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.14	6.54	6.24	4.15	-	-	4.14	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.14	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.536	4.036	3.336	2.245	-	-	2.236	-	-
Pot Cap-1 Maneuver	267	315	771	286	318	623	1285	-	-	1115	-	-
Stage 1	710	666	-	549	540	-	-	-	-	-	-	-
Stage 2	494	534	-	676	665	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	179	296	768	241	299	621	1283	-	-	1113	-	-
Mov Cap-2 Maneuver	179	296	-	241	299	-	-	-	-	-	-	-
Stage 1	682	653	-	527	518	-	-	-	-	-	-	-
Stage 2	350	513	-	594	652	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	13.2		22.2			0.6			0.5			
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR		
Capacity (veh/h)	1283	-	-	236	768	269	621	1113	-	-		
HCM Lane V/C Ratio	0.029	-	-	0.098	0.083	0.472	0.151	0.015	-	-		
HCM Control Delay (s)	7.9	0	-	21.9	10.1	29.8	11.8	8.3	0	-		
HCM Lane LOS	A	A	-	C	B	D	B	A	A	-		
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.3	2.4	0.5	0	-	-		

HCM 6th TWSC
3: Highway 211 & Bornstedt Road

07/13/2021

Intersection						
Int Delay, s/veh	7.9					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations	↔		↑	↗	↘	↑
Traffic Vol, veh/h	76	219	150	17	103	193
Future Vol, veh/h	76	219	150	17	103	193
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	3	3	9	9	4	4
Mvmt Flow	94	270	185	21	127	238

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	677	185	0	0	185
Stage 1	185	-	-	-	-
Stage 2	492	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.14
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.236
Pot Cap-1 Maneuver	417	855	-	-	1378
Stage 1	844	-	-	-	-
Stage 2	612	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	379	855	-	-	1378
Mov Cap-2 Maneuver	379	-	-	-	-
Stage 1	844	-	-	-	-
Stage 2	556	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	17.5	0	2.7
HCM LOS	C		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	646	1378	-
HCM Lane V/C Ratio	-	-	0.564	0.092	-
HCM Control Delay (s)	-	-	17.5	7.9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	3.5	0.3	-

HCM Signalized Intersection Capacity Analysis
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕	↗					↕	↗	↘	↕	
Traffic Volume (vph)	65	1468	419	0	0	0	0	338	163	16	210	0
Future Volume (vph)	65	1468	419	0	0	0	0	338	163	16	210	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Grade (%)		0%			0%			6%			0%	
Total Lost time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Lane Util. Factor		0.95	1.00					1.00	1.00	1.00	1.00	
Frbp, ped/bikes		1.00	0.97					1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00	1.00					1.00	1.00	1.00	1.00	
Frft		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		1.00	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		3252	1408					1664	1391	1613	1699	
Flt Permitted		1.00	1.00					1.00	1.00	0.29	1.00	
Satd. Flow (perm)		3252	1408					1664	1391	498	1699	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	68	1529	436	0	0	0	0	352	170	17	219	0
RTOR Reduction (vph)	0	0	67	0	0	0	0	0	83	0	0	0
Lane Group Flow (vph)	0	1597	369	0	0	0	0	352	87	17	219	0
Confl. Peds. (#/hr)	2		6						3	3		
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	2%	2%	2%	3%	3%	3%
Turn Type	Perm	NA	Perm					NA	Perm	pm+pt	NA	
Protected Phases		2						4		3	8	
Permitted Phases	2		2						4	8		
Actuated Green, G (s)		53.0	53.0					21.5	21.5	28.0	28.0	
Effective Green, g (s)		53.0	53.0					21.5	21.5	28.0	28.0	
Actuated g/C Ratio		0.59	0.59					0.24	0.24	0.31	0.31	
Clearance Time (s)		4.5	4.5					4.5	4.5	4.5	4.5	
Vehicle Extension (s)		3.0	3.0					3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)		1915	829					397	332	179	528	
v/s Ratio Prot								c0.21		0.00	c0.13	
v/s Ratio Perm		0.49	0.26						0.06	0.03		
v/c Ratio		0.83	0.44					0.89	0.26	0.09	0.41	
Uniform Delay, d1		14.9	10.3					33.1	27.8	31.1	24.5	
Progression Factor		1.00	1.00					1.00	1.00	1.00	1.00	
Incremental Delay, d2		4.5	1.7					20.5	0.4	0.2	0.5	
Delay (s)		19.4	12.0					53.5	28.2	31.3	25.1	
Level of Service		B	B					D	C	C	C	
Approach Delay (s)		17.8			0.0			45.3			25.5	
Approach LOS		B			A			D			C	
Intersection Summary												
HCM 2000 Control Delay			23.6									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			90.0						13.5			Sum of lost time (s)
Intersection Capacity Utilization			73.2%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary
 1: Highway 211/Meinig Avenue & Pioneer Blvd

07/13/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↑	↗					↑	↗	↘	↑	
Traffic Volume (veh/h)	65	1468	419	0	0	0	0	338	163	16	210	0
Future Volume (veh/h)	65	1468	419	0	0	0	0	338	163	16	210	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1723	1723	1723				0	1527	1527	1709	1709	0
Adj Flow Rate, veh/h	68	1529	0				0	352	170	17	219	0
Peak Hour Factor	0.96	0.96	0.96				0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2				0	2	2	3	3	0
Cap, veh/h	79	1874					0	379	319	112	542	0
Arrive On Green	0.58	0.58	0.00				0.00	0.25	0.25	0.02	0.32	0.00
Sat Flow, veh/h	136	3216	1460				0	1527	1287	1628	1709	0
Grp Volume(v), veh/h	856	741	0				0	352	170	17	219	0
Grp Sat Flow(s),veh/h/ln	1716	1637	1460				0	1527	1287	1628	1709	0
Q Serve(g_s), s	37.4	31.1	0.0				0.0	20.3	10.3	0.0	9.0	0.0
Cycle Q Clear(g_c), s	37.4	31.1	0.0				0.0	20.3	10.3	0.0	9.0	0.0
Prop In Lane	0.08		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	1000	953					0	379	319	112	542	0
V/C Ratio(X)	0.86	0.78					0.00	0.93	0.53	0.15	0.40	0.00
Avail Cap(c_a), veh/h	1000	953					0	382	322	171	608	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00				0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	15.6	14.3	0.0				0.0	33.1	29.3	43.3	24.0	0.0
Incr Delay (d2), s/veh	9.3	6.2	0.0				0.0	28.7	1.7	0.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.9	12.2	0.0				0.0	10.1	3.2	0.4	3.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	20.5	0.0				0.0	61.7	31.0	43.9	24.5	0.0
LnGrp LOS	C	C					A	E	C	D	C	A
Approach Vol, veh/h		1597	A					522			236	
Approach Delay, s/veh		22.9						51.7			25.9	
Approach LOS		C						D			C	
Timer - Assigned Phs		2	3	4				8				
Phs Duration (G+Y+Rc), s		56.9	6.2	26.8				33.1				
Change Period (Y+Rc), s		4.5	4.5	4.5				4.5				
Max Green Setting (Gmax), s		49.0	5.0	22.5				32.0				
Max Q Clear Time (g_c+I1), s		39.4	2.0	22.3				11.0				
Green Ext Time (p_c), s		7.1	0.0	0.1				1.2				

Intersection Summary		
HCM 6th Ctrl Delay		29.6
HCM 6th LOS		C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th TWSC
2: Highway 211 & Dubarko Road

07/13/2021

Intersection												
Int Delay, s/veh	7.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕			↕	↕
Traffic Vol, veh/h	7	49	63	41	40	42	75	366	74	38	408	20
Future Vol, veh/h	7	49	63	41	40	42	75	366	74	38	408	20
Conflicting Peds, #/hr	6	0	0	0	0	6	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	105	-	-	130	-	-	-	-	-	340
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	1	1	1
Mvmt Flow	7	51	65	42	41	43	77	377	76	39	421	21

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1116	1106	421	1137	1089	421	442	0	0	453	0	0
Stage 1	499	499	-	569	569	-	-	-	-	-	-	-
Stage 2	617	607	-	568	520	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.12	-	-	4.11	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.218	-	-	2.209	-	-
Pot Cap-1 Maneuver	184	210	630	178	215	630	1118	-	-	1113	-	-
Stage 1	552	542	-	505	504	-	-	-	-	-	-	-
Stage 2	476	485	-	506	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	127	181	630	113	186	626	1118	-	-	1113	-	-
Mov Cap-2 Maneuver	127	181	-	113	186	-	-	-	-	-	-	-
Stage 1	501	517	-	458	457	-	-	-	-	-	-	-
Stage 2	364	440	-	390	505	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.1	45.3	1.2	0.7
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1118	-	-	172	630	140	626	1113	-	-
HCM Lane V/C Ratio	0.069	-	-	0.336	0.103	0.596	0.069	0.035	-	-
HCM Control Delay (s)	8.5	0	-	36.2	11.4	63	11.2	8.4	0	-
HCM Lane LOS	A	A	-	E	B	F	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.4	0.3	3.1	0.2	0.1	-	-

HCM 6th TWSC
3: Highway 211 & Bornstedt Road

07/13/2021

Intersection						
Int Delay, s/veh	7.2					
Movement	NBL	NBR	NET	NER	SWL	SWT
Lane Configurations	↔		↑	↗	↘	↑
Traffic Vol, veh/h	56	173	340	79	250	265
Future Vol, veh/h	56	173	340	79	250	265
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Yield	-	None
Storage Length	0	-	-	30	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	3	3	2	2
Mvmt Flow	58	180	354	82	260	276

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1150	354	0	0	354
Stage 1	354	-	-	-	-
Stage 2	796	-	-	-	-
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	219	690	-	-	1205
Stage 1	710	-	-	-	-
Stage 2	444	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	172	690	-	-	1205
Mov Cap-2 Maneuver	172	-	-	-	-
Stage 1	710	-	-	-	-
Stage 2	348	-	-	-	-

Approach	NB	NE	SW
HCM Control Delay, s	26.8	0	4.3
HCM LOS	D		

Minor Lane/Major Mvmt	NET	NER	NBLn1	SWL	SWT
Capacity (veh/h)	-	-	397	1205	-
HCM Lane V/C Ratio	-	-	0.601	0.216	-
HCM Control Delay (s)	-	-	26.8	8.8	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	3.8	0.8	-

HCM 2010 AWSC
2: Highway 211 & Dubarko Road

07/13/2021

Intersection	
Intersection Delay, s/veh	19.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕			↕	↕
Traffic Vol, veh/h	7	11	50	46	53	73	29	324	13	13	200	3
Future Vol, veh/h	7	11	50	46	53	73	29	324	13	13	200	3
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Heavy Vehicles, %	5	5	5	4	4	4	5	5	5	4	4	4
Mvmt Flow	9	14	64	59	68	94	37	415	17	17	256	4
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	10.4	11.6	28.3	14.6
HCM LOS	B	B	D	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	8%	39%	0%	46%	0%	6%	0%
Vol Thru, %	89%	61%	0%	54%	0%	94%	0%
Vol Right, %	4%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	366	18	50	99	73	213	3
LT Vol	29	7	0	46	0	13	0
Through Vol	324	11	0	53	0	200	0
RT Vol	13	0	50	0	73	0	3
Lane Flow Rate	469	23	64	127	94	273	4
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.79	0.048	0.118	0.254	0.163	0.477	0.006
Departure Headway (Hd)	6.06	7.521	6.602	7.212	6.257	6.292	5.549
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	596	473	538	495	569	571	641
Service Time	4.12	5.319	4.399	4.995	4.039	4.063	3.32
HCM Lane V/C Ratio	0.787	0.049	0.119	0.257	0.165	0.478	0.006
HCM Control Delay	28.3	10.7	10.3	12.5	10.3	14.7	8.4
HCM Lane LOS	D	B	B	B	B	B	A
HCM 95th-tile Q	7.6	0.2	0.4	1	0.6	2.6	0

HCM 2010 AWSC
2: Highway 211 & Dubarko Road

07/13/2021

Intersection	
Intersection Delay, s/veh	33.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↕		↕	↕		↕			↕	↕
Traffic Vol, veh/h	7	49	63	41	40	42	75	366	74	38	408	20
Future Vol, veh/h	7	49	63	41	40	42	75	366	74	38	408	20
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	3	3	3	3	3	3	2	2	2	1	1	1
Mvmt Flow	7	51	65	42	41	43	77	377	76	39	421	21
Number of Lanes	0	1	1	0	1	1	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	11.4	12	47.1	29.7
HCM LOS	B	B	E	D

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	15%	12%	0%	51%	0%	9%	0%
Vol Thru, %	71%	88%	0%	49%	0%	91%	0%
Vol Right, %	14%	0%	100%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	515	56	63	81	42	446	20
LT Vol	75	7	0	41	0	38	0
Through Vol	366	49	0	40	0	408	0
RT Vol	74	0	63	0	42	0	20
Lane Flow Rate	531	58	65	84	43	460	21
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.929	0.128	0.13	0.189	0.086	0.81	0.032
Departure Headway (Hd)	6.299	7.995	7.206	8.159	7.172	6.34	5.584
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	579	448	497	439	499	575	643
Service Time	4.314	5.75	4.961	5.913	4.926	4.055	3.298
HCM Lane V/C Ratio	0.917	0.129	0.131	0.191	0.086	0.8	0.033
HCM Control Delay	47.1	11.9	11	12.8	10.6	30.7	8.5
HCM Lane LOS	E	B	B	B	B	D	A
HCM 95th-tile Q	11.8	0.4	0.4	0.7	0.3	8	0.1

OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING
EAGLE CRK-SANDY HY at DUBARKO RD, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019

13 - 17 of 27 Crash records shown.

SER#	P R J S W DATE	CLASS	CITY STREET	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE
RD DPT	E L G N H R TIME	FROM	FIRST STREET	(MEDIAN) INT-REL	TRAF-	RNDFT	SURF	COLL	TRLR QTY	FROM	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE
UNLOC?	D C S V L K LAT	LONG	LES	(LANES) CONTL	CONTR	DRVBY	LIGHT	SVRTY	V# TYPE	TO	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE
02031	N N N N 05/06/2016	16	DUBARKO RD	CROSS	N	N	CLR	ANGL-OTH	01 NONE	STRGHT	01	DRVR	NONE	00	Unk	UNK	00
CITY			EAGLE CRK-SANDY HY	STOP SIGN	N	N	DRY	ANGL	N/A	N - S							00
N	4P	45 23 22.76 -122.15	017200100800	0		N	DAY	PDO	FSNGR CAR	STRGHT	01	DRVR	NONE	00	Unk	UNK	00
N		48.39							02 NONE	STRGHT							00
									N/A	E - W	01	DRVR	NONE	00	Unk	UNK	00
									FSNGR CAR								00
00805	N N N N 03/01/2017	16	DUBARKO RD	CROSS	N	N	CLD	ANGL-OTH	01 NONE	STRGHT							0822,013
CITY			EAGLE CRK-SANDY HY	STOP SIGN	N	N	DRY	ANGL	PRVTE	W - E							015
N	3P	45 23 22.76 -122.15	017200100800	0		N	DAY	INJ	FSNGR CAR	STRGHT	01	DRVR	INJC	17	F	OR-Y	000 082
N		48.39							02 NONE	STRGHT							000 013
									PRVTE	S - N	01	DRVR	INJC	43	M	OR-Y	000 000
									FSNGR CAR								000 000
									03 NONE	STOP	01	DRVR	INJB	27	F	OR-Y	022 000
									PRVTE	E - W							000 000
									FSNGR CAR								000 000
00846	N N N N 03/04/2017	16	DUBARKO RD	CROSS	N	N	RAIN	ANGL-OTH	01 NONE	STRGHT							02
CITY			EAGLE CRK-SANDY HY	STOP SIGN	N	N	WET	ANGL	PRVTE	W - E							015
N	6P	45 23 22.76 -122.15	017200100800	0		N	DLIT	INJ	FSNGR CAR	STRGHT	01	DRVR	NONE	21	M	OR-Y	000 028
N		48.39							02 NONE	STRGHT							000 000
									PRVTE	N - S	01	DRVR	INJC	21	F	OR-Y	000 000
									FSNGR CAR								000 000
02225	N N N N 06/07/2017	16	DUBARKO RD	CROSS	N	N	CLR	ANGL-OTH	01 NONE	STRGHT							02
CITY			EAGLE CRK-SANDY HY	STOP SIGN	N	N	DRY	ANGL	PRVTE	S - N							000 000
N	4P	45 23 22.76 -122.15	017200100800	0		N	DAY	INJ	FSNGR CAR	STRGHT	01	DRVR	INJB	40	M	OR-Y	000 000
N		48.39							02 NONE	STRGHT							015 000
									PRVTE	W - E	01	DRVR	INJC	38	M	OR-Y	000 028
									FSNGR CAR								000 000

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OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING
EAGLE CRK-SANDY HY at DUBARKO RD, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019

18 - 21 of 27 Crash records shown.

SR#	P R J S W DATE	CLASS	CITY STREET	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	A S	PH TYPE	SVRTY	E X RES	LOC	ACT EVENT	CAUSE
INVEST	E A I C O DAY	DIST	FIRST STREET	(MEDIAN)	TEAF-	RNDFT	SURF	COLL	TLR-OTY	FROM	G E LICNS	PH TYPE	SVRTY	E X RES	LOC	ACT EVENT	CAUSE
UNLOC?	D C S V L K LAT	LONG	LES	(LANES)	CONTL	DRVWY	LIGHT	SVRTY	V# TYPE	TO	OR-25	PH TYPE	SVRTY	E X RES	LOC	ACT EVENT	CAUSE
02958	N N N N 07/21/2017	16	DUBARKO RD	CROSS	N	N	CLR	O-1 L-TURN	0	TURN-L							02
	FR		EAGLE CRK-SANDY HY	CN	STOP SIGN	N	DRY	TURN	PRVTE	S -W		01	DRVR	NONE	28 M	OR-Y	00
	45 23 22.76	-122.15	017200100800	0		N	DAY	INJ	PSNGR CAR		OR-25						02
		48.39							02 NONE	STRGHT							00
									PRVTE	N -S		01	DRVR	INJB	29 F	OR-Y	00
									PSNGR CAR		OR-25						00
00647	N N N N 02/18/2017	16	DUBARKO RD	CROSS	N	N	RAIN	ANGL-OTH	01	STRGHT							03
	SA		EAGLE CRK-SANDY HY	CN	STOP SIGN	N	WET	ANGL	N/A	W -E		01	DRVR	NONE	00	Unk	00
	7P		017200100800	0		N	DLIT	PDO	PSNGR CAR		Unk						00
	45 23 22.76	-122.15							02 NONE	STRGHT							00
		48.39							N/A	N -S		01	DRVR	NONE	00	Unk	00
									PSNGR CAR		Unk						00
03467	N N N N 08/23/2017	16	DUBARKO RD	CROSS	N	N	CLR	ANGL-OTH	01	STRGHT							02
	WE		EAGLE CRK-SANDY HY	CN	STOP SIGN	N	DRY	ANGL	N/A	NE-SW		01	DRVR	NONE	00	Unk	00
	8A		017200100800	0		N	DAY	PDO	PSNGR CAR		Unk						00
	45 23 22.76	-122.15							02 NONE	STRGHT							00
		48.39							N/A	E -W		01	DRVR	NONE	00	Unk	00
									PSNGR CAR		Unk						00
03265	N N N N 09/14/2018	16	DUBARKO RD	CROSS	N	N	CLR	ANGL-OTH	01	TURN-L							02
	FR		EAGLE CRK-SANDY HY	CN	FLASHCN-R	N	DRY	TURN	PRVTE	W -N		01	DRVR	NONE	38 M	OR-Y	00
	9P		017200100800	0		N	DAEK	INJ	PSNGR CAR		028						02
	45 23 22.52	-122.15							01 NONE	TURN-L							00
		48.53							PRVTE	W -N		01	PSNG	INJC	35 F	OR-25	00
									PSNGR CAR		000						00
									01 NONE	TURN-L		02	PSNG	NONE	02 F		00
									PRVTE	W -N							00
									PSNGR CAR		000						00
									02 NONE	STRGHT		01	DRVR	NONE	62 M	OR-Y	00
									PRVTE	N -S							00
									PSNGR CAR		000						00

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OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING
EAGLE CRK-SANDY HY at DUBARKO RD, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019

22 - 24 of 27 Crash records shown.

CDS380
07/03/2021

CITY OF SANDY, CLACKAMAS COUNTY

SR#	P	R	J	S	M	D	DATE	CLASS	CITY STREET	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	A	S	PH	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
INVEST	E	A	I	C	O	DAY	DIST	FROM	FIRST STREET	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	A	S	PH	TYPE	SVRTY	E	X	RES	LOC	ERROR	ACT	EVENT	CAUSE	
UNLOC?	D	C	S	V	L	K	LAT	LONG	LEGS	(LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	TYPE	OWNER	COLL	FROM	TO	INJ	G	E	LI	CS	PED				
03281	N	N	N	N	N	N	09/23/2019	16	DUBARKO RD	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0			01	DRVR	NONE	31	M	OR-Y	OR-25		000	000	00
N							7A		EAGLE CRK-SANDY HY	CN	STOP	SIGN	N	DRY	ANGL	PRVTE	PSNGR	CAR	NE-SW											
N							45 23 22.59	-122.15	017200100800	02	0	N	DAMN	INJ																
							48.49																							
00075	N	N	N	N	N	N	01/08/2019	16	DUBARKO RD	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0											013	013	27.02
N							TU		EAGLE CRK-SANDY HY	CN	STOP	SIGN	N	DRY	ANGL	PRVTE			N-S											
N							4P			03	0	N	DLIT	INJ																
N							45 23 22.54	-122.15	017200100800																					
							48.5																							
00908	N	N	N	N	N	N	03/14/2019	16	DUBARKO RD	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0													
N							TH		EAGLE CRK-SANDY HY	CN	STOP	SIGN	N	DRY	ANGL	PRVTE			S-N											
N							2P			04	0	N	DAY	INJ																
N							45 23 22.76	-122.15	017200100800																					
							48.39																							
01291	N	N	N	N	N	N	04/22/2019	16	DUBARKO RD	CROSS	N	N	CLD	ANGL-OTH	01	NONE	0													
N							MO		EAGLE CRK-SANDY HY	CN	STOP	SIGN	N	DRY	ANGL	PRVTE			S-N											
N							5P			04	0	N	DAY	INJ																
N							45 23 22.54	-122.15	017200100800																					
							48.5																							

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OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING
PIONEER BLVD at EAGLE CRK-SANDY HY, City of Sandy, Clackamas County, 01/01/2015 to 12/31/2019

CDS380
 07/03/2021
 CITY OF SANDY, CLACKAMAS COUNTY

SER#	INVEST	RD DPT	UNLOC?	DM	P	R	J	S	M	DATE	CLASS	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	A	S	PH TYPE	SVRTY	E	X	RES	LOC	ACT EVENT	CAUSE
												FIRST STREET	DIRECT	(MEDIAN)	LEGS	TRAF-	RNDBT	SURF	COLL	TRLR QTY	FROM									
												SECOND STREET	LOCIN	(LANES)	CONTL	DRVWY	LIGHT	SVRTY	V# TYPE	OWNER	TO									

Disclaimer: The information contained in this report is compiled from individual driver and police crash reports submitted to the Oregon Department of Transportation as required in ORS 811.720. The Crash Analysis and Reporting Unit is committed to providing the highest quality crash data to customers. However, because submission of crash report forms is the responsibility of the individual driver, the Crash Analysis and Reporting Unit can not guarantee that all qualifying crashes are represented nor can assurances be made that all details pertaining to a single crash are accurate. Note: Legislative changes to DMV's vehicle crash reporting requirement, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

Preliminary Traffic Signal Warrant Analysis



Project Name: Bornstedt Views

Intersection: Highway 211 at Dubarko Road

Scenario: 2023 Background Plus Site Trips (30th-Highest Hour)

Number of Major Street Lanes: 1 PM Peak Hour Volume 1018 (sum of both approaches)

Number of Minor Street Lanes: 1 PM Peak Hour Volume 83 (highest-volume approach)^a

Posted or 85th percentile speed > 40 mph: Yes

Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Analysis Calculations

	8th Highest Hour ^b	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	575	350	
Minor Street Volume	47	105	No
Condition B - Interruption of Continuous Traffic			
Major Street Volume	575	525	
Minor Street Volume	47	53	No
Combination Warrant^c			
Major Street Volume	575	420	
Minor Street Volume	47	84	No

^a Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.

^b Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.

^c This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Preliminary Traffic Signal Warrant Analysis



Project Name: Bornstedt Views

Intersection: Highway 211 at Bornstedt Road

Scenario: 2023 Background Plus Site Trips (30th-Highest Hour)

Number of Major Street Lanes: 1 PM Peak Hour Volume 941 (sum of both approaches)

Number of Minor Street Lanes: 1 PM Peak Hour Volume 55 (highest-volume approach)^a

Posted or 85th percentile speed > 40 mph: Yes

Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Analysis Calculations

	8th Highest Hour ^b	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	532	350	
Minor Street Volume	31	105	No
Condition B - Interruption of Continuous Traffic			
Major Street Volume	532	525	
Minor Street Volume	31	53	No
Combination Warrant^c			
Major Street Volume	532	420	
Minor Street Volume	31	84	No

^a Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.

^b Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.

^c This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Left-Turn Lane Warrant Analysis (ODOT Methodology)

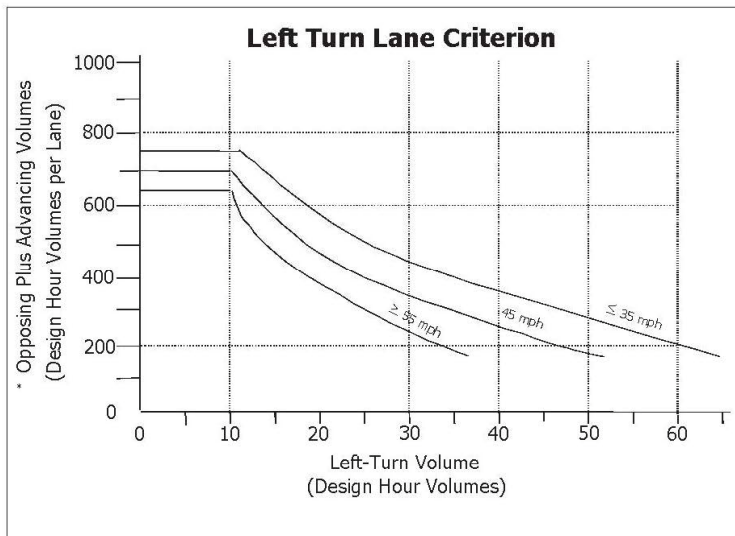


Project Name: Bornstedt Subdivision
 Approach: Highway 211 NB at Dubarko Road
 Scenario: 2021 Existing Conditions

Number of Advancing Lanes: 1
 Number of Opposing Lanes: 1
 Major-Street Design Speed: 45 mph

	AM Volume	PM Volume
Advancing Volume for Design Hour:	321	461
Opposing Volume for Design Hour:	183	396
Design Hour Volume Per Lane:	504	857
Number of Left Turns per Hour:	27	71
Left-turn lane warrants satisfied?	YES	YES

Exhibit 7-1 Left Turn Lane Criterion (TTI)



* (Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)

Right-Turn Lane Warrant Analysis (ODOT Methodology)



Project Name: Bornstedt Views Subdivision
 Approach: Highway 211 Northbound at Dubarko Road
 Scenario: 2021 Existing Conditions

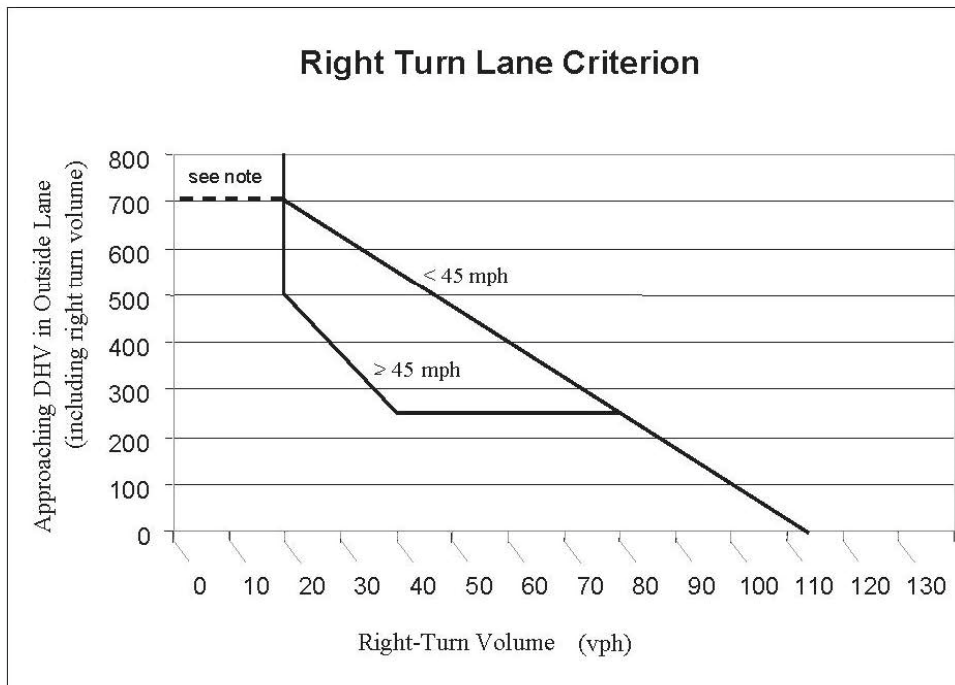
Major-Street Design Speed: 45 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	11	65
Approaching DVH in Outside Lane:	321	461
Calculated Turn Volume Threshold:	34	23
Right Turn Volume Exceeds Threshold?	NO	YES

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane. The vehicular volume criteria are determined using the curve in Exhibit 7-2.

Exhibit 7-2 Right Turn Lane Criterion



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.



TERAGAN & ASSOCIATES, INC. ARBORICULTURAL CONSULTANTS

MEMORANDUM

EXHIBIT F

DATE: April 29, 2021
TO: Mac Even (Even Better Homes)
FROM: Todd Prager, RCA #597, ISA Board Certified Master Arborist
RE: Tree Plan for The Bornstedt Views Subdivision

Summary

This report includes tree removal, preservation, and protection recommendations for the proposed Bornstedt Views Subdivision in Sandy, Oregon.

Background

Even Better Homes is proposing to construct a 42-lot subdivision with new streets, sidewalks, and utilities at 19618 SE Bornstedt Road in Sandy, Oregon. The topographic survey of existing trees is provided in Attachment 1, the proposed site plan with the proposed tree removal and retention is provided in Attachment 2, and the inventory of existing trees is provided in Attachment 3.

The assignment requested of our firm for this project was to:

- Assess the trees within the development site;
- Identify the trees to be removed and retained; and
- Provide tree protection recommendations for the trees to be retained.

Tree Assessment

In July 2020 I completed the inventory of existing trees at the site.

The complete inventory data for each tree is provided in Attachment 3 and includes the tree number, common name, scientific name, trunk diameter (DBH), crown radius, health condition, structural condition, pertinent comments, and whether it is an onsite 11-inch DBH or greater tree in good condition.¹

All County Surveyors and Planners added color coded labels to the inventory to denote trees that are 11-inch DBH or greater and in good condition (yellow), trees

¹ Section 17.102.50 of the City of Sandy Code requires three onsite trees over 11-inch DBH that are in good condition to be retained.

that are not 11-inch DBH or greater and/or not in good condition (red), trees to be retained (green), and trees to be removed (salmon).

The tree numbers in the inventory in Attachment 3 correspond to the tree numbers on the plans in Attachments 1 and 2. The trees were also tagged with their corresponding numbers in the field.

Tree Removal and Retention

This section of the report includes tree removal and retention recommendations based on the proposed site plan.

Tree Removal

The standard tree protection requirements in the City of Sandy Code range from at least 10 feet from the trunks of retained trees (SDC 17.102.50.B.1) to five feet beyond the driplines (SDC 17.92.10.D) unless otherwise approved by the Planning Director.

A typical alternative minimum protection zone allows encroachments no closer than a radius from a tree of .5 feet per inch of DBH if no more than 25 percent of the critical root protection zone area (estimated at one foot radius per inch of DBH) is impacted. Figure 1 illustrates this concept.

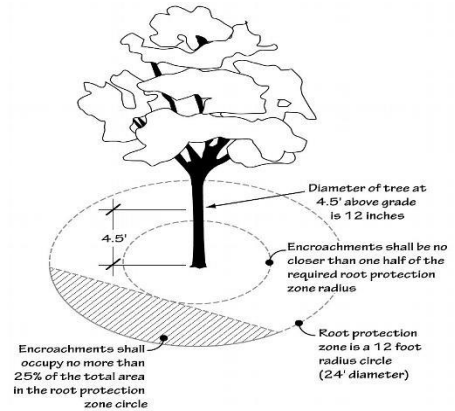


Figure 1: Alternative minimum protection zone

Using these criteria, while considering the tree conditions and their locations relative to construction and other site improvements, 709 of the assessed trees at the site are proposed for removal.

Tree Retention

A total of 38 trees are proposed to be retained. All 38 of these are in good condition, over 11-inch DBH, and not considered nuisance species according to the City of Sandy. Section 17.102.50.A of the City of Sandy Code includes five criteria for tree retention with development. The five criteria followed by my findings in *italics* are listed below:

1. At least three trees 11 inches DBH or greater are to be retained for every one-acre of contiguous ownership.

Finding: The site is 12.739 acres in size so 38 non-nuisance trees over 11-inch DBH in good condition are required to be retained. The proposed preservation includes 38 non-nuisance trees over 11-inch DBH in good condition. This criterion is met.

2. Retained trees can be located anywhere on the site at the landowner's discretion before the harvest begins. Clusters of trees are encouraged.

Teragan & Associates, Inc.
3145 Westview Circle • Lake Oswego, OR 97034
Phone: 971.295.4835 • Fax: 503.697.1976
Email: todd@teragan.com • Website: teragan.com

Finding: The retained trees are clustered at the north, central, and east ends of the site as shown in Attachment 2. This criterion is met.

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.

Finding: All of the trees subject to this standard are in good health condition and likely to grow to maturity. The structural condition of all retained trees is fair to good. The proposed clustering of retained trees will help to minimize blow down hazards. Therefore, this criterion is met.

4. If possible, at least two of the required trees per acre must be of conifer species.

Finding: Thirty-three (33) of the 38 non-nuisance trees over 11-inch DBH and in good condition to be retained are conifer species. This criterion is met.

5. Trees within the required protected setback areas may be counted towards the tree retention standard if they meet these requirements.

Finding: There is no protected setback area at the site. This criterion is not applicable.

Tree Protection Recommendations

The standard tree protection requirements in the City of Sandy Code range from at least 10 feet from the trunks of retained trees (SDC 17.102.50.B.1) to five feet beyond the driplines (SDC 17.92.10.D) unless otherwise approved by the Planning Director.

A typical alternative minimum protection zone allows encroachments no closer than a radius from a tree of .5 feet per inch of DBH if no more than 25 percent of the critical root protection zone area (estimated at one foot radius per inch of DBH) is impacted. Figure 1 illustrates this concept.

The reason for using this alternative is because it allows the tree protection zone to better relate to the size of the tree and its root zone. For example, a 10-foot tree protection setback would not be adequate for a 48-inch DBH tree which should have a minimum setback of at least 24 feet. Also, driplines can be highly variable based on species growth habits and onsite conditions such as the presence of adjacent trees or past pruning.

The trees to be retained can be adequately protected by placing tree protection fencing as shown in Attachment 2. The tree protection fencing will protect at least 75 percent of their critical roots zones and avoid any encroachments closer than a radius of .5 feet per inch of DBH to a tree to be retained. No grading, stockpiling, storage, disposal, or any other construction related activity shall occur in the tree protection zones unless specifically reviewed and approved by the project arborist.

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Phone: 971.295.4835 • Fax: 503.697.1976
Email: todd@teragan.com • Website: teragan.com

The following additional protection measures shall apply to the trees at the site:

- *Tree Protection Fencing*: Establish tree protection fencing in the locations shown in Attachment 1. 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. Fence installation may be delayed until immediately after tree removal is complete.
- *Directional Felling*: Fell the trees to be removed away from the trees to be retained so they do not contact or otherwise damage the trunks or branches of the trees to be retained. No vehicles or heavy equipment shall be permitted within the tree protection zones during tree removal operations.
- *Stump Removal*: The stumps of the trees to be removed from within the tree protection zones shall either be retained in place or stump ground to protect the root systems of the trees to be retained.
- *Protect Tree Crowns*: Care will need to be taken to not contact or otherwise damage the crowns of the trees that may extend into the construction area.
- *Monitoring of New Grove Edges*: It will be important to reassess and monitor the trees along the newly exposed tree grove edges following site clearing and periodically during construction and after high wind events to ensure they do not pose a high risk. This monitoring should occur for the next two to three storm seasons following site clearing.
- *Sediment Fencing*: Shift sediment fencing to outside the tree protection zones. If erosion control is required inside the tree protection zones, use straw wattles to minimize root zone disturbance of the trees to be retained.

Additional tree protection recommendations for the trees to be retained are provided in Attachment 4.

Conclusion

Thirty-eight (38) non-nuisance trees over 11-inch DBH in good condition are proposed to be retained at The Views Bornstedt Subdivision site. The required tree retention for the 12.739 acres site is 38 trees.

The trees to be retained will be adequately protected by adhering to the recommendations in this report.

Please contact me if you have questions, concerns, or need any additional information.

Sincerely,

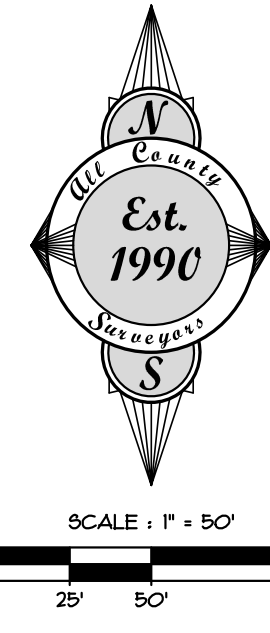


Todd Prager

*ASCA Registered Consulting Arborist #597
ISA Board Certified Master Arborist, WE-6723B
ISA Qualified Tree Risk Assessor
AICP, American Planning Association*

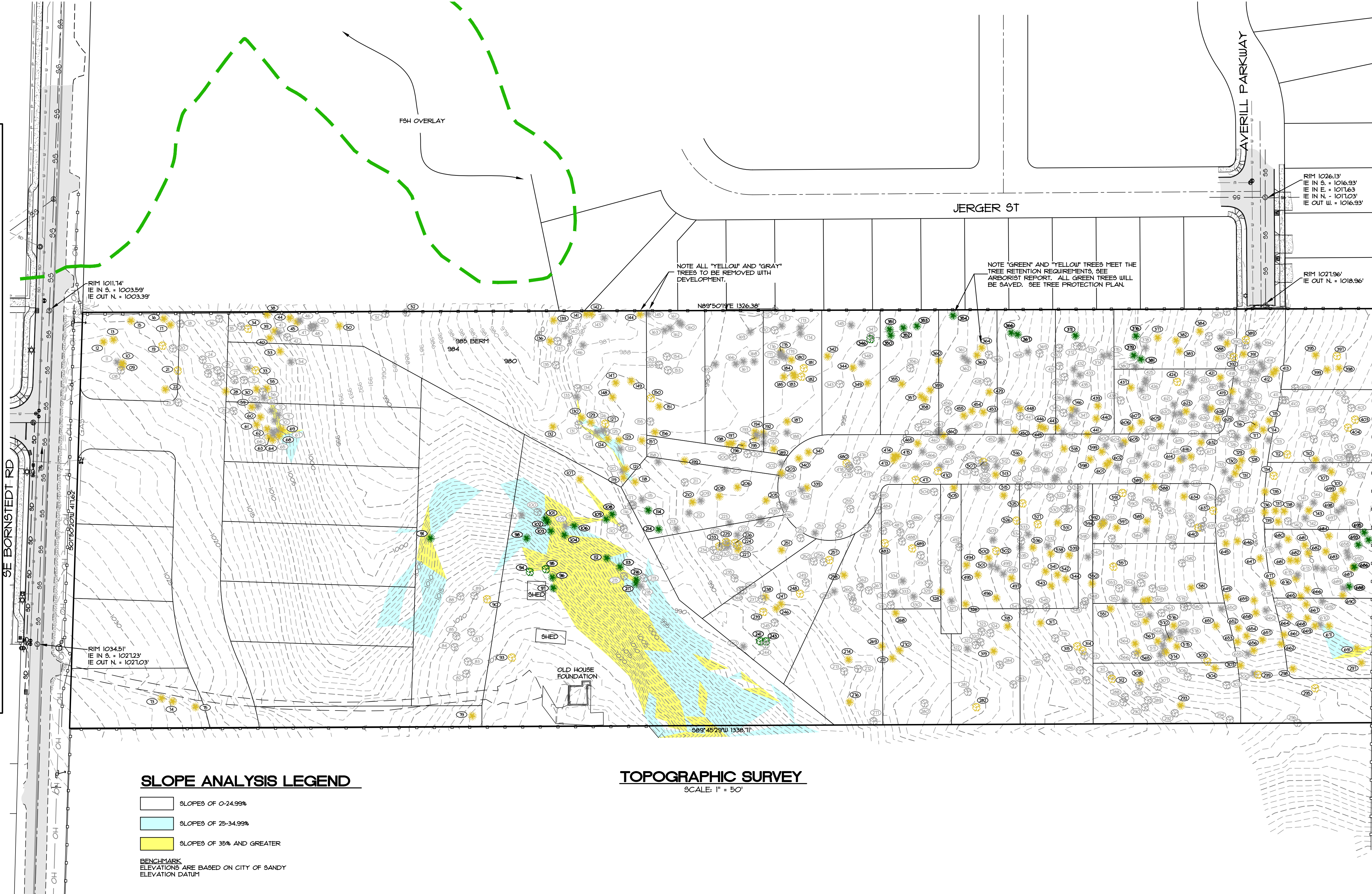
Attachments: Attachment 1 - Topographic Survey with Existing Trees
Attachment 2 - Site Plan w/ Tree Removal, Retention and Protection
Attachment 3 - Tree Inventory
Attachment 4 - Tree Protection Recommendations
Attachment 5 - Assumptions and Limiting Conditions

Attachment 1



LEGEND

- (E) PROPERTY LINE
- (E) LOT LINE
- (E) CL. RIGHT OF WAY
- (E) EASEMENT LINE
- (E) 5' GROUND CONTOUR
- (E) 1' GROUND CONTOUR
- (E) BUILDING WALL
- (E) AC PAVEMENT
- (E) SIDEWALK/CONCRETE
- (E) GRAVEL
- (E) CURB + GUTTER
- (E) FENCE
- (E) WATER LINE
- (E) 6" WATER LINE
- (E) 8" WATER LINE
- (E) 12" WATER LINE
- (E) STORM LINE
- (E) SANITARY LINE
- (E) GAS LINE
- (E) TELEPHONE LINE, CAT
- (E) OVERHEAD POWER LI
- FOUND SURVEY MONIPIEN
- (E) STORM MANHOLE
- (E) CATCH BASIN
- (E) WATER METER
- (E) WATER VALVE
- (E) MANHOLE
- (E) GAS VALVE
- (E) LIGHT POLE
- (E) UTILITY POLE
- (E) POLE W/ GUY WIRE
- (E) SIGN
- (E) DECIDUOUS TREE
- (E) CONIFEROUS TREE
- (F) SANITARY LINE
- (F) SANITARY MANHOLE
- (F) STORM LINE
- (F) STORM MANHOLE
- (F) CATCH BASIN
- (F) WATER LINE
- (F) WATER METER
- (F) WATER VALVE
- (F) FIRE HYDRANT
- (F) STREET LIGHT



SLOPE ANALYSIS LEGEND

- SLOPES OF 0-24.99%
- SLOPES OF 25-34.99%
- SLOPES OF 35% AND GREATER

BENCHMARK
ELEVATIONS ARE BASED ON CITY OF SANDY
ELEVATION DATUM

TOPOGRAPHIC SURVEY

SCALE: 1" = 50'

NO.	REVISION	DATE	BY



SCALE	N/A	VERT.	4E
HORIZ.	1" = 50'	DATE	4-28-21
FILE	19-268 - Planning - SFR.dwg	LEGAL	SECTION
		TWP.	24
		RANGE	2S
		SECTION	24
		CHECKED	DLH
		APPROVED	RLM

PROJECT: **THE BORNSTEDT VIEWS TOPOGRAPHIC SURVEY**

Surveyors & Planners, Inc.
Surveying, Planning and
Civil Engineering and
P.L.L.C.
P.O. Box 895 Sandy, OR 97055
Phone: (503) 666-4730
Fax: (503) 666-4730
DATE OF PLOT: 4-29-21

CLIENT: **EVEN BETTER HOMES, INC.**
MAC EVEN
P.O. BOX 2021
PRESHAW
PHONE: (503) 348-5602
EMAIL: mac@evenbetterhomes.com

SHEET **C3**
OF **10**

TREE TO BE SAVED OR REMOVED	TREE NO	COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	RETENTION OPTION	COMMENTS
	281	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	POOR	FAIR	YES	ONE SIDED, UNDERIZED LEAVES
	290	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	15	POOR	POOR	NO	CODOMINANT AT 1' WITH INCLUDED BARK, CODOMINANT STEM FAILED
	291	BIGLEAF MAPLE	ACER MACROPHYLLUM	25	25	FAIR	FAIR	NO	UNDERIZED LEAVES
	293	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	20	POOR	FAIR	NO	ONE SIDED, UNDERIZED LEAVES
	293	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	20	GOOD	FAIR	YES	ONE SIDED
	294	SCOLLERS WILLOW	SALIX SCOLLERIANA	15	8	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY
	296	BIGLEAF MAPLE	ACER MACROPHYLLUM	20	15	GOOD	FAIR	YES	ONE SIDED
	296	SWEET CHERRY	PRUNUS AVIUM	12	8	FAIR	FAIR	NO	UNDERIZED LEAVES, ONE SIDED
	297	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
	298	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
	299	BIGLEAF MAPLE	ACER MACROPHYLLUM	21	20	GOOD	FAIR	YES	ONE SIDED, MULTIPLE LEADERS AT 10'
	300	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	1	1	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, SUPPRESSED
	301	SWEET CHERRY	PRUNUS AVIUM	1	3	VERY POOR	VERY POOR	NO	30% DEAD
	302	BIGLEAF MAPLE	ACER MACROPHYLLUM	30	30	FAIR	FAIR	NO	SIGNIFICANT DECAY AT ROOT CROWN, ONE SIDED
	303	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	MODERATELY ONE SIDED
	304	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	GOOD	FAIR	YES	MODERATELY ONE SIDED
	305	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	20	GOOD	FAIR	YES	ONE SIDED
	306	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	15	FAIR	FAIR	NO	33% LCR, UNDERIZED LEAVES, MARGINAL TRUNK TAPER
	307	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	20	FAIR	FAIR	NO	CODOMINANT AT 4' WITH INCLUDED BARK, PAST SCARFOLD BRANCH FAILURES
	308	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	25	GOOD	FAIR	YES	60% LCR
	309	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	10	POOR	POOR	NO	OVERTOPPED BY ADJACENT TREES, TOP FAILED
	311	BLACK HAWTHORN	CRATAEGUS DOUGLASSII	8	10	FAIR	FAIR	NO	SIGNIFICANT LEAN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
	312	BLACK COTONWOOD	POPULUS TRICHOCARPA	12	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
	313	BIGLEAF MAPLE	ACER MACROPHYLLUM	35	25	GOOD	FAIR	YES	MULTIPLE LEADERS AT LOWER TRUNK WITH INCLUDED BARK
	313	RED ALDER	ALNUS RUBRA	22	20	FAIR	FAIR	NO	CODOMINANT AT 4' WITH INCLUDED BARK, PAST SCARFOLD BRANCH FAILURES
	322	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	5	FAIR	FAIR	NO	MODERATELY SUPPRESSED, OVERTOPPED BY ADJACENT TREES
	323	RED ALDER	ALNUS RUBRA	8	10	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
	324	RED ALDER	ALNUS RUBRA	8	10	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
	325	RED ALDER	ALNUS RUBRA	8	5	POOR	POOR	NO	SUPPRESSED
	326	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	25	GOOD	FAIR	YES	SLEEP IN LOWER TRUNK
	328	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
	330	RED ALDER	ALNUS RUBRA	8	8	POOR	POOR	NO	THIN CROWN
	330	BIGLEAF MAPLE	ACER MACROPHYLLUM	3	5	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
	332	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	5	FAIR	FAIR	NO	MODERATELY SUPPRESSED, OVERTOPPED BY ADJACENT TREES
	333	RED ALDER	ALNUS RUBRA	13	10	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
	334	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	10	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
	335	RED ALDER	ALNUS RUBRA	8	10	FAIR	FAIR	NO	ONE SIDED, MARGINAL TRUNK TAPER
	335	RED ALDER	ALNUS RUBRA	8	5	POOR	POOR	NO	SUPPRESSED
	336	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	25	GOOD	FAIR	YES	MODERATELY ONE SIDED
	337	PACIFIC DOGWOOD	CORNUS NITALLII	1	2	POOR	POOR	NO	SUPPRESSED
	338	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	8	1	POOR	POOR	NO	GROWING ON OLD STUMP
	339	SCOLLERS WILLOW	SALIX SCOLLERIANA	1	1	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY
	340	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	5	GOOD	FAIR	NO	KINK AT LOWER TRUNK
	341	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	5	FAIR	FAIR	NO	MODERATELY SUPPRESSED
	342	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	41	25	GOOD	FAIR	YES	ONE SIDED, MODERATELY THIN CROWN
	343	SCOLLERS WILLOW	SALIX SCOLLERIANA	14	10	POOR	POOR	NO	EXTENSIVE DIEBACK AND DECAY
	344	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	10	GOOD	FAIR	NO	GROWING ON OLD STUMP
	345	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	10	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
	346	BIGLEAF MAPLE	ACER MACROPHYLLUM	24	25	GOOD	FAIR	YES	ONE SIDED
	348	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	1	10	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES, GROWING ON OLD STUMP
	349	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	1	10	GOOD	FAIR	NO	OVERTOPPED BY ADJACENT TREES, GROWING ON OLD STUMP
	350	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
	351	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	20	GOOD	FAIR	YES	ONE SIDED
	352	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	10	GOOD	FAIR	YES	ONE SIDED, MODERATELY THIN CROWN
	353	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	25	GOOD	FAIR	YES	ONE SIDED
	354	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	45	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
	355	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	38	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
	356	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	20	GOOD	GOOD	NO	ONE SIDED
	357	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	20	GOOD	FAIR	YES	ONE SIDED
	358	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	20	GOOD	FAIR	YES	ONE SIDED
	359	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	25	GOOD	FAIR	YES	ONE SIDED
	360	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	36	30	GOOD	FAIR	YES	CODOMINANT AT 2', 16' CODOMINANT STEM SUPPRESSED
	361	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
	362	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	10	FAIR	FAIR	NO	ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
	363	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	30	GOOD	FAIR	YES	ONE SIDED, 50% LCR
	364	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	52	25	GOOD	FAIR	YES	CODOMINANT AT 1' WITH INCLUDED BARK
	365	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	GOOD	FAIR	NO	MODERATELY SUPPRESSED
	366	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	30	GOOD	FAIR	YES	ONE SIDED
	367	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	10	GOOD	FAIR	YES	ONE SIDED, OVERTOPPED BY ADJACENT TREES
	368	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	41	20	GOOD	FAIR	NO	MODERATELY THIN CROWN
	369	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
	370	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	10	VERY POOR	VERY POOR	NO	DEAD
	371	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	15	GOOD	FAIR	YES	40% LCR
	372	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	20	FAIR	FAIR	NO	CODOMINANT AT ROOT LEVEL, ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
	373	ACER MACROPHYLLUM	ACER MACROPHYLLUM	12	25	FAIR	FAIR	NO	SIGNIFICANT DECAY AT ROOT CROWN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
	374	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	14	0	VERY POOR	VERY POOR	NO	DEAD
	375	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	20	POOR	POOR	NO	THINNING CROWN
	376	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	10	GOOD	FAIR	YES	ONE SIDED
	377	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	31	20	GOOD	FAIR	YES	MODERATELY ONE SIDED
	378	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	0	VERY POOR	VERY POOR	NO	DEAD
	379	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES	ONE SIDED
	380	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	15	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES, BRANCH DIEBACK
	381	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	GOOD	FAIR	YES	ONE SIDED, MARGINAL TRUNK TAPER
	382	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	10	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES, MARGINAL TRUNK TAPER
	383	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	40	20	GOOD	FAIR	YES	ONE SIDED
	384	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	21	15	GOOD	FAIR	YES	ONE SIDED
	385	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	15	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
	386	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	25	20	FAIR	FAIR	NO	ONE SIDED, MODERATELY THIN CROWN
	387	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	10	GOOD	GOOD	NO	ONE SIDED
	388	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	15	GOOD	FAIR	YES	50% LCR, MARGINAL TRUNK TAPER
	389	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	20	GOOD	FAIR	YES	ONE SIDED
	390	BIGLEAF MAPLE	ACER MACROPHYLLUM	1	1	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
	391	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	20	GOOD	FAIR	YES	50% LCR, MARGINAL TRUNK TAPER
	392	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	12	GOOD	FAIR	YES	OVERTOPPED BY ADJACENT TREES
	393	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	8	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
	394	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	22	15	POOR	POOR	NO	SIGNIFICANT DIEBACK
	395	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	10	GOOD	FAIR	YES	CODOMINANT AT 1'
	396	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	10	FAIR	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
	397	BIGLEAF MAPLE	ACER MACROPHYLLUM	4	10	GOOD	FAIR	NO	ONE SIDED, OVERTOPPED BY ADJACENT TREES
	398	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	12	10	GOOD	FAIR	YES	CODOMINANT AT 1' WITH INCLUDED BARK
	399	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	25	GOOD	FAIR	YES	ONE SIDED
	400	SCOLLERS WILLOW	SALIX SCOLLERIANA	10	10	FAIR	FAIR	NO	ONE SIDED
	401	RED ALDER	ALNUS RUBRA	1	5	GOOD	FAIR	NO	ONE SIDED
	402	RED ALDER	ALNUS RUBRA	8	10	GOOD	FAIR	NO	ONE SIDED
	403	RED ALDER	ALNUS RUBRA	11	10	GOOD	FAIR	YES	ONE SIDED, CODOMINANT AT 5' WITH INCLUDED BARK
	404	RED ALDER	ALNUS RUBRA	11	20	GOOD	FAIR	NO	EXTREME LEAN, CODOMINANT AT 1'
	405	RED ALDER	ALNUS RUBRA	1	1	GOOD	FAIR	NO	MARGINAL TRUNK TAPER
	406	RED ALDER	ALNUS RUBRA	9	10	FAIR	FAIR	NO	PREVIOUS TOP FAILURE
	407	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	8	FAIR	FAIR	NO	PREVIOUS TOP FAILURE
	408	RED ALDER	ALNUS RUBRA	15	10	FAIR	FAIR	NO	DIEBACK, BOUED TRUNK
	409	SCOLLERS WILLOW	SALIX SCOLLERIANA	9	7	POOR	POOR	NO	TOP FAILED AT 10'
	410	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	10	FAIR	FAIR	NO	ONE SIDED, UNDERIZED LEAVES
	411	SCOLLERS WILLOW	SALIX SCOLLERIANA	6	2	POOR	POOR	NO	SIGNIFICANT DIEBACK AND DECAY
	412	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	25	GOOD	FAIR	YES	ONE SIDED
	413	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	15	GOOD	FAIR	YES	ONE SIDED, 60% LCR
	414	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	FAIR	FAIR	NO	OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
	415	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	5	POOR	POOR	NO	SUPPRESSED DECAY AT LOWER TRUNK
	416	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED
	417	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	FAIR	FAIR	NO	40% LCR, BOUED LOWER TRUNK
	418	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	FAIR	FAIR	NO	MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
	419	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	GOOD	FAIR	YES	50% LCR
	420	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	POOR	POOR	NO	SUPPRESSED, KINKED TRUNK
	4								

TREE TO BE SAVED OR REMOVED	TREE RETENTION OPTION	"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.					
TREE NO COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	RETENTION OPTION	COMMENTS
576	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	15	10	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER, 40% LCR
577	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	10	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
578	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	FAIR	FAIR	NO ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
579	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	18	FAIR	FAIR	NO MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK, CO-DOMINANT AT 2' WITH INCLUDED BARK
580	BIGLEAF MAPLE	ACER MACROPHYLLUM	1	10	FAIR	FAIR	NO MODERATELY SUPPRESSED, EPICORMIC GROWTH AT LOWER TRUNK
581	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	45	30	GOOD	GOOD	YES
582	SCOLLERS BILLOW	SALIX SCOLLERIANA	6	6	POOR	POOR	NO 25% LCR, SIGNIFICANT DIEBACK
583	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	15	GOOD	FAIR	NO ONE SIDED
584	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	15	FAIR	FAIR	NO ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
585	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	20	GOOD	FAIR	YES MODERATELY ONE SIDED
586	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	16	FAIR	FAIR	NO OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
587	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	1	8	GOOD	FAIR	NO ONE SIDED
588	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	18	GOOD	FAIR	YES ONE SIDED, 60% LCR
589	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	30	GOOD	FAIR	YES MODERATELY ONE SIDED
590	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	8	POOR	POOR	NO SUPPRESSED
591	BIGLEAF MAPLE	ACER MACROPHYLLUM	18	20	GOOD	FAIR	YES ONE SIDED
592	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	8	GOOD	FAIR	NO ONE SIDED, OVERTOPPED BY ADJACENT TREES
593	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	20	GOOD	FAIR	YES ONE SIDED, PUSHING AGAINST ADJACENT TREE
594	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	20	GOOD	FAIR	YES ONE SIDED, PUSHING AGAINST ADJACENT TREE
595	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	1	8	GOOD	GOOD	NO
596	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	8	POOR	POOR	NO OVERTOPPED BY ADJACENT TREES, SUPPRESSED
597	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES ONE SIDED
598	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	43	28	GOOD	FAIR	YES ONE SIDED
599	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	GOOD	FAIR	YES 40% LCR, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
600	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	13	0	VERY POOR	VERY POOR	NO 25' SNAG
601	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	31	25	GOOD	FAIR	YES ONE SIDED
602	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	33	20	GOOD	FAIR	YES ONE SIDED
603	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	6	0	VERY POOR	VERY POOR	NO T SNAG
604	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
605	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	15	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
606	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	GOOD	FAIR	YES 40% LCR
607	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	10	GOOD	FAIR	YES OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
608	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	8	POOR	POOR	NO SUPPRESSED, SIGNIFICANT LEAN, TOP FAILED
609	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	0	VERY POOR	VERY POOR	NO DEAD
610	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	0	VERY POOR	VERY POOR	NO DEAD
611	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	11	0	VERY POOR	VERY POOR	NO DEAD
612	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	10	8	POOR	POOR	NO EXTENSIVE DIEBACK
613	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	POOR	POOR	NO OVERTOPPED BY ADJACENT TREES, SUPPRESSED
614	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	30	GOOD	FAIR	YES ONE SIDED
615	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	FAIR	FAIR	NO MODERATELY SUPPRESSED
616	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES ONE SIDED
617	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	8	POOR	POOR	NO OVERTOPPED BY ADJACENT TREES, SUPPRESSED
618	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	15	FAIR	FAIR	NO ONE SIDED, BRANCH DIEBACK
619	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	18	GOOD	FAIR	YES 38% LCR, MARGINAL TRUNK TAPER
620	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	0	0	VERY POOR	VERY POOR	NO DEAD 20' SNAG
621	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	12	FAIR	FAIR	NO ONE SIDED, POOR TRUNK TAPER, 25% LCR
622	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	18	FAIR	FAIR	NO OVERTOPPED BY ADJACENT TREES, TWO DEAD LEADERS AT 12'
623	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	34	15	GOOD	FAIR	YES ONE SIDED, 40% LCR, MARGINAL TRUNK TAPER
624	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	16	FAIR	FAIR	NO MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
625	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	6	FAIR	FAIR	NO MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
626	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	8	0	VERY POOR	VERY POOR	NO DEAD T SNAG
627	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	14	FAIR	FAIR	YES MARGINAL TRUNK TAPER
628	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
629	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES MARGINAL TRUNK TAPER, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
630	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	10	POOR	POOR	NO MODERATELY SUPPRESSED, TOP FAILED
631	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	8	FAIR	FAIR	NO MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
632	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES 50% LCR, CROWN EXTENSION SUPPRESSED BY ADJACENT TREES
633	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	8	8	POOR	POOR	NO SUPPRESSED, SIGNIFICANT DIEBACK
634	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	26	18	GOOD	FAIR	YES MODERATELY ONE SIDED
635	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	8	POOR	POOR	NO MODERATELY SUPPRESSED
636	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	23	0	VERY POOR	VERY POOR	NO DEAD
637	BIGLEAF MAPLE	ACER MACROPHYLLUM	16	16	GOOD	FAIR	YES ONE SIDED, 35% LCR
638	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	10	GOOD	FAIR	YES STEM FAILURE AND DECAY
639	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	12	GOOD	FAIR	NO ONE SIDED, MARGINAL TRUNK TAPER
640	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	10	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
641	BIGLEAF MAPLE	ACER MACROPHYLLUM	10	8	FAIR	FAIR	NO OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED, CO-DOMINANT AT 2' WITH INCLUDED BARK
642	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	10	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED
643	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	11	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED
644	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	8	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED
645	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	46	25	GOOD	FAIR	YES ONE SIDED
646	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	20	GOOD	FAIR	YES ONE SIDED, 50% LCR
647	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	25	GOOD	FAIR	YES 40% LCR
648	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	42	20	GOOD	FAIR	YES 40% LCR
649	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	51	25	GOOD	FAIR	YES MODERATELY ONE SIDED
650	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	12	FAIR	FAIR	NO ONE SIDED, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
651	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	13	GOOD	FAIR	YES MARGINAL TRUNK TAPER
652	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	15	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
653	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES ONE SIDED, KINKED LOWER TRUNK
654	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	12	FAIR	FAIR	YES CROWN EXTENSION SUPPRESSED BY ADJACENT TREES, MARGINAL TRUNK TAPER
655	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	1	5	POOR	POOR	NO OVERTOPPED BY ADJACENT TREES, SUPPRESSED
656	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	13	GOOD	FAIR	YES MARGINAL TRUNK TAPER
657	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	15	GOOD	FAIR	YES MARGINAL TRUNK TAPER
658	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	10	GOOD	FAIR	YES MARGINAL TRUNK TAPER, 35% LCR
659	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	12	GOOD	FAIR	YES MARGINAL TRUNK TAPER, 40% LCR
660	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	10	10	FAIR	FAIR	NO ONE SIDED, LARGE SCAR AT LOWER TRUNK
661	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	16	GOOD	FAIR	YES MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
662	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	12	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
663	BIGLEAF MAPLE	ACER MACROPHYLLUM	8	15	GOOD	FAIR	NO OVERTOPPED BY ADJACENT TREES
664	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	4	8	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
665	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	18	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
666	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	18	GOOD	FAIR	YES MODERATELY ONE SIDED, MARGINAL TRUNK TAPER
667	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	14	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
668	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES ONE SIDED
669	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	18	18	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
670	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	18	FAIR	FAIR	NO MARGINAL TRUNK TAPER, MODERATELY SUPPRESSED
671	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	20	GOOD	FAIR	YES ONE SIDED
672	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	18	FAIR	FAIR	NO CO-DOMINANT AT 3' WITH INCLUDED BARK, MODERATELY SUPPRESSED
673	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	8	FAIR	FAIR	NO MARGINAL TRUNK TAPER, MODERATELY SUPPRESSED
674	BIGLEAF MAPLE	ACER MACROPHYLLUM	9	12	GOOD	FAIR	NO ONE SIDED
675	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	0	VERY POOR	VERY POOR	NO DEAD
676	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	20	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
677	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	16	15	GOOD	FAIR	YES 50% LCR, MARGINAL TRUNK TAPER
678	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	GOOD	FAIR	NO ONE SIDED, MARGINAL TRUNK TAPER
679	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	FAIR	FAIR	NO MODERATELY SUPPRESSED, OVERTOPPED BY ADJACENT TREES
680	BIGLEAF MAPLE	ACER MACROPHYLLUM	22	20	GOOD	FAIR	YES CO-DOMINANT AT 2' WITH INCLUDED BARK, MODERATELY SUPPRESSED
681	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	15	GOOD	FAIR	YES 40% LCR, MARGINAL TRUNK TAPER
682	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	14	FAIR	FAIR	NO 33% LCR, POOR TRUNK TAPER
683	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	11	GOOD	FAIR	YES 40% LCR, MARGINAL TAPER
684	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	9	GOOD	FAIR	YES 40% LCR, MARGINAL TAPER, BOUED TRUNK
685	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	20	GOOD	FAIR	YES MODERATELY ONE SIDED
686	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	15	GOOD	FAIR	YES MARGINAL TRUNK TAPER, 40% LCR, PREVIOUS LEADER FAILURE AT 20'
687	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	13	18	GOOD	FAIR	YES ONE SIDED
688	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	29	20	GOOD	FAIR	YES MODERATELY ONE SIDED
689	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	21	20	GOOD	FAIR	YES MODERATELY ONE SIDED
690	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	8	FAIR	FAIR	NO OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
691	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	31	22	GOOD	FAIR	YES MODERATELY ONE SIDED
692	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	24	18	GOOD	FAIR	YES ONE SIDED
693	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	9	POOR	POOR	NO SUPPRESSED
694	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	26	20	GOOD	FAIR	YES ONE SIDED
695	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	22	16	GOOD	FAIR	YES ONE SIDED
696	RED ALDER	ALNUS RUBRA	25	18	GOOD	FAIR	YES ONE SIDED
697	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	8	POOR	POOR	NO SUPPRESSED
698	RED ALDER	ALNUS RUBRA	14	0	VERY POOR	VERY POOR	NO DEAD
699	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	10	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
700	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	12	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
701	BIGLEAF MAPLE	ACER MACROPHYLLUM	13	10	FAIR	FAIR	NO OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
702	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	28	20	GOOD	FAIR	YES MODERATELY ONE SIDED
703	RED ALDER	ALNUS RUBRA	5	5	FAIR	FAIR	NO SIGNIFICANT LEAN, THIN CROWN
704	RED ALDER	ALNUS RUBRA	13	18	POOR	POOR	NO SIGNIFICANT LEAN, SIGNIFICANT DECAY
705	RED ALDER	ALNUS RUBRA	6	1	FAIR	FAIR	NO THIN CROWN
706	RED ALDER	ALNUS RUBRA	6	1	FAIR	FAIR	NO THIN CROWN, CO-DOMINANT AT 6'
707	WESTERN REDCEDAR	THUJA PLICATA	28	18	GOOD	GOOD	YES
708	WESTERN REDCEDAR	THUJA PLICATA	1	1	GOOD	GOOD	NO
709	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	6	6	POOR	POOR	NO SUPPRESSED
710	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	52	25	GOOD	GOOD	YES
711	BIGLEAF MAPLE	ACER MACROPHYLLUM	6	15	FAIR	FAIR	NO EXTREME LEAN, OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
712	BIGLEAF MAPLE	ACER MACROPHYLLUM	11	12	GOOD	FAIR	YES OVERTOPPED BY ADJACENT TREES, MODERATELY SUPPRESSED
713	WESTERN HEMLOCK	TSUGA HETEROPHYLLA	30	0	VERY POOR	VERY POOR	NO DEAD
714	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	44	20	GOOD	FAIR	YES 50% LCR
715	BIGLEAF MAPLE	ACER MACROPHYLLUM	14	15	FAIR	FAIR	YES ONE SIDED, OVERTOPPED BY ADJACENT TREES
716	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	19	12	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER
717	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	25	18	GOOD	FAIR	YES ONE SIDED, MARGINAL TRUNK TAPER, BOUED TRUNK

TREE TO BE SAVED OR REMOVED	TREE RETENTION OPTION	"YES" INDICATES TREES THAT MEET TREE RETENTION REQUIREMENT. SEE NOTE 4.					
TREE NO COMMON NAME	SCIENTIFIC NAME	DBH	C-RAD	CONDITION	STRUCTURE	RETENTION OPTION	COMMENTS
118	BIGLEAF MAPLE	ACER MACROPHYLLUM	12	8	POOR	POOR	NO TOP FAILED, SUPPRESSED
119	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	23	10	FAIR	FAIR	NO ONE SIDED, MARGINAL TRUNK TAPER, KINKED TRUNK, MODERATELY SUPPRESSED
120	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	9	5	POOR	POOR	NO SUPPRESSED, EXTENSIVE PORRODAEDALEA PINI CONKS
121	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	14	10	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
122	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	11	8	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER
123	DOUGLAS-FIR	PSEUDOTSUGA MENZIESII	32	8	FAIR	FAIR	NO ONE SIDED, MODERATELY SUPPRESSED, MARGINAL TRUNK TAPER, KINKED TRUNK
124	DOUGLAS-FIR</						

Attachment 4 Additional Tree Protection Recommendations

The following recommendations meet or exceed City of Sandy Code requirements:

Before Construction Begins

1. Notify all contractors of tree protection procedures. For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection.
 - a. Hold a tree protection meeting with all contractors to explain the goals of tree protection.
 - c. Have all contractors sign memoranda of understanding regarding the goals of tree protection. The memoranda should include a penalty for violating the tree protection plan. The penalty should equal the resulting fines issued by the local jurisdiction plus the appraised value of the tree(s) within the violated tree protection zone per the current Trunk Formula Method as outline in the current edition of the *Guide for Plant Appraisal* by the Council of Tree & Landscape Appraisers. The penalty should be paid to the owner of the property.
2. Fencing
 - a. Trees to remain in the grove should be protected by installation of tree protection fencing as shown in Attachment 2.
 - b. The fencing should be put in place before the ground is cleared in order to protect the trees and the soil around the trees from disturbances.
 - c. Fencing should be established by the project arborist based on the needs of the trees to be protected and to facilitate construction.
 - d. Fencing should consist of 6-foot high steel fencing on concrete blocks or 6-foot metal fencing secured to the ground with 8-foot metal posts placed no farther than ten feet apart to prevent it from being moved by contractors, sagging, or falling down.
 - e. Fencing should remain in the position that is established by the project arborist and not be moved without approval from the project arborist until final project approval.
3. Signage
 - a. All tree protection fencing should have signage as follows so that all contractors understand the purpose of the fencing:

TREE PROTECTION ZONE

**DO NOT REMOVE OR ADJUST THE APPROVED
LOCATION OF THIS TREE PROTECTION FENCING.**

Please contact the project arborist if alterations to the approved
location of the tree protection fencing are necessary.

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- b. Signage should be placed every 75-feet or less.

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During Construction

1. Protection Guidelines Within the Tree Protection Zones:
 - a. No new buildings; grade change or cut and fill, during or after construction; new impervious surfaces; or utility or drainage field placement should be allowed within the tree protection zones.
 - b. No traffic should be allowed within the tree protection zones. This includes but is not limited to vehicle, heavy equipment, or even repeated foot traffic.
 - c. No storage of materials including but not limiting to soil, construction material, or waste from the site should be permitted within the tree protection zones. Waste includes but is not limited to concrete wash out, gasoline, diesel, paint, cleaner, thinners, etc.
 - d. Construction trailers should not be parked/placed within the tree protection zones.
 - e. No vehicles should be allowed to park within the tree protection zones.
 - f. No other activities should be allowed that will cause soil compaction within the tree protection zones.
2. The trees should be protected from any cutting, skinning or breaking of branches, trunks or woody roots.
3. The project arborist should be notified prior to the cutting of woody roots from trees that are to be retained to evaluate and oversee the proper cutting of roots with sharp cutting tools. Cut roots should be immediately covered with soil or mulch to prevent them from drying out.
4. Trees that have roots cut should be provided supplemental water during the summer months.
5. Any necessary passage of utilities through the tree protection zones should be by means of tunneling under woody roots by hand digging or boring with oversight by the project arborist.
6. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

After Construction

1. Carefully landscape the areas within the tree protection zones. Do not allow trenching for irrigation or other utilities within the tree protection zones.
2. Carefully plant new plants within the tree protection zones. Avoid cutting the woody roots of trees that are retained.
3. Do not install permanent irrigation within the tree protection zones unless it is drip irrigation to support a specific planting or the irrigation is approved by the project arborist.
4. Provide adequate drainage within the tree protection zones and do not alter soil hydrology significantly from existing conditions for the trees to be retained.
5. Provide for the ongoing inspection and treatment of insect and disease populations that are capable of damaging the retained trees and plants.
6. The retained trees may need to be fertilized if recommended by the project arborist.
7. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

Attachment 5 Assumptions and Limiting Conditions

1. Any legal description provided to the consultant is assumed to be correct. The site plans and other information provided by Even Better Homes and their consultants was the basis of the information provided in this report.
2. It is assumed that this property is not in violation of any codes, statutes, ordinances, or other governmental regulations.
3. The consultant is not responsible for information gathered from others involved in various activities pertaining to this project. Care has been taken to obtain information from reliable sources.
4. Loss or alteration of any part of this delivered report invalidates the entire report.
5. Drawings and information contained in this report may not be to scale and are intended to be used as display points of reference only.
6. The consultant's role is only to make recommendations. Inaction on the part of those receiving the report is not the responsibility of the consultant.
7. The purpose of this report is to:
 - Assess the within the development site;
 - Identify the trees to be removed and retained; and
 - Provide tree protection recommendations for the trees to be retained.

EXHIBIT G



Jason Smith
Environmental Consulting
849 Woodpecker Dr
Kelso, WA 98626

Environmental Services
Planning & Permitting
Assessment & Analysis
Project Management

September 30, 2020

Even Better Homes, Inc.
Attn: Mac Even
PO Box 2021
Gresham, OR 97030

SUBJ: Stream and Wetland Presence Determination - 19618 Bornstedt Road, Sandy OR

Summary

No wetlands or streams are located on Clackamas County Parcel number 00677306 (19618 Bornstedt Road, Sandy OR 97055).

Scope

Wetland presence was evaluated using Level 3 Routine Wetland Determination in accordance with methods prescribed by the US Army Corps of Engineers 1987 Wetland Delineation Manual.

Section B. Preliminary Data Gathering and Synthesis

53. This section discusses potential sources of information that may be helpful in making a wetland determination. When the routine approach is used, it may often be possible to make a wetland determination based on available vegetation, soils, and hydrology data for the area.

Level 3 - Combination of Levels 1 and 2. This level should be used when there is sufficient information already available to characterize the vegetation, soils, and hydrology of a portion, but not all, of the project area. Methods described for Level 1 may be applied to portions of the area for which adequate information already exists, and onsite methods (Level 2) must be applied to the remainder of the area (see Section D, Subsection 3).

Stream presence determination followed guidance from the Oregon Dept. of State Lands (DSL) publication "A Guide to the Removal-Fill Permit Process" (2019). Procedures for Non-tidal Rivers, Intermittent and Perennial Streams, Lakes, and Ponds include determining whether a stream is perennial, intermittent or ephemeral using Ordinary High Water (OHW) mark and other field indicators:

Field indicators of OHW include:

- Clear, natural line impressed on the shore, including scour, shelving and exposed roots
- Change in plant community from riparian (e.g., willows) to upland (e.g., oak, fir) dominated. If the area is cropped, hydrophytic plants, or evidence of crop stress or damage from high flows would be indicative of high water.
- Textural change of depositional sediment or changes in the character of the soil (e.g. from sand, sand and cobble, cobble and gravel to upland soils). Sediments may appear stratified. This indicator may require careful evaluation on floodplains where certain farming practices regularly disturb the soil profile.

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● Page 2

- Elevation below which no fine debris (needles, leaves, cones, seeds, soil organic matter) occurs
- Presence of water-borne litter and debris, wrack accumulation, water-stained leaves, water lines on tree trunks, flattened vegetation. Certain farming practices can obscure these indicators.

Findings

The project area in question is the small “valley” that runs through the center of the parcel. The area is mapped in the National Wetland Inventory with a 1.00 acre Freshwater Forested/Shrub Wetland habitat is classified as Palustrine (P), Forested (FO), Broad-Leaved Deciduous (1), Seasonally-Flooded (C) (PFO1C). The wetland is demarcated as a stream.

The NWI-mapped wetland is reflected in the Oregon Statewide Wetlands Inventory (SWI) database. The wetlands in this area were photo interpreted using 1:58,000 scale, color infrared imagery from 1981. The stream classification mapped in the National Hydrography Dataset is Intermittent.

The SWI database is a synthesis of NWI, National Hydrography Data Set and NRCS Soils data and generally meets Corps '87 manual requirements for preliminary data gathering and synthesis. Although the SWI shows the NWI-mapped wetland and associated intermittent stream, the area is not mapped with hydric soils (confirmed with the NRCS Soils Mapper database).

In addition, local knowledge indicates the mapped stream does not exist, and therefore the wetland does not exist. A field visit performed September 4, 2020 confirmed that no stream or associated wetland is present on the site.







The photographs confirm that no stream features are present on the site, and a stream channel was assumed to be the wetland.

Field indicators of OHW:

- Clear, natural line impressed on the shore, including scour, shelving and exposed roots
 - No channel present.

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- Change in plant community from riparian (e.g., willows) to upland (e.g., oak, fir) dominated. If the area is cropped, hydrophytic plants, or evidence of crop stress or damage from high flows would be indicative of high water.
 - No change in vegetation. No riparian or wetland vegetation observed. Fir trees dominate overstory vegetation.
- Textural change of depositional sediment or changes in the character of the soil (e.g. from sand, sand and cobble, cobble and gravel to upland soils). Sediments may appear stratified. This indicator may require careful evaluation on floodplains where certain farming practices regularly disturb the soil profile.
 - No disturbed soils present. No depositional or other stream bed characteristics observed.
- Elevation below which no fine debris (needles, leaves, cones, seeds, soil organic matter) occurs
 - Not present.
- Presence of water-borne litter and debris, wrack accumulation, water-stained leaves, water lines on tree trunks, flattened vegetation. Certain farming practices can obscure these indicators.
 - No water-borne features present.

Conclusion

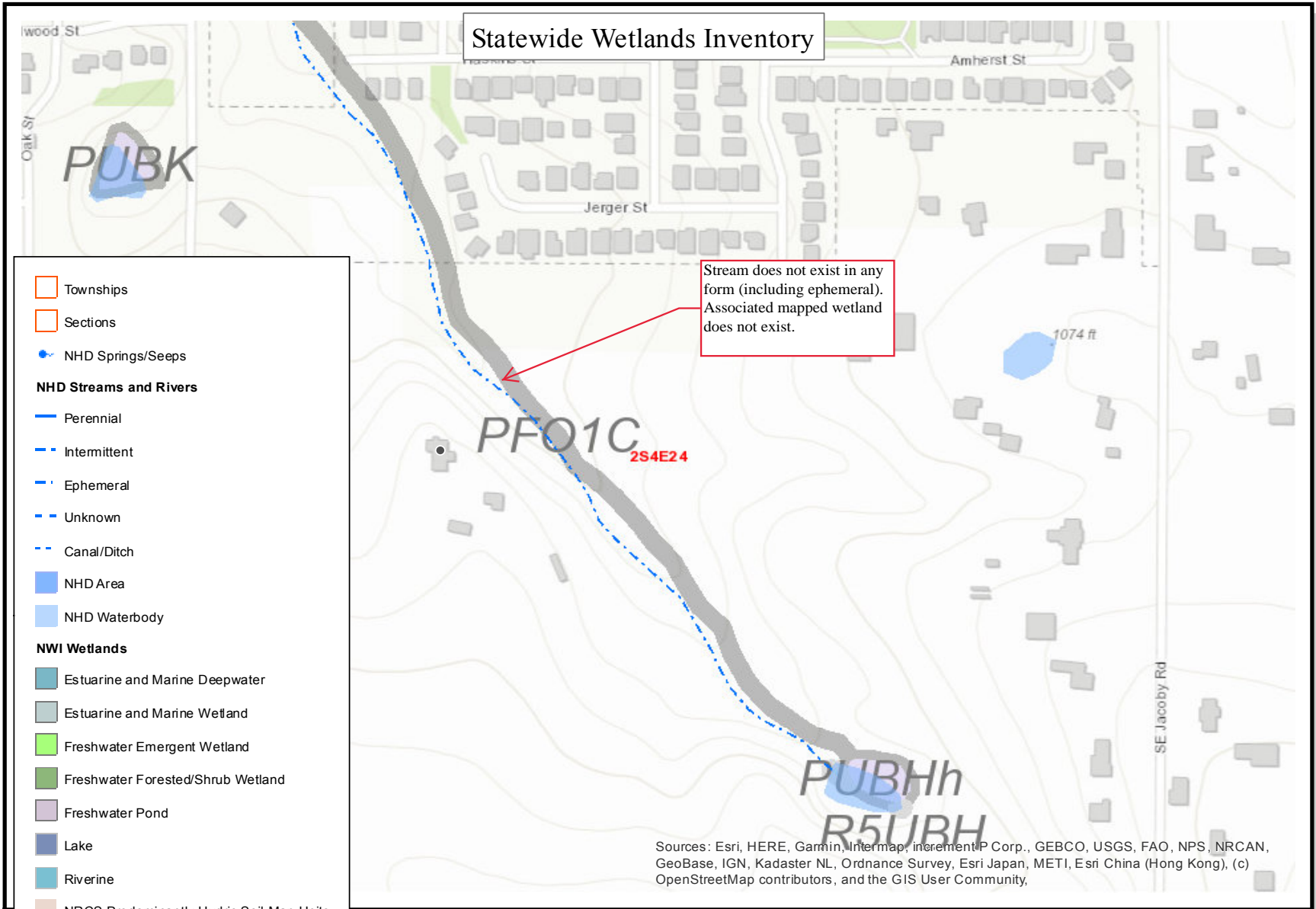
The mapped stream and associated wetland do not exist. No areas with field indicators for wetland hydrology or wetland vegetation were observed.

These findings and conclusions are subject to concurrence.



Jason Smith
Project Manager

ENCL: SWI Maps

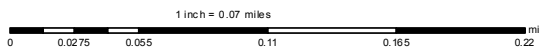


Statewide Wetlands Inventory

Stream does not exist in any form (including ephemeral). Associated mapped wetland does not exist.

- Townships
- Sections
- NHD Springs/Seeps
- NHD Streams and Rivers**
- Perennial
- - - Intermittent
- · · Ephemeral
- · - Unknown
- - - Canal/Ditch
- NHD Area
- NHD Waterbody
- NWI Wetlands**
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine
- NRCS Predominantly Hydric Soil Map Units
- NRCS Agate-Winlo Soils in Jackson County

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community,



The Statewide Wetlands Inventory (SWI) represents the best data available at the time this map was published and is updated as new data becomes available. In all cases, actual field conditions determine the presence, absence and boundaries of wetlands and waters (such as creeks and ponds). An onsite investigation by a wetland professional can verify actual field conditions.

<https://www.oregon.gov/ds/WWW/Pages/SWI.aspx>

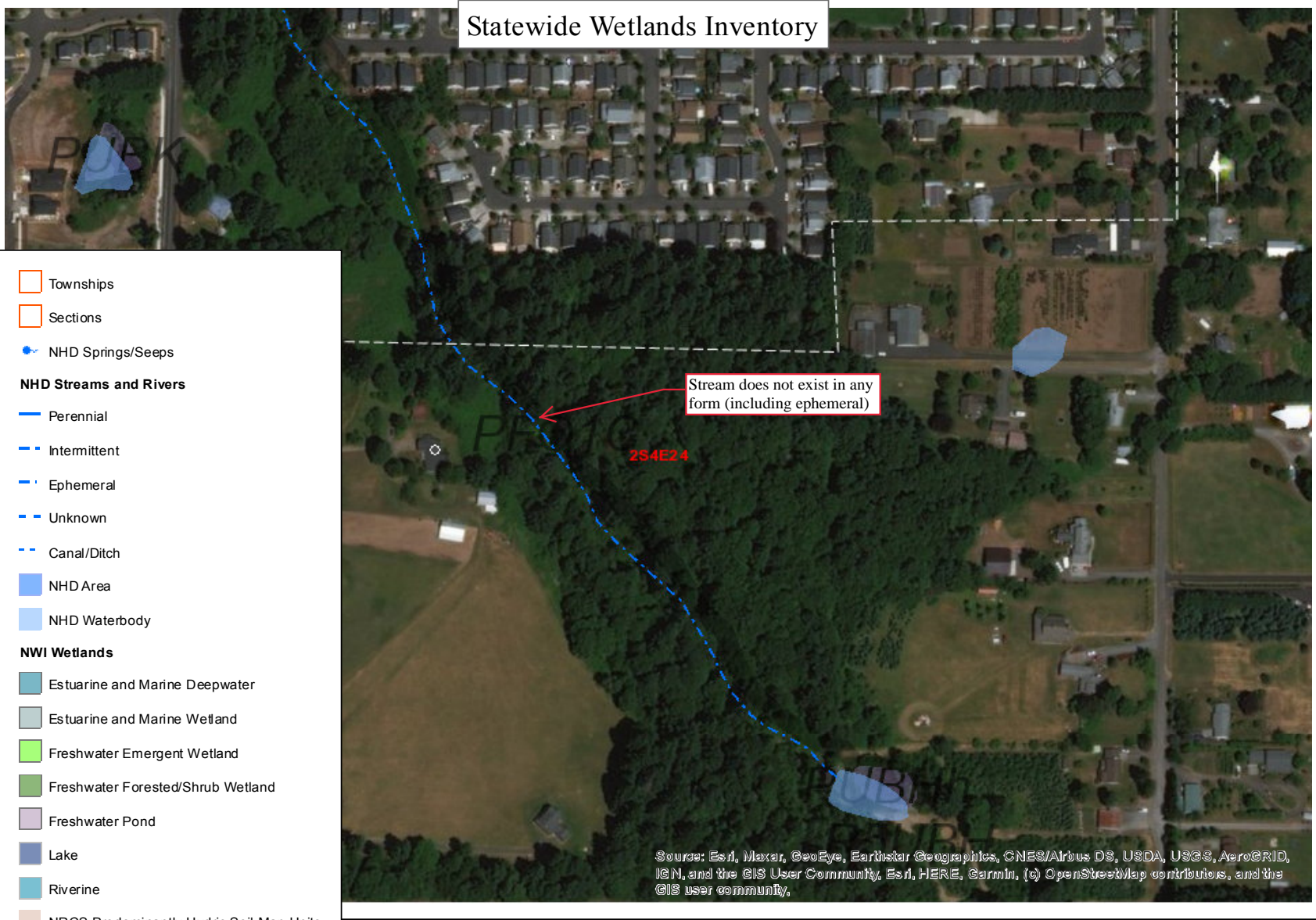


Date: 9/3/2020



State of Oregon
 Department of State Lands
 775 Summer Street NE, Ste 100
 Salem, OR 97301-1279
 (503) 986-5200

Statewide Wetlands Inventory

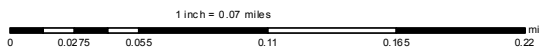


- Townships
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- Perennial
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- Riverine
- NRCS Predominantly Hydric Soil Map Units
- NRCS Agate-Winlo Soils in Jackson County

Stream does not exist in any form (including ephemeral)

2S4E24

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community.



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Date: 9/3/2020



State of Oregon
 Department of State Lands
 775 Summer Street, NE, Ste 100
 Salem, OR 97301-1279
 (503) 986-5200





EXHIBIT H

Geotechnical Investigation and Consultation Services

Proposed The Bornstedt Views Development Site

Tax Lot No. 100

SE Bornstedt Road and SE Averill Parkway

Sandy (Clackamas County), Oregon

for

Even Better Homes, Inc.

**Project No. 1666.003.G
May 3, 2021**

REDMOND GEOTECHNICAL SERVICES

May 3, 2021

Mr. Mac Even
Even Better Homes, Inc.
P.O. Box 2021
Gresham, Oregon 97030

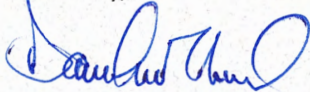
Dear Mr. Even:

**Re: Geotechnical Investigation and Consultation Services,
Proposed The Bornstedt Views Development Site, Tax Lot No. 100,
SE Bornstedt Road and SE Averill Parkway, Sandy (Clackamas County), Oregon**

Submitted herewith is our report entitled "Geotechnical Investigation and Consultation Services, Proposed The Bornstedt Views Development Site, Tax Lot No. 100, SE Bornstedt Road and SE Averill Parkway, Sandy (Clackamas County), Oregon". The scope of our services was outlined in our formal proposal to Mr. Mac Even of Even Better Homes, Inc. dated July 10, 2020. Authorization of our services was provided by Mr. Mac Even on September 16, 2020.

During the course of our investigation, we have kept you and/or others advised of our schedule and preliminary findings. We appreciate the opportunity to assist you with this phase of the project. Should you have any questions regarding this report, please do not hesitate to call.

Sincerely,



Daniel M. Redmond, P.E., G.E.
President/Principal Engineer

Cc: Mr. Ray Moore
All County Surveyor's & Planners, Inc.



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**GEOTECHNICAL INVESTIGATION AND CONSULTATION SERVICES
PROPOSED THE BORNSTEDT VIEWS DEVELOPMENT SITE
TAX LOT NO. 100
SE BORNSTEDT ROAD AND SE AVERILL PARKWAY
SANDY (CLACKAMAS COUNTY) OREGON**

INTRODUCTION

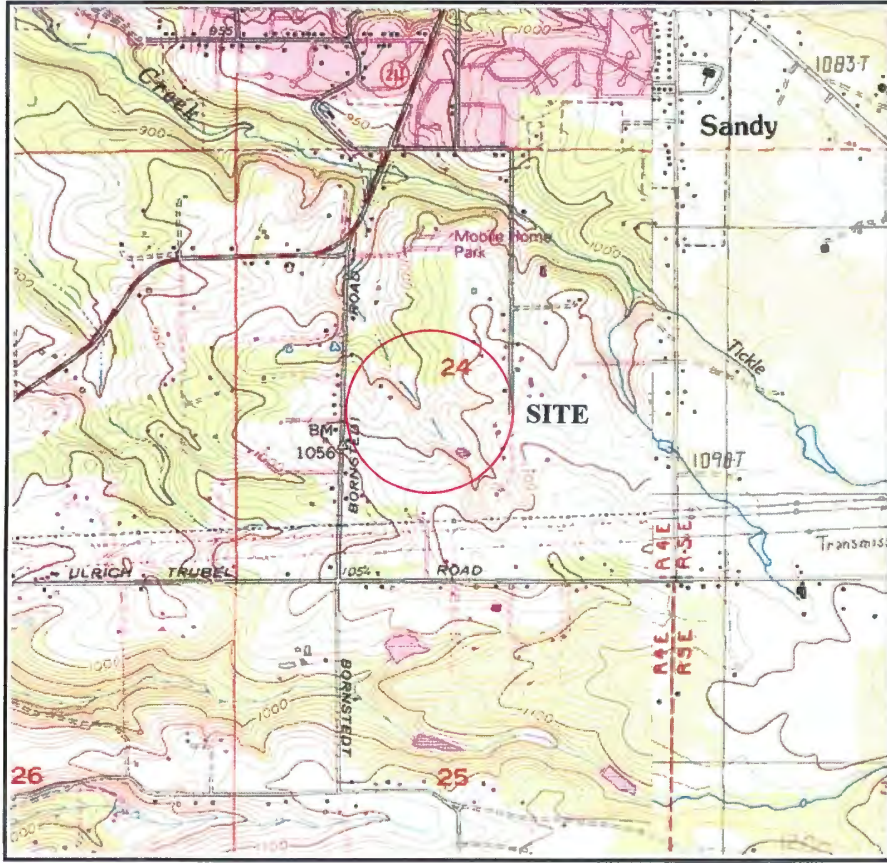
Redmond Geotechnical Services, LLC is please to submit to you the results of our Geotechnical Investigation and Consultation Services at the site of the proposed new The Bornstedt Views residential development project located to the east of SE Bornstedt Road and to the west of SE Averill Parkway in Sandy (Clackamas County), Oregon. The general location of the subject site is shown on the Site Vicinity Map, Figure No. 1. The purpose of our geotechnical investigation and consultation services at this time was to explore the existing subsurface soils and/or groundwater conditions across the subject site and to evaluate any potential concerns with regard to development at the site as well as to develop and/or provide appropriate geotechnical design and construction recommendations for the proposed new The Bornstedt Views residential development project.

PROJECT DESCRIPTION

Based on a review of the proposed site development plans, we understand that present plans will consist of the construction of a new residential subdivision development. Reportedly, the project will consist of the development and/or construction of approximately four-two (42) new single-family residential home sites and/or lots ranging in size from about 7,500 to 12,000 square feet. We understand that the lots will primarily be developed with new two-story wood-frame residential structures.

Support of the new single-family residential structures is anticipated to consist primarily of conventional shallow strip (continuous) footings although some individual (column) footings will also be required. Additionally, we envision that the proposed new single-family residential structures will likely be constructed with raised wooden post and beams floors although some concrete slab-on-grade floors are also possible. Further, due to the sloping site grades, we anticipate that some of the proposed new residential homes and/or structures may be constructed with partial and/or below levels. As such, construction of some below grade retaining walls is also anticipated form the project. Structural loading information, although unavailable at this time, is anticipated to be fairly typical for this type of two-story wood-frame structure and is expected to result in maximum dead plus live continuous (strip) and individual (column) footing loads on the order of about 2.0 to 3.5 kips per lineal foot (klf) and 10 to 35 kips, respectively.

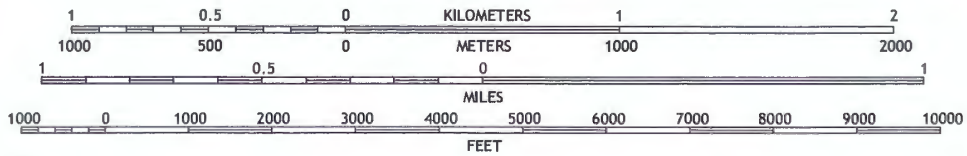
REDMOND GEOTECHNICAL SERVICES



**SANDY QUADRANGLE
OREGON**

7.5-MINUTE SERIES

SCALE 1:24 000



CONTOUR INTERVAL 40 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

SITE VICINITY MAP

**THE BORNSTEDT VIEWS
TL 100, SE BORNSTEDT ROAD**

Project No. 1666.003.G

Figure No. 1

Other associated site improvements for the project will include construction of new paved public streets and/or private access drives and parking areas. Additionally, the project will include the construction of new underground utility services as well as new concrete curbs and sidewalks. Further, we understand that development of the site will also include the collection of storm water from hard and/or impervious surfaces (i.e., roofs and pavements) for on-site treatment and disposal within various storm water detention facilities designed by the Civil Engineer.

Earthwork and grading operations for the project to bring the subject property to finish design grades and/or elevations will reportedly result in both cuts and/or fills. A review of the proposed site grading plans for the project indicate that cuts and/or fills of between five (5) and ten (10) feet are generally anticipated across the site.

SCOPE OF WORK

The purpose of our geotechnical studies was to evaluate the overall subsurface soil and/or groundwater conditions underlying the subject site with regard to the proposed new The Bornstedt Views residential development and construction at the site and any associated impacts or concerns with respect to development at the site as well as provide appropriate geotechnical design and construction recommendations for the project. Specifically, our geotechnical investigation included the following scope of work items:

1. Review of available and relevant geologic and/or geotechnical investigation reports for the subject site and/or area.
2. A detailed field reconnaissance and subsurface exploration program of the soil and ground water conditions underlying the site by means of ten (10) exploratory test pit excavations. The exploratory test pits were excavated to depths ranging from about five (5) to seven (7) feet beneath existing site grades at the approximate locations as shown on the Site Exploration Plan, Figure No. 2. Additionally, field infiltration testing was also performed within various test pits excavated across the subject site.
3. Laboratory testing to evaluate and identify pertinent physical and engineering properties of the subsurface soils encountered relative to the planned site development and construction at the site. The laboratory testing program included tests to help evaluate the natural (field) moisture content and dry density, maximum dry density and optimum moisture content, Atterberg Limits and gradational characteristics as well as direct shear strength and "R"-value tests.
4. A literature review and engineering evaluation and assessment of the regional seismicity to evaluate the potential ground motion hazard(s) at the subject site. The evaluation and assessment included a review of the regional earthquake history and sources such as potential seismic sources, maximum credible earthquakes, and recurrence intervals as well as a discussion of the possible ground response to the selected design earthquake(s), fault rupture, landsliding, liquefaction, and tsunami and seiche flooding.

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5. Engineering analyses utilizing the field and laboratory data as a basis for furnishing recommendations for foundation support of the proposed new residential structures. Recommendations include maximum design allowable contact bearing pressure(s), depth of footing embedment, estimates of foundation settlement, lateral soil resistance, and foundation subgrade preparation. Additionally, construction and/or permanent subsurface water drainage considerations have also been prepared. Further, our report includes recommendations regarding site preparation, placement and compaction of structural fill materials, suitability of the on-site soils for use as structural fill, criteria for import fill materials, and preparation of foundation, pavement and/or floor slab subgrades.
6. Flexible pavement design and construction recommendations for the proposed new public streets and private access drives and parking area improvements.

SITE CONDITIONS

Regional and Site Geology

The subject site and/or area is located on the eastern margin of the Portland Basin near where the basin meets the western edge of the Cascade Mountains physiographic province (Orr and Orr, 1999). Bedrock in this region consists of volcanic rocks emplaced tens of millions of years ago, associated with the Columbia River Basalt Group and with volcanics from the Western Cascades province (Gannet and Caldwell, 1998).

The volcanic basement is overlain by silts, sands and gravels of Miocene to Pleistocene age which form the majority of the basin fill in the area. The basin fill sediments generally are mapped as Sandy River Mudstone towards the lower portion of the assemblage in turn overlain by the Troutdale Formation, a series of gravels, sands and silts deposited by the ancestral Columbia River and smaller rivers flowing from the Cascade Mountains (Schlicker and Finlayson, 1979). In the vicinity of Sandy, the Troutdale Formation is overlain by the Springwater Formation, a conglomerate with some volcanoclastic sands, silts, and debris flows derived from the Cascade Range. The conglomerate consists of gravels, cobbles, and boulders of volcanic composition that are strongly and deeply weathered to completely decomposed residual soils often producing a red, fine-grained soil up to 75 feet deep.

Surface Conditions

The proposed new The Bornstedt Views residential development property consists of one (1) generally rectangular shaped tax lot (TL 100) which encompass a total plan area of approximately 12.74 acres. The proposed The Bornstedt Views residential development property is roughly located to the east of SE Bornstedt Road and to the west of SE Averill Parkway. The subject property is presently improved and contains an existing single-family residential home as well as various detached wooden outbuildings.

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Surface vegetation across the site generally consists of a light to moderate growth of grass, weeds and brush as well as numerous small to large sized trees. Additionally, the central portion of the subject property contains an existing seasonal drainage basin and/or tributary to Tickle Creek.

Topographically, the subject site is generally characterized as gently sloping terrain (i.e., 5 to 10 percent) descending downwards from the east and the west towards the central portion of the site associated with the seasonal tributary of Tickle Creek. Overall topographic relief across the entire site estimated at about sixty-eight (68) feet and ranges from a low about Elevation 978 feet near the northerly end of the existing seasonal drainage basin to a high of about Elevation 1046 near the easterly portion of the site.

Subsurface Soil Conditions

Our understanding of the subsurface soil conditions underlying the site was developed by means of ten (10) exploratory test pits excavated to depths ranging from about five (5) to seven (7) feet beneath existing site grades on October 1, 2020 with portable Geoprobe equipment. The location of the exploratory test pits were located in the field by marking off distances from existing and/or known site features and are shown in relation to the existing site features and/or site improvements on the Site Exploration Plan, Figure No. 2. Detailed logs of the test pit explorations, presenting conditions encountered at each location explored, are presented in the Appendix, Figure No's. A-4 through A-8.

The exploratory test pit excavations were observed by staff from Redmond Geotechnical Services, LLC who logged each of the test pit explorations and obtained representative samples of the subsurface soils encountered across the site. Additionally, the elevation of the exploratory test pit excavations were referenced from a site topographic survey prepared by All County Surveyor's & Planners, Inc. and should be considered as approximate. All subsurface soils encountered at the site and/or within the exploratory test pit excavations were logged and classified in general conformance with the Unified Soil Classification System (USCS) which is outlined on Figure No. A-3.

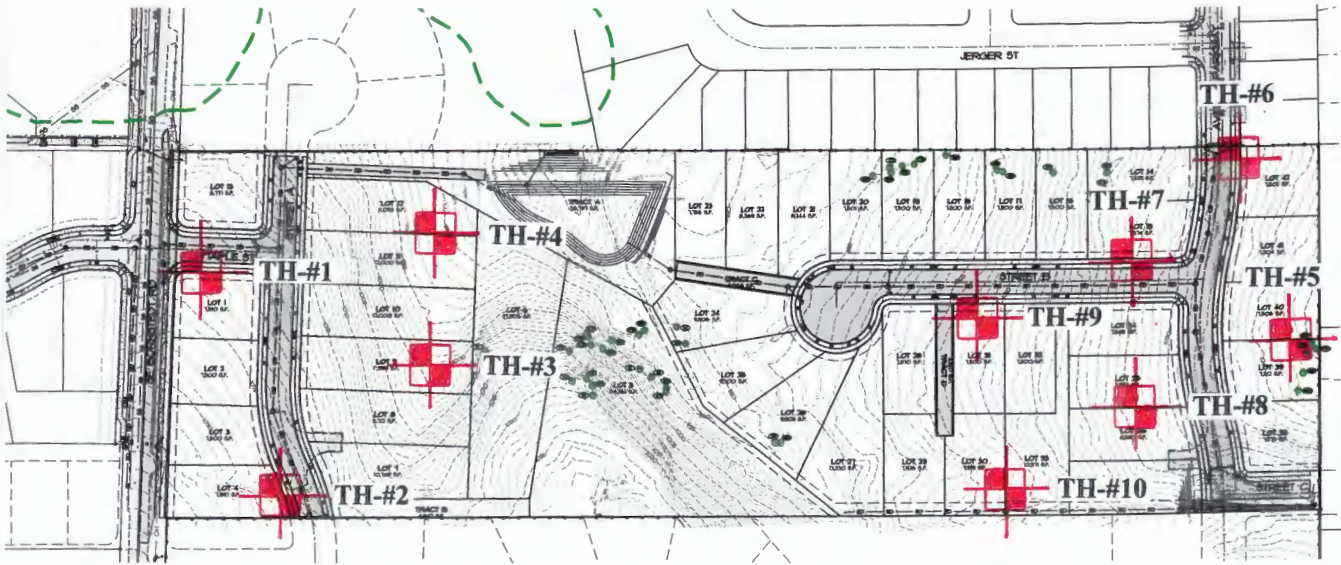
The test pit explorations revealed that the subject site is underlain by native soil deposits comprised of residual soils and/or highly weathered bedrock deposits composed of a surficial layer of dark brown, wet, soft, organic, sandy, clayey silt topsoil materials to depths of about 12 to 14 inches. These surficial topsoil materials were inturn underlain by residual soils composed of reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey silt to silty clay to depths of about four (4) to six (6) feet beneath the existing site and/or surface grades. These clayey silt to silty clay soils are best characterized by relatively low to moderate strength and moderate compressibility. These upper residual soils were inturn underlain by light reddish- to orangish-brown, very moist, very stiff to dense, sandy, clayey silt to highly weathered bedrock deposits to the maximum depth explored of about seven (7) feet beneath the existing site and/or surface grades. These sandy, clayey silt to highly weathered bedrock deposits are best characterized by relatively moderate strength and low to moderate compressibility.


Project No. 1666.003.G

**THE BORNSTEDT VIEWS
TL 100, SE BORNSTEDT ROAD**

Figure No. 2

SITE EXPLORATION PLAN



 **TH-#10** **LEGEND**
Indicates approximate location
of exploratory test hole



Groundwater

Groundwater was not encountered within any of the exploratory test pit explorations (TH-#1 through TH-#10) at the time of excavation to depths of at least 7.0 feet beneath existing surface grades except. However, the central portion of the subject property contains an existing seasonal drainage basin.

In this regard, groundwater elevations at the site may fluctuate seasonally in accordance with rainfall conditions and/or associated with runoff across the site as well as changes in site utilization. As such, we are generally of the opinion that the static water levels and/or surface water ponding observed and/or not observed during our recent field exploration work generally reflect the seasonal groundwater level(s) at and/or beneath the site.

INFILTRATION TESTING

We performed two (2) field infiltration tests at the site on October 1, 2020. The infiltration tests were performed in test holes TH-#4 and TH-#10 at depths of between four (4) and five (5) feet beneath the existing site and/or surface grades. The subgrade soils encountered in the infiltration test hole consisted of sandy, clayey silt to silty clay. The infiltration testing was performed in general conformance with current EPA and/or the City of Sandy/Clackamas County Encased Falling Head test method which consisted of advancing a 6-inch diameter PVC pipe approximately 6 inches into the exposed soil horizon at each test location. Using a steady water flow, water was discharged into the pipe and allowed to penetrate and saturate the subgrade soils. The water level was adjusted over a two (2) hour period and allowed to achieve a saturated subgrade soil condition consistent with the bottom elevation of the surrounding test pit excavation. Following the required saturating period, water was again added into the PVC pipe and the time and/or rate at which the water level dropped was monitored and recorded. Each measurable drop in the water level was recorded until a consistent infiltration rate was observed and/or repeated.

Based on the results of the field infiltration testing at the site, we have found that the native sandy, clayey silt subgrade soil deposits possess an ultimate infiltration rate on the order of about 0.1 to 0.2 inches per hour (in/hr).

LABORATORY TESTING

Representative samples of the on-site subsurface soils were collected at selected depths and intervals from various test pit excavations and returned to our laboratory for further examination and testing and/or to aid in the classification of the subsurface soils as well as to help evaluate and identify their engineering strength and compressibility characteristics. The laboratory testing consisted of visual and textural sample inspection, moisture content and dry density determinations, maximum dry density and optimum moisture content, Atterberg Limits and gradation analyses as well as direct shear strength and "R"-value tests. Results of the various laboratory tests are presented in the Appendix, Figure No's. A-9 through A-13.

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SEISMICITY AND EARTHQUAKE SOURCES

The seismicity of the southwest Washington and northwest Oregon area, and hence the potential for ground shaking, is controlled by three separate fault mechanisms. These include the Cascadia Subduction Zone (CSZ), the mid-depth intraplate zone, and the relatively shallow crustal zone. Descriptions of these potential earthquake sources are presented below.

The CSZ is located offshore and extends from northern California to British Columbia. Within this zone, the oceanic Juan de Fuca Plate is being subducted beneath the continental North American Plate to the east. The interface between these two plates is located at a depth of approximately 15 to 20 kilometers (km). The seismicity of the CSZ is subject to several uncertainties, including the maximum earthquake magnitude and the recurrence intervals associated with various magnitude earthquakes. Anecdotal evidence of previous CSZ earthquakes has been observed within coastal marshes along the Washington and Oregon coastlines. Sequences of interlayered peat and sands have been interpreted to be the result of large Subduction zone earthquakes occurring at intervals on the order of 300 to 500 years, with the most recent event taking place approximately 300 years ago. A study by Geomatrix (1995) and/or USGS (2008) suggests that the maximum earthquake associated with the CSZ is moment magnitude (M_w) 8 to 9. This is based on an empirical expression relating moment magnitude to the area of fault rupture derived from earthquakes that have occurred within Subduction zones in other parts of the world. An M_w 9 earthquake would involve a rupture of the entire CSZ. As discussed by Geomatrix (1995) this has not occurred in other subduction zones that have exhibited much higher levels of historical seismicity than the CSZ. However, the 2008 USGS report has assigned a probability of 0.67 for a M_w 9 earthquake and a probability of 0.33 for a M_w 8.3 earthquake. For the purpose of this study an earthquake of M_w 9.0 was assumed to occur within the CSZ.

The intraplate zone encompasses the portion of the subducting Juan de Fuca Plate located at a depth of approximately 30 to 50 km below western Washington and western Oregon. Very low levels of seismicity have been observed within the intraplate zone in western Oregon and western Washington. However, much higher levels of seismicity within this zone have been recorded in Washington and California. Several reasons for this seismic quiescence were suggested in the Geomatrix (1995) study and include changes in the direction of Subduction between Oregon, Washington, and British Columbia as well as the effects of volcanic activity along the Cascade Range. Historical activity associated with the intraplate zone includes the 1949 Olympia magnitude 7.1 and the 1965 Puget Sound magnitude 6.5 earthquakes. Based on the data presented within the Geomatrix (1995) report, an earthquake of magnitude 7.25 has been chosen to represent the seismic potential of the intraplate zone.

The third source of seismicity that can result in ground shaking within the Vancouver and southwest Washington area is near-surface crustal earthquakes occurring within the North American Plate. The historical seismicity of crustal earthquakes in this area is higher than the seismicity associated with the CSZ and the intraplate zone. The 1993 Scotts Mills (magnitude 5.6) and Klamath Falls (magnitude 6.0), Oregon earthquakes were crustal earthquakes.

Liquefaction

Seismic induced soil liquefaction is a phenomenon in which loose, granular soils and some silty soils, located below the water table, develop high pore water pressures and lose strength due to ground vibrations induced by earthquakes. Soil liquefaction can result in lateral flow of material into river channels, ground settlements and increased lateral and uplift pressures on underground structures. Buildings supported on soils that have liquefied often settle and tilt and may displace laterally. Soils located above the ground water table cannot liquefy, but granular soils located above the water table may settle during the earthquake shaking.

Our review of the subsurface soil test pit logs from our exploratory field explorations (TH-#1 through TH-#10) and laboratory test results indicate that the site is generally underlain by medium stiff to very stiff, sandy, clayey silt to silty clay and/or dense highly weathered bedrock deposits to depths of at least 7.0 feet beneath existing site grades. Additionally, groundwater was generally not encountered within any of the exploratory test pit excavations (TH-#1 through TH-#10) at the site during our field exploration work.

As such, due to the medium stiff to very stiff and/or cohesive nature of the sandy, clayey silt to silty clay subgrade soils and/or dense, highly weathered bedrock deposits beneath the site, it is our opinion that the native clayey, sandy silt to silty clay subgrade soil and/or highly weathered bedrock deposits located beneath the subject site have a very low potential for liquefaction during the design earthquake motions previously described.

Landslides

No ancient and/or active landslides were observed or are known to be present on the subject site. Additionally, the subject property does not contain any steep slopes (i.e., greater than 40 percent). As such, development of the subject site into the planned residential development does not appear to present a potential geologic and/or landslide hazard provided that the site grading and development activities conform with the recommendations presented within this report.

Surface Rupture

Although the site is generally located within a region of the country known for seismic activity, no known faults exist on and/or immediately adjacent to the subject site. As such, the risk of surface rupture due to faulting is considered negligible.

Tsunami and Seiche

A tsunami, or seismic sea wave, is produced when a major fault under the ocean floor moves vertically and shifts the water column above it. A seiche is a periodic oscillation of a body of water resulting in changing water levels, sometimes caused by an earthquake. Tsunami and seiche are not considered a potential hazard at this site because the site is not near to the coast and/or there are no adjacent significant bodies of water.

Flooding and Erosion

Stream flooding is a potential hazard that should be considered in lowland areas of Clackamas County and Sandy. The FEMA (Federal Emergency Management Agency) flood maps should be reviewed as part of the design for the proposed new residential structures and site improvements. Elevations of structures on the site should be designed based upon consultants reports, FEMA (Federal Emergency Management Agency), and Clackamas County requirements for the 100-year flood levels of any nearby creeks, streams and/or drainage basins.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the results of our field explorations, laboratory testing, and engineering analyses, it is our opinion that the site is presently stable and suitable for the proposed new The Bornstedt Views residential development and its associated site improvements provided that the recommendations contained within this report are properly incorporated into the design and construction of the The Bornstedt Views residential development project.

The primary features of concern at the site are 1) the presence of highly moisture sensitive clayey and silty subgrade soils across the site, 2) the presence of gently to moderately steep sloping site conditions across the site and 3) the relatively low infiltration rates anticipated within the near surface clayey and silty clay subgrade soils.

With regard to the moisture sensitive clayey and silty subgrade soils, we are generally of the opinion that all site grading and earthwork activities be scheduled for the drier summer months which is typically June through September. In regards to the gently to moderately steep sloping site conditions across the site, we are of the opinion that site grading and/or structural fill placement should be minimized where possible and should generally limit cuts and/or fills to about ten (10) feet unless approved by the Geotechnical Engineer. Additionally, where existing site slopes and/or surface grades exceed about 20 percent (1V:5H) and in order to construct the proposed new site improvements, benching and keying of all fills into the natural site slopes will be required. Further, due to the presence of the existing seasonal drainage basins at the site, the use of subdrains will be required beneath all structural fills above existing slopes which exceed about 20 percent. In addition to the above, we recommend that each lot which borders the easterly moderately steep slope (Lots 1 through 12) engage a Geotechnical Engineer to provide site specific design and construction recommendations for the proposed single-family residential structures. With regard to the relatively low infiltration rates anticipated within the clayey and silty subgrade soils beneath the site, we generally do not recommend any storm water detention and/or infiltration within structural and/or embankment fills. However, storm water detention and some infiltration may be feasible within storm water detention basins excavated into the existing medium stiff, sandy, clayey silt to silty clayey residual soils. In this regard, we recommend that all proposed storm water detention and/or infiltration systems for the project be reviewed and approved by Redmond Geotechnical Services, LLC.

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The following sections of this report provide specific recommendations regarding subgrade preparation and grading as well as foundation and floor slab design and construction for the new The Bornstedt Views residential development project.

Site Preparation

As an initial step in site preparation, we recommend that the proposed new The Bornstedt Views residential development site as well as any associated structural and/or site improvement area(s) be stripped and cleared of all existing improvements, any existing unsuitable fill materials, surface debris, existing vegetation, topsoil materials, and/or any other deleterious materials present at the time of construction. In general, we envision that the site stripping to remove existing vegetation and topsoil materials will generally be about 12 inches. However, localized areas requiring deeper removals, such as any existing undocumented and/or unsuitable fill materials as well as old foundation remnants, will likely be encountered and should be evaluated at the time of construction by the Geotechnical Engineer. The stripped and cleared materials should be properly disposed of as they are generally considered unsuitable for use/reuse as fill materials.

Following the completion of the site stripping and clearing work and prior to the placement of any required structural fill materials and/or structural improvements, the exposed subgrade soils within the planned structural improvement area(s) should be inspected and approved by the Geotechnical Engineer and possibly proof-rolled with a half and/or fully loaded dump truck. Areas found to be soft or otherwise unsuitable should be over-excavated and removed or scarified and recompacted as structural fill. During wet and/or inclement weather conditions, proof rolling and/or scarification and recompaction as noted above may not be appropriate.

The on-site native sandy, clayey silt subgrade soil materials are generally considered suitable for use/reuse as structural fill materials provided that they are free of organic materials, debris, and rock fragments in excess of about 6 inches in dimension. However, if site grading is performed during wet or inclement weather conditions, the use of some of the on-site native soil materials which contain significant silt and clay sized particles will be difficult at best. In this regard, during wet or inclement weather conditions, we recommend that an import structural fill material be utilized which should consist of a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines. Representative samples of the materials which are to be used as structural fill materials should be submitted to the Geotechnical Engineer and/or laboratory for approval and determination of the maximum dry density and optimum moisture content for compaction.

In general, all site earthwork and grading activities should be scheduled for the drier summer months (June through September) if possible. However, if wet weather site preparation and grading is required, it is generally recommended that the stripping of topsoil materials be accomplished with a tracked excavator utilizing a large smooth-toothed bucket working from areas yet to be excavated. Additionally, the loading of strippings into trucks and/or protection of moisture sensitive subgrade soils will also be required during wet weather grading and construction.

In this regard, we recommend that areas in which construction equipment will be traveling be protected by covering the exposed subgrade soils with a geotextile fabric such as Mirafi FW404 followed by at least 12 inches or more of crushed aggregate base rock. Further, the geotextile fabric should have a minimum Mullen burst strength of at least 250 pounds per square inch for puncture resistance and an apparent opening size (AOS) between the U.S. Standard No. 70 and No. 100 sieves.

All structural fill materials placed within the new building and/or pavement areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Structural fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches. Additionally, all fill materials placed within five (5) lineal feet of the perimeter (limits) of the proposed single-family structures and/or pavements should be considered structural fill. Additionally, due to the sloping site conditions, we recommend that all structural fill materials planned in areas where existing surface and/or slope gradients exceed about 20 percent (1V:5H) be properly benched and/or keyed into the native (natural) slope subgrade soils. In general, a bench width of about eight (8) to ten (10) feet and a keyway depth of about one (1) to one and one-half (1.5) feet is recommended (see Typical Key and Bench Fill Slope Detail, Figure No. 3).

However, the actual bench width and keyway depth should be determined at the time of construction by the Geotechnical Engineer. Further, all fill slopes should be constructed with a finish slope surface gradient no steeper than about 2H:1V. All aspects of the site grading, including a review of the proposed site grading plan(s), should be approved and/or monitored by a representative of Redmond Geotechnical Services, LLC.

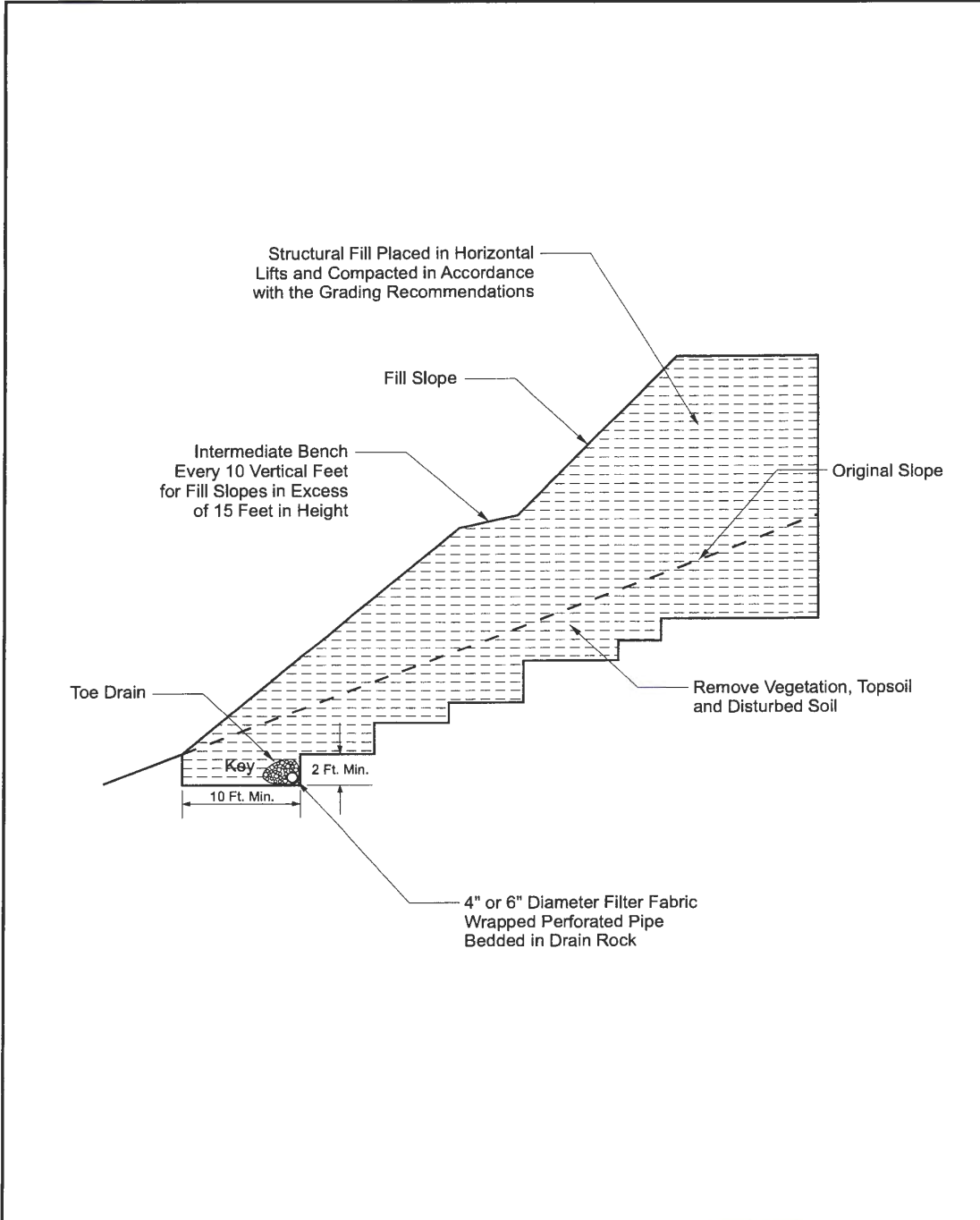
Foundation Support

Based on the results of our investigation, it is our opinion that the site of the proposed new The Bornstedt Views residential development is suitable for support of the planned two-story wood-frame structures provided that the following foundation design recommendations are followed. The following sections of this report present specific foundation design and construction recommendations for the planned new single-family residential structures.

Shallow Foundations

In general, conventional shallow continuous (strip) footings and individual (spread) column footings may be supported by approved native (untreated) subgrade soil materials and/or clayey silt structural fill soils based on an allowable contact bearing pressure of about 2,000 pounds per square foot (psf). This recommended allowable contact bearing pressure is intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads. In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection).

REDMOND GEOTECHNICAL SERVICES



TYPICAL BENCH AND KEY FILL SLOPE DETAIL

**THE BORNSTEDT VIEWS
TL 100, SE BORNSTEDT ROAD**

Project No. 1666.003.G

Figure No. 3

Individual column footings (where required) should be embedded at least 18 inches below grade and have a minimum width of at least 24 inches. Additionally, if foundation excavation and construction work is planned to be performed during wet and/or inclement weather conditions, we recommend that a 2- to 4-inch layer of compacted crushed rock be used to help protect the exposed foundation bearing surfaces until the placement of concrete.

Total and differential settlements of foundations constructed as recommended above and supported by approved native subgrade soils or by properly compacted structural fill materials are expected to be well within the tolerable limits for this type of wood-frame structure and should generally be less than about 1-inch and 1/2-inch, respectively.

Allowable lateral frictional resistance between the base of the footing element and the supporting subgrade bearing soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.30 and 0.45 for native silty subgrade soils and/or import gravel fill materials, respectively. In addition, lateral loads may be resisted by passive earth pressures on footings poured "neat" against in-situ (native) subgrade soils or properly backfilled with structural fill materials based on an equivalent fluid density of 250 pounds per cubic foot (pcf). This recommended value includes a factor of safety of approximately 1.5 which is appropriate due to the amount of movement required to develop full passive resistance.

Floor Slab Support

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slab area be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should help provide a capillary break to prevent migration of moisture through the slab. However, additional moisture protection can be provided by using a 10-mil polyolefin geo-membrane sheet such as StegoWrap.

The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where floor slab subgrade materials are undisturbed, firm and stable and where the underslab aggregate base rock section has been prepared and compacted as recommended above, we recommend that a modulus of subgrade reaction of 150 pci be used for design.

Retaining/Below Grade Walls

Retaining and/or below grade walls should be designed to resist lateral earth pressures imposed by native soils or granular backfill materials as well as any adjacent surcharge loads. For walls which are unrestrained at the top and free to rotate about their base, we recommend that active earth pressures be computed on the basis of the following equivalent fluid densities:

Non-Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	35	30
3H:1V	60	50
2H:1V	90	80

For walls which are fully restrained at the top and prevented from rotation about their base, we recommend that at-rest earth pressures be computed on the basis of the following equivalent fluid densities:

Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	55	50
3H:1V	75	70
2H:1V	95	90

The above recommended values assume that the walls will be adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or if adjacent surcharge loading is present, the above recommended values will be significantly higher. For seismic loading, we recommend an additional uniform pressure of 6H where H is the height of the wall in feet.

Backfill materials behind walls should be compacted to 90 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Special care should be taken to avoid over-compaction near the walls which could result in higher lateral earth pressures than those indicated herein. In areas within three (3) to five (5) feet behind walls, we recommend the use of hand-operated compaction equipment.

Pavements

Flexible pavement design for the proposed new public street improvements as well as the proposed new private drives and parking area improvements for The Views planned development was determined in accordance with the City of Sandy and/or Clackamas County Department of Public Works standards.

The subgrade soil samples collected at the site were tested in the laboratory in accordance with the ASTM Vol. 4.08 Part D-2844-69 (AASHTO T-190-93) test method for the determination of the subgrade soil "R"-value and expansion pressure. The results of the "R"-value testing was then converted to an equivalent Resilient Modulus (M_{RSg}) in accordance with current AASHTO methodology. The results of the laboratory "R"-value tests revealed that the subgrade soils have an apparent "R"-value of between 29 and 31 with an average "R"-value of 30 (see Figure No. A-14).

Using the current AASHTO methodology for converting "R"-value to Resilient Modulus (M_{RS}), the subgrade soils have a Resilient Modulus (M_{RS}) of about 6,070 psi which is classified a "Fair" (M_{RS} = 5,000 psi to 10,000 psi). Based on the above, we recommend that the asphaltic concrete pavement section(s) for the new The Views planned development areas at the site consist of the following:

Collector Streets

The following documents and/or design input parameters were used to help determine the flexible pavement section design for improvements to new and/or existing Collector Streets:

- . **Street Classification:** Collector Street
- . **Design Life:** 20 years
- . **Serviceability:** 4.2 initial, 2.5 terminal
- . **Traffic Loading Data:** 1,000,000 18-kip EAL's
- . **Reliability Level:** 90%
- . **Drainage Coefficient:** 1.0 (asphalt), 0.8 (aggregate)
- . **Asphalt Structural Coefficient:** 0.41
- . **Aggregate Structural Coefficient:** 0.10

Based on the above design input parameters and using the design procedures contained within the AASHTO 1993 Design of Pavement Structures Manual, a Structural Number (SN) of 4.1 was determined. In this regard, we recommend the following flexible pavement section for the new improvements to new and/or existing Collector Streets:

<u>Material Type</u>	<u>Pavement Section (inches)</u>
Asphaltic Concrete	5.0
Aggregate Base Rock	14.0

Local Residential Streets

The following documents and/or design input parameters were used to help determine the flexible pavement section design for new local residential streets:

- . **Street Classification:** Local Residential Street
- . **Design Life:** 25 years
- . **Serviceability:** 4.2 initial, 2.5 terminal
- . **Traffic Loading Data:** 100,000 18-kip EAL's
- . **Reliability Level:** 90%
- . **Drainage Coefficient:** 1.0 (asphalt), 0.8 (aggregate)
- . **Asphalt Structural Coefficient:** 0.41
- . **Aggregate Structural Coefficient:** 0.10

Based on the above design input parameters and using the design procedures contained within the AASHTO 1993 Design of Pavement Structures Manual, a Structural Number (SN) of 2.6 was determined. In this regard, we recommend the following flexible pavement section for the construction of new Local Residential Streets:

<u>Material Type</u>	<u>Pavement Section (inches)</u>
Asphaltic Concrete	4.0
Aggregate Base Rock	10.0

Private Access Drives and Parking Areas

We recommend that the asphaltic concrete pavement section(s) for any private access drives and parking areas associated with The Views planned development areas consist of the following:

	<u>Asphaltic Concrete Thickness (inches)</u>	<u>Crushed Base Rock Thickness (inches)</u>
Automobile Parking Areas	3.0	8.0
Automobile Drive Areas	3.5	10.0

Note: Where heavy vehicle traffic is anticipated such as those required for fire and/or garbage trucks, we recommend that the automobile drive area pavement section be increased by adding 0.5 inches of asphaltic concrete and 2.0 inches of aggregate base rock. Additionally, the above recommended flexible pavement section(s) assumes a design life of 20 years.

Pavement Subgrade, Base Course & Asphalt Materials

The above recommended pavement section(s) were based on the design assumptions listed herein and on the assumption that construction of the pavement section(s) will be completed during an extended period of reasonably dry weather. All thicknesses given are intended to be the minimum acceptable. Increased base rock sections and the use of a woven geotextile fabric may be required during wet and/or inclement weather conditions and/or in order to adequately support construction traffic and protect the subgrade during construction. Additionally, the above recommended pavement section(s) assume that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Further, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course.

Pavement base course materials should consist of well-graded 1-1/2 inch and/or 3/4-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the Oregon Department of Transportation, Standard Specifications for Highway Construction. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete paving materials should be compacted to at least 92 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

Wet Weather Grading and Soft Spot Mitigation

Construction of the proposed new paved site improvements is generally recommended during dry weather. However, during wet weather grading and construction, excavation to subgrade can proceed during periods of light to moderate rainfall provided that the subgrade remains covered with aggregate. A total aggregate thickness of 8- to 12-inches may be necessary to protect the subgrade soils from heavy construction traffic. Construction traffic should not be allowed directly on the exposed subgrade but only atop a sufficient compacted base rock thickness to help mitigate subgrade pumping. If the subgrade becomes wet and pumps, no construction traffic shall be allowed on the road alignment. Positive site drainage shall be maintained if site paving will not occur before the on-set of the wet season.

Depending on the timing for the project, any soft subgrade found during proof-rolling or by visual observations can either be removed and replaced with properly dried and compacted fill soils or removed and replaced with compacted crushed aggregate. However, and where approved by the Geotechnical Engineer, the soft area may be covered with a bi-axial geogrid and covered with compacted crushed aggregate.

Soil Shrink-Swell and Frost Heave

The results of the laboratory "R"-value tests indicate that the native subgrade soils possess a low to moderate expansion potential. As such, the exposed subgrade soils should not be allowed to completely dry and should be moistened to near optimum moisture content (plus or minus 3 percent) at the time of the placement of the crushed aggregate base rock materials. Additionally, exposure of the subgrade soils to freezing weather may result in frost heave and softening of the subgrade. As such, all subgrade soils exposed to freezing weather should be evaluated and approved by the Geotechnical Engineer prior to the placement of the crushed aggregate base rock materials.

Excavation/Slopes

Temporary excavations of up to about four (4) feet in depth may be constructed with near vertical inclinations. Temporary excavations greater than about four (4) feet but less than eight (8) feet should be excavated with inclinations of at least 1 to 1 (horizontal to vertical) or properly braced/shored. Where excavations are planned to exceed about eight (8) feet, this office should be consulted.

All shoring systems and/or temporary excavation bracing for the project should be the responsibility of the excavation contractor. Permanent slopes should be constructed no steeper than about 2H to 1V unless approved by the Geotechnical Engineer.

Depending on the time of year in which trench excavations occur, trench dewatering may be required in order to maintain dry working conditions if the invert elevations of the proposed utilities are located at and/or below the groundwater level. If groundwater is encountered during utility excavation work, we recommend placing trench stabilization materials along the base of the excavation.

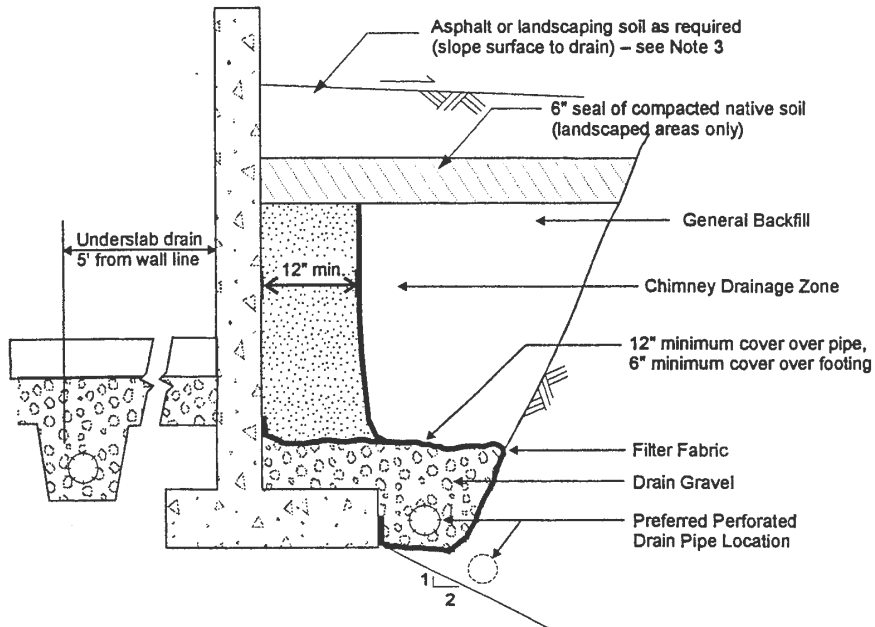
Trench stabilization materials should consist of 1-foot of well-graded gravel, crushed gravel, or crushed rock with a maximum particle size of 4 inches and less than 5 percent fines passing the No. 200 sieve. The material should be free of organic matter and other deleterious material and placed in a single lift and compacted until well keyed.

Surface Drainage/Groundwater

We recommend that positive measures be taken to properly finish grade the site so that drainage waters from the residential structures and landscaping areas as well as adjacent properties or buildings are directed away from the new single-family residential structures foundations and/or floor slabs. All roof drainage should be directed into conduits that carry runoff water away from the residential structures to a suitable outfall. Roof downspouts should not be connected to foundation drains. A minimum ground slope of about 2 percent is generally recommended in unpaved areas around the proposed new residential structures.

Groundwater was not encountered at the site within any of the exploratory test pits excavated at the site at the time of excavation to depths of up to 7.0 feet beneath existing site grades. However, the central portion of the site contains an existing seasonal drainage basin. Further, groundwater elevations in the area and/or across the subject property may fluctuate seasonally and may temporarily pond/perch near the ground surface during periods of prolonged rainfall.

As such, based on our current understand of the possible site grading required to bring the subject site to finish design grade(s), we are of the opinion that an underslab drainage system is generally not required for the proposed single-family residential structures. However, a perimeter foundation drain is recommended for any perimeter footings and/or below grade retaining walls. A typical recommended perimeter footing/retaining wall drain detail is shown on Figure No. 4. Additionally, a subdrain is recommended beneath and/or within all structural fills which are constructed within and/or above the existing seasonal drainage basins.



SCHEMATIC - NOT TO SCALE

NOTES:

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾"-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

TYPICAL PERIMETER FOOTING/RETAINING WALL DRAIN DETAIL

Project No. 1666.003.G	THE BORNSTEDT VIEWS TL 100, SE BORNSTEDT ROAD	Figure No. 4
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Further, due to our understanding that various storm water detention and/or infiltration basins will be utilized for the project as well as the relatively low infiltration rates of the near surface sandy, clayey silt subgrade soils and/or highly weathered bedrock deposits anticipated within and/or near to the foundation bearing level of the proposed residential structures, we are generally of the opinion that storm water detention basins and/or infiltration systems should not be utilized around and/or up-gradient of the proposed residential structures unless approved by the Geotechnical Engineer.

Design Infiltration Rates

Based on the results of our field infiltration testing, we recommend using the following infiltration rate to design any on-site near surface storm water infiltration and/or disposal systems for the project:

Subgrade Soil Type	Recommended Infiltration Rate
sandy, clayey SILT (ML)	less than 0.1 inches per hour (in/hr)

Note: A safety factor of two (2) was used to calculate the above recommended design infiltration rate. Additionally, given the gradational variability of the on-site sandy, clayey sit subgrade soils beneath the site as well as the anticipation of some site grading for the project, it is generally recommended that field testing be performed during and/or following construction of any on-site storm water infiltration system(s) in order to confirm that the above recommended design infiltration rates are appropriate.

Seismic Design Considerations

Structures at the site should be designed to resist earthquake loading in accordance with the methodology described in the 2019 and/or latest edition of the State of Oregon Structural Specialty Code (OSSC), ASCE 7-16 and/or Amendments to the 2018 International Building Code (IBC). The maximum considered earthquake ground motion for short period and 1.0 period spectral response may be determined from the Oregon Structural Specialty Code and/or from the 2015 National Earthquake Hazard Reduction Program (NEHRP) "Recommended Provisions for Seismic Regulations for New Buildings and Other Structures" published by the Building Seismic Safety Council. We recommend Site Class "D" be used for design. Using this information, the structural engineer can select the appropriate site coefficient values (F_a and F_v) from the 2018 IBC and/or ASCE 7-16 to determine the maximum considered earthquake spectral response acceleration for the project. However, we have assumed the following response spectrum for the project:

Table 1. Recommended Seismic Design Parameters

Site Class	Ss	S1	Fa	Fv	Sms	SM1	Sds	Sd1
D	0.702	0.314	1.239	1.986	0.867	0.6123	0.579	0.416

Notes: 1. Ss and S1 were established based on the ASCE 7-16 mapped maximum considered earthquake spectral acceleration maps for 2% probability of exceedence in 50 years.

2. Fa and Fv were established based on the ASCE 7-16 using the selected Ss and S1 values.

CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond Geotechnical Services, LLC** be retained to provide construction monitoring and testing services during all earthwork operations for the proposed new The Bornstedt Views residential development. The purpose of our monitoring services would be to confirm that the site conditions reported herein are as anticipated, provide field recommendations as required based on the actual conditions encountered, document the activities of the grading contractor and assess his/her compliance with the project specifications and recommendations. It is important that our representative meet with the contractor prior to any site grading to help establish a plan that will minimize costly over-excavation and site preparation work. Of primary importance will be observations made during site preparation and stripping, structural fill placement, footing excavations and construction as well as retaining wall backfill.

CLOSURE AND LIMITATIONS

This report is intended for the exclusive use of the addressee and/or their representative(s) to use to design and construct the proposed new single-family residential structures and their associated site improvements described herein as well as to prepare any related construction documents. The conclusions and recommendations contained in this report are based on site conditions as they presently exist and assume that the explorations are representative of the subsurface conditions between the explorations and/or at other locations across the study area. The data, analyses, and recommendations herein may not be appropriate for other structures and/or purposes. We recommend that parties contemplating other structures and/or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report. Additionally, the above recommendations are contingent on Redmond Geotechnical Services, LLC being retained to provide all site inspections and construction monitoring services for this project. Redmond Geotechnical Services, LLC will not assume any responsibility and/or liability for any engineering judgment, inspection and/or testing services performed by others.

REDMOND GEOTECHNICAL SERVICES

It is the owners/developers responsibility for insuring that the project designers and/or contractors involved with this project implement our recommendations into the final design plans, specifications and/or construction activities for the project. Further, in order to avoid delays during construction, we recommend that the final design plans and specifications for the project be reviewed by our office to evaluate as to whether our recommendations have been properly interpreted and incorporated into the project.

If during any future site grading and construction, subsurface conditions different from those encountered in the explorations are observed or appear to be present beneath excavations, we should be advised immediately so that we may review these conditions and evaluate whether modifications of the design criteria are required. We also should be advised if significant modifications of the proposed site development are anticipated so that we may review our conclusions and recommendations.

LEVEL OF CARE

The services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty or other conditions, either expressed or implied, is made.

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Appendix "A"

Test Pit Logs and Laboratory Test Data

APPENDIX

FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATION

Subsurface conditions at the site were explored by excavating ten (10) exploratory test pits (TH-#1 through TH-#10) on October 1, 2020. The approximate location of the test pit explorations are shown in relation to the existing site features and/or site improvements on the Site Exploration Plan, Figure No. 2.

The test pits were excavated using Geoprobe excavating equipment in general conformance with ASTM Methods in Vol. 4.08, D-1586-94 and D-1587-83. The test pits were excavated to depths ranging from about 5.0 to 7.0 feet beneath existing site grades. Detailed logs of the test pits are presented on the Log of Test Pits, Figure No's. A-4 through A-8. The soils were classified in accordance with the Unified Soil Classification System (USCS), which is outlined on Figure No. A-3.

The exploration program was coordinated by a field engineer who monitored the excavating and exploration activity, obtained representative samples of the subsurface soils encountered, classified the soils by visual and textural examination, and maintained continuous logs of the subsurface conditions. Disturbed and/or undisturbed samples of the subsurface soils were obtained at appropriate depths and/or intervals and placed in plastic bags and/or with a thin walled ring sample.

Groundwater was not encountered within any of the exploratory test pits (TH-#1 through TH-#10) at the time of excavating to depths of up to 7.0 feet beneath existing surface grades.

LABORATORY TESTING

Pertinent physical and engineering characteristics of the soils encountered during our subsurface investigation were evaluated by a laboratory testing program to be used as a basis for selection of soil design parameters and for correlation purposes. Selected tests were conducted on representative soil samples. The program consisted of tests to evaluate the existing (in-situ) moisture-density, maximum dry density and optimum moisture content, Atterberg Limits and gradational characteristics as well as direct shear strength and "R"-value tests.

Dry Density and Moisture Content Determinations

Density and moisture content determinations were performed on both disturbed and relatively undisturbed samples from the test pit explorations in general conformance with ASTM Vol. 4.08 Part D-216. The results of these tests were used to calculate existing overburden pressures and to correlate strength and compressibility characteristics of the soils. Test results are shown on the test pit logs at the appropriate sample depths.

A-2

Maximum Dry Density

Two (2) Maximum Dry Density and Optimum Moisture Content tests were performed on representative samples of the on-site sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-1557. This test was conducted to help establish various engineering properties for use as structural fill. The test results are presented on Figure No. A-9.

Atterberg Limits

Two (2) Liquid Limit (LL) and Plastic Limit (PL) tests were performed on representative samples of the sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-4318-85. These tests were conducted to facilitate classification of the soils and for correlation purposes. The test results appear on Figure No. A-10.

Gradation Analysis

Two (2) Gradation analyses were performed on representative samples of the sandy, clayey silt subsurface soils in accordance with ASTM Vol. 4.08 Part D-422. The test results were used to classify the soil in accordance with the Unified Soil Classification System (USCS). The test results are shown graphically on Figure No. A-11.

Direct Shear Strength Test

One (1) Direct Shear Strength test was performed on a undisturbed and/or remolded sample of the sandy, clayey silt to silty clay subgrade soils at a continuous rate of shearing deflection (0.02 inches per minute) in accordance with ASTM Vol. 4.08 Part D-3080-79. The test results were used to determine engineering strength properties and are shown graphically on Figure No's. A-12.

"R"-Value Tests

Two (2) "R"-value tests were performed on remolded samples of the sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-2844. The test results were used to help evaluate the subgrade soils supporting and performance capabilities when subjected to traffic loading. The test results are shown on Figure No. A-13.

The following figures are attached and complete the Appendix:

Figure No. A-3	Key To Exploratory Test Pit Logs
Figure No's. A-4 through A-8	Log of Test Pits
Figure No. A-9	Maximum Dry Density
Figure No. A-10	Atterberg Limits Test Results
Figure No. A-11	Gradation Test Results
Figure No. A-12	Direct Shear Strength Test Results
Figure No. A-13	Results of "R"-Value Tests
Figure No's. A-14 and A-14	Field Infiltration Test Results

REDMOND GEOTECHNICAL SERVICES

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty, or clayey fine sands or clayey silts with slight plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

DEFINITION OF TERMS

		U.S. STANDARD SERIES SIEVE				CLEAR SQUARE SIEVE OPENINGS		
		200	40	10	4	3/4"	3"	12"
SILTS AND CLAYS	SAND				GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE			

GRAIN SIZES

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT [†]
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50


CLAYS AND PLASTIC SILTS	STRENGTH [‡]	BLOWS/FOOT [†]
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

RELATIVE DENSITY

[†] Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

[‡] Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

CONSISTENCY

 <p>REDMOND GEOTECHNICAL SERVICES PO Box 20547 • PORTLAND, OREGON 97294</p>	KEY TO EXPLORATORY TEST PIT LOGS Unified Soil Classification System (ASTM D-2487)		
	THE BORNSTEDT VIEWS TL 100, SE Bornsteddy Road		
	PROJECT NO.	DATE	Figure
	1666.003.G	10/26/20	

BACKHOE COMPANY: Inland Company

BUCKET SIZE: 6 inches

DATE: 10/01/20

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
TEST PIT NO. TH-#1 ELEVATION 1,025'±						
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			36.6	ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5	X			30.9	ML/RK	Light reddish- to orangish-brown, very moist, very stiff to dense, sandy, clayey SILT to highly weathered bedrock
Total Depth = 6.0 feet No groundwater encountered at time of exploration						

TEST PIT NO. TH-#2 ELEVATION 1,030'±						
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			38.8	ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5						
Total Depth = 6.0 feet No groundwater encountered at time of exploration						

LOG OF TEST PITS

PROJECT NO. 1666.003.G

THE BORNSTEDT VIEWS

FIGURE NO. A-4

REDMOND GEOTECHNICAL SERVICES

BACKHOE COMPANY: Inland Company BUCKET SIZE: 6 inches DATE: 10/01/20

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			37.1	ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5					ML/RK	Light reddish- to orangish-brown, very moist, very stiff to dense, sandy, clayey SILT to highly weathered bedrock
10						Total Depth = 7.0 feet No groundwater encountered at time of exploration

TEST PIT NO. TH-#4 ELEVATION 995'±						
DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
					ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1666.003.G THE BORNSTEDT VIEWS FIGURE NO. A-5

REDMOND GEOTECHNICAL SERVICES

BACKHOE COMPANY: Inland Company						BUCKET SIZE: 6 inches	DATE: 10/01/20
DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. TH-#5	ELEVATION 1,035'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)	
					ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)	
5						Total Depth = 6.0 feet No groundwater encountered at time of exploration	
10							
15							
						TEST PIT NO. TH-#6	ELEVATION 1,035'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)	
	X			36.9	M: / CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)	
5					ML/RK	Light reddish- to orangish-brown, very moist, very stiff to dense, sandy, clayey SILT to highly weathered bedrock	
						Total Depth = 7.0 feet No groundwater encountered at time of exploration	
10							
15							
LOG OF TEST PITS							
PROJECT NO. 1666.003.G			THE BORNSTEDT VIEWS			FIGURE NO. A-6	

REDMOND GEOTECHNICAL SERVICES

BACKHOE COMPANY: Inland Company						BUCKET SIZE: 6 inches		DATE: 10/01/20	
DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION			
						TEST PIT NO. TH-#7		ELEVATION 1,025'±	
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)			
					ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)			
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration			
10									
15									
						TEST PIT NO. TH-#8		ELEVATION 1,020'±	
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)			
	X			39.5	ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)			
5					ML/RK	Light reddish-to orangish-brown, very moist, very stiff to dense, sandy, clayey SILT to highly weathered bedrock			
	X			38.8		Total Depth = 7.0 feet No groundwater encountered at time of exploration			
10									
15									
LOG OF TEST PITS									
PROJECT NO. 1666.003,G				THE BORNSTEDT VIEWS				FIGURE NO. A-7	

REDMOND GEOTECHNICAL SERVICES

BACKHOE COMPANY: Inland Company BUCKET SIZE: 6 inches DATE: 10/01/20

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#9 ELEVATION 1,015'±
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
	X			38.0	ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5					ML/RK	Light reddish to orangish-brown, very moist, very stiff to dense, sandy, clayey SILT to highly weathered bedrock
						Total Depth = 6.0 feet No groundwater encountered at time of exploration

TEST PIT NO. TH-#10 ELEVATION 1,010'±						
DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
0					ML	Dark brown, wet, soft, organic, sandy, clayey SILT (Topsoil)
					ML/CL	Reddish-brown, very moist to wet, soft to medium stiff, sandy, clayey SILT to silty CLAY (Residual Soil)
5						Total Depth = 5.0 feet No groundwater encountered at time of exploration

LOG OF TEST PITS

PROJECT NO. 1666.003.G THE BORNSTEDT VIEWS FIGURE NO. A-8

REDMOND GEOTECHNICAL SERVICES

MAXIMUM DENSITY TEST RESULTS

SAMPLE LOCATION	SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
TH-#1 @ 2.0'	Reddish-brown, sandy, clayey SILT to silty CLAY (ML/CL)	100.0	34.0
TH-#6 @ 2.0'	Reddish-brown, sandy, clayey SILT to silty CLAY (ML/CL)	99.0	35.0

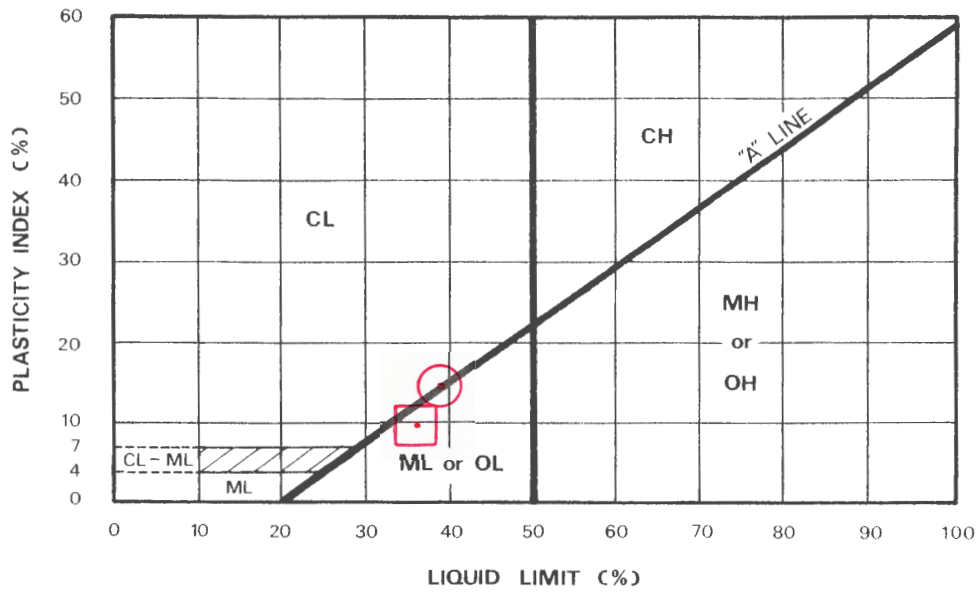
EXPANSION INDEX TEST RESULTS

SAMPLE LOCATION	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (pcf)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (%)	EXPANSION INDEX	EXPANSIVE CLASS.

MAXIMUM DENSITY & EXPANSION INDEX TEST RESULTS

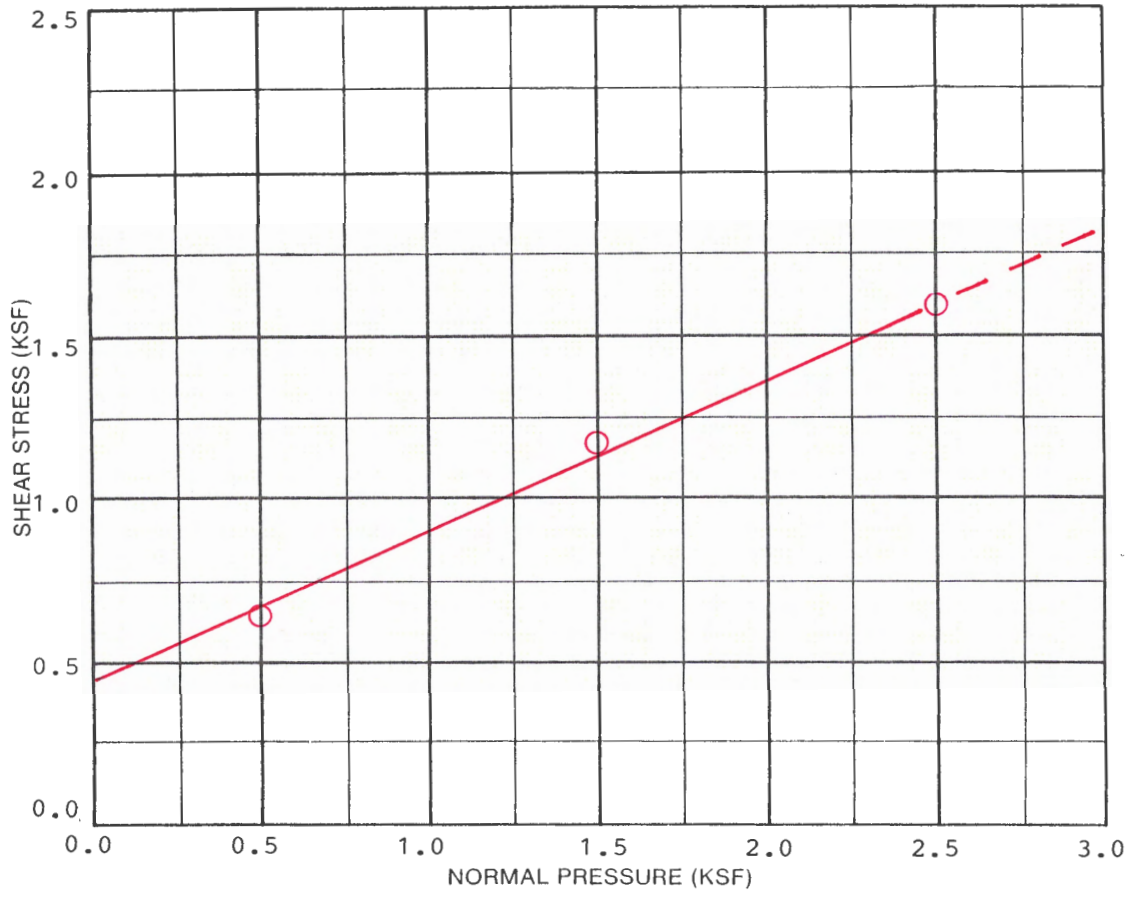
PROJECT NO. 1666.003.G	THE BORNSTEDT VIEWS	FIGURE NO.: A-9
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REDMOND GEOTECHNICAL SERVICES



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
	TH-#1	2.0	36.6	36.1	9.9	85.1		ML/CL
	TH-#6	2.0	36.9	39.4	14.2	90.3		ML/CL

<p>REDMOND GEOTECHNICAL SERVICES PO Box 20547 • PORTLAND, OREGON 97294</p>	THE BORNSTEDT VIEWS PLASTICITY CHART AND DATA		
	THE BORNSTEDT VIEWS TL 100, SE Bornstedt Road		
	PROJECT NO.	DATE	Figure A-10
	1666.003.G	10/26/20	



SAMPLE DATA	
DESCRIPTION: Reddish-brown, sandy, clayey SILT to silty CLAY (ML/CL) (Remolded)	
BORING NO.: TH-#1	
DEPTH (ft): 2.0	ELEVATION (ft):
TEST RESULTS	
APPARENT COHESION (C): 450 psf	
APPARENT ANGLE OF INTERNAL FRICTION (φ): 24°	

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.6	1.1	1.6	
INITIAL H ₂ O CONTENT (%)	34.0	34.0	34.0	
FINAL H ₂ O CONTENT (%)	35.1	29.5	23.3	
INITIAL DRY DENSITY (PCF)	92.0	92.0	92.0	
FINAL DRY DENSITY (PCF)	92.8	95.5	99.7	
STRAIN RATE: 0.02 inches per minute				

**REDMOND
GEOTECHNICAL
SERVICES**
PO Box 20547 • PORTLAND, OREGON 97294

DIRECT SHEAR TEST DATA		
THE BORNSTEDT VIEWS TL 100, SE Bornstedt Road		
PROJECT NO.	DATE	Figure A-12
1666.003.G	10/26/20	

RESULTS OF R (RESISTANCE) VALUE TESTS

SAMPLE LOCATION: TH-#1

SAMPLE DEPTH: 2.0 feet bgs

Specimen	A	B	C
Exudation Pressure (psi)	219	329	431
Expansion Dial (0.0001")	0	1	2
Expansion Pressure (psf)	0	3	8
Moisture Content (%)	37.6	34.4	31.1
Dry Density (pcf)	92.4	96.2	100.6
Resistance Value, "R"	18	29	36
"R"-Value at 300 psi Exudation Pressure = 28			

SAMPLE LOCATION: TH-#6

SAMPLE DEPTH: 2.0 feet bgs

Specimen	A	B	C
Exudation Pressure (psi)	208	326	439
Expansion Dial (0.0001")	0	1	2
Expansion Pressure (psf)	0	3	8
Moisture Content (%)	37.2	34.1	30.7
Dry Density (pcf)	92.9	97.1	101.4
Resistance Value "R"	19	31	40
"R"-Value at 300 psi Exudation Pressure = 30			

Division 004 Appendix C - Infiltration Testing

Location: The Bornstedt Views	Date: October 1, 2020	Test Hole: TH-#4
Depth to Bottom of Hole: 4.0 feet	Hole Diameter: 6 inches	Test Method: Encased Falling Head
Tester's Name: Daniel M. Redmond, P.E., G.E.		
Tester's Company: Redmond Geotechnical Services, LLC		Tester's Contact Number: 503-285-0598
Depth (feet)	Soil Characteristics	
0-1.0	Dark brown Topsoil	
1.0-4.0	Reddish-brown, sandy, clayey SILT to silty CLAY (ML/CL)	

Time	Time Interval (Minutes)	Measurement (inches)	Drop in Water (inches)	Infiltration Rate (inches/hour)	Remarks
11:00	0	48.00	----		Filled w/12" water
11:20	20	48.20	0.20	0.60	
11:40	20	48.34	0.14	0.42	
12:00	20	48.45	0.11	0.33	
12:20	20	48.54	0.09	0.27	
12:40	20	48.62	0.08	0.24	
1:00	20	48.69	0.07	0.21	
1:20	20	48.76	0.07	0.21	
1:40	20	48.83	0.07	0.21	

Infiltration Test Data Table

Figure No. A-14

Division 004 Appendix C - Infiltration Testing

Location: The Bornstedt Views	Date: October 1, 2020	Test Hole: TH-#10
Depth to Bottom of Hole: 5.0 feet	Hole Diameter: 6 inches	Test Method: Encased Falling Head
Tester's Name: Daniel M. Redmond, P.E., G.E.		
Tester's Company: Redmond Geotechnical Services, LLC		Tester's Contact Number: 503-285-0598
Depth (feet)	Soil Characteristics	
0-1.0	Dark brown Topsoil	
1.0-5.0	Reddish-brown, sandy, clayey SILT to silty CLAY (ML/CL)	

Time	Time Interval (Minutes)	Measurement (inches)	Drop in Water (inches)	Infiltration Rate (inches/hour)	Remarks
11:30	0	60.00	----		Filled w/12" water
11:50	20	60.15	0.15	0.45	
12:10	20	60.25	0.10	0.30	
12:30	20	60.32	0.07	0.21	
12:50	20	60.37	0.05	0.15	
1:10	20	60.41	0.04	0.12	
1:30	20	60.44	0.03	0.09	
1:50	20	60.47	0.03	0.09	
2:10	20	60.50	0.03	0.09	

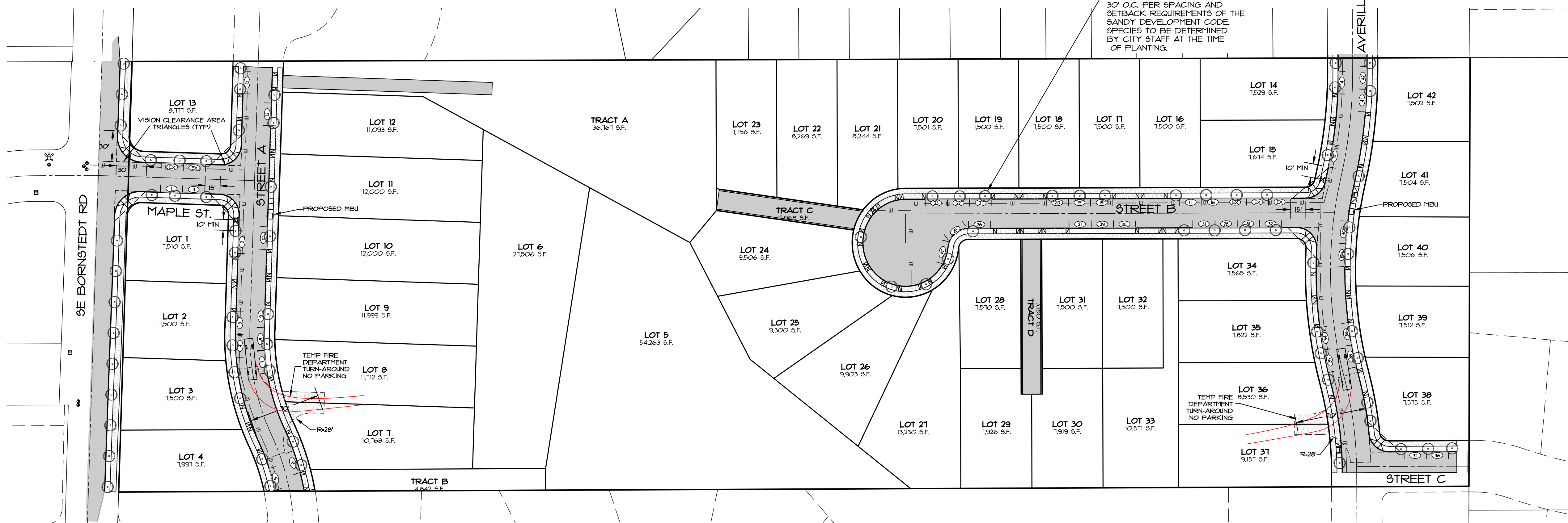
Infiltration Test Data Table

Figure No. A-15

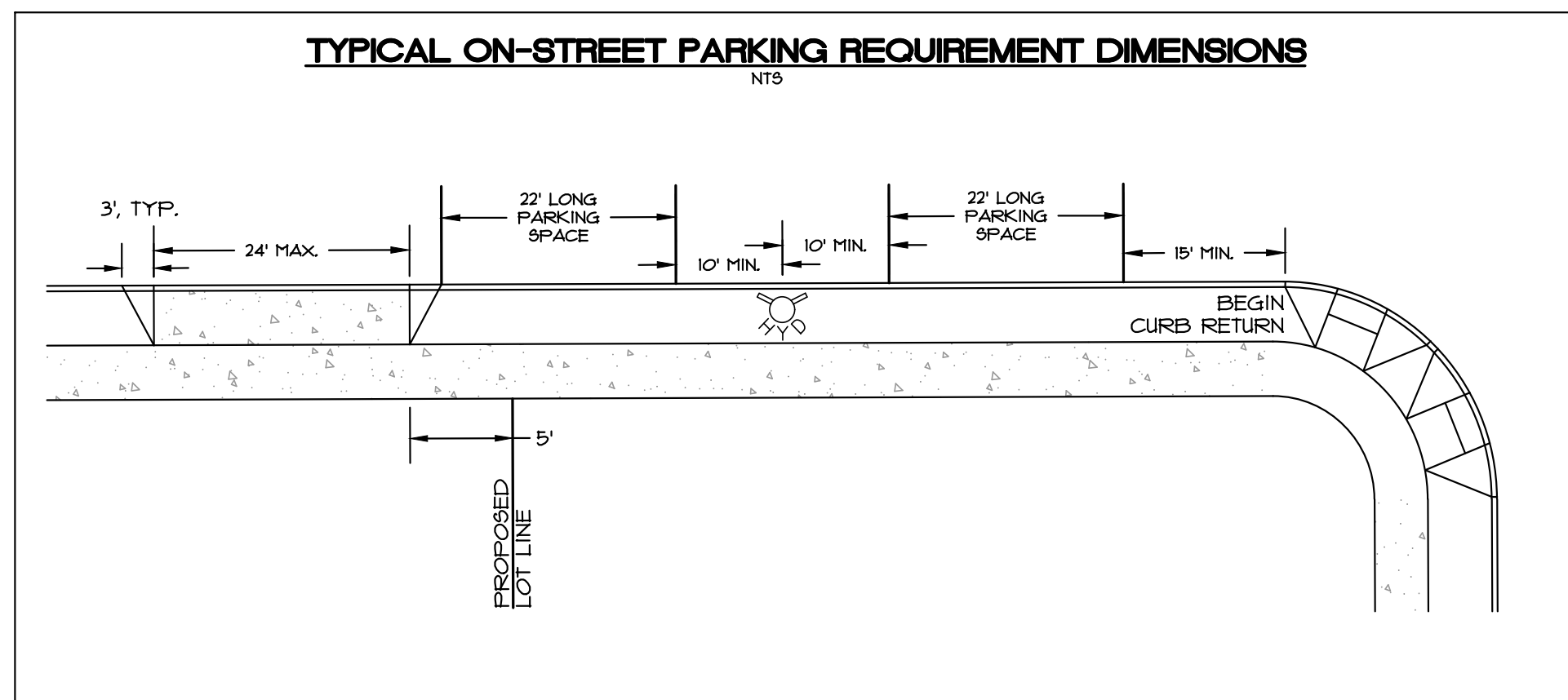
EXHIBIT I



SCALE: 1" = 50'

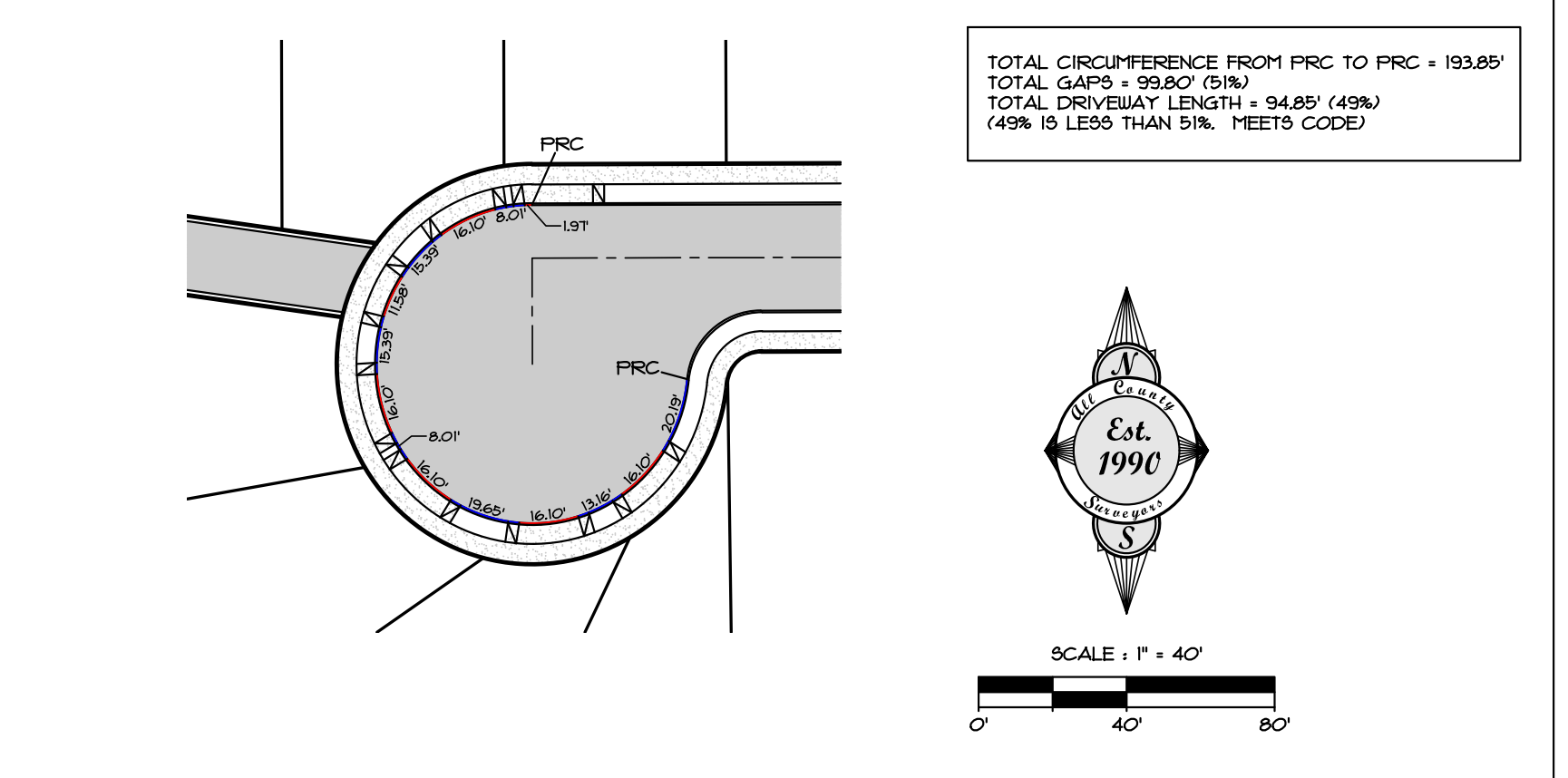


STREET TREES TO BE PLANTED 30' O.C. PER SPACING AND SETBACK REQUIREMENTS OF THE SANDY DEVELOPMENT CODE. SPECIES TO BE DETERMINED BY CITY STAFF AT THE TIME OF PLANTING.



TYPICAL ON-STREET CAR PARKING TOTAL ON-STREET SPACES PROPOSED = 49
MINIMUM REQUIRED = 42

- LEGEND**
- SUBJECT PROPERTY BOUNDARY LINE
 - PROPOSED LOT LINE
 - PROPOSED CURB AND PAVEMENT
 - PROPOSED SIDEWALK
 - PROPOSED UNSTRIPED 22' LONG ON-STREET PARKING SPACE
 - PARKING SPACE NUMBER CORRESPONDING TO LOT NUMBER (EACH SPACE IS WITHIN 300' OF EACH DWELLING)
 - PARKING SPACE THAT EXCEEDS THE REQUIREMENT
 - ⊙ PROPOSED FIRE HYDRANT
 - PROPOSED MBU



NO.	REVISION	DATE	BY
1	ADDED FIRE TURN TEMPLATE	7-26-21	RLM



SCALE	N/A	VERT. SCALE	1" = 50'
DATE	7-26-21	FILE NO.	19-268 - Planning - SFR.dwg
DESIGNED	RLM	CHECKED	DLH
DRAWN	RLM	APPROVED	RLM

PROJECT: **THE BORNSTEDT VIEWS ON-STREET PARKING PLAN**

LOCATION: **19618 SE BORNSTEDT ROAD, SANDY, OR**

Surveyors & Planners, Inc.
 Surveying, Planning and
 Civil Engineering and
 P.L.L.C.
 P.O. Box 895 Sandy, OR 97055
 Phone: (503) 348-5602
 Fax: (503) 668-4730
 DATE OF PLOT: 7-26-21

CLIENT: **EVEN BETTER HOMES, INC.**
 MAC EVEN
 P.O. BOX 2021
 PRESIDENT
 PHONE: (503) 348-5602
 EMAIL: macc@evenbetterhomes.com

EXHIBIT J

From: Hassan Ibrahim
Sent: Monday, January 27, 2020 11:46 AM
To: Ray Moore
Cc: Mike Walker ; Mac Even ; Kelly O'Neill Jr.
Subject: RE: 19-268 - The Bornstedt Views

Ray,

With the north end of street A terminating with a cul de sac and in the future another access to Bornstedt will be 5 lots to the south and another 4 lots further south and given the topographic challenge, Street A being a 100 feet to the east provides a stacking of 4 cars length exiting to Bornstedt Rd. Having said that, I don't have much grief with the proposed alignment to the north.

Hassan Ibrahim, P.E.
CURRAN-McLEOD, INC.
6655 SW Hampton St, Ste. 210
Portland, OR 97223
Tel: 503-684-3478
Fax: 503-624-8247
Cell: 503-807-2737
email: hai@curran-mcleod.com

From: Kelly O'Neill Jr.
Sent: Monday, January 27, 2020 11:30 AM
To: Ray Moore <raym@allcountysurveyors.com>
Cc: Mike Walker <mwalker@ci.sandy.or.us>; Hassan Ibrahim <hai@curran-mcleod.com>; Mac Even <mac@evenbetterhomes.com>
Subject: Re: 19-268 - The Bornstedt Views

BTW on the design we discussed this morning I would encourage a 15 foot pedestrian tract at the north end of the rowhouses. Alternatively providing a 10 foot setback would be great. The further we can keep proposed housing from existing homes achieves outstanding design IMO and reduces negative feedback from the existing neighborhood.

On Mon, Jan 27, 2020, 11:23 AM Ray Moore <raym@allcountysurveyors.com> wrote:
Mike, These are going to be skinny lots (+/- 44' wide) now that I have to turn them to run east/west. The 15' easement will make it difficult to build on the

most north lot. Plus if you look at the existing grade at the north end of Street A (if it were shifted 50 more feet to the east) The existing ground elevation +/- 1,000. So you would need a +/- 15' to 20' wall at the end of the street. The current street alignment will still need a +/- 10' tall wall.

Thanks,

Ray Moore, PE, PLS
All County Surveyors & Planners, Inc.
PO Box 955, Sandy, OR 97055
Phone: 503-668-3151
Fax: 503-668-4730
email: raym@allcountysurveyors.com

From: MW
Sent: Monday, January 27, 2020 11:09 AM
To: Ray Moore
Cc: Hassan Ibrahim ; Kelly O'Neill Jr. ; Mac Even
Subject: Re: 19-268 - The Bornstedt Views

Ray,

It appears you could pick up 8 or so feet on the sewer invert if you drain to the existing MH in Bornstedt at the common line of Zion Meadows and Marshall Ridge instead of the one at the intersection of Maple and Bornstedt. The easement would have to be 15 ft. wide for a single utility. It might be easier to vary that standard than the separation.

On Mon, Jan 27, 2020 at 10:59 AM Ray Moore

<raym@allcountysurveyors.com> wrote:

Hi Hassan. We had a pre pre-app meeting today with Mike and Kelly. Mike was concerned about the location of Street A as shown on the attached sketch Maps. Street A is shown 100' East of Bornstedt and Mike said this should be 150'. We have modified the street a bit so that the 150' can be accommodated as Street A extends south.

We cannot shift the Street A at our entrance, do to the steep slope that breaks off fast to the east. We are just barely able to get the gravity sewer to work at 100'. Please let me know what you think.

Thanks!

Ray Moore, PE, PLS
All County Surveyors & Planners, Inc.
PO Box 955, Sandy, OR 97055
Phone: 503-668-3151
Fax: 503-668-4730
email: raym@allcountysurveyors.com

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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

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Date: August 17, 2021

EXHIBIT K

Emily MeHarg
City of Sandy
39250 Pioneer Blvd.
Sandy, OR. 97055

Re: File No. 20-21 SUB/TREE - Response to 6/3/2021 Bornstedt Views Incompleteness Letter

Dear Emily:

This letter and its attachments contain some but not all of the missing materials identified in the City's June 3, 2021 letter notifying the Applicant of the Application's incompleteness. The Applicant is submitting some but not all of the missing information for the purposes of making the application complete under ORS 227.178(2)(b). The receipt by the City of some but not all of the missing information starts the 120-day period for a final decision by the City on the application under ORS 227.178(1) on the day that the letter and its attachments are received by the City. The Application has been made complete within 180 days of the submittal date of May 6, 2021. The only clear and objective standards that will apply to the Application are those in effect on the submittal date of May 6, 2021. The only construction standards that will apply to the subdivision are those in effect on the submittal date of May 6, 2021, unless the Applicant elects otherwise. ORS 92.040(2). The Applicant reserves the right to submit additional argument and evidence regarding the Application.

- 1. Stormwater Report (referenced as Exhibit B in your submittal, but not actually included in the submittal items).**
Response: A Stormwater Report is attached.
- 2. Arborist Report (referenced as Exhibit C in your submittal, but not actually included in the submittal items).**
Response: An Arborist Report is attached.
- 3. Transportation Impact Analysis. The TPR findings conducted as part of the annexation application do not qualify for the exemption in Section 17.84.50(B.6.b).**
Response: A Transportation Impact Analysis is attached.
- 4. Update the entire plan set to detail 150 feet of spacing between Bornstedt Road and proposed Street A in compliance with Section 17.84.50(E.2).**
Response: The Applicant is not providing the requested information relating to Sandy Development Code ("SDC") 17.84.50(E)(2), which provides as follows:

“E. 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:

“2. Local streets should typically intersect in “T” configurations rather than four-way intersections to minimize conflicts and discourage through traffic. Adjacent “T” intersections shall maintain a minimum of 150 feet between the nearest edges of the two rights-of-way.”

The Application requests approval of a tentative plat for single-family lots under SDC 17.100.60(B) for property with the Sandy Urban Growth Boundary (the “UGB”). The City has a population exceeding 2500 persons and has not taken an exception to ORS 197.303. Therefore, the Application qualifies as a “Needed Housing” application under ORS 197.303(1). Because the application is for Needed Housing, ORS 197.307(4) applies to the Application and it provides that the City may apply only clear and objective standards, conditions and procedures to the Application except as provided for in ORS 197.307(6). ORS 197.307(6) does not apply to this Application because the City did not have a clear and objective path available to the Applicant on the May 6, 2021 submittal date.

*SDC 17.84.50(E)(2) is not a clear and objective standard. The standard uses the words “discourage,” “excessive,” “intended,” “typically” and “minimize.” The standard also introduces a mandatory procedure that is not clear and objective because it requires that “other designs intended to discourage traffic” **shall** be considered. The standard is subjective because it uses the word “discourage.” The words identified above are not clear and objective because the City cannot apply them without applying discretion and judgment.*

Alternatively, the Sandy City Engineer sent an email to the Applicant’s Engineer (attached) stating he approves of the Applicant’s design.

- 5. Update the entire plan set to detail Maple Street continuing east-west through the property in compliance with Section 17.100.100, specifically subsections A, D, and F, with sufficient north-south streets to meet to block length standards of Section 17.100.120. After initial conversations with the Public Works Director and review of the development code, Maple Street shall extend to the east property boundary. The necessity for Maple Street to extend through the subject property will necessitate reconfiguration of proposed lots, utilities, and tracts.**

Response: *The subject property does not lend itself to an interconnected and gridded street pattern due to the topographic constraints. As shown on Sheet C3 of the plan set, the site contains a north-south ravine with slopes in excess of 35 percent. The applicant is not opposed to constructing a pedestrian path between Street A on the west side of the ravine and Street B on the east side but is strongly opposed to constructing a road through this area. SDC 17.100.100(A), (D) and (F) provide as follow:*

“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.

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

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 that have no future street plan. Streets shall terminate at other streets or at parks, schools or other public land within a neighborhood.

Local streets shall align and connect with other roads when crossing collectors and arterials per the criteria in Section 17.84.50.K.5.e. (NOTE: THE SDC DOES NOT CONTAIN SDC 17.84.50.K.e.)

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.”

For the same reasons explained in Item 4, the words and phrases “safe, “convenient”, “logical”, “recognizable”, “spread traffic over many streets”, “key streets”, “generally”, “modifications as appropriate”, “to adapt to topography or natural conditions”, “logical”, “connected” and “where development may

practically occur” are not clear and objective and may not be applied to the application.

Additionally, SDC 17.100.100 contains many subjective words and phrases and the Applicant reserves the right to specifically identify such subjective words and phrases to demonstrate why the City may not apply them to the Application under ORS 197.307(4).

For the reasons explained above, SDC 17.100.120 is subjective and may not be applied to the Application. SDC 17.100.120 provides as follows:

“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.

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 ten 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.”

SDC 17.100.120(A), (B) and (D) use the following subjective words and phrases: “sufficient,” “appropriate,” “unless topographic, natural resource, or other similar physical conditions justify longer blocks,” “minimum,” “to enhance public convenience and mobility,” and “may” are not clear and objective and may not be applied to this application.

- 6. Demonstrate the turning radius with a turning template for fire apparatus at the two turnarounds.**

Response: A turning template is attached.

- 7. Demonstrate how the proposal complies with Section 17.100.220(B).**

Response: Lot 5 (54,263 square feet) and Lot 6 (27,506 square feet) are proposed to contain more than double the 7,500 square foot minimum Lot size. The size of these lots is due to the topography of the site and the difficulty in serving this area of the development with street access. Both of these large lots are

proposed to be accessed by Tract B, a private drive. As required by Section 17.100.150 - Residential Shared Private Drives, a private drive is not allowed to provide access to more than two lots. With this restriction and site limitations, division of Lots 5 and 6 further in the future is not possible.

8. \$1,500 third party review fee for review of stream and wetland determination.

Response: The submitted application included a Stream and Wetland Presence Determination by an Environmental Consultant. This report was prepared by following guidance from the Oregon Department of State Lands for determining the presence of stream and wetland resources. The conclusion of this work is the stream and associated wetland mapped on the site "do not exist". With this conclusion, the applicant finds the City's request to provide an additional \$1,500 third party review fee is not appropriate and the applicant has decided not to pay this fee.

9. Details on all proposed retaining walls (location, height, architectural finish).

Response: No retaining walls are proposed or required with the development.

Sincerely,



Tracy Brown
Tracy Brown Planning Consultants, LLC

Cc via Email:

- Mac Even, Even Better Homes (applicant)
- Michael Robinson, Schwabe, Williamson, and Wyatt
- Ray Moore, All County Surveyors and Planners

Attachments:

- Stormwater Report
- Arborist Report
- Transportation Impact Analysis
- Email correspondence: Hassan Ibrahim, City Engineer to Ray Moore, Project Engineer
- Fire Apparatus Turning Templates

EXHIBIT L

September 24, 2021

Michael C. Robinson
Admitted in Oregon
T: 503-796-3756
C: 503-407-2578
mrobinson@schwabe.com

VIA E-MAIL

Mr. Kelly O'Neill, Jr., Director
City of Sandy Development Services Department
Sandy City Hall
39250 Pioneer Blvd.
Sandy, OR 97055

RE: City of Sandy (the "City") File No. 21-021 SUB/TREE, Bornstedt Views Single Family Subdivision Application (the "Application"); Applicant's Objection to Use of Subjective Procedures

Dear Mr. O'Neill:

This office represents Even Better Homes, the Applicant. The Applicant has asked me to write you concerning two issues in the City's September 1, 2021 letter (the "Letter") deeming the Application complete (**Exhibit 1**). Please place this letter in the official Planning Department file for the Application.

The Application is a Needed Housing application as defined in ORS 197.303(1)(a). The Application land is zoned for residential uses. The City's population exceeds 2,500 persons and the City has not taken an exception to the definition of "needed housing" as evidenced by a lack of an exception in the City's acknowledged Comprehensive Plan.

The Application is also subject to ORS 197.307(4), (6) and (7) regulating housing, including needed housing. These sections collectively require the City to apply only clear *and* objective standards, conditions and procedures to the regulation of housing unless a clear and objective approval process is available (no such process was available in the Sandy Development Code (the "SDC") for a subdivision application submitted on May 6, 2021 based on the "Goal Post Rule" in ORS 227.178(3)) and under ORS 92.040(2) and the City's approval procedures for the Application are subject to the clear *and* objective requirements in ORS 197.307(4). The Application land is not subject to ORS 197.307(5) because it is not in a formally adopted central city plan nor is it in an historic area.

Other statutes applicable to the Application include ORS 197.522(1)-(3), 227.173(2) and 227.175(4)(b)-(e).

Mr. Kelly O'Neill, Jr., Director
September 24, 2021
Page 2

The Letter deemed the Application complete but also stated that the Director elevated the Application to a Type III procedure and that unspecified Type III variance applications, not requested by the Applicant, are the basis for the Director's subjective decision. The Applicant explained in its completeness submittal why all of the relevant clear and objective approval criteria were satisfied.

The Director does not have the authority to subjectively elevate the Application from a Type II to a Type III procedure because doing so is not subject to clear and objective standards and procedures. The Letter's sole reason for doing so is the lack of Type III variances not requested by the Applicant.

SDC 17.12.20.D (**Exhibit 2**) provides that a subdivision application in compliance with the SDC is a Type II application and authorizes the Director to elevate the Application to a Type III procedure under limited situations in SDC 17.12.30. SDC 17.12.30 is referred to as a "discretionary process." Neither standard is clear and objective but even if one were, the elevation provision is dependent upon a subjective standard—"if the Director *contemplates persons other than the applicant* can be *expected* to question the application's *compliance* with the *Code*"—which is contrary to the Director's authority under ORS 197.307(4). Moreover, the Letter shows that the Director elevated the Application because of the lack of requested Type III variances, which is *not* a basis for elevation under SDC 17.12.30, thus demonstrating the Director's use of unknown and subjective standards to elevate the Application. In addition to improperly applying a subjective standard to the Application, the Director exceeded his authority to do so under the relevant SDC standard for elevation under a Type II procedure.

The Director has no authority to apply Type III variances for the Application not requested by the Applicant. ORS 227.178(1)-(3). If the City finds that the Application does not meet applicable clear and objective approval standards, the Applicant has the unfettered right to either propose a modification to the Application or to propose a condition of approval to make the application consistent with the relevant clear and objective standard. ORS 197.522(3) (**Exhibit 3**). Further, the Director failed to identify in the Letter the relevant standards subject to the variances and thus did not meet the City's burden of showing that such standards meet *both* ORS 197.307(4) and 197.195(1).

The Applicant respectfully requests that the Director apply the Type II procedure to the Application and not apply unknown variances not requested by the Applicant in the Application. Failure to do so violates ORS 197.307(4) by applying a subjective process which has the cumulative effect of discouraging needed housing through unreasonable cost and delay.

Mr. Kelly O'Neill, Jr., Director
September 24, 2021
Page 3

Very truly yours,



Michael C. Robinson

MCR:jmhi
Enclosures

cc: Mr. Mac Even (*via email*) (*w/enclosures*)
Mr. Tracy Brown (*via email*) (*w/enclosures*)
Mr. Ray Moore (*via email*) (*w/enclosures*)
Mr. Mike Ard (*via email*) (*w/enclosures*)
Mr. Chris Crean (*via email*) (*w/enclosures*)
Mr. Garrett Stephenson (*via email*) (*w/enclosures*)

PDX\137019\262784\MCR\31714841.1

September 1, 2021

Mac Even
PO Box 2021
Gresham, OR 97030

All County Surveyors & Planners, Inc.
PO Box 955
Sandy, OR 97055

William Bloom
PO Box 1283
Wrangell, AK 99929

Tracy Brown Planning Consultants
17075 Fir Drive
Sandy, OR 97055

RE: NOTICE REGARDING INCOMPLETION OF SUBMISSION
FILE NUMBER: 21-021 SUB/TREE
PROJECT NAME: Bornstedt Views Subdivision

Application accepted as complete on: August 17, 2021

- Application incomplete. The additional information necessary to consider your application is listed below. The application will be deemed complete upon submission of one of the following options:
1. All of the missing information;
 2. Some of the missing information and written notice that no other information will be provided; or
 3. Written notice that none of the missing information will be provided.

If one of the above listed options is not received by the city by the 180th day following submittal of your application, the application will be void per state law (ORS 227.178 (4)).

Requested additional information filed on: _____

Following submission of your land use application (received on 5/06/2021), staff found the application incomplete on June 3, 2021. On August 17, 2021, the applicant submitted some of the missing information and written notice that no other information will be provided. The applicant further requested that the application be deemed complete effective August 17, 2021 for the purpose of beginning the "120-day clock." Thus, staff finds the application complete as of August 17, 2021 for the purpose of beginning the "120-day clock."

The applicant submitted the application as a Type II Subdivision and did not apply for any variances. However, as explained in the incompleteness letter from June 3, 2021 staff finds that several Type III variances are required to process the subdivision request as submitted. Therefore, staff has elevated the subdivision request to the Planning Commission for review. A Planning Commission hearing will be scheduled.

Please call me at (503) 783-2585 or email emeharg@ci.sandy.or.us if you have any questions.

Sincerely,



Emily Meharg,
Senior Planner

Sec. 17.12.20. Type II—Noticed administrative review.

Type II decisions are made by the Planning Director or designee with public notice, and an opportunity for a public hearing if appealed. An appeal of a Type II decision is heard by the Planning Commission according to the provisions of Chapter 17.28. Notification of a Type II decision is sent according to the requirements of Chapter 17.22. If the Director contemplates persons other than the applicant can be expected to question the application's compliance with the Code, the Director may elevate an application to a Type III review.

Types of Applications:

- A. Design Review, except Type I Design Reviews under Subsection 17.12.10.B. and Type III Design Reviews under 17.12.30.
- B. Historic Preservation Provisions Procedures for Alteration of an Historic Resource.
- C. Adjustments and Variances of up to 20 percent of a Quantifiable Dimension which does not increase density.
- D. Subdivisions in compliance with all standards of the Development Code.
- E. Partitions and Minor Replats.
- F. Flood, Slope and Hillside Development and Density Transfer-Uses listed in 17.60.40.
- G. Request for Interpretation.
- H. Tree Removal Permit (greater than 50 trees).
- I. Minor Conditional Use Permit.

Comprehensive Land Use Planning

ORS 197.522

Local government to approve subdivision, partition or construction

- **conditions**

(1) As used in this section:

(a) “Needed housing” has the meaning given that term in ORS 197.303 (“Needed housing” defined).

(b) “Partition” has the meaning given that term in ORS 92.010 (Definitions for ORS 92.010 to 92.192).

(c) “Permit” means a permit as defined in ORS 215.402 (Definitions for ORS 215.402 to 215.438 and 215.700 to 215.780) and a permit as defined in ORS 227.160 (Definitions for ORS 227.160 to 227.186).

(d) “Subdivision” has the meaning given that term in ORS 92.010 (Definitions for ORS 92.010 to 92.192).

(2) A local government shall approve an application for a permit, authorization or other approval necessary for the subdivision or partitioning of, or construction on, any land for needed housing that is consistent with the comprehensive plan and applicable land use regulations.

(3) If an application is inconsistent with the comprehensive plan and applicable land use regulations, the local government, prior to making a final decision on the application, shall allow the applicant to offer an amendment or to propose conditions of approval that would make the application consistent with the plan and applicable regulations. If an applicant seeks to amend the application or propose conditions of approval:

(a) A county may extend the time limitation under ORS 215.427 (Final action on permit or zone change application) for final action by the governing body of a county on an application for needed housing and may set forth a new time limitation for final action on the consideration of future amendments or proposals.

(b) A city may extend the time limitation under ORS 227.178 (Final action on certain applications required within 120 days) for final action by the governing body of a city on an application for needed housing and may set forth a new time limitation for final action on the consideration of future amendments or proposals.

(4) A local government shall deny an application that is inconsistent with the comprehensive plan and applicable land use regulations and that cannot be made consistent through amendments to the application or the imposition of reasonable conditions of approval. [1999 c.838 §4; 2015 c.374 §3]

9/20/21, 10:34 AM

ORS 197.522 - Local government to approve subdivision, partition or construction

Note: 197.522 (Local government to approve subdivision, partition or construction) was added to and made a part of ORS chapter 197 by legislative action but was not added to any smaller series therein. See Preface to Oregon Revised Statutes for further explanation.

Location:https://texas.public.law/statutes/tex._occ._code_title_3_subtitle_h.



SANDY FIRE DISTRICT NO. 72

Fire Prevention Division

EXHIBIT M

E-mail Memorandum

To: planning@ci.sandy.or.us

From: Gary Boyles

Date: September 18, 2021

Re: Bornstedt Views Subdivision File No. 21-021 SUB/TREE

Review and comments are based upon the current version of the Oregon Fire Code (OFC) as adopted by the Oregon Office of State Fire Marshal. The scope of this review is typically limited to fire apparatus access and water supply, although the applicant shall comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the fire code official. References, unless otherwise specified, include provisions found in the Metro Code Committee's Fire Code Applications Guide, OFC Chapter 5 and appendices B, C and D.

COMMENTS:

General

1. Construction documents detailing compliance with fire apparatus access and fire protection water supply requirements shall be provided to Sandy Fire District for review and approval prior to building permit submittal.
2. Approved fire apparatus access roadways and an approved water supply for fire protection, either temporary or permanent, shall be installed and operational prior to any combustible construction or storage of combustible materials on site in accordance with OFC Chapter 33.
3. Buildings shall be provided with approved address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property, including monument signs.

Fire Apparatus Access

FIRE APPARATUS ACCESS ROAD (as defined by the OFC). A road that provides fire apparatus access from a fire station to a facility, building or portion thereof. This is a general term inclusive of all other terms such as *fire lane*, public street, private street, parking lot lane and access roadway.

1. Fire apparatus access roads shall be within 150 feet of all portions of the exterior wall of the first story of any building as measured by an approved route around the exterior of the building. An approved turnaround will be required if the remaining distance to an approved intersecting roadway, as measured along the fire apparatus access road, is greater than 150 feet.
2. Dead end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround.
3. Dead-end streets in excess of 150 ft., resulting from a phased project, are to be provided with an approved temporary turnaround.
4. For developments of one- and two-family dwellings where the number of dwelling units exceed 30, or multiple-family residential projects having more than 100 dwelling units and where vehicle congestion, adverse terrain conditions or other factors that could limit access, as determined by the fire code official, shall be provided with not less than two approved means of access.
5. Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.
6. Fire apparatus access roadway grades shall not exceed 10 percent. Intersections and turnarounds shall be as level as possible and have a maximum of 5 percent grade with the exception of crowning for water run-off. Considerations of grades up to 15 percent may be allowed with a proposed alternate in accordance with the provisions of ORS 455.610(5).
7. Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 feet and an unobstructed vertical clearance of 13 feet 6 inches is to be maintained.
8. When the vertical distance between the grade plane and a building's highest roof surface exceeds 30 feet, approved aerial fire apparatus access roads shall be provided. For purposes of this requirement, the highest roof surface shall be determined by measurements to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater. If buildings are more than 30 feet in height, as measured above, the following requirements apply:
 - a. Aerial fire apparatus access roads shall be provided and have a minimum unobstructed width of 26 feet exclusive of shoulders or parking, in the immediate vicinity of the building or portion thereof that will accommodate aerial operations.
 - b. The aerial fire apparatus access road shall be located not less than 15 feet nor greater than 30 feet from the building and shall be positioned parallel to one entire side of the building.
 - c. The side of the building on which the aerial fire apparatus access road is positioned shall be approved by the fire code official.
 - d. Overhead utility and power lines shall not be located within the aerial fire apparatus access road or between the aerial fire apparatus access road and the building.

9. The inside turning radius and outside turning radius for fire apparatus access roads shall be not less than 28 feet and 48 feet respectively, measured from the same center point.
10. The installation of security gates or barricades across a fire apparatus access road shall comply with the following:
 - a. Minimum unobstructed width shall be 16-feet, or two 12-foot sections with a center post or island.
 - b. Gates or barricades shall be set back a minimum of 30 feet from the intersecting roadway.
 - c. Gates shall be of the swinging or sliding type. Barricades using cables or similar methods may be approved.
 - d. Construction of gates or barricades shall be of materials that allows manual operation by one person.
 - e. Locking devices shall be approved.
 - f. Electric gates shall be equipped with an approved means of emergency operation. A KNOX box or KNOX key switch may be required.
 - g. The security gates or barricades and the emergency operation shall be maintained in an operative condition at all times and replaced when defective.
11. Where fire apparatus roadways are not of sufficient width to accommodate parked vehicles and 20 feet of unobstructed driving surface, "NO PARKING-FIRE LANE" signs shall be placed on one or both sides of the roadway and in turnarounds as needed.
12. Streets and roads shall be identified with approved signs. Temporary signs shall be installed at each street intersection when construction of new roadways allows passage by vehicles.

Firefighting Water Supplies

1. The minimum available fire flow for one- and two-family dwellings served by a municipal water supply shall be 1,000 gpm at 20 psi residual provided the fire area of the dwelling(s) does not exceed 3,600 square feet. For dwellings that exceed 3,600 square feet, the required fire-flow shall be determined in accordance with OFC Appendix B, Table B105.1(2).
2. Fire flow testing will be required to determine available fire flow. Testing will be the responsibility of the applicant. Applicant to contact the City of Sandy Public Works for testing information and requirements and notify the Fire Marshal prior to fire flow testing.
3. For one- and two-family dwellings served by a municipal water system, all portions of the dwellings shall be located within 600 feet from a fire hydrant on a fire apparatus access road, as measured in an approved route that is approved by the fire code official.
4. Prior to the start of combustible construction, required fire hydrants shall be operational and accessible.

5. Fire hydrants installed within the Sandy Fire District shall comply with the following requirements:
 - a. Flow requirements and location of fire hydrants will be reviewed and approved by Sandy Fire upon building permit submittal.
 - b. **Each new fire hydrant installed shall be ordered in an OSHA safety red finish and have a 4-inch non-threaded metal faced hydrant connection with cap installed on the steamer port.** If a new building, structure, or dwelling is already served by an existing hydrant, the existing hydrant shall also be OSHA safety red and have a 4-inch non-threaded metal faced hydrant connection with cap installed.
6. The minimum number and distribution of fire hydrants shall be in accordance with City of Sandy requirements and OFC Appendix C.

NOTE:

Sandy Fire District comments may not be all inclusive based on information provided. A more detailed review may be needed for future development to proceed.

Please do not hesitate to contact Fire Marshal Gary Boyles at 503-891-7042 or fmboyles.sandyfire@gmail.com should you have any questions or concerns.



Staff Report
City of Sandy
39250 Pioneer Blvd.,
Sandy, OR 97055

EXHIBIT N

To: Planning Commission

Date: September 20, 2021

From: Sarah Richardson, Staff Liaison Parks and Trails Advisory Board

Subject: Bornstedt Views Proposed Development

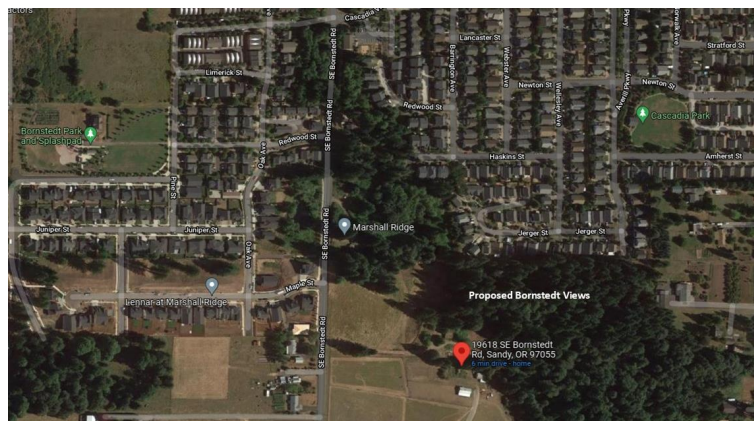
Attachments: None

I am sending this communication on behalf of the Sandy Parks and Trails Advisory Board.

The board met on August 11th, 2021 and reviewed the proposed development Bornstedt Views.

The property is located close to two existing neighborhood parks, approximately .3 miles from Bornstedt Park and .7 miles from Cascadia Park.

The current Parks and Trails Master Plan (i.e. the 1997 Parks Master Plan) states that "Neighborhood parks...serve a radius of approximately ½ mile...and eighty percent of all dwellings shall be located within one quarter mile of a Neighborhood Park".



Recommendation: The Parks and Trails Advisory Board recommends Fee in Lieu of Parkland Dedication given the size of the development, and its proximity to both Bornstedt Park and Cascadia Park.

We thank you for your consideration in this matter.

Staff Contact:

Sarah Richardson

503-489-2150

srichardson@cityofsandy.com

REPLINGER & ASSOCIATES LLC
TRANSPORTATION ENGINEERING

EXHIBIT O

September 27, 2021

Mr. Kelly O'Neill
City of Sandy
39250 Pioneer Blvd.
Sandy, OR 97055

**SUBJECT: REVIEW OF TRANSPORTATION IMPACT STUDY – BORNSTEDT
VIEWS SUBDIVISION**

Dear Kelly:

In response to your request, I have reviewed materials submitted in support of the Bornstedt Views Subdivision in the south part of Sandy. The Transportation Impact Study (TIS), dated August 5, 2021, was prepared under the direction of Michael Ard, PE of Ard Engineering. A future street plan and preliminary plat, dated 4/30/2021, were also provided.

The 12.7-acre site, located east of SE Bornstedt Road, west of SE Jacoby Road and south of Jerger Street is proposed for development with a 42-lot residential subdivision. The proposed development is in two distinct parts; the westerly portion will take access via a new roadway intersecting SE Bornstedt Road; the easterly part will include an extension of Averill Parkway from the north. There are provisions for future connections to adjacent parcels.

Overall

I find the TIS 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:

- Pioneer Boulevard (US 26 Eastbound) at Highway 211;
- Highway 211 at Dubarko Road; and
- Highway 211 at SE Bornstedt Road

In addition, the study addresses the impact of the proposed subdivision on the following local streets:

- Averill Parkway extending north from the site; and
- Newton Street, which provides a connection to Jacoby Road northeast of the subject property.

2. Traffic Counts. The AM and PM peak hour traffic counts and daily counts were conducted during June 2021. According to the TIS, these counts were adjusted by increasing US 26 counts by 14.6 percent and all other locations by 9.6 percent to account for influences of the on-going COVID pandemic. The engineer used a combination approach to account for seasonal variation of recreational traffic and separately for commuter traffic on US 26. The methodology appears consistent with the procedures defined by the Oregon Department of Transportation (ODOT). The adjusted counts appear reasonable.

3. Trip Generation. The TIS uses trip generation for single-family dwellings (land use code 210) from the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*. The engineer calculates that the subdivision would produce 31 total AM peak hour trips; 42 total PM peak hour trips; and 396 total daily trips. The calculation of trips generated by the development appears reasonable.

4. Trip Distribution. The TIS provided information about trip distribution from the site. According to the TIS, the project site was estimated based the existing travel patterns in the site vicinity. The engineer assumed 65 percent of site trips would travel to and from the west on Highway 26; 20 percent would travel to and from the east on Highway 26; 10 percent would travel to and from the south on Highway 211; and the remaining 5 percent would travel to and from the west on Dubarko Road. Since the project site is divided by wetlands in the middle, 13 homes will take access via Bornstedt Road, while the remaining 29 homes will take access via an extension of Averill Parkway. The trip distribution seems reasonable.

5. Traffic Growth. The TIS uses a 2.13 percent annual growth rate for Highway 26 and a 2.0 percent annual growth rate for other facilities. In addition, the TIS accounts for background traffic growth by including traffic from the following developments: Clackamas County Health Clinic, Mt. Hood Senior Living, The Pad, The Views, Shaylee Meadows, Mt. View Ridge, Marshall Ridge, Jacoby Heights, Trimble PD, and the Deer Meadows Subdivision. 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. The intersection of Pioneer Boulevard and Highway 211 is signalized; the other two intersections are stop-controlled with stop signs on the minor street approaches. The analyses were conducted for existing 2021 conditions, 2023 background conditions, and 2023 with the development.

The engineer calculates that the intersection of Pioneer Boulevard and Highway 211 is currently meeting the v/c standards specified by ODOT and will meet the ODOT standard in 2023 without and with the development in both the AM and PM peak hours. The maximum v/c is predicted to be 0.85, which is calculated to occur during the PM peak hour with the development. This meets ODOT standards.

Likewise, the intersection of Highway 211 at Bornstedt Road is calculated to meet the City of Sandy's LOS standard under current conditions and is calculated to meet the city's standard in 2023 without and with the development. The poorest performance is predicted to be LOS D, which is predicted during the PM peak hour with the development. This meets the city's standard.

According to the TIS, intersection of Highway 211 at Dubarko Road is currently operating at LOS E during the PM peak hour. This does not meet the city's performance standard. Long delays are encountered for the westbound Dubarko Road approach. The intersection performance is projected to deteriorate and is calculated to operate at level of service F for the westbound left/through lane during the evening peak hour either with or without the addition of site trips from the proposed development. The engineer calculates that if the intersection were converted to all-way stop control, operation would improve to level of service E, with average delays for the highest-delay approach lane (Dubarko Road, westbound) reduced from 55.6 seconds to 47.1 seconds, indicating a minor improvement to operation of the worst movement with all-way stop control and the proposed development in place. According to the engineer, the conversion to all-way stop control would also be expected to reduce the risk of angle and turning-movement collisions at the intersection.

The analysis of the intersection of Highway 211 and Dubarko Road in this TIS is consistent with other analyses of this intersection prepared in support of other developments.

The TIS also assessed traffic volumes on local streets to assure compliance with Section 17.10.30 of the Sandy Development Code. The TIS provided current and projected traffic volumes on Newton Street between Amherst Street and Jacoby Road; and on Averill Parkway immediately south of Cascadia Village Drive; immediately south of Newton Street; and immediately south of Amherst Street. The current counts and predicted traffic volumes from the development were used to determine whether the existing local street segments are currently carrying fewer than 1,000 daily trips and would continue to do so with the development. According to the engineer, the highest predicted daily volume will be 540 vehicles per day on Averill Parkway south of Cascadia Village Drive. He concludes that all impacted local streets will continue to operate with volumes below 1,000 vehicles per day.

- 7. Crash Information.** The TIA provides information from ODOT on crashes for the five-year period from 2015 through 2019. The intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road had no reported crashes during the five-year analysis period.

The intersection of Highway 211 at Dubarko Road has a high historical crash rate, which has not been significantly altered by recent improvements. The intersection of Highway 211 at Dubarko Road had 27 reported crashes during the five-year analysis period. Angle crashes and turning-movement crashes predominate. There was one reported incapacitating injury; ten reported "non-incapacitating" injuries; and 19 reports of a "possible injury/complaint of pain." The crash rate for the intersection was calculated to be 1.56 crashes per million entering vehicles. This is above the 90th percentile crash rate of 1.08 crashes per million entering vehicles for rural unsignalized four-way intersections in the state.

According to the engineer, all-way stop control can be installed where there are "Five or more crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions." The engineer concludes that the crash data shows that there were six angle collisions at the intersection in the most recent year for which complete data is available (2019). Accordingly, he recommends installation of all-way stop control based on crash history.

- 8. Site Plan and Access.** The site plan provides for two access points. The westerly portion of the subdivision would have access to Bornstedt Road opposite Maple Street; the easterly portion of the subdivision would have access via an extension of Averill Parkway. The site plan shows stub streets affording the potential for

connection to adjacent parcels when they are subdivided. The locations proposed for access appear appropriate.

9. *Sight Distance.* The engineer analyzed sight distance at the proposed access to Bornstedt Road. Based on the posted speed of 45 mph, sight distance of 500 feet is required. The engineer notes that sight distance to the north is currently limited by vegetation and by an embankment to the north of the site. He indicates that frontage improvements "will result in sight distances well in excess of 500 feet in each direction." He concludes that no further mitigation for sight distance will be necessary.

10. *Left-Turn Lane and Signal Warrants.* The engineer also evaluated the need for turn lanes and addressed traffic signal warrants.

TIS indicates that the intersection of Highway 211 at Bornstedt Road already has a southwest-bound left-turn lane.

The engineer concludes that intersection of Highway 211 at Dubarko Road currently meets ODOT warrants for a northbound left-turn lane and a northbound right-turn lane. He concludes, however, the need for these turn lanes is not related to the proposed development. Furthermore, he concludes that if all-way stop control is installed at the intersection as recommended based on his safety analysis, the turn lane warrants will no longer be applicable.

The engineer's analysis indicates traffic signal warrants are not met for Highway 211 either Bornstedt Road or Dubarko Road.

11. *Conclusions and Recommendations.* The engineer concludes that the intersections the intersections of Pioneer Boulevard at Highway 211 and Highway 211 at Bornstedt Road are projected to operate acceptably per ODOT and City of Sandy standards through 2023 either with or without the addition of site trips from the proposed development.

He calculates that the intersection of Highway 211 at Dubarko Road will operate at level of service F during the evening peak hour under year 2023 traffic conditions either with or without the trips from the proposed development. To improve performance of the intersection, he recommends the intersection be converted all-way stop control, which, he concludes, will improve operations to LOS E and reduce

Mr. Kelly O'Neill
September 27, 2021
Page 6

delays for the highest-delay movement as compared to background, no-build conditions.

The TIS indicates that local streets, including Averill Parkway, will meet the city's local street standard of having fewer than 1000 daily trips.

The engineer recommends all-way stop control for the intersection of Highway 211 and Dubarko Road to improve safety.

Conclusion and Recommendations

Based on the information provided by the applicant, I find the TIS meets City requirements. The engineer used appropriate data and methods in his analysis and makes reasonable conclusions and recommendations.

The TIS indicates that the intersections of Pioneer Boulevard and Highway 211 and the intersection of Highway 211 and Bornstedt Road will meet applicable ODOT and city operational standards.

Like other analyses conducted for developments, the TIS concludes that the intersection of Highway 211 and Dubarko Road will experience poor performance and continues to have a safety problem. The engineer recommends conversion to all-way stop control to improve intersection performance and to improve safety. He indicates a portion of the reported crashes are susceptible to reduction by the conversion to all-way stop control.

The TIS indicates that local streets, notably Averill Parkway, will not exceed the 1000 vehicle per day threshold established by city code.

If you have any questions or need any further information concerning this review, please contact me at replinger-associates@comcast.net.

Sincerely,



John Replinger, PE
Principal

BornstedtViewsTIS092721



EXHIBIT P

Marisol Martinez <mmartinez@ci.sandy.or.us>

Bornstedt Views Subdivision (File No. 21-021 SUB/TREE)

1 message

'Belt, Charlene R (BPA) - TERR-ROSS MHQA' via Planning <planning@ci.sandy.or.us> Wed, Sep 29, 2021 at 11:00 AM
Reply-To: "Belt, Charlene R (BPA) - TERR-ROSS MHQA" <crbelt@bpa.gov>
To: "planning@ci.sandy.or.us" <planning@ci.sandy.or.us>

Hi Emily,

BPA has reviewed the materials submitted for File No. 21-021 SUB/TREE and found no impact to our facilities. Thank you for the opportunity to comment.

Charlene Belt

Realty Specialist / COR

Real Property Field Services, Ross MHQA

Bonneville Power Administration

1211 NE Minnehaha St, Vancouver, WA 98665

(503) 230-5518 (office) / crbelt@bpa.gov

EXHIBIT Q

MEMORANDUM

TO: EMILY MEHARG, ASSOCIATE PLANNER
FROM: MIKE WALKER, DIRECTOR OF PUBLIC WORKS
RE: PUBLIC WORKS COMMENTS - FILE NO. 21-021
DATE: OCTOBER 5, 2021

The following are Public Works' comments on the above-referenced application.

Transportation

Street "B", a cul-de-sac is 450 feet in length measured from the west right-of-way line of Averill Parkway to the end of the cul-de-sac bulb, approximately 50 feet greater than the dimensional standard in section 17.84.50(3)e which states that "Cul-de-sacs shall not exceed 400 feet in length".

Vehicle Non-Access Reserve (VNAR) strips shall be depicted on the plat for the Bornstedt Road frontage of lots 1 through 4 and lot 13 to comply with section 17.98.80(A) of the Code.

Street improvements on tract A and lots 13, 37 and 38 frontages shall extend to the property line per 17.84.50(F)2 and 17.84.50(G) SMC. Retaining walls or slope easements on adjacent parcels may be required to accomplish this.

The location, number and width of all driveway approaches shall not exceed the spacing and dimensional standards in section 17.98.100 SMC.

The street improvements proposed on tract A and lots 13, 37 and 38 do not extend to the edge of the adjacent properties as required in 17.84.50(F)3 and 17.84.50(G) of the Code.

The Planning Commission or Director should require the extension of Maple ST. east though the site to connect to proposed street B as a logical extension of an existing street network per 17.84.50(H) SMC.

Utilities

The proposed 15' wide public storm drainage easement depicted at the rear of lots 24 through 27 does not collect or convey water from existing or proposed public streets. If based on the stream and wetland presence determination there is no seasonal drainage then there should be no need for a public easement to convey off site runoff from property outside the city. The City will not accept a public storm drain easement in this area.

The applicant shall install all water lines and fire hydrants in compliance with the applicable standards in Section 17.100.230, which lists requirements for water facilities.

The applicant is proposing at least eighteen separate, private pressure mains in the public utility easement adjacent Street B to serve lots 16 to 23 and lots 24 to 33. These lines are proposed as private and to be located in a public utility easement adjacent to the street frontage of lots 16 to 23 and 24 to 33.

It is unclear whether private pressure sewers as proposed will comply with the Oregon Plumbing Specialty Code or Oregon Department of Environmental Quality requirements. The City would not accept private force mains for ownership or maintenance.

Lumping as many as 9 private force mains in a PUE with other utilities (power, telecom, gas, fiber, CATV, etc.) is a recipe for disaster. If there is a leak on any line or lines there will be no way to identify which line(s) is/are leaking from the surface. There is no proposed method proposed for maintenance or repair of these lines. While as many as nine of the property owners may debate whose line is leaking and who is responsible for repairing a leaking line untreated sewage could continue pool under the ground and on the surface until the responsible party is identified and the pipe repaired.

The applicant could construct a gravity sewer line connecting to the existing public sewer line in Jerger St. to serve lots 16 – 33. There are existing 10-foot wide public utility easements between any of the lots on the south side of Jerger St. adjacent to Street B that could be used to access the public sewer line in Jerger.

Plans for public and private sewer collection and conveyance facilities shall be submitted to the Oregon Department of Environmental Quality for review and approval per ORS Chapters 454, 468 and 4868B and OAR 340-052 and in particular OAR 340-052-0040(2).

The applicant shall be conditioned to construct gravity sewers draining to the public sewer line in Jerger to serve lots 16 to 33.

General

The existing right-of-way of Bornstedt Road adjacent to the applicant's site is not accurately depicted on the proposed tentative plat. The recorded plat for Marshall Ridge shows the Bornstedt Road right-of-way varying between XX feet and XX feet (north to south). The tentative plat does not appear to comply with the minimum accuracy requirements in 17.100.XX

Public utility and street plans for land use applications are submitted to comply with the requirements in 17.100.60 SMC. Land use approval does not connote approval of utility or street construction plans which are subject to a separate submittal and review process.

10/4/21, 1:37 PM

City of Sandy Mail - Second fire access question



EXHIBIT R

Emily Meharg <emeharg@ci.sandy.or.us>

Second fire access question

Gary Boyles <fmboyles.sandyfire@gmail.com>
To: Emily Meharg <emeharg@ci.sandy.or.us>
Cc: "Kelly O'Neill Jr." <koneill@ci.sandy.or.us>

Mon, Oct 4, 2021 at 10:36 AM

Great question Emily. Multiple access roads would be triggered if the development of one-and two-family dwellings **exceeded** 30. Therefore, if two or more of the 29 eastern lots converted to duplexes then a second means of access to the new development would be required. I am taking the existing lots in the area into account and crediting Averill and Wellosby as meeting the intent of the fire code to get multiple fire apparatus to the scene of an emergency. However, the proposed new development will need adequate turnarounds, fire hydrants and will not be able to exceed 30 one-and two-family dwellings.

Gary Boyles
Fire Marshal
Sandy Fire District No. 72
PO Box 518
[17460 SE Bruns Ave.](#)
[Sandy, Oregon 97055](#)

Business line: 503-668-8093
Cell number: 503-891-7042

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Rebecca Casey <rcasey@ci.sandy.or.us>

EXHIBIT S

Fwd: New Development Near Cascadia Village

2 messages

Jeff Aprati <japrati@ci.sandy.or.us>
To: Planning <planning@ci.sandy.or.us>

Thu, Oct 7, 2021 at 1:43 PM

Jeff Aprati

Assistant to the City Manager / City Recorder
City of Sandy
503-489-0938
japrati@ci.sandy.or.us
www.ci.sandy.or.us

----- Forwarded message -----

From: 'Lori Pyles' via City Recorder <recorder@ci.sandy.or.us>

Date: Thu, Oct 7, 2021 at 1:35 PM

Subject: New Development Near Cascadia Village

To: jcrosby@ci.sandy.or.us <jcrosby@ci.sandy.or.us>, dcarlton@ci.sandy.or.us <dcarlton@ci.sandy.or.us>, rlesowski@ci.sandy.or.us <rlesowski@ci.sandy.or.us>, jlee@ci.sandy.or.us <jlee@ci.sandy.or.us>, shook@ci.sandy.or.us <shook@ci.sandy.or.us>, cmayton@ci.sandy.or.us <cmayton@ci.sandy.or.us>, hmacleanwenzel@ci.sandy.or.us <hmacleanwenzel@ci.sandy.or.us>, recorder@ci.sandy.or.us <recorder@ci.sandy.or.us>

All,

I would like to address the attached letter proposing opening up Averill as a way to get to the new development that will be coming to Jacoby and Barrington area. I do not feel that this street would be a good fit as it is close to the park in our neighborhood where our children play and the extra traffic from other homes would put the children at a higher risk. Not only that but the street is very packed with cars and would be hard to get through both ways.

Honestly, I believe this would be the same for all of the streets in the Cascadia Village neighborhood. They are basically one way streets where cars are parked on both sides making it very difficult for vehicles to come through. There are plenty of children on each street that play outside and those that walk their dogs who have to use the road at times to get around and I feel this would be more of a danger with extra traffic.

I recommend only using Jacoby and Barrington as ways to get into the new development and keep our streets in Cascadia Village as they are now.

Thank you
Lori Pyles

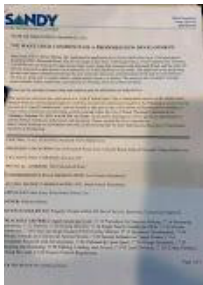


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EXHIBIT T

MARSHALL RIDGE

Plat 4003
BOOK 151 PAGE 014

LOCATED IN THE SW 1/4 SEC 24, T 2S, R 4E, W.M.
CITY OF SANDY, COUNTY OF CLACKAMAS, OREGON
DECEMBER 7, 2018

LEGEND

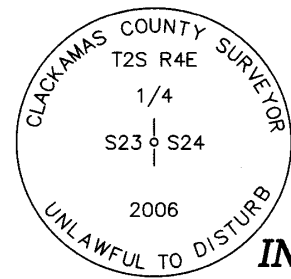
●	FOUND MONUMENT AS NOTED HEREON	(P1)	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4483 "ZION MEADOWS", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151", HELD, UNLESS OTHERWISE NOTED	SURVEY RECORDS
○	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" SET ON 10-02-19	(P2)	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4583 "MT. VIEW RIDGE", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151", HELD, UNLESS OTHERWISE NOTED	SDE
⊘	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" IN MONUMENT BOX, SET ON 10-02-19	(R1)	INDICATES RECORD OR CALCULATED VALUE PER SN 2018-037. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151" UNLESS OTHERWISE NOTED	SSE
△	SET 5/8" BY 30" IR W/ALUMINUM CAP MARKED "ACS&P 503-668-3151", SET ON 10-02-19	(R2)	INDICATES RECORD OR CALCULATED VALUE PER SN 11464. MONUMENT IS A 5/8" IR NO CAP UNLESS OTHERWISE NOTED	PUE
⊗	SET 1" BRASS DISC WITH PUNCH STAMPED "ACS&P 668-3151", SET ON 10-02-19	(R3)	INDICATES RECORD OR CALCULATED VALUE PER SN2016-163	VNAR
FD	FOUND MONUMENT	(R4)	INDICATES RECORD OR CALCULATED VALUE PER SN11533	PSDE
W/YPC	INDICATES WITH YELLOW PLASTIC CAP	SN	INDICATES SURVEY NUMBER, CLACKAMAS COUNTY	PSSE
IR	INDICATES IRON ROD			TPR
IP	INDICATES IRON PIPE, INSIDE DIAMETER			SAE
ALUM	INDICATES ALUMINUM CAP MARKED			DNR

SHEET INDEX

SHEET 1	PLAT BOUNDARY, SURVEYOR'S CERTIFICATE, LEGEND, AND SHEET INDEX
SHEET 2	WEST HALF, LEGEND, AND NOTE
SHEET 3	EAST HALF, LEGEND, AND NOTE
SHEET 4	CURVE TABLE, DETAILS, AND LEGEND
SHEET 5	NARRATIVE, FENCE NOTE, DECLARATION, ACKNOWLEDGMENT, PLAT NOTES, APPROVALS, AND CONSENT AFFIDAVIT



SCALE : 1" = 80'
0' 40' 80' 160'

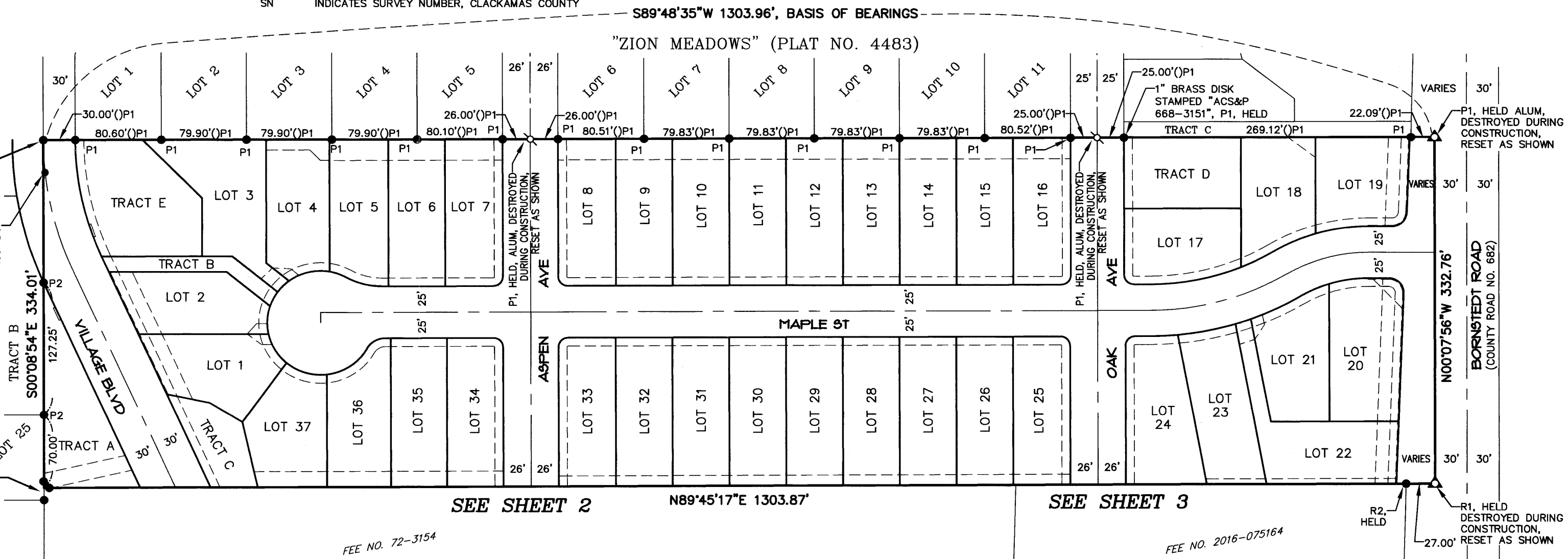


INITIAL POINT
3-1/4" BRASS DISK
IN 2-3/8" STEEL PIPE, WEST 1/4 CORNER,
SECTION 24, T2S, R4E, USBT 2006-012,
HELD.

5/8" IR NO CAP 0.15 E,
R3, R4, DESTROYED
DURING CONSTRUCTION,
DNR

MT. VIEW RIDGE
(PLAT NO. 4583)

SEE SHEET 2 &
DETAIL "C"
(SHEET 4)



SURVEYOR'S CERTIFICATE

I, DALE L. HULT, DO HEREBY CERTIFY THAT I HAVE CORRECTLY SURVEYED AND MARKED WITH PROPER MONUMENTS THE LAND REPRESENTED ON THE ATTACHED PLAT, BEING DESCRIBED IN DOCUMENT NUMBER 2018-053570, CLACKAMAS COUNTY DEED RECORDS, LOCATED IN THE SW 1/4 OF SECTION 24, T2S, R4E, W.M., CITY OF SANDY, CLACKAMAS COUNTY, OREGON, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE INITIAL POINT, THE WEST ONE-QUARTER CORNER OF SAID SECTION 24, BEING MARKED WITH A 3 1/4" BRASS DISK; THENCE S00°08'54"E ALONG THE EAST LINE OF "MT. VIEW RIDGE" (PLAT NO. 4583) A DISTANCE OF 334.01 FEET TO THE NORTHWEST CORNER OF THAT ADJOINING TRACT RECORDED AS FEE NO. 72-3154, CLACKAMAS COUNTY DEED RECORDS; THENCE N89°45'17"E ALONG THE NORTH LINE THEREOF, AND THE NORTH LINE OF TRACT PER FEE NO. 2016-075164, A DISTANCE OF 1303.87 FEET TO THE WEST RIGHT OF

WAY LINE OF SE BORNSTEDT ROAD (60 FOOT WIDE RIGHT OF WAY); THENCE N00°07'56"W ALONG THE WEST RIGHT OF WAY THEREOF A DISTANCE OF 332.76 FEET TO A POINT ON THE NORTH LINE OF THE SOUTHWEST ONE QUARTER OF SAID SECTION 24; THENCE S89°48'35"W ALONG SAID NORTH LINE OF THE SOUTHWEST ONE QUARTER OF SAID SECTION 24 AND THE SOUTH LINE OF ADJOINING "ZION MEADOWS" (PLAT NO. 4483) A DISTANCE OF 1303.96 FEET TO THE INITIAL POINT.

CONTAINING AN AREA OF 434,705 SQUARE FEET (9.98 ACRES), MORE OR LESS.

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JANUARY 23, 1990
DALE L. HULT
2427

SHEET 1 OF 5

RENEWS 07/01/21

CLIENT: STAFFORD DEVELOPMENT COMPANY



DRAWN: DRR CHECKED: MSR APPROVED: DLH

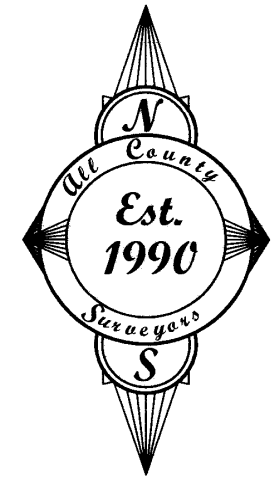
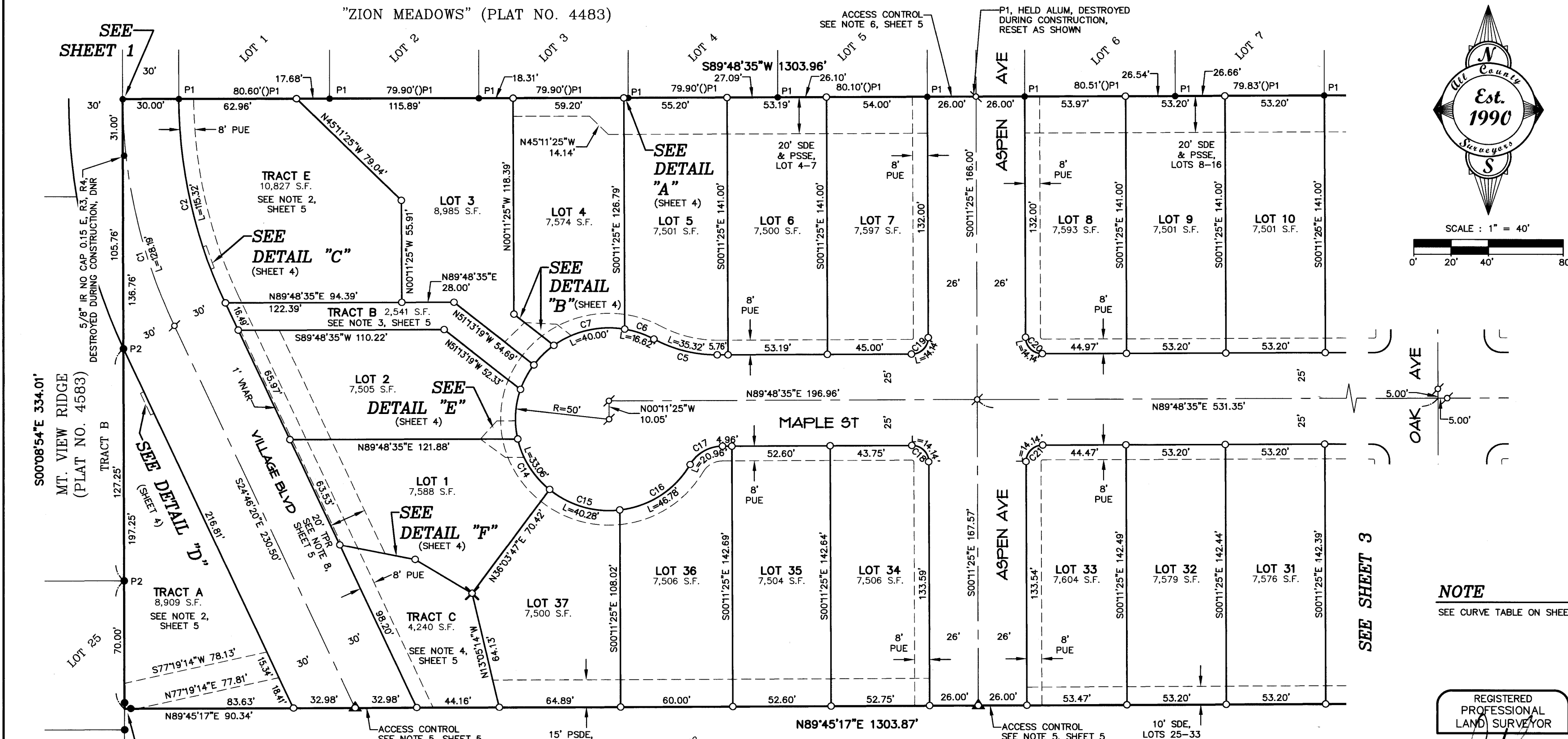
DWG NUMBER: 17-025 Plat.dwg
DATE OF PLOT: 11-14-19

Plat 4603

BOOK 151 PAGE 014

MARSHALL RIDGE

LOCATED IN THE SW 1/4 SEC 24, T 2S, R 4E, W.M.
CITY OF SANDY, COUNTY OF CLACKAMAS, OREGON
DECEMBER 7, 2018



SCALE : 1" = 40'

NOTE
SEE CURVE TABLE ON SHEET 4

REGISTERED PROFESSIONAL LAND SURVEYOR

Dale L. Hult

OREGON
JANUARY 23, 1990
DALE L. HULT
2427

RENEWS 07/01/21

CLIENT: STAFFORD LAND COMPANY

All County Surveyors & Planners, Inc.

Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
Subject to General Conditions 2006 ©

SEE DETAIL "G" (SHEET 4)

LEGEND

●	FOUND MONUMENT AS NOTED HEREON	ALUM	INDICATES ALUMINUM CAP MARKED	(OR3)	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 2018-163	TPR	TREE PRESERVATION RESTRICTION, SEE NOTE 8, SHEET 5
○	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" SET ON 10-02-19	(OP1)	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4483 "ZION MEADOWS", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151", HELD, UNLESS OTHERWISE NOTED	(OR4)	INDICATES RECORD OR CALCULATED VALUE PER SN 11533	SAE	INDICATES SHARED ACCESS EASEMENT, BENEFITING LOTS AS NOTED HEREON
⊘	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" IN MONUMENT BOX, SET ON 10-02-19	(OP2)	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4583 "MT. VIEW RIDGE", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151", HELD, UNLESS OTHERWISE NOTED	SN	INDICATES SURVEY NUMBER, CLACKAMAS COUNTY SURVEY RECORDS	DNR	INDICATES DESTROYED NOT REPLACED
△	SET 5/8" BY 30" IR W/ALUMINUM CAP MARKED "ACS&P 503-668-3151", SET ON 10-02-19	(OR1)	INDICATES RECORD OR CALCULATED VALUE PER SN 2018-037. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151" UNLESS OTHERWISE NOTED	SDE	INDICATES PRIVATE STORM DRAINAGE EASEMENT, BENEFITING LOTS AS NOTED HEREON		
⊗	SET 1" BRASS DISC STAMPED "ACS&P 668-3151", SET ON 10-02-19	(OR2)	INDICATES RECORD OR CALCULATED VALUE PER SN 11464. MONUMENT IS A 5/8" IR NO CAP UNLESS OTHERWISE NOTED	SSE	INDICATES PRIVATE SANITARY SEWER EASEMENT, BENEFITING LOTS AS NOTED HEREON		
FD	FOUND MONUMENT			PUE	PUBLIC UTILITY EASEMENT		
W/YPC	INDICATES WITH YELLOW PLASTIC CAP			VNAR	VEHICULAR NON-ACCESS RESTRICTION, GRANTED TO CITY OF SANDY JURISDICTION		
IR	INDICATES IRON ROD			PSDE	INDICATES PUBLIC STORM DRAIN EASEMENT		
IP	INDICATES IRON PIPE, INSIDE DIAMETER			PSSE	INDICATES PUBLIC SANITARY SEWER EASEMENT		

SHEET 2 OF 5

DRAWN: DRR CHECKED: MSR APPROVED: DLH

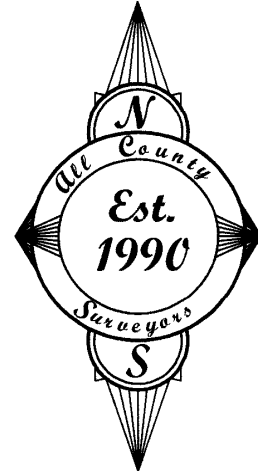
DWG NUMBER: 17-025 Plat.dwg
DATE OF PLOT: 11-14-19

Plat 4403

BOOK 151 PAGE 014

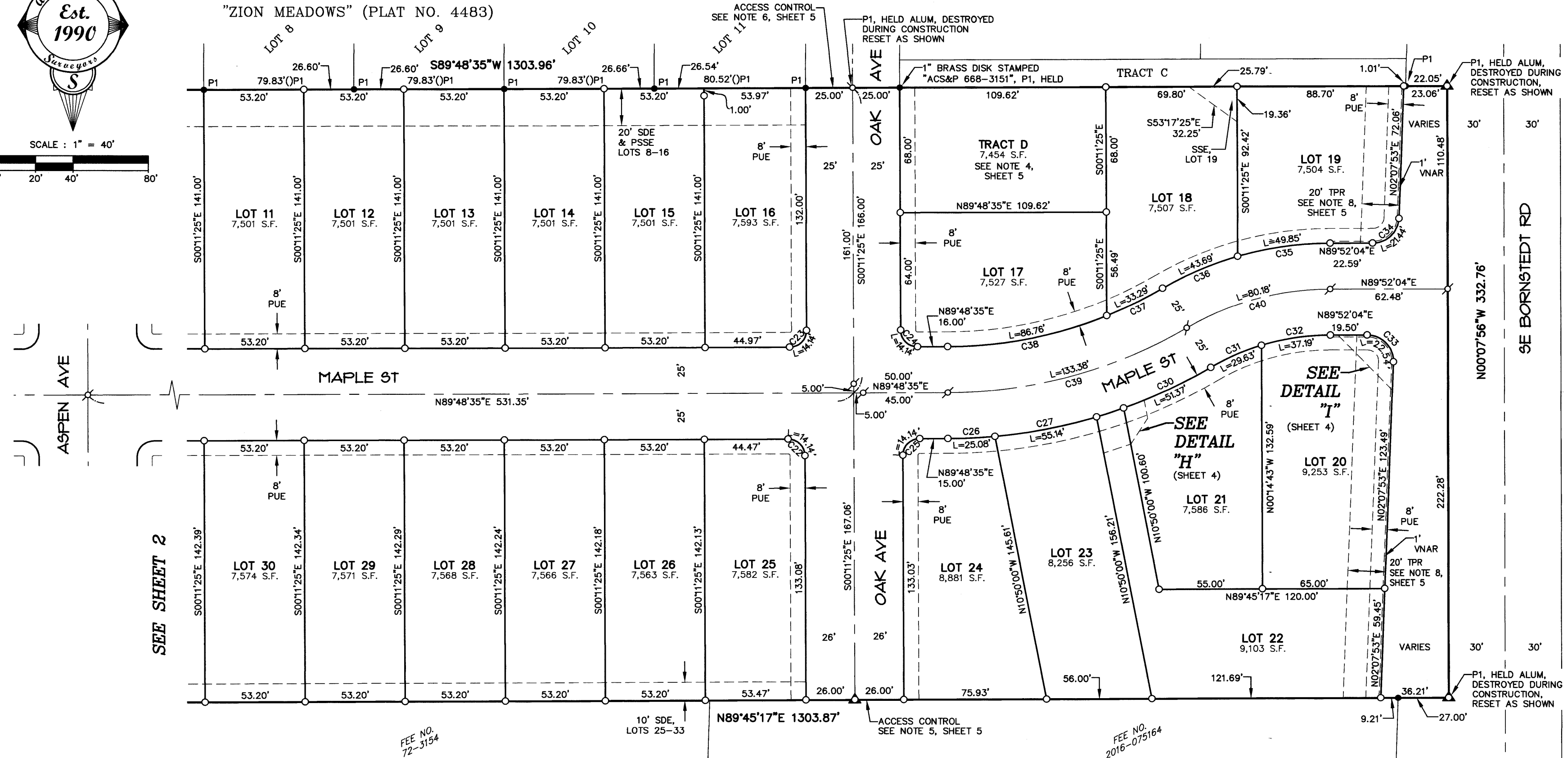
MARSHALL RIDGE

LOCATED IN THE SW 1/4 SEC 24, T 2S, R 4E, W.M.
CITY OF SANDY, COUNTY OF CLACKAMAS, OREGON
DECEMBER 7, 2018



SCALE: 1" = 40'
0' 20' 40' 80'

"ZION MEADOWS" (PLAT NO. 4483)



LEGEND

●	FOUND MONUMENT AS NOTED HEREON	()P1	INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4483 "ZION MEADOWS", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151" SET ON 10-02-19	SDE	INDICATES PRIVATE STORM DRAINAGE EASEMENT, BENEFITING LOTS AS NOTED HEREON
○	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" SET ON 10-02-19	()R1	INDICATES RECORD OR CALCULATED VALUE PER SN 2018-037. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151" UNLESS OTHERWISE NOTED	SSE	INDICATES PRIVATE SANITARY SEWER EASEMENT, BENEFITING LOTS AS NOTED HEREON
⊗	SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" IN MONUMENT BOX, SET ON: 10-02-19	()R2	INDICATES RECORD OR CALCULATED VALUE PER SN 11464. MONUMENT IS A 5/8" IR NO CAP UNLESS OTHERWISE NOTED	PUE	PUBLIC UTILITY EASEMENT
▲	SET 5/8" BY 30" IR W/ALUMINUM CAP MARKED "ACS&P 503-668-3151", SET ON 10-02-19	()R3	INDICATES RECORD OR CALCULATED VALUE PER SN2016-163	VNAR	VEHICULAR NON-ACCESS RESTRICTION, GRANTED TO CITY OF SANDY JURISDICTION
⊗	SET 1" BRASS DISC STAMPED "ACS&P 668-3151", SET ON 10-02-19	()R4	INDICATES RECORD OR CALCULATED VALUE PER SN11533	PSDE	INDICATES PUBLIC STORM DRAIN EASEMENT
FD	FOUND MONUMENT	()R3	INDICATES RECORD OR CALCULATED VALUE PER SN2016-163	PSSE	INDICATES PUBLIC SANITARY SEWER EASEMENT
W/YPC	INDICATES WITH YELLOW PLASTIC CAP	()R4	INDICATES RECORD OR CALCULATED VALUE PER SN11533	TPR	TREE PRESERVATION RESTRICTION, SEE NOTE 8, SHEET 5
IR	INDICATES IRON ROD	SN	INDICATES SURVEY NUMBER, CLACKAMAS COUNTY SURVEY RECORDS	SAE	INDICATES SHARED ACCESS EASEMENT, BENEFITING LOTS AS NOTED HEREON
IP	INDICATES IRON PIPE, INSIDE DIAMETER			DNR	INDICATES DESTROYED NOT REPLACED
ALUM	INDICATES ALUMINUM CAP MARKED				

NOTE

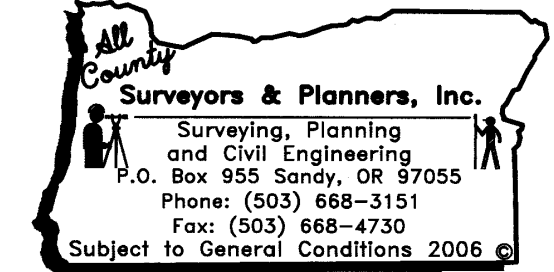
SEE CURVE TABLE ON SHEET 4

REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JANUARY 23, 1990
DALE L. HULT
2427

RENEWS 07/01/21

CLIENT: STAFFORD LAND COMPANY



SHEET 3 OF 5

DRAWN: DRR CHECKED: MSR APPROVED: DLH

DWG NUMBER: 17-025 Plat.dwg
DATE OF PLOT: 11-14-19

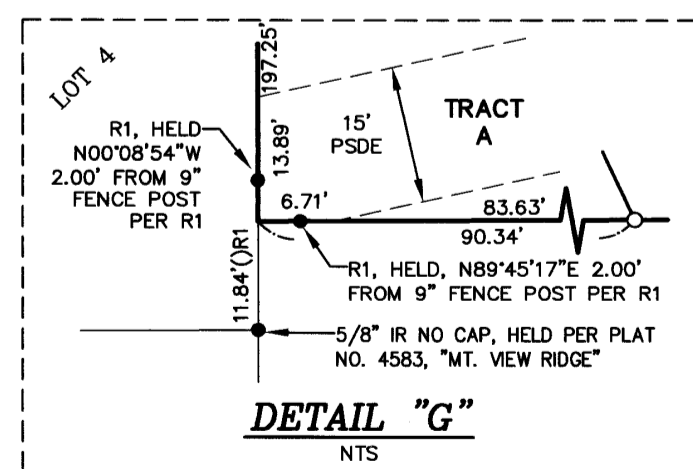
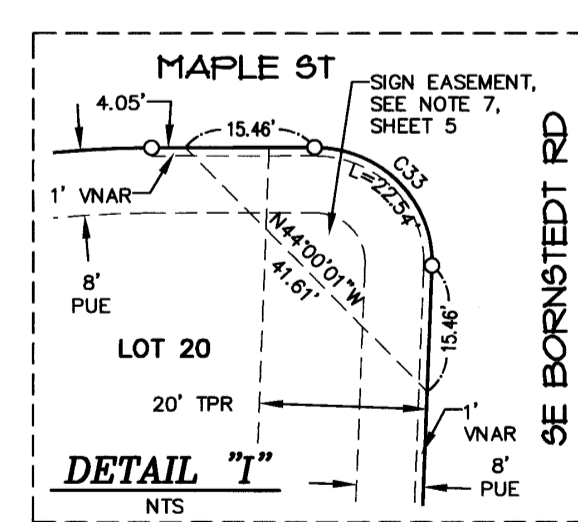
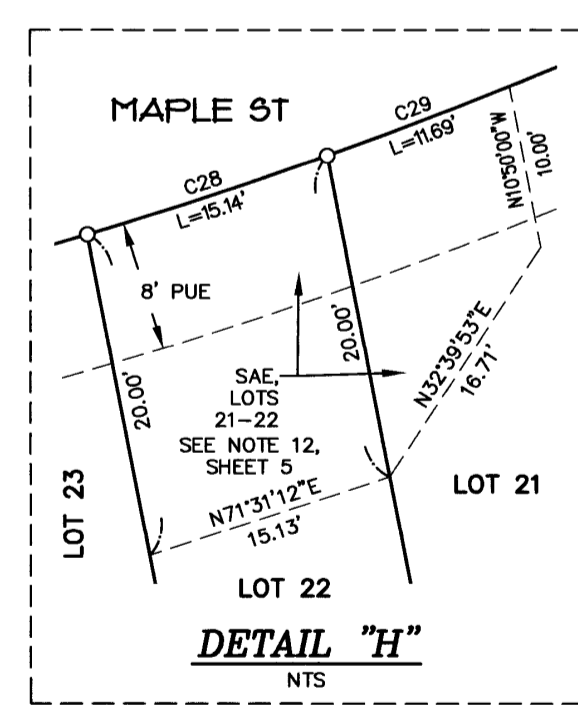
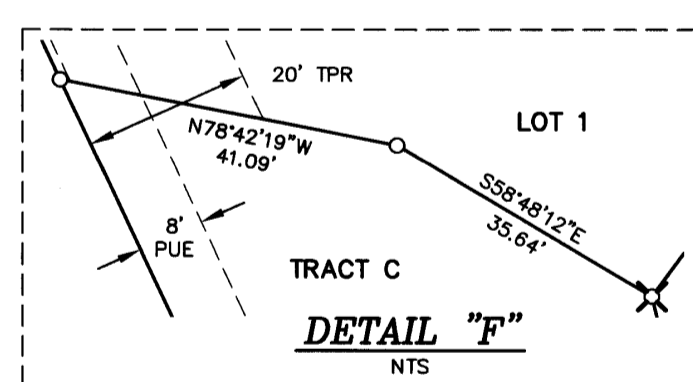
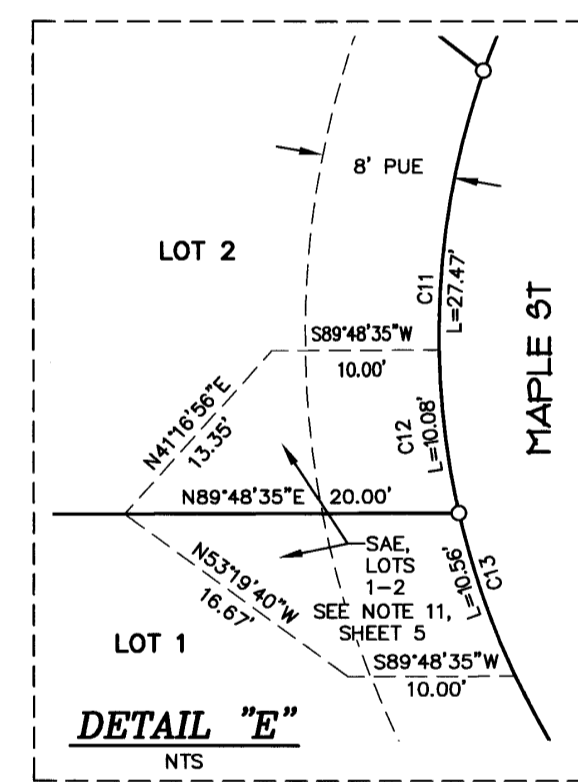
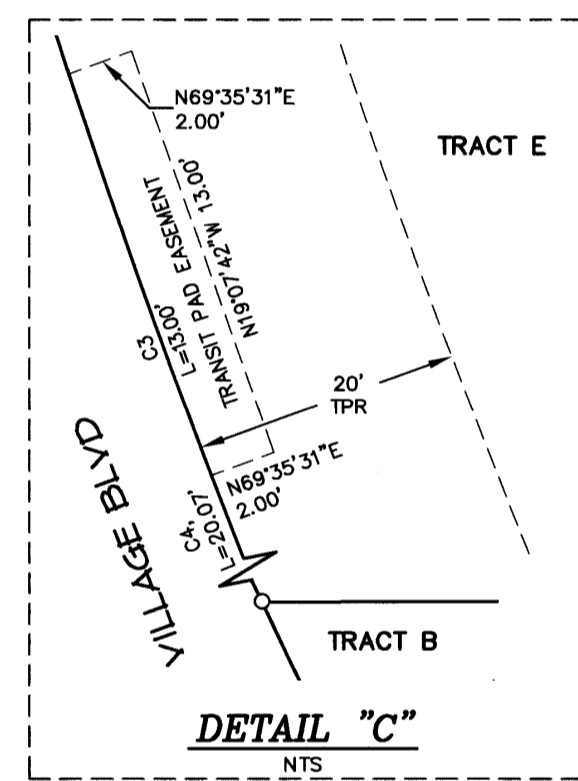
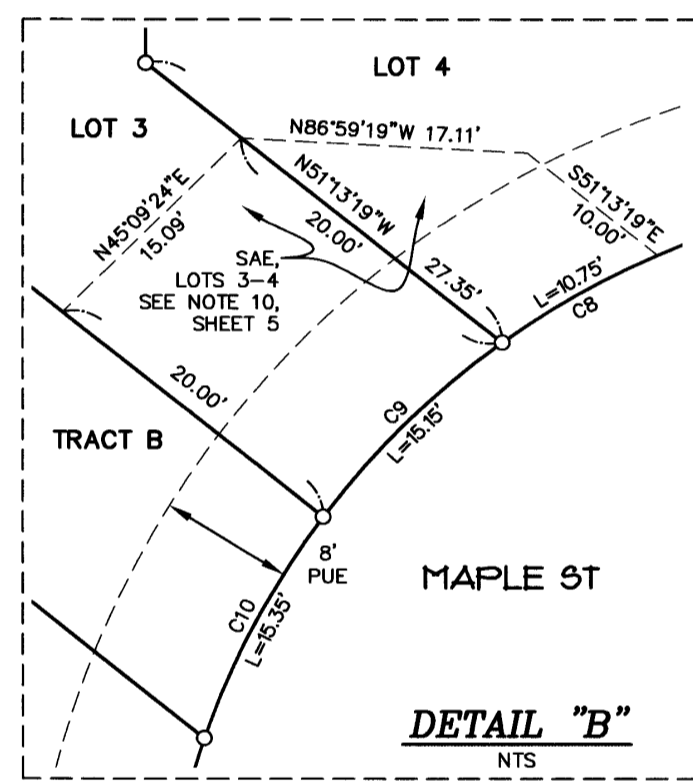
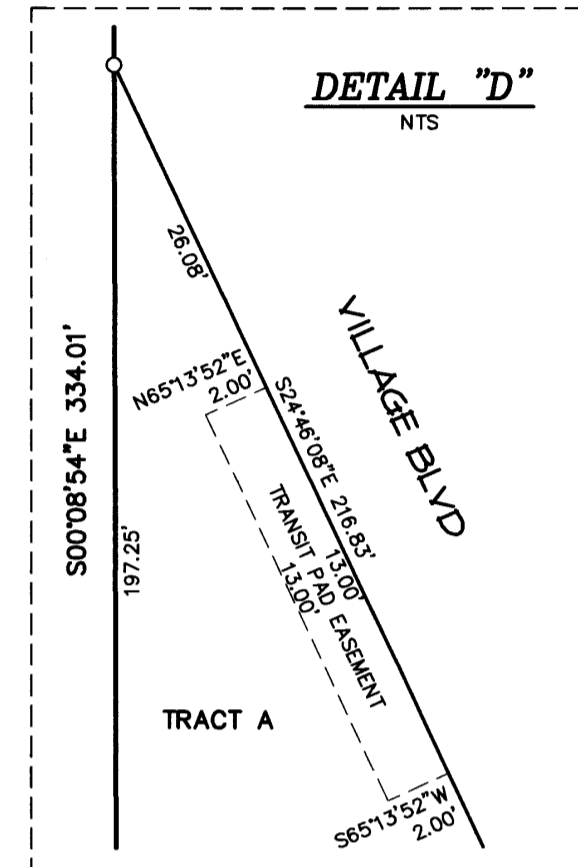
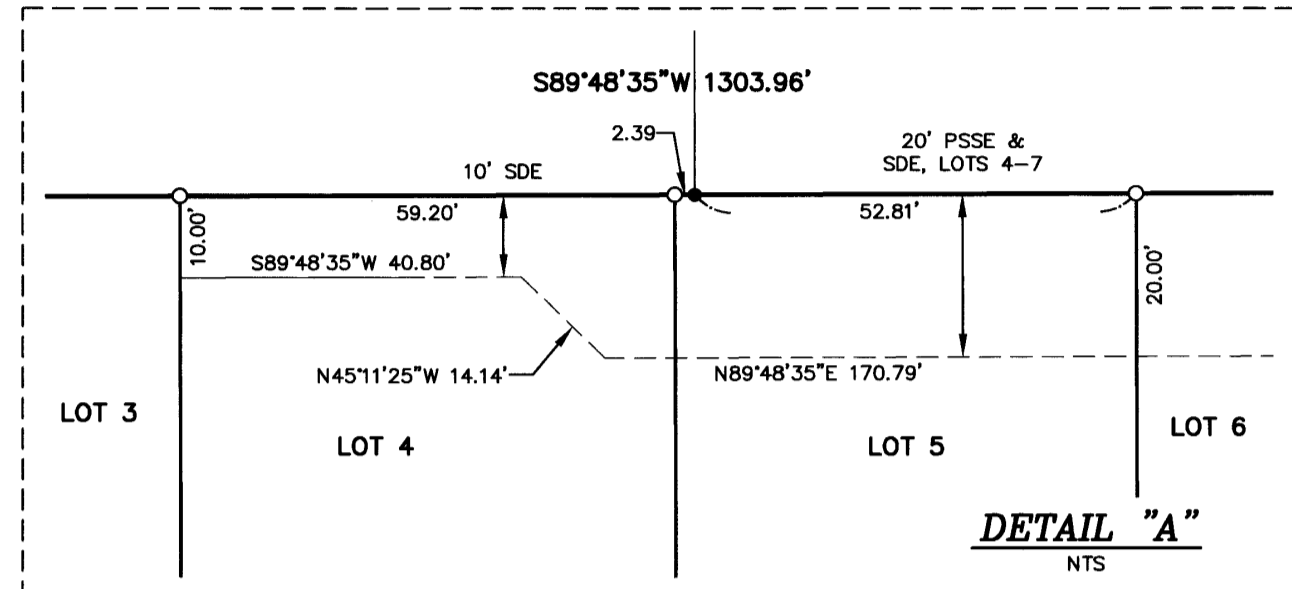
Plat 4603

BOOK 151 PAGE 014

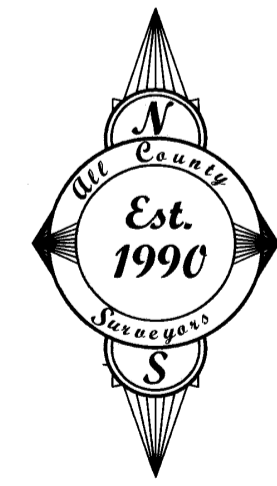
MARSHALL RIDGE

LOCATED IN THE SW 1/4 SEC 24, T 2S, R 4E, W.M.
CITY OF SANDY, COUNTY OF CLACKAMAS, OREGON
DECEMBER 7, 2018

CURVE TABLE				
CURVE	LENGTH	RADIUS	DELTA	CHORD
C1	128.19'	300.00'	24°28'58"	S12°31'38"E 127.22'
C2	115.32'	270.00'	24°28'18"	S12°31'56"E 114.45'
C3	13.00'	270.00'	2°45'35"	S19°07'42"E 13.00'
C4	20.07'	270.00'	4°15'35"	S22°38'17"E 20.07'
C5	35.32'	70.00'	28°54'21"	S75°44'14"E 34.94'
C6	16.62'	50.00'	19°02'28"	N70°48'18"W 16.54'
C7	40.00'	50.00'	45°50'12"	S76°45'22"W 38.94'
C8	10.75'	50.00'	12°18'58"	S59°59'45"W 10.73'
C9	15.15'	50.00'	17°21'44"	S45°09'24"W 15.09'
C10	15.35'	50.00'	17°35'06"	S27°41'00"W 15.29'
C11	27.47'	50.00'	31°28'59"	S03°08'57"W 27.13'
C12	10.08'	50.00'	11°33'21"	S06°48'52"E 10.07'
C13	10.56'	50.00'	12°06'10"	S18°38'37"E 10.54'
C14	33.06'	50.00'	37°53'09"	S31°32'07"E 32.46'
C15	40.28'	50.00'	46°09'08"	S73°33'15"E 39.20'
C16	46.78'	50.00'	53°36'25"	S56°33'58"W 45.09'
C17	20.96'	20.00'	60°02'49"	S59°47'10"W 20.01'
C18	14.14'	9.00'	90°00'00"	N45°11'25"W 12.73'
C19	14.14'	9.00'	90°00'00"	N44°48'35"E 12.73'
C20	14.14'	9.00'	90°00'00"	S45°11'25"E 12.73'
C21	14.14'	9.00'	90°00'00"	S44°48'35"W 12.73'
C22	14.14'	9.00'	90°00'00"	N45°11'25"W 12.73'
C23	14.14'	9.00'	90°00'00"	N44°48'35"E 12.73'
C24	14.14'	9.00'	90°00'00"	S45°11'25"E 12.73'
C25	14.14'	9.00'	90°00'00"	S44°48'35"W 12.73'
C26	25.08'	275.00'	5°13'28"	N87°11'51"E 25.07'
C27	55.14'	275.00'	11°29'18"	N78°50'28"E 55.05'
C28	15.14'	275.00'	3°09'13"	N71°31'12"E 15.13'
C29	11.69'	275.00'	2°26'12"	N68°43'30"E 11.69'
C30	51.37'	275.00'	10°42'09"	N64°35'31"E 51.29'
C31	29.63'	125.00'	13°34'46"	S66°01'50"W 29.56'
C32	37.19'	125.00'	17°02'51"	S81°20'39"W 37.05'
C33	22.54'	14.00'	92°15'49"	N44°00'01"W 20.19'
C34	21.44'	14.00'	87°44'11"	N45°59'59"E 19.40'
C35	49.85'	175.00'	16°19'21"	S81°42'23"W 49.69'
C36	43.69'	175.00'	14°18'16"	S66°23'35"W 43.58'
C37	33.29'	225.00'	8°28'37"	N63°28'45"E 33.26'
C38	86.76'	225.00'	22°05'32"	N78°45'49"E 86.22'
C39	133.38'	250.00'	30°34'08"	N74°31'31"E 131.81'
C40	80.18'	150.00'	30°37'37"	S74°33'15"W 79.23'



- LEGEND**
- FOUND MONUMENT AS NOTED HEREON
 - SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" SET ON 10-02-19
 - ⊙ SET 5/8" BY 30" IR W/YPC MARKED "ACS&P 503-668-3151" IN MONUMENT BOX, SET ON: 10-02-19
 - △ SET 5/8" BY 30" IR W/ALUMINUM CAP MARKED "ACS&P 503-668-3151", SET ON 10-02-19
 - ⊗ SET 1" BRASS DISC STAMPED "ACS&P 668-3151", SET ON 10-02-19
 - FD FOUND MONUMENT
 - W/YPC INDICATES WITH YELLOW PLASTIC CAP
 - IR INDICATES IRON ROD
 - IP INDICATES IRON PIPE, INSIDE DIAMETER
 - ALUM INDICATES ALUMINUM CAP MARKED
 - ()P1 INDICATES RECORD OR CALCULATED VALUE PER PLAT NO. 4483 "ZION MEADOWS", CLACKAMAS COUNTY PLAT RECORDS. MONUMENT IS A 5/8" IR W/YPC MARKED "ACS&P 503-668-3151", HELD, UNLESS OTHERWISE NOTED
 - ()R1 INDICATES RECORD OR CALCULATED VALUE PER SN 2018-037. MONUMENT IS A 5/8" IR W/PC MARKED "ACS&P 503-668-3151" UNLESS OTHERWISE NOTED
 - ()R2 INDICATES RECORD OR CALCULATED VALUE PER SN 11464. MONUMENT IS A 5/8" IR NO CAP UNLESS OTHERWISE NOTED
 - ()R3 INDICATES RECORD OR CALCULATED VALUE PER SN2016-163
 - ()R4 INDICATES RECORD OR CALCULATED VALUE PER SN11533
 - SN INDICATES SURVEY NUMBER, CLACKAMAS COUNTY SURVEY RECORDS
 - SDE INDICATES PRIVATE STORM DRAINAGE EASEMENT, BENEFITING LOTS AS NOTED HEREON
 - SSE INDICATES PRIVATE SANITARY SEWER EASEMENT, BENEFITING LOTS AS NOTED HEREON
 - PUE PUBLIC UTILITY EASEMENT
 - VNAR VEHICULAR NON-ACCESS RESTRICTION, GRANTED TO CITY OF SANDY JURISDICTION
 - PSDE INDICATES PUBLIC STORM DRAIN EASEMENT
 - PSSE INDICATES PUBLIC SANITARY SEWER EASEMENT
 - TPR TREE PRESERVATION RESTRICTION, SEE NOTE 8, SHEET 5
 - SAE INDICATES SHARED ACCESS EASEMENT, BENEFITING LOTS AS NOTED HEREON
 - DNR INDICATES DESTROYED NOT REPLACED



REGISTERED PROFESSIONAL LAND SURVEYOR

OREGON
JANUARY 23, 1990
DALE L. HULT
2427

RENEWS 07/01/21

CLIENT: STAFFORD LAND COMPANY

All County Surveyors & Planners, Inc.
Surveying, Planning and Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-3151
Fax: (503) 668-4730
Subject to General Conditions 2006 C

SHEET 4 OF 5

DRAWN: DRR CHECKED: MSR APPROVED: DLH

DWG NUMBER: 17-025 Plat.dwg
DATE OF PLOT: 11-14-19

Plat 4603

BOOK 151 PAGE 014

MARSHALL RIDGE

LOCATED IN THE SW 1/4 SEC 24, T 2S, R 4E, W.M.
CITY OF SANDY, COUNTY OF CLACKAMAS, OREGON
DECEMBER 7, 2018

NARRATIVE

THE PURPOSE OF THIS PLAT IS TO SUBDIVIDE THE SUBJECT TRACT AS DESCRIBED IN DEED DOC. NO 2008-014936, CLACKAMAS COUNTY DEED RECORDS. THE BOUNDARY RESOLUTION IS PER SN2018-037, CLACKAMAS COUNTY SURVEY RECORDS. THE BASIS OF BEARINGS IS ALONG THE NORTH LINE PER R1 AS SHOWN.

PLAT NOTES

1. THIS PLAT IS SUBJECT TO CONDITIONS OF APPROVAL AS STATED IN THE CITY OF SANDY PLANNING FILE NO. NO. 17-066 SUB/VAR.
2. A TREE PRESERVATION RESTRICTION SHALL BE ACROSS THE ENTIRETY OF TRACTS A AND E GRANTED TO THE CITY OF SANDY. SAID TRACTS ARE CONVEYED TO THE MARSHALL RIDGE HOME OWNERS ASSOCIATION RECORDED IN DOCUMENT NO. 2019-075520, CLACKAMAS COUNTY DEED RECORDS.
3. TRACT B IS A PUBLIC PEDESTRIAN ACCESS TRACT CONVEYED TO THE CITY OF SANDY RECORDED IN DOCUMENT NO. 2019-075521, CLACKAMAS COUNTY DEED RECORDS AND IS SUBJECT TO A PUBLIC PEDESTRIAN EASEMENT.
4. TRACTS C AND D ARE CONVEYED TO THE CITY OF SANDY RECORDED IN DOCUMENT NO. 2019-075521, CLACKAMAS COUNTY DEED RECORDS, FOR PUBLIC STORM WATER DETENTION FACILITIES TO BE OWNED AND MAINTAINED BY THE CITY OF SANDY.
5. ACCESS FROM ADJACENT PROPERTIES SHALL BE CONTROLLED BY THE CITY OF SANDY BY THE RECORDING OF THIS PLAT. THIS ACCESS CONTROL WILL BE AUTOMATICALLY TERMINATED UPON THE ACCEPTANCE OF PUBLIC RIGHT-OF-WAY DEDICATION OR THE RECORDING OF A PLAT EXTENDING THE RIGHT-OF-WAY ONTO ADJACENT PROPERTY.
6. THE ACCESS CONTROL RESTRICTION GRANTED TO THE CITY OF SANDY PER NOTE 13, SHEET 4 OF "ZION MEADOWS" WILL AUTOMATICALLY TERMINATE ALONG OAK AVENUE, ASPEN AVENUE, AND A PORTION OF VILLAGE BOULEVARD UPON THE DEDICATION OF RIGHT-OF-WAY AND RECORDING OF THIS PLAT.
7. LOT 20 CONTAINS A SIGN EASEMENT, BENEFITING THE MARSHALL RIDGE HOME OWNERS ASSOCIATION.
8. LOTS 1-3, 6, 9, 11, 12, 14-16, 19, 20, 22 AND 23 ARE SUBJECT TO A RESTRICTIVE COVENANT FOR TREE PROTECTION RECORDED AS DOCUMENT NO. 2019-075522, CLACKAMAS COUNTY DEED RECORDS.
9. THIS PLAT IS SUBJECT TO DECLARATION OF COVENANTS, CONDITIONS, AND RESTRICTIONS PER DOCUMENT NO. 2019-075522, CLACKAMAS COUNTY DEED RECORDS.
10. A PRIVATE DRIVEWAY MAINTENANCE AGREEMENT FOR COMMON ACCESS FOR LOTS 3 AND 4 IS RECORDED UNDER FEE NO. 2019-075524, CLACKAMAS COUNTY DEED RECORDS.
11. A PRIVATE DRIVEWAY MAINTENANCE AGREEMENT FOR COMMON ACCESS FOR LOTS 1 AND 2 IS RECORDED UNDER FEE NO. 2019-075525, CLACKAMAS COUNTY DEED RECORDS.
12. A PRIVATE DRIVEWAY MAINTENANCE AGREEMENT FOR COMMON ACCESS FOR LOTS 21 AND 22 IS RECORDED UNDER FEE NO. 2019-075526, CLACKAMAS COUNTY DEED RECORDS.

FENCE NOTE

FENCES ARE EITHER ON THE PROPERTY LINE OR NON-EXISTENT AT THE TIME OF THIS PLAT.

DECLARATION

KNOW ALL MEN BY THESE PRESENTS, THAT STAFFORD DEVELOPMENT COMPANY, LLC IS THE OWNER OF THE LAND DESCRIBED IN THE ACCOMPANYING SURVEYOR'S CERTIFICATE AND HAS CAUSED THE SUBDIVISION TO BE PREPARED AND THE PROPERTY DIVIDED IN ACCORDANCE WITH O.R.S. CHAPTER 92, AS SHOWN ON THE ANNEXED MAP AND DOES HEREBY DEDICATE TO THE PUBLIC FOREVER ALL RIGHT-OF-WAYS DEPICTED FOR PUBLIC STREET PURPOSES AND HEREBY GRANTING RESTRICTIONS AND PUBLIC AND PRIVATE EASEMENTS WHERE NOTED AND DOES NOT CLAIM OWNERSHIP BEYOND THE PLAT BOUNDARIES. THE PROPERTY IS SUBJECT TO ANY EXISTING EASEMENTS AND RESTRICTIONS SHOWN AS NOTED IN THE PLAT NOTES HEREON.

Gordon Root
GORDON ROOT - MANAGER

ACKNOWLEDGMENT

COUNTY OF CLACKAMAS
STATE OF OREGON S.S.

KNOW ALL MEN BY THESE PRESENTS THAT ON November 15 2019 BEFORE ME A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE PERSONALLY APPEARED GORDON ROOT AS MANAGER OF STAFFORD DEVELOPMENT COMPANY, LLC, WHOM BEING FIRST DULY SWORN DID SAY HE IS THE IDENTICAL PERSON NAMED IN THE FOREGOING INSTRUMENT, AND THAT SAID INSTRUMENT WAS EXECUTED FREELY AND VOLUNTARILY.

Tracy M. Hayden
NOTARY SIGNATURE
Tracy M. Hayden
NOTARY PUBLIC - OREGON
COMMISSION NO. 984279
MY COMMISSION EXPIRES: March 7, 2023

CONSENT AFFIDAVIT

A SUBDIVISION PLAT CONSENT AFFIDAVIT FROM COMMUNITY FINANCIAL CORPORATION, AN OREGON CORPORATION, A TRUST DEED BENEFICIARY PER DOCUMENT NO. 2018-053571, HAS BEEN EXECUTED AND RECORDED AS DOCUMENT NO. 2019-075518, CLACKAMAS COUNTY DEED RECORDS.

A SUBDIVISION PLAT CONSENT AFFIDAVIT FROM BLUM FAMILY DYNASTY, INC., AN OREGON CORPORATION, A TRUST DEED BENEFICIARY PER DOCUMENT NO. 2018-053572, HAS BEEN EXECUTED AND RECORDED AS DOCUMENT NO. 2019-075517, CLACKAMAS COUNTY DEED RECORDS.

APPROVALS

CITY OF SANDY

CITY OF SANDY FILE NO. 17-066 SUB/VAR
APPROVED THIS 21st DAY OF November 2019

BY: [Signature]
CITY OF SANDY PLANNING DIRECTOR

APPROVED THIS 22nd DAY OF November 2019

BY: [Signature]
CITY OF SANDY ENGINEER,
CURRAN MCLEOD, INC.

CLACKAMAS COUNTY

APPROVED THIS 26th DAY OF November 2019

BY: [Signature]
CLACKAMAS COUNTY SURVEYOR;
AND CLACKAMAS COUNTY BOARD OF COMMISSIONERS
DELEGATE PER COUNTY CODE 11.02

ALL TAXES, FEES, ASSESSMENTS OR OTHER CHARGES AS PROVIDED BY O.R.S. 92.095 HAVE BEEN PAID THROUGH

June 30 2020
APPROVED THIS 26 DAY OF November 2019

CLACKAMAS COUNTY ASSESSOR & TAX COLLECTOR
BY: [Signature]
DEPUTY

STATE OF OREGON
COUNTY OF CLACKAMAS S.S.

I DO HEREBY CERTIFY THAT THE ATTACHED PLAT WAS RECEIVED FOR RECORD AND RECORDED ON THE

26th DAY OF November 2019

AT 3:28 O'CLOCK P.M

AS PLAT NUMBER 4603

DOCUMENT NO. 2019-075519

SHERRY HALL, CLACKAMAS COUNTY CLERK

BY: [Signature]
DEPUTY

SHEET 5 OF 5

REGISTERED
PROFESSIONAL
LAND SURVEYOR

[Signature]
OREGON
JANUARY 23, 1990
DALE L. HULT
2427

RENEWS 07/01/21

CLIENT: STAFFORD LAND COMPANY



DRAWN: DRR CHECKED: MSR APPROVED: DLH

DWG NUMBER: 17-025 Plat.dwg
DATE OF PLOT: 11-14-19



EXHIBIT U
NO. 2019-16

AN ORDINANCE APPROVING ANNEXATION OF ONE PROPERTY TOTALING APPROXIMATELY 12.84 ACRES AND ASSIGNMENT OF SFR, SINGLE FAMILY RESIDENTIAL ZONING IN CONFORMANCE WITH THE 2017 URBAN GROWTH BOUNDARY EXPANSION ANALYSIS.

Whereas, William Bloom as the property owner submitted an application (File No. 18-026 ANN) requesting approval to annex one parcel totaling approximately 12.84 acres known as T2S R4E Section 24 C, Tax Lot 100 and requested that SFR (Single Family Residential) zoning be assigned in conformance with the 2017 Urban Growth Boundary Expansion Analysis;

Whereas, Sandy Municipal Code Chapter 17.78, Annexation identifies the procedures to be followed by the City for annexations;

Whereas, in 2016, the Oregon Legislature passed Senate Bill 1573, effective March 15, 2016 that requires a city whose charter requires annexations to be approved by voters to annex the property without submitting it to the voters if the proposal meets certain criteria;

Whereas, the City received a letter dated August 27, 2018 from the Housing Land Advocates ("HLA") and the Fair Housing Council of Oregon ("FHCO") regarding the annexation's compliance with Goal 10. To the extent it is necessary, the City finds that the decision to annex the subject property complies with Goal 10 and its implementing rule at OAR Chapter 660, division 8. In 2014, the City completed an "urbanization study." That study was deemed acknowledged in 2015. The study included an analysis and update of the city's comprehensive plan with respect to Goal 10 and concluded the existing UGB did not contain sufficient residential lands to meet the city's housing needs to 2034. The urbanization study contained a buildable lands inventory ("BLI") and a housing needs projection ("HNP"), both of which followed the methodologies required by ORS 197.296, Goal 10, OAR Chapter 660, division 8 and OAR Chapter 660, division 24;

Whereas, in 2017, the city completed its UGB expansion in accordance with the urbanization study. The Department of Land Conservation and Development approved the UGB expansion in a letter dated June 2, 2017. No parties objected to the UGB expansion and it is now acknowledged in accordance with Oregon law. The property that is the subject of this annexation was included in the UGB expansion to satisfy part of the land needs identified in the urbanization study and its HNP. The property is being annexed in accordance with its conceptual zoning in the UGB expansion, Single Family Residential (SFR). The HNP concluded that the city had a need of approximately 277 acres of low density residential land through 2034. This property contains approximately 12.84 developable acres and therefore increases the city's identified low density residential land. Therefore, Goal 10 is satisfied;

#2019-16

Whereas, original notification of the proposed annexation was sent to the Department of Land Conservation and Development on July 17, 2019 and was updated on June 10, 2019. A separate notice was sent to the property owners and other property owners within 300 feet of the subject property on July 10, 2018 and July 30, 2019 with a legal description of the request being published in the in the August 15, 2018 and August 7, 2019 editions of the Sandy Post;

Whereas, the Sandy Planning Commission reviewed the request at a public hearing on July 22, 2019 and recommended City Council approve the annexation with the recommended conditions identified by staff in the staff report; and

Whereas, the Sandy City Council reviewed the request at a public hearing on September 3, 2019 and determined the proposal complies with both the criteria in SB 1573 and the criteria in the Sandy Municipal Code Chapter 17.78, Annexation.

NOW, THEREFORE, THE CITY OF SANDY ORDAINS AS FOLLOWS,

Section 1: The City Council directs staff to amend the city limits boundary and to provide notice of the annexation to other agencies and organizations as required by state law.

Section 2: The City Council adopts the September 3, 2019 staff report as findings supporting the approval of this annexation and incorporates the report into this ordinance by reference, including the conditions of approval stated in the report.

Section 3: Following adoption of this Ordinance, the Zoning designation for the subject properties will be changed to SFR, Single Family Residential as shown on the adopted zoning map.

Section 4: A legal description and map of the property is attached as Exhibit A to this ordinance.

This ordinance is adopted by the Common Council of the City of Sandy and approved by the Mayor this 03 day of September 2019



Stan Pulliam, Mayor

#2019-16

ATTEST:



Karey Milne, City Recorder

#2019-16

Exhibit 'A'

Parcel 3 of Partition Plat 2018-045

A tract of land located in the Northeast 1/4 of the Southwest 1/4 of Section 24 Township 2 South, Range 4 East, Willamette Meridian, County of Clackamas, State of Oregon and being more particularly described as follows:

Beginning at the 2-inch Iron Pipe marking the center of said Section 24;

Thence South 01°21'13" West 415.49 Feet along the centerline of said Section 24 to an Iron Rod with Pink Plastic Cap "45th P.GEO PLS90079";

Thence leaving said center section line, North 89°02'23" West along the North line of Parcel 4 of Partition Plat 2018-045, Clackamas County Survey Records, and a Westerly extension of said line 1398.64 Feet to the Westerly Right of Way of Southeast Bornstedt Road (County Road No. 682);

Thence North 03°03'52" East along the Westerly Right of Way of said Road 75.94 Feet;

Thence leaving said Westerly Right of Way line South 89°02'26" East 60.01 Feet to a point on the Easterly Right of Way of said road;

Thence North 03°03'54" East along the Easterly Right of Way of said Road 341.59 Feet to an Iron Rod with Pink Plastic Cap "45th P.GEO PLS90079";

Thence leaving said Easterly Right of Way, South 88°57'48" East 1326.15 Feet along the North line of the Northwest 1/4 of the Southwest 1/4 of Section 24 to said Point of Beginning.

Containing 12.84 Acres, more or less

Refer to Exhibit B for map of described tract

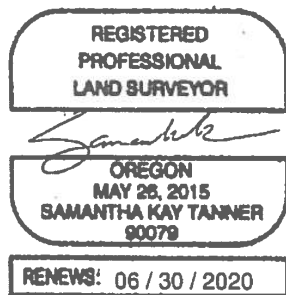
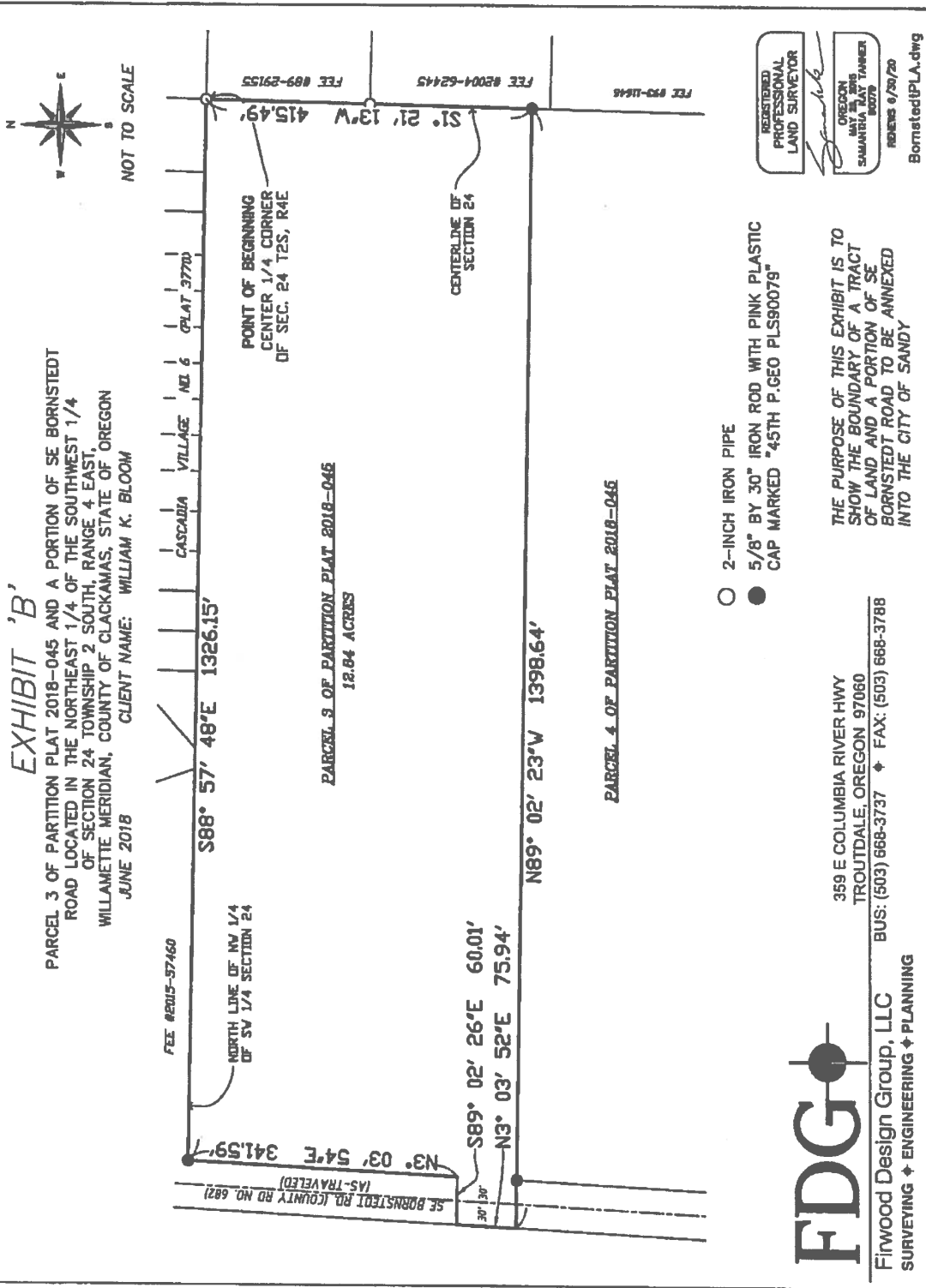


Exhibit A - PARCEL 3.docx PP 2018-045

EXHIBIT 'B'

PARCEL 3 OF PARTITION PLAT 2018-045 AND A PORTION OF SE BORNSTEDT ROAD LOCATED IN THE NORTHEAST 1/4 OF THE SOUTHWEST 1/4 OF SECTION 24 TOWNSHIP 2 SOUTH, RANGE 4 EAST, WILLAMETTE MERIDIAN, COUNTY OF CLACKAMAS, STATE OF OREGON
 JUNE 2018 CLIENT NAME: WILLIAM K. BLOOM



**CITY COUNCIL
ANNEXATION PROPOSAL
STAFF REPORT**

SUBJECT: File No. 18-026 ANN – Bloom Annexation

AGENDA DATE: September 3, 2019

DEPARTMENT: Planning Division

STAFF CONTACT: James A. Cramer, Associate Planner

Application Complete: June 28, 2018
120-Day Deadline: April 5, 2019 (additional details within I.G. of this report)
Heard by Planning Commission: July 22, 2019

EXHIBITS:

Applicant's Submittals

- A. Land Use Application
- B. Supplemental Land Use Application No. 1 & 2
- C. Mailing Labels for Notifying Property Owners
- D. Notification Map
- E. Parcel 3 of Partition Plat No. 2018-045 (Sheet 1 and 2)
- F. Replat of Parcel 1 of Partition Plat 2015-029 and The Adjoining Tract of Land Described in Deed Document No. 2008-049728
- G. Z0023-17-PLA Site Plan
- H. Project Narrative
- I. Site Photos

Public Comments

- J. Darcy and Dennis Jones (July 19, 2018 & August 15, 2019)
- K. Doug Gabbert (August 21, 2018)
- L. Darcy and Dennis Jones (June 1, 2019)

Agency Comments

- M. City Traffic Engineer (October 5, 2019)
- N. ODOT (August 22, 2018)
- O. ODOT (October 15, 2018)

Supplemental Documents provided by Applicant

- P. Transportation Planning Rule Analysis (October 4, 2018)

Supplemental Documents Provided by Staff

- Q. Applicant's Extension Request Letter (August 27, 2018)
- R. Clackamas County Notice of Land Use Decision (May 20, 2019)
- S. Notice of a Proposed Change to a Comprehensive Plan or Land Use Regulation
- T. Fair Housing Council of Oregon (August 27, 2018)
- U. Planning Commission Staff Report

V. Clackamas County Confirmation

I. BACKGROUND

A. APPLICABLE CRITERIA & REVIEW STANDARDS

Sandy Development Code: Chapter 17.12 Procedures for Decision Making; 17.18 Processing Applications; 17.22 Notices; 17.28 Appeals; 17.34 Single Family Residential; 17.78 Annexations

Urban Growth Boundary Expansion Analysis: Chapter 4 Expansion Alternative Justification

B. PROCEEDING

In conformance with the standards of Chapter 17 of the Sandy Municipal Code (SMC) and the voter annexation requirements, this application is processed as a Type IV, Quasi-Judicial Land Use Decision.

C. FACTUAL INFORMATION

1. APPLICANT/PROPERTY OWNER: William Bloom
2. LEGAL DESCRIPTION: T2S R4E Section 24 C, Tax Lot 100
3. PROPOSAL: The applicant, William Bloom, requests a Type A Annexation for a parcel totaling approximately 12.84 acres into the City of Sandy. The current Clackamas County Comprehensive Plan Designation of this property is Rural (R) and the current zoning of the property is Rural Residential Farm Forest 5-Acre (RRFF-5) with a Historic District (HD) Overlay and Historic Landmark (HL) Overlay. The applicant proposes to zone the property as Single Family Residential (SFR) and designate the property as Low Density Residential (LDR) on the Sandy Comprehensive Plan Map.
4. SITE LOCATION: To the south of the adjacent Cascadia Village neighborhood. Fronting SE Bornstedt Road on the east side of the right-of-way.
5. SITE SIZE: property is 12.84 acres
6. SITE DESCRIPTION: The site contains approximately 12.74 acres of land with approximately .10 acres of right-of-way for a total land area of 12.84 acres. The subject property is currently outside the city limits; however, the property is contiguous to city limits on its north and west property lines.
7. COUNTY COMPREHENSIVE PLAN/ZONING: The existing Clackamas County Comprehensive Plan Designation of the property is Rural (R) and the current zoning of

the property is Rural Residential Farm Forest 5-Acre (RRFF-5) with a Historic District (HD) Overlay.

8. **PROPOSED CITY COMPREHENSIVE PLAN DESIGNATION/ZONING:** The applicant proposes to reclassify the property to Low Density Residential (LDR) on the Sandy Comprehensive Plan Map and zone the property to Single Family Residential (SFR) on the Sandy Zoning Map.
9. **VICINITY DESCRIPTION:**
North: Low Density Residential (R-1)
South: Rural Residential Farm Forest 5-Acre (RRFF-5)
East: Rural Residential Farm Forest 5-Acre (RRFF-5)
West: Single Family Residential (SFR)
10. **SERVICE CONSIDERATIONS:** The subject property has an existing 1,056 square foot historic barn and a well house. The site previously had a single-family residence which was demolished via a practice burn by the Sandy Fire Department on May 19, 2018. Future development of the property will require connection to city water and sewer service. Storm drainage, including retention, detention, and water quality treatment will also be required. Any future development will require conformance with storm detention and water quality requirements.
11. **RESPONSE FROM GOVERNMENTAL AGENCIES, UTILITY PROVIDERS, AND CITY DEPARTMENTS:** No comments received.

D. PUBLIC COMMENT

- Darcy and Dennis Jones of 38884 Jerger St. – were told when they purchased their home that the space behind their home would never be developed and do not want to see their views or the existing trees be removed. Suffer from migraines and nervous additional construction noise would “set them off.”
- Doug Gabbert of 19404 Oak Ave. – concerns regarding additional traffic on Bornstedt Rd. including the noise it may produce.
- Darcy and Dennis Jones of 38884 Jerger St. – would like the “greenspace” to remain.

E. PREVIOUS LAND USE DECISIONS: The site previously had a single-family residence which was demolished via a practice burn by the Sandy Fire Department on May 19, 2018. The subject property is currently under the jurisdiction of Clackamas County where a Historic Landmark (HL) Overlay was previously placed on the Fisher Root Cellar, (SHOP #1190) located upon the subject property. The land owner requested demolition (Case File No. Z0169-19-HL) of the root cellar and therefore removing the HL overlay designation. The Clackamas County Historic Review Board (HRB) met on May 9, 2019 to consider the proposal. At this hearing the HRB determined the cellar to be deteriorated to the point of being unsafe and recommended approval of the demolition request to which the Clackamas County Planning Department approved with the conditions identified within Exhibit V.

F. SENATE BILL 1573: Senate Bill 1573 was passed by the legislature and became effective on March 15, 2016 requiring city's whose charter requires annexation to be approved by voters to annex the property without submitting it to the voters if the proposal meets certain criteria:

(a) The territory is included within an urban growth boundary adopted by the city or Metro, as defined in ORS 197.015; **RESPONSE:** As shown on the attached Vicinity Map, the subject property is located within the city's Urban Growth Boundary (UGB).

(b) The territory is, or upon annexation of the territory into the city will be, subject to the acknowledged comprehensive plan of the city; **RESPONSE:** The subject property is identified to have a Low Density Residential designation as identified on the adopted Comprehensive Plan map.

(c) At least one lot or parcel within the territory is contiguous to the city limits or is separated from the city limits only by a public right of way or a body of water; **RESPONSE:** The subject parcel is contiguous to city limits along the north and west property lines.

(d) The proposal conforms to all other requirements of the city's ordinances. **RESPONSE:** An evaluation of each of the city criteria follows.

G. PROCEDURAL CONSIDERATIONS

This request is being processed as a Type A Annexation which is processed as a Type IV review. The proposal was initially scheduled to be heard by Planning Commission on August 27, 2018. Notifications were mailed to property owners within 300 feet of the subject property and to affected agencies on July 10, 2018 as well as a Notice of a Proposed Change to a Comprehensive Plan or Land Use Regulation (Exhibit S) was submitted to the Oregon Department of Land Conservation and Development on July 17, 2018. In addition staff published the legal notice in the August 15, 2018 edition of the Sandy Post.

This land use file (18-026 ANN) was continued at the August 27, 2018 Planning Commission hearing to an undisclosed date due to additional analysis (Transportation Planning Rule and Historic Landmark) being required prior to a recommendation being rendered. The applicant's representative, Kristina Molina, worked closely with staff to provide the materials needed with the understanding that the application would remain open until the documents were received and a hearing could be scheduled. The City received the additional materials needed (Exhibits O, P and R) to complete analysis and the proposal was then scheduled to be heard by Planning Commission on July 22, 2019. Notifications were mailed to property owners within 300 feet of the subject property and to affected agencies on June 18, 2019, a legal notice was published on June 26, 2019 in the local newspaper (Sandy Post) and the Notice of a Proposed Change to a Comprehensive Plan or Land Use Regulation was updated on the Oregon Department of Land Conservation and Development's website on June 10, 2019. In addition, Staff sent an additional notice to neighboring property owners regarding the pending September 3, 2019 City Council hearing associated with the proposed annexation on July 30, 2019 and published the legal notice in the August 7, 2019 edition of

the Sandy Post.

II. ANALYSIS OF CONFORMANCE – DEVELOPMENT CODE

SANDY DEVELOPMENT CODE

1. Chapter 17.26 Zoning District Amendments

In association with the annexation request, the applicant requests Single Family Residential (SFR) zoning to apply the underlying conceptual zoning designation determined in the 2017 Urban Growth Boundary Expansion Analysis.

2. Zoning

The Zoning Map depicts a conceptual zoning designation for the property of SFR, Single Family Residential. Density will be evaluated during land use review (i.e. subdivision) of the subject property.

The applicant submitted a Trip Generation (TG) & Transportation Planning Rule (TPR) Analysis (Exhibit P), which analyzes a reasonable “worst-case” development scenario for the proposed zoning. The analysis determined the change in zoning from RRFF-5 (Clackamas County) to SFR (City of Sandy) will result in a potential increase of up to 31 trips during the morning peak hour, 41 trips during the evening peak hour and 388 daily trips. It was determined by the engineer completing this analysis that this traffic increase is insufficient to result in a significant effect as defined under Oregon’s Transportation Planning Rule, therefore the TPR was satisfied and no mitigation is necessary or recommended.

Upon review of the submitted TG & TPR by the City’s third-party Transportation Engineer, it was determined that the analysis completed by the applicant is sufficient to show compliance with TPR analysis and traffic impact analysis should be completed at time of a future development proposal (i.e. subdivision) to determine considerations as they apply to a specific proposal (Exhibit M). Upon review of the submitted TG & TPR by ODOT it was recommended the City include a condition to limit future development of the site to no more than 43 single family lots or 388 average daily trips (Exhibit P).

3. Chapter 17.78 Annexation

Section 17.78.20 requires that the following conditions must be met prior to beginning an annexation request:

- A. The requirements of Oregon Revised Statutes, Chapters 199 and 222, for initiation of the annexation process are met; and
- B. The site must be within the City of Sandy Urban Growth Boundary; and

- C. The site must be contiguous to the city or separated from it only by a public right of way or a stream, bay, lake or other body of water; and
- D. The site has not violated Section 17.78.25.

RESPONSE: *Oregon Revised Statute Section 199 pertains to Local Government Boundary Commissions and City-County Consolidation. Oregon Revised Statute Section 222 pertains to City Boundary Changes; Mergers; Consolidations and Withdrawals. The proposal complies with applicable requirements at this time and all notices were mailed as necessary.*

The site is located within the Urban Growth Boundary (UGB). The north property line is contiguous with city limits and the west property line is contiguous with city limits for 417 feet along the SE Bornstedt Road right-of-way. The proposed annexation would not create an island, cherry stem, or shoestring annexation.

Section 17.78.25 requires review of tree retention requirements per SMC 17.102 and SMC 17.60 at the time of annexation to discourage property owners from removing trees prior to annexing as a way of avoiding Urban Forestry Ordinance provisions.

- A. Properties shall not be considered for annexation for a minimum of five (5) years if any of the following apply:
 - 1. Where any trees six (6) inches or greater diameter at breast height (DBH) have been removed within 25 feet of the high water level along a perennial stream in the five years prior to the annexation application.
 - 2. Where more than two (2) trees (six (6) inches or greater DBH) per 500 linear feet have been removed in the area between 25 feet and 80 feet of the high water level of Tickle Creek in the five years prior to the annexation application.
 - 3. Where more than two (2) trees (six (6) inches or greater DBH) per 500 linear feet have been removed in the area between 25 feet and 50 feet of the high water level along other perennial streams in the five years prior to the annexation application.
 - 4. Where any trees six (6) inches or greater DBH have been removed on 25 percent or greater slopes in the five years prior to the annexation application.
 - 5. Where more than ten (10) trees (11 inches or greater DBH) per gross acre have been removed in the five years prior to the annexation application, except as provided below:
 - a. Sites under one (1) acre in area shall not remove more than five (5) trees in the five years prior to the annexation application.

- b. Sites where removal of ten (10) or fewer trees will result in fewer than three (3) trees per gross acre remaining on the site. Tree removal may not result in fewer than three (3) trees per gross acre remaining on the site. At least three (3) healthy, non-nuisance trees 11 inches DBH or greater must be retained for every one-acre of contiguous ownership.
- c. For properties in or adjacent to the Bornstedt Village Overlay (BVO), tree removal must not result in fewer than six (6) healthy 11 inch DBH or greater trees per acre. For properties in or adjacent to the BVO and within 300 feet of the FSH Overlay District, tree removal must not result in fewer than nine (9) healthy 11 inch DBH or greater trees per acre.

Rounding: Site area shall be rounded to the nearest half acre and allowed tree removal shall be calculated accordingly. For example, a 1.5 acre site will not be allowed to remove more than fifteen (15) trees in the five years prior to the annexation application. A calculation of 1.2 acres is rounded down to one (1) acre and a calculation of 1.8 is rounded up to two (2) acres.

Cumulative Calculation: Total gross acreage includes riparian areas and other sensitive habitat. Trees removed under SMC 17.78.25(A) 2. and 3. shall count towards tree removal under SMC 17.78.25(A) 5.

B. Exceptions. The City Council may grant exceptions to this section where:

- 1. The property owner can demonstrate that Douglas Fir, Western Red Cedar, or other appropriate native trees were planted at a ratio of at least two trees for every one tree removed no less than five years prior to the submission of the annexation application, and at least 50 percent of these trees have remained healthy; or
- 2. The Council finds that tree removal was necessary due to hazards, or utility easements or access; or
- 3. The trees were removed because they were dead, dying, or diseased and their condition as such resulted from an accident or non-human cause, as determined by a certified arborist or other qualified professional; or
- 4. The trees removed were nuisance trees; or
- 5. The trees were removed as part of a stream restoration and enhancement program approved by the Oregon Department of Fish and Wildlife as improving riparian function; or
- 6. The trees removed were orchard trees, Christmas trees, or commercial nursery trees grown for commercial purposes; or

7. The application of this section will create an island of unincorporated area.

RESPONSE: *The subject property is 12.74 acres with .10 acres of right-of-way. The applicant has not proposed any development at this time and therefore have not completed an arborist report; however, review of aerial photography reveals the property is heavily forested on the east half of the property with a cluster of trees in the northwest corner of the property. A review of historic aerial photos from 1995 to the present reveals no significant tree removal from the property.*

Section 17.78.50 contains required annexation criteria. Requests for annexation should not have an adverse impact on the citizens of Sandy, either financially or in relation to the livability of the city or any neighborhoods within the annexation area. Generally, it is desirable for the city to annex an area if the annexation meets **any** of the following criteria:

- A. A necessary control for development form and standards of an area adjacent to the city; or
- B. A needed solution for existing problems, resulting from insufficient sanitation, water service, or other urban service related problems; or
- C. Land for development to meet urban needs and that meets a logical growth pattern of the city and encourages orderly growth; or
- D. Needed routes for utility and transportation networks.

RESPONSE: *The applicant's narrative indicates they believe annexation of the subject property meets Criterion C and D above. Staff generally agrees with the applicant that the property provides a logical growth pattern for the city and encourages orderly growth. The site is bordered by city limits on the entire north property line and the property to the north has been developed into a single-family dwelling neighborhood known as Cascadia Village. Cascadia Village was designed to include a stubbed street, Averill Parkway, that intersects the subject site to allow for future connection between Cascadia Village and future development on the subject property. Property to the west of the subject site was approved for development by Planning Commission (File No. 17-066 SUB/VAR) on March 26, 2018. The approval granted the property to be subdivided into 37 residential lots for development of single-family homes as well as six variances to the Sandy Development Code.*

Currently, there are utility connections available within Averill Parkway north of the subject property and in SE Bornstedt Road right-of-way to the west of the subject property. Annexation of the subject property will allow for future development which will in turn lead to extension of utility services providing needed utility infrastructure to serve future development within the city's urban growth boundary. Future

development of the subject property and improvements to SE Bornstedt Road right-of-way will add to the existing and future transportation network within the urban growth boundary.

Per Section 17.78.60 (F)3. the applicant was supposed to map the location of areas subject to regulation under Chapter 17.60, Flood and Slope Hazard (FSH) Overlay District. Prior to future development of this property the City will require that the FSH Overlay is mapped and required setback areas per Section 17.60.30 are identified on the subject property.

4. Urban Growth Boundary Expansion Analysis

Chapter 4 Expansion Alternative Justification

Goal 12 – Transportation contains policies to ensure sufficient and adequate transportation facilities and services are available. This goal states that Oregon Administrative Rule (OAR) 660-024-0020(1)(d) does not require the City to conduct an analysis pursuant to the transportation planning rule (“TPR”) prior to adding lands to expand the UGB. This is because the lands that are being added to the UGB will retain their existing county zoning until the owners of the lands choose to annex into the City. At that time, the City will conduct a TPR analysis relative to those lands.

***RESPONSE:** Upon receiving the application, staff did not require TPR findings to be submitted. After additional analysis of code requirements, conversations with the Oregon Department of Transportation (ODOT) and confirmation from the City’s attorney, it was determined that TPR findings shall be submitted for review prior to final approval of any proposed annexations of lands brought into the UGB with the 2017 UGB Expansion. All TPR analysis shall consider a ‘reasonable worst case’ development scenario consistent with the type of development allowable under the City of Sandy Development Code for the zoning district the conceptual zoning map defines for the subject property. The analysis shall be based on the trip rates presented in the Institute of Transportation Engineers’ Trip Generation Manual – 10th Edition. The analysis conducted by the applicant shall also be reviewed by the City of Sandy transportation engineer which requires the payment of a \$1,500 third-party review fee. Until TPR findings are complete and the analysis determines either an insignificant or significant effect on transportation facilities the City of Sandy staff cannot provide a recommendation on approval for this application.*

Upon review of the submitted TPR findings by the City’s third-party Transportation Engineer, it was determined that the analysis completed by the applicant is sufficient to show compliance with TPR analysis and traffic impact analysis should be completed at time of a future development proposal (i.e. subdivision) to determine considerations as they apply to a specific proposal (Exhibit M). Upon review of the submitted trip generation & TPR by ODOT it was recommended the City include a condition to limit future development of the site to no more than 43 single family lots or 388 average daily trips (Exhibit P).

III. SUMMARY

The broad purpose of the City is to provide for the health, safety, and welfare of Sandy's residents. As a means of working to accomplish this purpose, the City regulates development to ensure it occurs in appropriate locations with access to services and is consistent with the values of the community. In addition, the City must ensure that an adequate level of urban services, such as sanitary sewer, can be provided before permitting annexation and subsequent development.

The proposed annexation is located within the city's urban growth boundary with the anticipation of being included in city limits. As noted above, the subject property complies with the criteria contained in Chapter 17.78 of the Sandy Development Code and complies with the requirements found in Senate Bill 1573 passed by the Oregon Legislature in 2016.

Following annexation, the subject property would be zoned Single Family Residential (SFR) as shown on the conceptual zoning map with a comprehensive land designation of Low Density Residential.

IV. PLANNING COMMISSION ACTION

The proposed annexation was presented to the City of Sandy's Planning Commission on Monday July 22, 2019. At that meeting the Planning Commission unanimously voted, 7:0, to forward the proposed annexation to City Council with the recommendation of approval with the following conditions:

1. Prior to the future development of the subject property the standards and criteria of the Flood & Slope Hazard (FSH) Overlay District (Chapter 17.60) shall be applied to the subject property.
2. Prior to the future development of the subject property the Flood & Slope Hazard (FSH) Overlay District map shall be updated to include the subject property.
3. Prior to the future development of the subject property the development shall be limited to no more than 43 single family lots or 388 average daily trips.
4. Prior to the future development of the subject property an applicant, or representative, shall confirm the conditions associated with Case File No. Z0169-19-HL have been fulfilled (Exhibit V).



Emily Meharg <emeharg@ci.sandy.or.us>

FILE# 21-021 SUB/TREE

jbmamoyer@outlook.com <jbmamoyer@outlook.com>
To: city <planning@ci.sandy.or.us>

Sat, Oct 16, 2021 at 4:30 PM

Hi,

We live adjacent to the proposed development at 19618. Our address is 19880. We've lived here since 2004. My grandparents, then my father owned the 19618 property for at least 60 years. There ARE wetlands on that property! I see the decision made that there weren't any wetlands was done in September, of last year, during the dry/fire season. Every fall and winter, after our pond fills up, it overflows, and runs through our property, and through 19618, over the hill, behind the old house. The whole area is soggy. Also, when it's REALLY raining, a creek comes down the property line, from the back fence, and joins this creek.

I'm adding photos of the seasonal creek where it goes through our property, so you can see how much water there is.

Barb Moyer

3 attachments



ATT00213.png
278K



ATT00225.png
1179K



ATT00237.png
251K









EXHIBIT W

DAN JOHNSON
DIRECTOR

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

DEVELOPMENT SERVICES BUILDING

150 BEAVERCREEK ROAD OREGON CITY, OR 97045

MEMORANDUM

TO: City of Sandy, Planning Department
FROM: Kenneth Kent, Clackamas County Engineering
DATE: October 19, 2021
RE: 21-021 SUB – Bornstedt View Subdivision
Legal: 24E24C 00100

This office has the following comments pertaining to this proposal:

1. The proposed 44-lot subdivision includes frontage on SE Bornstedt Road, which is a County maintained minor arterial roadway. Based on this, access and improvements along the frontage of the project site on SE Bornstedt Road requires approval by Clackamas County.
2. County standards limit access onto arterial roadways, requiring that access is taken from lower functional classification roads when available. The proposed access with a new roadway, SE Maple Street, opposite the existing SE Maple Street of the west side of SE Bornstedt Road is consistent with county standards.
3. The existing right-of-way width of SE Bornstedt Road includes a one half width of 30 feet from centerline along the project site frontage. The standard width of an urban arterial roadway calls for a total right-of-way width of 70 feet. The applicant will be required to dedicate approximately 5 feet to provide a minimum one half width of 35 feet.
4. The minimum improvements on the SE Bornstedt Road frontage consistent with the Clackamas County Roadway Standards include, but are not limited to, up to an 20-foot wide half-street improvement, 6-inch Curb, 5-foot wide landscape strip, and a 5-foot wide sidewalk.
5. Clackamas County Roadway Standards (Section 240) requires that intersections with County roads provide minimum intersection sight distance based on the travel speed of the roadway. SE Bornstedt Road has a posted speed limit of 45 miles per hour, which requires a minimum of 500 feet of sight distance to the north and south. The applicant will be required to verify minimum sight distance at the time of development and construction of the new intersection if SE Bornstedt Road.

CONCLUSION

If the City of Sandy approves the request, the following conditions of approval are recommended. If the applicant is advised to or chooses to modify the proposal in terms of access

location and/or design following the preparation of these comments this office requests an opportunity to review and comment on such changes prior to a decision being made.

1. All frontage improvements in, or adjacent to Clackamas County right-of-way, shall be in compliance with *Clackamas County Roadway Standards*.
2. Prior to commencement of site work and recording of the plat the applicant shall obtain a Development Permit from the Clackamas County Engineering Division for design and construction of required improvements, utility installation and access to SE Bornstedt Road. To obtain the Permit, the applicant shall submit plans prepared and stamped by an Engineer registered in the State of Oregon. **Prior to final plat approval:** all required improvements shall be constructed and inspected, or financially guaranteed in the form of a performance bond when access has met minimum Substantial Completion requirements, per Roadway Standards Section 190. Performance bonds shall be in the amount of 125% of the approved engineer's cost estimate of the required improvements.
3. The applicant shall dedicate approximately 5 feet of public right-of-way along the entire SE Bornstedt Road frontage to provide a minimum 35-foot one half right-of-way width. The right-of-way centerline and width shall be verified by a professional survey to the satisfaction of DTD Engineering and Survey Departments.
4. The applicant shall grant an 8-foot wide public easement for signs, slope and public utilities along the entire SE Bornstedt Road right-of-way frontage.
5. Minimum improvements on the SE Bornstedt Road frontage consistent with *Clackamas County's Roadway Standards* include, but are not limited to, up to a one half-street improvement, including:
 - a. Up to a minimum 20-foot wide, one half-street improvement shall be constructed along the entire site frontage to arterial roadway standards, with a structural section per Clackamas County Roadway Standards Standard Drawing C100.
 - b. The half street improvement design shall include cross sections every 25 feet per Roadway Standards Section 250.7.5. The design shall demonstrate that the new curb line and cross slope to the existing centerline allow for construction of a curb on the opposite side of the road with cross slopes that meet minimum standards.
 - c. Lane transitions shall be provided per Roadway Standards Section 250.6.4 based on a 45 MPH design speed.
 - d. Standard curb, or curb and gutter if curblines slope is less than one percent.
 - e. Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.
 - f. A minimum 5-foot wide unobstructed sidewalk shall be constructed along the entire site frontage, per Standard Drawing S960. If the sidewalk does not connect to sidewalk on adjacent property, the end of the sidewalk shall require the construction of a concrete

ramp, adjacent to the end of the sidewalk, providing a transition from the new sidewalk to the edge of the pavement. The ramps shall meet ADA guidelines.

- g. Dual curb ramps shall be constructed per Oregon Standard Drawing (RD 900 Series) at the SE Maple Street intersection with SE Bornstedt Road.
 - h. The intersection SE Maple Street with SE Bornstedt Road shall be constructed at a 90 degree angle, per Section 250.8.2 and 250.8.4 of the Roadway Standards. A minimum 50-foot long landing shall be constructed with an average grade of no more than 5 percent, per Roadway Standards Section 250.7.3.
 - i. Provide minimum intersection sight distance of 500 feet north and south at the SE Maple adequate intersection sight distance per Section 240 of the Clackamas County Roadway Standards. Profile and survey information shall be provide demonstrating adequate intersection sight distance.
 - j. Drainage facilities shall be provided in conformance with Clackamas County Roadway Standards, Chapter 4.
6. A note shall be placed on the plat indicating an access restriction along the SE Bornstedt Road frontage of Lots 1, 2, 3, 4 and 13.