



29799 SW Town Center Loop E, Wilsonville, OR 97070  
 Phone: 503.682.4960 Fax: 503.682.7025  
 Web: [www.ci.wilsonville.or.us](http://www.ci.wilsonville.or.us)

Planning Division  
 Development Permit Application

Final action on development application or zone change is required within 120 days in accordance with provisions of ORS 227.175

A pre application conference is normally required prior to submittal of an application. Please visit the City's website for submittal requirements

Pre-Application Meeting Date: July 1, 2021

Incomplete applications will not be scheduled for public hearing until all of the required materials are submitted.

**Applicant:**

Name: Dan Grimberg  
 Company: West Hills Land Development  
 Mailing Address: 3330 NW Yeon St, Ste 200  
 City, State, Zip: Portland, OR 97210  
 Phone: 503.789.0358 Fax: \_\_\_\_\_  
 E-mail: dan@westhillsdevelopment.com

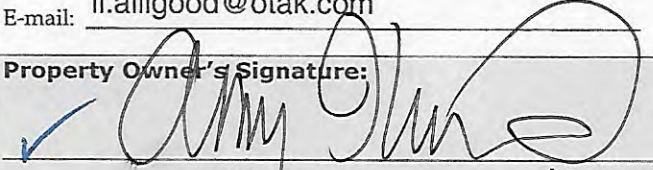
**Authorized Representative:**

Name: Li Alligood, AICP  
 Company: Otak, Inc.  
 Mailing Address: 808 SW Third Ave, Ste 800  
 City, State, Zip: Portland, OR 97204  
 Phone: 503.415.2384 Fax: \_\_\_\_\_  
 E-mail: li.alligood@otak.com


**Property Owner:**

Name: Amy Thurmond  
 Company: NA  
 Mailing Address: 7070 SW Frog Pond Ln  
 City, State, Zip: Wilsonville, OR 97070  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

**Property Owner's Signature:**

  
 Printed Name: Amy Thurmond Date: 10.6.2021

**Applicant's Signature:** (if different from Property Owner)

  
 Printed Name: Dan Grimberg Date: 10/6/21

**Site Location and Description:**

Project Address if Available: 7070 SW Frog Pond Ln Suite/Unit \_\_\_\_\_  
 Project Location: \_\_\_\_\_  
 Tax Map #(s): 31 W 12D Tax Lot #(s): 1501 County:  Washington  Clackamas

**Request:**

Residential subdivision (Frog Pond Estates) of 17 lots, two tracts, and associated infrastructure in Frog Pond West.

**Project Type:**  Class I  Class II  Class III

Residential  Commercial  Industrial  Other: \_\_\_\_\_

**Application Type(s):**

- |  |   |   |   |
|--|---|---|---|
| <input checked="" type="checkbox"/> Annexation               | <input type="checkbox"/> Appeal                     | <input type="checkbox"/> Comp Plan Map Amend            | <input type="checkbox"/> Parks Plan Review              |
| <input type="checkbox"/> Final Plat                          | <input type="checkbox"/> Major Partition            | <input type="checkbox"/> Minor Partition                | <input type="checkbox"/> Request to Modify Conditions   |
| <input type="checkbox"/> Plan Amendment                      | <input type="checkbox"/> Planned Development        | <input checked="" type="checkbox"/> Preliminary Plat    | <input checked="" type="checkbox"/> Site Design Review  |
| <input type="checkbox"/> Request for Special Meeting         | <input type="checkbox"/> Request for Time Extension | <input type="checkbox"/> Signs                          | <input checked="" type="checkbox"/> Stage II Final Plan |
| <input type="checkbox"/> SROZ/SRIR Review                    | <input type="checkbox"/> Staff Interpretation       | <input checked="" type="checkbox"/> Stage I Master Plan | <input type="checkbox"/> Variance                       |
| <input checked="" type="checkbox"/> Type C Tree Removal Plan | <input type="checkbox"/> Tree Permit (B or C)       | <input type="checkbox"/> Temporary Use                  | <input type="checkbox"/> Other (describe)               |
| <input type="checkbox"/> Villebois SAP                       | <input type="checkbox"/> Villebois PDP              | <input type="checkbox"/> Villebois FDP                  |   |
| <input checked="" type="checkbox"/> Zone Map Amendment       | <input checked="" type="checkbox"/> Waiver(s)       | <input type="checkbox"/> Conditional Use                |   |







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E-mail: dan@westhillsdevelopment.com

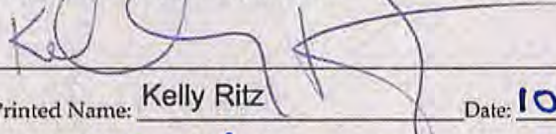
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City, State, Zip: Portland, OR 97204  
Phone: 503.415.2384 Fax: \_\_\_\_\_  
E-mail: li.alligood@otak.com


**Property Owner:**

Name: Kelly Ritz  
Company: Venture Properties LLC  
Mailing Address: 4230 Galewood St, Ste 100  
City, State, Zip: Lake Oswego, OR 97035  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
E-mail: \_\_\_\_\_

**Property Owner's Signature:**

  
Printed Name: Kelly Ritz Date: 10/13/21

**Applicant's Signature:** (If different from Property Owner)

  
Printed Name: Dan Grimberg Date: 10/13/21

**Site Location and Description:**

Project Address if Available: NA Suite/Unit \_\_\_\_\_  
Project Location: SE corner of SW Frog Pond Ln and SW Columbine Ave  
Tax Map #(s): 31W12D Tax Lot #(s): 1500 County:  Washington  Clackamas

**Request:**

Residential subdivision (Frog Pond Estates) of 17 lots, two tracts, and associated infrastructure in Frog Pond West. The subdivision includes Tract I of the Frog Pond Ridge subdivision.

**Project Type:**  Class I  Class II  Class III

Residential  Commercial  Industrial  Other: \_\_\_\_\_

**Application Type(s):**

- |  |   |   |   |
|--|---|---|---|
| <input type="checkbox"/> Annexation                  | <input type="checkbox"/> Appeal                     | <input type="checkbox"/> Comp Plan Map Amend            | <input type="checkbox"/> Parks Plan Review            |
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 City, State, Zip: Portland, OR 97210  
 Phone: 503.789.0358 Fax: \_\_\_\_\_  
 E-mail: dan@westhillsdevelopment.com

**Authorized Representative:**

Name: Li Alligood, AICP  
 Company: Otak, Inc.  
 Mailing Address: 808 SW Third Ave, Ste 800  
 City, State, Zip: Portland, OR 97204  
 Phone: 503.415.2384 Fax: \_\_\_\_\_  
 E-mail: li.alligood@otak.com

**Property Owner:**

Name: Kathy Ludwig, Superintendent  
 Company: West Linn-Wilsonville School District 3JT  
 Mailing Address: 22210 SW Stafford Rd  
 City, State, Zip: Wilsonville, OR 97062  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_  
 E-mail: \_\_\_\_\_

**Property Owner's Signature:**

Kathy Ludwig  
 Printed Name: Kathy Ludwig, Superintendent Date: 10/7/21

**Applicant's Signature:** (If different from Property Owner)

Dan Grimberg  
 Printed Name: Dan Grimberg Date: 10/7/21

**Site Location and Description:**

Project Address if Available: 7035 & 7151 SW Boeckman Rd Suite/Unit \_\_\_\_\_  
 Project Location: \_\_\_\_\_  
31 W 12DC 4500  
 Tax Map #(s): 31 W 12DD Tax Lot #(s): 0400 County:  Washington  Clackamas

**Request:**

Residential subdivision (Frog Pond Estates) of 17 lots, two tracts, and associated infrastructure in Frog Pond West. The School District is annexing TL4500 to the City for right-of-way dedication to extend Brisband Street to the west.

**Project Type:**  **Class I**  **Class II**  **Class III**

Residential  Commercial  Industrial  Other: \_\_\_\_\_

**Application Type(s):**

- |  |   |   |   |
|--|---|---|---|
| <input checked="" type="checkbox"/> Annexation               | <input type="checkbox"/> Appeal                     | <input type="checkbox"/> Comp Plan Map Amend            | <input type="checkbox"/> Parks Plan Review            |
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| <input checked="" type="checkbox"/> Zone Map Amendment       | <input type="checkbox"/> Waiver(s)                  | <input type="checkbox"/> Conditional Use                |   |



**Frog Pond Estates Subdivision (Thurmond Property)**  
**Land Use Application**  
Design Review Board Hearing Submittal

**Submitted to:**

City of Wilsonville  
29799 SW Town Center Loop E.  
Wilsonville, OR 97070

February 18, 2022

**Prepared By:**

Otak, Inc.  
808 SW Third Avenue, Suite 800  
Portland, OR 97204

Project No. 20141.000



# REQUESTS

**Annexation, Zone Map Amendment, Stage I Master Plan, Stage II Final Plan, Site Design Review of Open Space, Type C Tree Removal and Protection Plan, Preliminary Subdivision, Replat, and Waiver approvals** are requested to develop the Frog Pond Estates subdivision and associated infrastructure. The Frog Pond Estates site consists of 7070 SW Frog Pond Ln (“Thurmond property”); a portion of 7035 SW Boeckman Rd (“CSD property”); a portion of 7151 SW Boeckman Rd (“WLWSD property”); and Tract I of the approved Frog Pond Ridge subdivision. See Sheet P2.00.

## SITE INFORMATION

SUBJECT SITE: 7070 SW Frog Pond Ln (TLID 31W12D 01501)  
7035 SW Boeckman Rd (portion of TLID 31W12DD 00400)  
7151 SW Boeckman Rd (portion of TLID 31W12DC 04500)  
Frog Pond Ridge Tract I (portion of TLID 31W12D 1500)

SITE AREA: 7070 SW Frog Pond Ln: 4.06 ac  
7035 SW Boeckman Rd: 0.14 ac included in application  
7151 SW Boeckman Rd: 9.18 ac  
Frog Pond Ridge Tract I: 0.07 ac

COMPREHENSIVE PLAN : Proposed: Residential Neighborhood RN and Public Facilities PF

ZONING: *Current: Clackamas County RRF5 and Residential Neighborhood RN*  
Proposed: Residential Neighborhood RN and Public Facilities PF

## APPLICANT/PROPERTY OWNER

APPLICANT: West Hills Land Development LLC  
3330 NW Yeon Ave, Suite 200  
Portland, OR 97210  
  
Contact: Dan Grimberg  
503.726.7033  
dan@westhillsdevelopment.com

PROPERTY OWNERS: *31W12D 01501*  
Amy Thurmond  
7070 SW Frog Pond Ln  
Wilsonville, OR 97070

*31W12DD 00400*  
West Linn-Wilsonville School District 3JT  
22210 SW Stafford Rd  
Wilsonville, OR 97062

*31W12DC 04500*  
West Linn-Wilsonville School District 3JT  
22210 SW Stafford Rd  
Wilsonville, OR 97062

*31W12D 1500*  
Venture Properties LLC  
4230 Galewood St, Ste 100  
Lake Oswego, OR 97035

## PROJECT DEVELOPMENT TEAM

APPLICANT'S  
REPRESENTATIVE/  
LAND USE PLANNER:

Otak, Inc.  
808 SW Third Avenue, Suite 800  
Portland, OR 97204

Contact: Li Alligood, AICP  
503.415.2384  
li.alligood@otak.com

CIVIL ENGINEER:

Contact: Mike Peebles, PE  
503.415.2354  
mike.peebles@otak.com

LANDSCAPE ARCHITECT:

Contact: Gabriel Kruse, PLA  
503.415.2402  
gabriel.kruse@otak.com

SURVEYOR:

Contact: Mike Spelts, PLS  
503.415.2321  
mike.spelts@otak.com

GEOTECHNICAL  
ENGINEER:

Hardman Geotechnical Services, Inc.  
10110 SW Nimbus Ave, Suite B-5  
Portland, OR 97223

Contact: Scott Hardman  
503.530.8076  
shardman.hgsi@frontier.com

ARBORIST:

Portland Tree Consulting  
PO Box 19042  
Portland, OR 97280

Contact: Ryan Neumann  
503.452.8160  
ryan@pdxtreeconsulting.com



# TABLE OF CONTENTS

|   | Page      |
|---|-----------|
| <b>I. Requests</b> .....  | <b>1</b>  |
| <b>II. Project Description</b> .....  | <b>1</b>  |
| <b>III. Comprehensive Plan Policies</b> .....   | <b>2</b>  |
| A. Urban Growth Management.....   | 2         |
| B. Land Use and Development.....  | 4         |
| C. Areas of Special Interest.....   | 7         |
| <b>IV. Zoning Regulations</b> .....   | <b>8</b>  |
| A. Section 4.035 Site Development Permits.....  | 8         |
| B. Section 4.113. Standards Applying to Residential Developments In Any Zone.....   | 9         |
| C. Section 4.118 Standards Applying in all Planned Development Zones.....   | 12        |
| D. Section 4.124. Standards applying to all Planned Development Residential Zones.....  | 13        |
| E. Section 4.127. Residential Neighborhood (RN) Zone.....   | 15        |
| F. Section 4.136. Public Facility Zones.....  | 23        |
| G. Section 4.140. Planned Development Regulations.....  | 23        |
| <b>V. General Development Regulations</b> .....   | <b>27</b> |
| A. Section 4.154. On-site Pedestrian Access and Circulation.....  | 27        |
| C. Section 4.156. Sign Code Regulations.....  | 31        |
| D. Section 4.167. General Regulations - Access, Ingress and Egress.....   | 31        |
| E. Section 4.169. General Regulations – Double-Frontage Lots.....   | 31        |
| F. Section 4.175. Public Safety and Crime Prevention.....   | 32        |
| G. Section 4.176. Landscaping, Screening, and Buffering.....  | 32        |
| H. Section 4.177. Street Improvement Standards.....   | 40        |
| I. Section 4.180. Exceptions and Modifications - Projections into Required Yards.....   | 45        |
| J. Section 4.181. Exceptions & Modifications - Height Limits.....   | 45        |
| K. Section 4.182. Exceptions and Modifications - Setback Modifications.....   | 46        |
| L. Section 4.197. Zone Changes and Amendments To This Code – Procedures.....  | 46        |
| <b>VI. Land Divisions</b> .....   | <b>48</b> |
| A. Section 4.210. Application Procedure.....  | 48        |
| B. Section 4.236. General Requirements - Streets.....   | 49        |
| C. Section 4.237. General Requirements – Other.....   | 51        |
| D. Section 4.262. Improvements - Requirements.....  | 53        |
| <b>VII. Underground Utilities</b> .....   | <b>55</b> |
| A. Section 4.300 General.....   | 55        |
| B. Section 4.320. Requirements.....   | 55        |
| <b>VIII. Site Design Review</b> .....   | <b>55</b> |
| A. Section 4.400. Purpose.....  | 55        |
| B. Section 4.421. Criteria and Application of Design Standards.....   | 56        |
| C. Section 4.440. Procedure.....  | 58        |
| <b>IX. Tree Preservation and Protection</b> .....   | <b>59</b> |
| A. Section 4.600.20. Applicability of Subchapter.....   | 59        |
| B. Section 4.610.00. Application Review Procedure.....  | 61        |
| C. Section 4.620.00. Tree Relocation, Mitigation, Or Replacement.....   | 65        |
| <b>X. Annexations and Urban Growth Boundary Amendments</b> .....  | <b>67</b> |
| A. Section 4.700. Procedures Relating To The Processing Of Requests For Annexation And Urban Growth<br>Boundary Amendments..... | 67        |
| <b>XI. Conclusion</b> .....   | <b>67</b> |

## Appendices

- Appendix A — City of Wilsonville Annexation Petitions and Certifications
- Appendix B — Stormwater Preliminary Drainage Report dated October 14, 2021, by Otak, Inc.
- Appendix C — Trip Generation Memo dated November 12, 2021, by DKS and Associates
- Appendix D — Tree Plan dated December 8, 2021, by Portland Tree Consulting
- Appendix E — Geotechnical Report dated October 8, 2021, by Hardman Geotechnical Services, Inc.
- Appendix F — Stafford Meadows PUD recorded CC&Rs and Bylaws
- Appendix G — Example Building Elevations
- Appendix H — Service Provider Letter from Republic Services dated November 4, 2021
- Appendix I — Service Provider Letter from Tualatin Valley Fire and Rescue dated October 13, 2021

## Reduced Size Plan Set

- Sheet P0.00 – Cover Sheet
- Sheet P1.00 – Existing Conditions – Aerial
- Sheet P1.10 – Existing Conditions – Survey Mapping
- Sheet P2.00 – Preliminary Site Plan
- Sheet P2.10 – Preliminary Street Cross Sections
- Sheet P3.00 – Preliminary Plat
- Sheet P4.00 – Preliminary Utility Plan
- Sheet P5.00 – Preliminary Grading Plan
- Sheet P6.00 – Annexation Plan
- Sheet P7.00 – Zoning Map
- Sheet P8.00 – Proposed Circulation and Connectivity
- Sheet P9.00 – Possible Future Development
- Sheet P10.00 – Site Impacts of Street Extensions
- Sheet P11.00 – Sub-districts and Density
- Sheet P12.00 – Site Lines
- Sheet L1.00 – Tree Removal and Protection Plan
- Sheet L2.00 – Street Tree and Tract A Planting Plan
- Sheet L2.10 – Landscape Tract Plan
- Sheet L2.20 – Landscape Details
- Sheet L3.00 – Landscape Notes and Details
- Sheet IL.1 – Illumination Notes
- Sheet IL.2 – Illumination Details
- Sheet IL.3 – Illumination Details
- Sheet IL.4 – Illumination Plan

**Note:** All plan sheets are also separately bound in a larger format within the development application submittal.

## Tables

|  |    |
|--|----|
| Table 1. Proposed residential units .....  | 6  |
| Table 2. Frog Pond Estates Density Calculations .....                                | 6  |
| Table 3. Case Studies .....  | 7  |
| Table 4. Compliance with Frog Pond West Neighborhood Lot Dimensional Standards ..... | 18 |
| Table 5. Tree Credits .....  | 38 |



# I. Requests

**Annexation, Zone Map Amendment, Stage I Master Plan, Stage II Final Plan, Site Design Review of Open Space, Type C Tree Removal and Protection Plan, Preliminary Subdivision, Replat, and Waiver approvals** are requested to develop the Frog Pond Estates subdivision and associated infrastructure. The Frog Pond Estates site consists of 7070 SW Frog Pond Ln (“Thurmond property”); a portion of 7035 SW Boeckman Rd (“CSD property”); a portion of 7151 SW Boeckman Rd (“WLWSD property”); and Tract I of the approved Frog Pond Ridge subdivision. See Sheet P2.00.

**Annexation** approval is required to annex the Thurmond and WLWSD properties into City limits. Annexation of the Thurmond property is necessary to allow development and connection to City utilities. Annexation of the WLWSD property is necessary to dedicate right-of-way to extend the Brisband St right-of-way approximately 40 ft. to the west of the CSD property line.

**Zone Map Amendment** approval is required to apply the RN zoning to the Thurmond property and the PF zoning to the WLWSD property. These properties are currently zoned Clackamas County RRFF 5, which does not allow the development envisioned in the Frog Pond Master Plan.

**Stage I Master Plan and Stage II Final Plan** approvals are required because all development of 2 acres or greater in the RN Zone requires approval as a Planned Development, which requires approval of Stage I and Stage II applications. As shown on Sheet P0.00, the Frog Pond Estate development is 4.06 acres in area, which exceeds the 2-acre threshold.

**Site Design Review** approval is required for review of common tracts and landscaping, landscaping in the public right-of-way, and walls.

**Tentative Subdivision Plat** approval is required to divide the property into 17 lots and two tracts. Land divisions of four lots or more are defined as subdivisions.

**Type C Tree Plan** approval is required to remove trees on site for the proposed development.

# II. Project Description

The subject site is located within the Frog Pond West Master Plan area of the City of Wilsonville. It is the applicant’s fourth development in Frog Pond West (previous developments are Stafford Meadows, to the southeast; Frog Pond Meadows, to the east; and Frog Pond Ridge, also to the east).

The applicant, West Hills Land Development LLC, proposes to divide the subject site into 17 lots and 2 tracts and develop the public infrastructure required to serve those lots. In addition, Tract I of the Frog Pond Ridge subdivision is proposed to be replatted to allow a portion of Tract I to be incorporated into Lots 15-17, and a portion to be dedicated as public right-of-way to extend SW Brisband St to the west along the site frontage. In addition, the CSD and WLWSD properties intend to dedicate right-of-way to create a full-width Brisband St to the western property line of the Thurmond property.

The Frog Pond Estates development area is 4.06 acres in area. A total of 17 detached residential lots are proposed, for future development with 17 detached residential homes. The Thurmond property is developed with a residential dwelling and outbuildings at the north end, and is otherwise vacant. The CSD property is currently vacant. The WLWSD property is developed with a residential dwelling and outbuildings, and is planned for future development as a public school to serve the Frog Pond West area.

The development area is adjacent to approved developments in the Frog Pond West area and will extend infrastructure to the north and west to serve the site. Frog Pond Ln improvements will be extended to the west along the northern site boundary, and the SW Columbine Ave right-of-way along the eastern site boundary will be widened by 6 ft. to the full 52-ft. right-of-way width. SW Brisband Ave to the south will be extended to the western site boundary. Two new east-west streets are proposed: public Street A provides frontage and access to Lots 9-14; private Street B provides frontage and access to Lots 5-8 and Tract A. Tract B is a stormwater facility.

### III. Comprehensive Plan Policies

#### A. Urban Growth Management

**Response:** Annexation of the site is subject to the provisions of the Urban Growth Management chapter of the Comprehensive Plan, specifically Goal 2.1 and Policy 2.2.1.

**Policy 2.2.1**

*The City of Wilsonville shall plan for the eventual urbanization of land within the local planning area, beginning with land within the Urban Growth Boundary.*

**Implementation Measure 2.2.1.a**

*Allow annexation when it is consistent with future planned public services and when a need is clearly demonstrated for immediate urban growth.*

**Response:** The Comprehensive Plan states:

*“Based on Metro’s (1981) regional growth allocation statistics, Wilsonville’s population was projected to grow to 15,600 by the year 2000. In the same time period, the City’s economic growth is expected to generate a total of 14,400 jobs. Those projections proved to be surprisingly accurate. In fact, Wilsonville’s population in 2000 approached the 15,600 figure, and the number of jobs exceeded the 14,400 figure.”*

The subject site is located within the West Neighborhood of the Frog Pond planning area. The Frog Pond Area Plan was adopted in 2015 and the Frog Pond West Master Plan was adopted in 2017 and provides for single-family residential and institutional uses to meet the needs of Wilsonville’s growing population. The Frog Pond Area Plan includes a transportation framework, parks and open space framework, and infrastructure framework to support development within the Frog Pond area and assure adequate public services.

This criterion is met.

**Implementation Measure 2.2.1.e**

*Changes in the City boundary will require adherence to the annexation procedures prescribed by State law and Metro standards. Amendments to the City limits shall be based on consideration of:*

- 1. Orderly, economic provision of public facilities and services, i.e., primary urban services are available and adequate to serve additional development or improvements are scheduled through the City’s approved Capital Improvements Plan.*

**Response:** The Frog Pond Area Plan includes implementation measures to ensure the orderly and economic provision of public facilities and services for the Frog Pond Area, including Frog Pond West. Site development is proposed with concurrent applications for Stage I and Stage II Master Plans and Preliminary Subdivision, which proposes the extension of public facilities and services to the Frog Pond Estates site. These proposed services are generally consistent with the Frog Pond Area Plan and Frog Pond West Master Plan, and the City’s Finance Plan and Capital Improvements Plan.

This criterion is met.

- 2. Availability of sufficient land for the various uses to insure choices in the marketplace for a 3 to 5 year period.*

**Response:** The inclusion of the Frog Pond area within the UGB and the adoption of the Frog Pond Area Plan demonstrate the need for residential development and public facilities in the Frog Pond Area. Annexation of the subject site will allow development of the uses envisioned by the adopted Frog Pond West Master Plan.



### 3. *Statewide Planning Goals.*

**Response:** The Statewide Planning Goals provide direction to local jurisdictions regarding the State's policies on land use. These goals are implemented at the local level through Comprehensive Plans, which are required and reviewed by the Department of Land Conservation and Development (DLCD) for conformance with the Statewide Planning Goals. It is assumed that the City's adopted Comprehensive Plan (which includes the adopted Frog Pond Area Plan and Frog Pond West Master Plan) is in compliance with the Statewide Planning Goals (specifically Goal 2: Land Use Planning), and that compliance with the Wilsonville Comprehensive Plan also demonstrates compliance with the Statewide Planning Goals.

Relevant Statewide Planning Goals include:

- Goal 10: Housing
- Goal 12: Transportation
- Goal 14: Urbanization

Responses to each are addressed below.

#### *Goal 10: Housing*

This goal identifies a need for "needed housing," which is defined (for cities having populations larger than 2,500) as attached and detached single-family housing, multiple-family housing, and manufactured homes. Annexation of the subject site into the Wilsonville city limits will provide detached single-family housing, which is defined as "needed housing" and will serve an identified need in the city.

#### *Goal 12: Transportation*

This goal identifies the importance of a safe, convenient, and economic transportation system, and requires local jurisdictions to adopt a Transportation System Plan (TSP). The proposed annexation area will comply with the Wilsonville Transportation System Plan, which has been updated to include the Frog Pond West area. Annexation of the subject site will allow for development of the site, including new street connections included in the TSP.

#### *Goal 14: Urbanization*

This goal identifies the need for orderly and efficient growth, the need to accommodate housing and employment within the urban growth boundary, and the importance of livable communities. The orderly annexation of this site, which is located within the Frog Pond West area, will provide additional housing within the UGB.

### 4. *Applicable Metro Plans;*

**Response:** The Metro Code contains applicable requirements. Section 3.07 Urban Growth Management Functional Plan (Functional Plan) provides direction to communities within Metro's jurisdiction regarding the region's land use and transportation policies, and Chapter 3.09 Local Government Boundary Changes identifies requirements for annexations.

Wilsonville is located within the jurisdiction of Metro, and its local plans and land use ordinances are subject to review by Metro. It is assumed that the City's adopted Comprehensive Plan (which includes the adopted Frog Pond West Master Plan) complies with the Functional Plan, and that compliance with the Wilsonville Comprehensive Plan also demonstrates compliance with the Functional Plan.

#### ***Metro Code 3.07 Urban Growth Management Functional Plan***

Applicable Titles of the Functional Plan are addressed below.

##### *Title 1: Housing Capacity*

Annexation of the subject site will increase the housing capacity of the city, as described and confirmed through adoption of the Frog Pond West Master Plan.

##### *Title 11: Planning for New Urban Areas*

The City of Wilsonville's adopted Frog Pond Area Plan and Frog Pond West Master Plan include a

comprehensive overview of future development in the Frog Pond planning area. The proposed annexation will expand the boundaries of the city and allow for orderly development of the Frog Pond West Area.

**Metro Code 3.09 Local Government Boundary Changes**

**3.09.040 Requirements for Petitions**

- A. A petition for a boundary change must contain the following information:
  - 1. The jurisdiction of the reviewing entity to act on the petition;
  - 2. A map and a legal description of the affected territory in the form prescribed by the reviewing entity;
  - 3. For minor boundary changes, the names and mailing addresses of all persons owning property and all electors within the affected territory as shown in the records of the tax assessor and county clerk; and
  - 4. For boundary changes under ORS 198.855(3), 198.857, 222.125 or 222.170, statements of consent to the annexation signed by the requisite number of owners or electors.
- B. A city, county and Metro may charge a fee to recover its reasonable costs to carry out its duties and responsibilities under this chapter.

**Response:** The petition included as Appendix A includes the information required by this section.

- 5. Encouragement of development within the City limits before conversion of urbanizable (UGB) areas.

**Response:** The subject site is located within the Frog Pond West planning area, which has been the subject of a great deal of local planning efforts. Expansion of the city’s UGB to include this area was completed due to a determination that there was inadequate development area within the existing city limits. Annexation of this site will allow development that implements the vision of the Frog Pond West Master Plan.

**B. Land Use and Development**

**Response:** The requested zone change to RN and PF is subject to compliance with Comprehensive Plan map designation and applicable goals, policies and objectives as well as compliance with the Land Use and Development chapter of the Comprehensive Plan. The PF zone change will accommodate development of a new public school, which is considered a Complementary Facilities and Services use. The RN zone change is specifically subject to Policy 4.1.4 and implementation measures 4.1.4.b, d, e, q, and x.

**Public Facilities and Services**

**Policy 3.1.10**

*The City of Wilsonville shall continue to coordinate planning for educational facilities with all three local school districts and Clackamas Community College.*

**Implementation Measure 3.1.10.c**

*The City shall continue to coordinate with the school districts for the planning, scheduling, and construction of needed educational facilities. To minimize unnecessary duplication, the City will also work in concert with the school districts for the provision of recreational facilities and programs.*

**Response:** The proposed zone change to Public Facilities FP implements the adopted Frog Pond West Master Plan and allows for the future development of a public school to serve the area. The proposed development permitted by the zone change will provide school and educational and services to serve the new households in Frog Pond West.

**Land Use and Development**

**Policy 4.1.4**

*The City of Wilsonville shall provide opportunities for a wide range of housing types, sizes, and densities at prices and rent levels to accommodate people who are employed in Wilsonville.*



**Implementation Measure 4.1.4.b**

*Plan for and permit a variety of housing types consistent with the objectives and policies set forth under this section of the Comprehensive Plan, while maintaining a reasonable balance between the economics of building and the cost of supplying public services. It is the City's desire to provide a variety of housing types needed to meet a wide range of personal preferences and income levels. The City also recognizes the fact that adequate public facilities and services must be available in order to build and maintain a decent, safe, and healthful living environment.*

**Response:** The proposed zone change to Residential Neighborhood RN implements the adopted Frog Pond West Master Plan and allows for development of single-family detached housing. The proposed development permitted by the zone change will provide adequate public facilities and services to serve the new dwellings.

**Implementation Measure 4.1.4.d**

*Encourage the construction and development of diverse housing types, but maintain a general balance according to housing type and geographic distribution, both presently and in the future. Such housing types may include, but shall not be limited to: Apartments, single-family detached, single-family common wall, manufactured homes, mobile homes, modular homes, and condominiums in various structural forms.*

**Response:** The Frog Pond West Master Plan anticipates single-family detached development. The proposed zone change implements the adopted Frog Pond West Master Plan and allows for development of single-family detached housing.

**Implementation Measure 4.1.4.e**

*Targets are to be set in order to meet the City's Goals for housing and assure compliance with State and regional standards.*

**Response:** The Frog Pond Area Plan and Frog Pond West Master Plan establish minimum and maximum residential densities for this area in compliance with state and regional standards. The proposed zone change will allow development of the subject site in conformance with those densities.

**Implementation Measure 4.1.4.q**

*The City will continue to allow for mobile homes and manufactured dwellings, subject to development review processes that are similar to those used for other forms of housing. Individual units will continue to be allowed on individual lots, subject to design standards. Mobile home parks and subdivisions shall be subject to the same procedures as other forms of planned developments.*

**Response:** No mobile homes or manufactured dwellings are proposed, but the applicant acknowledges that they are allowed.

**Implementation Measure 4.1.4.x**

*Apartments and mobile homes are to be located to produce an optimum living environment for the occupants and surrounding residential areas. Development criteria includes:*

- 1. Buffering by means of landscaping, fencing, and distance from conflicting uses.*
- 2. Compatibility of design, recognizing the architectural differences between apartment buildings and houses.*
- 3. On-site recreation space as well as pedestrian and bicycle access to parks, schools, mass transit stops and convenience shopping.*
- 4. The siting of buildings to minimize the visual effects of parking areas and to increase the availability of privacy and natural surveillance for security.*

**Response:** No apartments or mobile homes are proposed or permitted by the requested zoning.

**RESIDENTIAL PLANNING DISTRICTS SHOWN ON THE LAND USE MAP OF THE COMPREHENSIVE PLAN**

**Response:** The Frog Pond West Master Plan Table 1 and Appendix C and the RN zone identify minimum and maximum density targets for the Frog Pond West subdistricts. As shown in Table 1 below, the proposed development will consist of 17 lots and meets the minimum and maximum zone density. These densities are not specifically addressed in Comprehensive Plan policies.

**Table 1. Proposed residential units**

| Land Use Designation | Sub-district | Net Buildable Area (ac) | % of Subdistrict | Minimum du | Maximum du <sup>1</sup> | Proposed du | Comment  |
|----------------------|--------------|-------------------------|------------------|------------|-------------------------|-------------|--|
| R-7                  | 4            | 2.68                    | 10.75            | 9.24 (9)   | 11.5 (12)               | 12          | Meets density requirements                             |
| R-10                 | 7            | 1.38                    | 13.89            | 3.33 (3)   | 4.17 (4)                | 5           | Meets density requirements as further described below. |
| <b>Total</b>         |              | <b>4.06</b>             |                  | <b>12</b>  | <b>16</b>               | <b>17</b>   |  |

Appendix C of the Frog Pond West Master Plan Table 1 (from the Frog Pond Area Plan) illustrates a maximum unit count of 124 for all R-10 zoned Subdistricts within the Frog Pond West Master Plan area. Further, it notes a maximum allowable density of 4.4 dwelling units per acre.

Table 3 of Appendix C *Gross and Net Subdistrict Acres in Frog Pond West* shows a combined net acreage of the R-10 zoned Subdistricts (Subdistricts 3, 7 and 8) of 41.5 acres. As noted in Table 2 - Minimum and Maximum Dwelling Units Permitted in Each Subdistrict, Subdistricts 3, 7 and 8 are permitted a total of 115 units which equates to a net maximum density of 2.8 dwelling units per acre.

The portion of Frog Pond Estates within Subdistrict 7 is 1.38 acres. If the maximum density allocation of 4.4 dwelling units per acre (as noted in the Frog Pond Area Plan and the Frog Pond West Master Plan) is applied this portion of Subdistrict 7, the allowable maximum units would be six (6) dwelling units by right. The proposed density for this area is five (5) lots. See Table 2 below.

**Table 2. Frog Pond Estates Density Calculations**

| Frog Pond Estates    |                           |                           |                         |                         |                           |                                      |                                      |                               |                               |               |
|----------------------|---------------------------|---------------------------|-------------------------|-------------------------|---------------------------|--------------------------------------|--------------------------------------|-------------------------------|-------------------------------|---------------|
| Density Calculations |                           |                           |                         |                         |                           |                                      |                                      |                               |                               |               |
| Subdistrict          | Net Subdistrict Area (sf) | Net Subdistrict Area (ac) | Proposed Site area (sf) | Proposed Site area (ac) | Percentage of Subdistrict | Minimum Units Allowed in Subdistrict | Maximum Units Allowed in Subdistrict | Minimum Units Allowed on Site | Maximum Units Allowed on Site | Proposed Lots |
| 4                    | 1,087,653                 | 24.97                     | 116,892                 | 2.683                   | 10.75%                    | 86                                   | 107                                  | 9.24                          | 11.50                         | 12.00         |
| 7                    | 431,244                   | 9.90                      | 59,890                  | 1.375                   | 13.89%                    | 24                                   | 30                                   | 3.33                          | 4.17                          | 5.00          |
|                      |                           |                           |                         | 4.058                   |                           |                                      |                                      |                               |                               |               |

This portion of the site within Subdistrict 7 represents a unique situation within the Frog Pond West Master Plan area. The proportion of this small part of the subarea that is able to accommodate lot area (90.9 percent) is much greater than any subarea in Frog Pond Ridge, Frog Pond Meadows, or Stafford Meadows. See Table 3 below.

<sup>1</sup> Calculated as described below.

**Table 3. Case Studies**

| Site Usage Comparison                |              |                           |                    |                             |               |                                  |                   |                                      |  |
|--------------------------------------|--------------|---------------------------|--------------------|-----------------------------|---------------|----------------------------------|-------------------|--------------------------------------|--|
| <b>Case Study: Frog Pond Ridge</b>   |              |                           |                    |                             |               |                                  |                   |                                      |  |
| Subdistrict                          | Zone         | Net subdistrict area (ac) | Net site area (ac) | % of gross subdistrict area | Lot area (ac) | Lot area as a % of net site area | Right of way (ac) | Right of way as a % of net site area |  |
| 4                                    | R-7          | 24.8                      | 5.93               | 23.91%                      | 3.08          | 51.94%                           | 2.11              | 35.58%                               |  |
| 5                                    | R-5          | 8                         | 3.28               | 41.00%                      | 1.82          | 55.49%                           | 1.46              | 44.51%                               |  |
| 6                                    | R-5          | 14.9                      | 7.04               | 47.25%                      | 3.39          | 48.15%                           | 3.65              | 51.85%                               |  |
| <b>Total</b>                         |              |                           | 16.25              |                             | 8.29          | <b>51.02%</b>                    | 7.22              | <b>44.43%</b>                        |  |
| <b>Case Study: Frog Pond Meadows</b> |              |                           |                    |                             |               |                                  |                   |                                      |  |
| Subdistrict                          | Zone         | Net subdistrict area (ac) | Net site area (ac) | % of gross subdistrict area | Lot area (ac) | Lot area as a % of net site area | Right of way (ac) | Right of way as a % of net site area |  |
| 2                                    | R-7          | 5.73                      | 1.98               | 34.55%                      | 0.37          | 18.69%                           | 0.78              | 39.39%                               |  |
| 5                                    | R-7          | 8                         | 5.58               | 69.75%                      | 3.06          | 54.84%                           | 1.73              | 31.00%                               |  |
| 6                                    | R-5          | 14.9                      | 7.39               | 49.60%                      | 4.32          | 58.46%                           | 1.68              | 22.73%                               |  |
| 12                                   | R-7 (church) | 3.8                       | 0.69               | NA                          |               |                                  |                   |                                      |  |
| <b>Total</b>                         |              |                           | 15.64              |                             | 7.75          | <b>49.55%</b>                    | 4.19              | <b>26.79%</b>                        |  |
| <b>Case Study: Stafford Meadows</b>  |              |                           |                    |                             |               |                                  |                   |                                      |  |
| Subdistrict                          | Zone         | Net subdistrict area (ac) | Net site area (ac) | % of gross subdistrict area | Lot area (ac) | Lot area as a % of net site area | Right of way (ac) | Right of way as a % of net site area |  |
| 2                                    | R-7          | 5.73                      | 3.65               | 63.70%                      | 2.52          | 69.04%                           | 1.13              | 30.96%                               |  |
| 3                                    | R-10         | 11                        | 11                 | 100.00%                     | 6.52          | 59.27%                           | 3.58              | 32.55%                               |  |
| 12                                   | Civic        | 3.8                       | 0.69               | 18.16%                      | 0.69          | 100.00%                          | 0.01              | 1.45%                                |  |
| <b>Total</b>                         |              |                           | 15.34              |                             | 9.73          | <b>63.43%</b>                    | 4.72              | <b>30.77%</b>                        |  |
| <b>Case Study: Frog Pond Estates</b> |              |                           |                    |                             |               |                                  |                   |                                      |  |
| Subdistrict                          | Zone         | Net subdistrict area (ac) | Net site area (ac) | % of gross subdistrict area | Lot area (ac) | Lot area as a % of net site area | Right of way (ac) | Right of way as a % of net site area |  |
| 4                                    | R-7          | 24.97                     | 2.683              | 10.75%                      | 2.2           | 82.00%                           | 0.41              | 15.39%                               |  |
| 7                                    | R-10         | 9.9                       | 1.375              | 13.89%                      | 1.25          | 90.91%                           | 0.11              | 7.71%                                |  |
| <b>Total</b>                         |              |                           | 4.058              |                             | 3.45          | 85.02%                           | 0.52              | 12.79%                               |  |

Note that the net area of Subdistrict 4 shown above is less than the area shown in Table 3 of Appendix C of the Frog Pond West Master Plan. This is because the table failed to net out approximately 4.93 acres of SROZ. The tables included above assume that SROZ is netted out of the total.

The Frog Pond West Master Plan calls for minimal right-of-way dedication in this area of Frog Pond West. There are two proposed east-west connections, which are provided by the proposed site concept. This section of Frog Pond Lane is a local street, which allows driveway access. As a result, no alleys are required or proposed to provide access to the proposed lots. This area of Frog Pond West does not contain any mapped SROZ or other natural resources, though it does contain a number of existing mature trees.

Because of its small size and the minimal right-of-way area required by the Frog Pond West Master Plan, the proposed site area within Subdistrict 7 easily accommodates five lots that meet all dimensional standards. The lots as proposed exceed the minimum lot size requirement of Subdistrict 7 by 15-57 percent. Dimensional requirements are exceeded in all cases, which allow for the preservation of significant mature trees on lots. Because the proposed development of five lots in this portion of the Subdistrict exceeds minimum lot development standards while preserving significant trees and allowing for compliant future development within the master plan area, and given the overall unit allowance within Subdistrict 7, the applicant finds that the proposed density is permitted within the subdistrict.

### C. Areas of Special Interest

#### AREA L

*This area is located north of Boeckman Road, south of Frog Pond Lane, west of Wilsonville (Stafford) Road, and east of Boeckman Creek. It contains a mixture of rural-residential and small*



agricultural uses. Eventual redevelopment of the area is expected to be primarily residential. The West Linn – Wilsonville School District and a church have acquired property in the area, causing speculation that redevelopment with full urban services could occur prior to 2010. In fact, construction of a new church has already commenced at the corner of Boeckman Road and Wilsonville/Stafford Road.

The existing development patterns, and values of the existing homes in the Frog Pond neighborhood are expected to slow the redevelopment process. Most of the landowners in the area have expressed little or no interest in urban density redevelopment. The Metro standard for urbanizing residential land is an average residential density of at least 10 units/acre. Those densities may not appeal to many of the current residents of the area who live in large homes on lots with acreage. In view of the School District's plans to construct a school within the neighborhood, the City must prepare plans to serve the new school and the surrounding area.

**Response:** The site is located within Area L, now known as the Frog Pond Plan Area. The Frog Pond West Master Plan was adopted in 2017 and provides land use and infrastructure plans for urban density redevelopment. The proposed zone change to RN and PF implements the provisions of the Frog Pond West Master Plan.

## IV. Zoning Regulations

### A. Section 4.035 Site Development Permits

[...]

(.04) *Site Development Permit Application.*

A. *An application for a Site Development Permit shall consist of the materials specified as follows, plus any other materials required by this Code.*

1. *A completed Permit application form, including identification of the project coordinator, or professional design team.*

**Response:** Completed application forms have been submitted.

2. *An explanation of intent, stating the nature of the proposed development, reasons for the Permit request, pertinent background information, information required by the development standards and other information specified by the Director as required by other sections of this Code because of the type of development proposal or the area involved or that may have a bearing in determining the action to be taken. As noted in Section 4.014, the applicant bears the burden of proving that the application meets all requirements of this Code.*

**Response:** This narrative includes a description of the nature of the proposed development, reasons for the request, pertinent background information, and responses to applicable criteria.

3. *Proof that the property affected by the application is in the exclusive ownership of the applicant, or that the applicant has the consent of all individuals or partners in ownership of the affected property.*

**Response:** The submittal includes application forms signed by the property owners and the applicant, verifying that all owners consent to the application.

4. *Legal description of the property affected by the application.*

**Response:** A legal description of the property is included in Appendix A.

5. *The application shall include conceptual and quantitatively accurate representations of the entire development sufficient to judge the scope, size and impact of the development on the community, public facilities and adjacent properties; and except as otherwise specified in this Code, shall be accompanied by the following information,*

**Response:** The exhibits and reports included with this submittal include this information.

6. *Unless specifically waived by the Director, the submittal shall include: ten (10) copies folded to 9" x 12" or (one (1) set of full-sized scaled drawings and nine (9) 8 1/2" x 11" reductions of larger drawings) of the proposed Site Development Plan, including a small scale vicinity map and showing:*
  - a. *Streets, private drives, driveways, sidewalks, pedestrian ways, off-street parking, loading areas, garbage and recycling storage areas, power lines and railroad tracks, and shall indicate the direction of traffic flow into and out of off-street parking and loading areas, the location of each parking space and each loading berth and areas of turning and maneuvering vehicles.*
  - b. *The Site Plan shall indicate how utility service , including sanitary sewer, water and storm drainage, are to be provided. The Site Plan shall also show the following off-site features: distances from the subject property to any structures on adjacent properties and the locations and uses of streets, private drives, or driveways on adjacent properties.*
  - c. *Location and dimensions of structures, utilization of structures, including activities and the number of living units.*
  - d. *Major existing landscaping features including trees to be saved, and existing and proposed contours.*
  - e. *Relevant operational data, drawings and/or elevations clearly establishing the scale, character and relationship of buildings, streets, private drives, and open space.*
  - f. *Topographic information sufficient to determine direction and percentage of slopes, drainage patterns, and in environmentally sensitive areas, e.g., flood plain, forested areas, steep slopes or adjacent to stream banks, the elevations of all points used to determine contours shall be indicated and said points shall be given to true elevation above mean sea level as determined by the City Engineer. The base data shall be clearly indicated and shall be compatible to City datum, if bench marks are not adjacent. The following intervals shall be shown:*
    - i. *One (1) foot contours for slopes of up to five percent (5%);*
    - ii. *Two (2) foot contours for slopes of from six percent (6%) to twelve percent (12%);*
    - iii. *Five (5) foot contours for slopes of from twelve percent (12%) to twenty percent (20%). These slopes shall be clearly identified, and*
    - iv. *Ten (10) foot contours for slopes exceeding twenty percent (20%).*
  - g. *A tabulation of land area, in square feet, devoted to various uses such as building area (gross and net rentable), parking and paving coverage, landscaped area coverage and average residential density per net acre.*
  - h. *An application fee as set by the City Council.*
  - i. *If there are trees in the development area, an arborist's report, as required in Section 4.600. This report shall also show the impacts of grading on the trees.*
  - j. *A list of all owners of property within 250 feet of the subject property, printed on label format. The list is to be based on the latest available information from the County Assessor.*

**Response:** A site circulation plan is included as Sheet P8.00; utility plans are included as Sheet P4.00; an existing conditions plan, including contours and trees, is included as Sheets P1.00 and P1.10; topographic information is shown on Sheet P1.0; a tabulation of land area and uses is included in Sheet P2.00; the application fee has been submitted with this application; an arborist report is included as Appendix D; and a list of property owners within 250 ft. of the subject property, in label format, is included with this application.

## **B. Section 4.113. Standards Applying to Residential Developments In Any Zone**

### **(.01) Open Space Area shall be provided in the following manner**

**Response:** The site is located within the Frog Pond West master plan area, and the provisions of Section 4.127 supersede these standards and are addressed below.

### **(.02) Building Setbacks**

*(for Fence Setbacks, see subsection .08). The following provisions apply unless otherwise provided for by the Code or a legislative master plan. [Section .03 Building Setbacks amended by Ord. 806, /17/2017]*

- A. For lots over 10,000 square feet:
1. Minimum front yard setback: Twenty (20) feet.
  2. Minimum side yard setback: Ten (10) feet. In the case of a corner lot less than one hundred (100) feet in width, abutting more than one street or tract with a private drive, the side yard on the street or private drive side of such lot shall be not less than twenty percent (20%) of the width of the lot, but not less than ten (10) feet.
  3. In the case of a key lot, the front setback shall equal one-half (1/2) the sum of depth of the required yard on the adjacent corner lot along the street or tract with a private drive upon which the key lot faces and the setback required on the adjacent interior lot.
  4. No structure shall be erected within the required setback for any future street shown within the City's adopted Transportation Master Plan or Transportation Systems Plan.
  5. Minimum setback to garage door or carport entry: Twenty (20) feet. Except, however, in the case of an alley where garages or carports may be located no less than four (4) feet from the property line adjoining the alley.
  6. Minimum rear yard setback: Twenty (20) feet. Accessory buildings on corner lots must observe the same rear setbacks as the required side yard of the abutting lot.

**Response:** Three lots over 10,000 square feet are proposed: Lots 1, 2, 5, and 6. As shown on Sheet P2.00, development on these lots can meet these setback requirements.

- B. For lots not exceeding 10,000 square feet:
1. Minimum front yard setback: Fifteen (15) feet, with open porches allowed to extend to within ten (10) feet of the property line.
  2. Minimum side yard setback: One story: five (5) feet; Two or more stories: seven (7) feet. In the case of a corner lot, abutting more than one street or tract with a private drive, the side yard on the street side of such lot shall be not less than ten (10) feet.
  3. In the case of a key lot, the front setback shall equal one-half (1/2) the sum of depth of the required yard on the adjacent corner lot along the street or tract with a private drive upon which the key lot faces and the setback required on the adjacent interior lot.
  4. No structure shall be erected within the required setback for any future street shown within the City's adopted Transportation Master Plan or Transportation Systems Plan.
  5. Minimum setback to garage door or carport entry: Twenty (20) feet. Wall above the garage door may project to within fifteen (15) feet of property line, provided that clearance to garage door is maintained. Where access is taken from an alley, garages or carports may be located no less than four (4) feet from the property line adjoining the alley.
  6. Minimum rear yard setback: One story: fifteen (15) feet. Two or more stories: Twenty (20) feet. Accessory buildings on corner lots must observe the same rear setbacks as the required side yard of the abutting lot. [Section 4.113(.03) amended by Ord. 682, 9/9/10]

**Response:** The Frog Pond Estates site is within the Frog Pond West Master Plan Area and the RN zone is being applied through this application. The site is subject to the setback requirements of Section 4.127, which are addressed in the responses to that section.

**(.03) Height Guidelines**

The Development Review Board may regulate heights as follows:

- A. Restrict or regulate the height or building design consistent with adequate provision of fire protection and fire-fighting apparatus height limitations.
- B. To provide buffering of low density developments by requiring the placement of buildings more than two (2) stories in height away from the property lines abutting a low density zone.
- C. To regulate building height or design to protect scenic vistas of Mt. Hood or the Willamette River from greater encroachments than would occur if developed conventionally.

**Response:** No low-density developments are adjacent to the site and no scenic vistas have been identified on the site. No height regulation is needed.



**(.04) Residential uses for treatment or training**

- A. Residential Homes, as defined in Section 4.001, shall be permitted in any location where a single-family dwelling is permitted.
- B. Residential Facilities, as defined in Section 4.001, shall be permitted in any location where multiple-family dwelling units are permitted.

**Response:** No residential homes or facilities are proposed. These standards are not applicable.

**(.05) Off Street Parking**

*Off-street parking shall be provided as specified in Section 4.155.*

**Response:** The provisions of Section 4.155 are addressed in Section V of this narrative.

**(.06) Signs**

*Signs shall be governed by the provisions of Sections 4.156.01 – 4.156.11.*

**Response:** The provisions of Sections 4.156.01-11 are addressed in Section V of this narrative.

**(.07) Fences**

- A. The maximum height of a sight-obscuring fence located in the required front yard of a residential development shall not exceed four (4) feet.
- B. The maximum height of a sight-obscuring fence located in the side yard of a residential lot shall not exceed four (4) feet forward of the building line and shall not exceed six (6) feet in height in the rear yard, except as approved by the Development Review Board. Except, however, that a fence in the side yard of residential corner lot may be up to six (6) feet in height, unless a greater restriction is imposed by the Development Review Board acting on an application. A fence of up to six (6) feet in height may be constructed with no setback along the side, the rear, and in the front yard of a residential lot adjoining the rear of a corner lot as shown in the attached Figure.
- C. Notwithstanding the provisions of Section 4.122(10)(a) and (b), the Development Review Board may require such fencing as shall be deemed necessary to promote and provide traffic safety, noise mitigation, and nuisance abatement, and the compatibility of different uses permitted on adjacent lots of the same zone and on adjacent lots of different zones.
- D. Fences in residential zones shall not include barbed wire, razor wire, electrically charged wire, or be constructed of sheathing material such as plywood or flakeboard.

**Response:** The site is located within Frog Pond West and is subject to these standards. No fences on residential lots are proposed at this time. Fencing is proposed around the stormwater facility in Tract C, and will be a 6-ft. black chain link fence. See Sheet L2.20 Detail 1.

**(.08) Corner Vision**

*Vision clearance shall be provided as specified in Section 4.177, or such additional requirements as specified by the City Engineer.*

**Response:** The provisions of Section 4.177 are addressed in Section V of this narrative.

**(.09) Prohibited Uses**

- A. Uses of structures and land not specifically permitted in the applicable zoning districts.
- B. The use of a trailer, travel trailer or mobile coach as a residence, except as specifically permitted in an approved RV park.
- C. Outdoor advertising displays, advertising signs, or advertising structures except as provided in Sections 4.156.05, 4.156.07, 4.156.09, and 4.156.10.

**Response:** No prohibited uses are proposed.

**(.10) Accessory Dwelling Units**

*Accessory Dwelling Units, are permitted subject to standards and requirements of this Subsection. [Amended by Ord. #825, 10/15/18]*

**Response:** No accessory dwelling units are proposed, though future development may include accessory dwelling units. These standards are not applicable.

**(.11) Reduced Setback Agreements**

*The following procedure has been created to allow the owners of contiguous residential properties to reduce the building setbacks that would typically be required between those properties, or to allow for neighbors to voluntarily waive the solar access provisions of Section 4.137. Setbacks can be reduced to zero through the procedures outlined in this subsection.[...]*

**Response:** No reduced setbacks are requested through these provisions.

**(.12) Bed and Breakfasts**

**Response:** No bed and breakfasts are proposed. These standards are not applicable.

**C. Section 4.118 Standards Applying in all Planned Development Zones.**

**(.01) Height Guidelines:** *In “S” overlay zones, the solar access provisions of Section 4.137 shall be used to determine maximum building heights. In cases that are subject to review by the Development Review Board, the Board may further regulate heights as follows: [...]*

**Response:** The subject site is not located within the “S” overlay zone. These standards are not applicable.

**(.02)** *Underground Utilities shall be governed by Sections 4.300 to 4.320. All utilities above ground shall be located so as to minimize adverse impacts on the site and neighboring properties.*

**Response:** The provisions of Sections 4.300 to 4.320 are addressed in Section VII of this narrative.

**(.03)** *Notwithstanding the provisions of Section 4.140 to the contrary, the Development Review Board, in order to implement the purposes and objectives of Section 4.140, and based on findings of fact supported by the record may:*

A. *Waive the following typical development standards:*

1. *minimum lot area;*
  2. *lot width and frontage;*
  3. *height and yard requirements;*
  4. *lot coverage;*
  5. *lot depth;*
  6. *street widths;*
  7. *sidewalk requirements;*
  8. *height of buildings other than signs;*
  9. *parking space configuration and drive aisle design;*
  10. *minimum number of parking or loading spaces;*
  11. *shade tree islands in parking lots, provided that alternative shading is provided;*
  12. *fence height;*
  13. *architectural design standards;*
  14. *transit facilities; and*
  15. *On-site pedestrian access and circulation standards; and*
  16. *Solar access standards, as provided in section 4.137.*
- [Amended by Ord. #719, 6/17/13.]*

**Response:** No waivers to these development standards are requested.

B. *The following shall not be waived by the Board, unless there is substantial evidence in the whole record to support a finding that the intent and purpose of the standards will be met in alternative ways:*

1. *open space requirements in residential areas;*
2. *minimum density standards of residential zones;*
3. *minimum landscape, buffering, and screening standards;*

*[...]*

**Response:** No waivers are being requested for these items.

[...]

**D. Section 4.124. Standards applying to all Planned Development Residential Zones.**

**(.01) Examples of principal uses that are typically permitted:**

- A. Open Space.
- B. Single-Family Dwelling Units.
- C. Duplexes. [Added by Ord. #825, 10/15/18]
- D. Multiple-Family Dwelling Units. [Amended by Ord. #825, 10/15/18]
- E. Public parks, playgrounds, recreational and community buildings and grounds, tennis courts, and similar recreational uses, all of a non-commercial nature, provided that any principal building or public swimming pool shall be located not less than forty-five (45) feet from any other lot.
- F. Manufactured homes, subject to the standards of Section 4.115 (Manufactured Housing).

**Response:** The proposed development includes open space and single-family dwelling units. These uses are permitted uses in the PDR zones.

**(.02) Permitted accessory uses to single family and detached dwelling units: [Amended by Ord. #825, 10/15/18]**

- A. Accessory uses, buildings and structures customarily incidental to any of the principal permitted uses listed above and located on the same lot.
- B. Living quarters without kitchen facilities for persons employed on the premises or for guests. Such facilities shall not be rented or otherwise used as a separate dwelling unless approved as an accessory dwelling unit or duplex.
- C. Accessory dwelling units, subject to the standards of Section 4.113 (.11). [Amended by Ord. #825, 10/15/18]
- D. Home occupations.
- E. A private garage or parking area.
- F. Temporary real estate signs, small announcement or professional signs, and subdivision signs, as provided in the provisions of Sections 4.156.05, 4.156.07, 4.156.09, and 4.156.10. [Amended by Ord. No. 704, 6/18/12]
- G. Temporary buildings for uses incidental to construction work, which buildings shall be removed upon completion or abandonment of the construction work.
- H. Accessory buildings and uses shall conform to front and side yard setback requirements. If the accessory buildings and uses do not exceed 120 square feet or ten (10) feet in height, and they are detached and located behind the rear-most line of the main buildings, the side and rear yard setbacks may be reduced to three (3) feet.
- 10. Livestock and farm animals, subject to the provisions of Section 4.162.

**Response:** No accessory uses to the proposed detached single-family dwelling units are requested at this time. It is possible that future homes may include accessory buildings, which would be reviewed at the time of building permit.

**(.03) Permitted accessory uses for duplexes and attached multiple-family dwelling units: [Amended by Ord. #825, 10/15/18]**

- A. Accessory uses, buildings, and structures customarily incidental to any of the aforesaid principal permitted uses, located on the same lot therewith.
- B. Home occupations.
- C. A private garage or parking area.
- D. Temporary buildings for uses incidental to construction work, which buildings shall be removed upon completion or abandonment of the construction work.
- E. Accessory buildings and uses shall conform to front and side yard setback requirements. If the accessory buildings and uses do not exceed 120 square feet or ten (10) feet in height, and they are detached and located behind the rear-most line of the main buildings, the side and rear yard setbacks may be reduced to three (3) feet.
- F. Livestock and farm animals, subject to the provisions of Section 4.162.

**Response:** No duplex dwelling units or attached multiple-family dwelling units are proposed.

**(.05) Appropriate PDR zone based on Comprehensive Plan Density:**

| Comprehensive Plan Density | Zoning District |
|----------------------------|-----------------|
| 0-1 u/acre                 | PDR-1           |
| 2-3 u/acre                 | PDR-2           |
| 4-5 u/acre                 | PDR-3           |
| 6-7 u/acre                 | PDR-4           |
| 10-12 u/acre               | PDR-5           |
| 16-20 u/acre               | PDR-6           |
| 20 + u/acre                | PDR-7           |

**Table 1: PDR Zone based on Comprehensive Plan Density**

*\*All dwelling unit types, except accessory dwelling units, are included for calculating density.*

*[Section 4.124(.05) amended by Ordinance No. 538, 2/21/02.]*

**Response:** The Comprehensive Plan Designation of Residential Neighborhood is implemented by the Residential Neighborhood RN zone. The RN zoning district is not included in the table above.

**(.06) Block and access standards:**

1. *Maximum block perimeter in new land divisions: 1,800 feet.*
2. *Maximum spacing between streets or private drives for local access: 530 feet, unless waived by the Development Review Board upon finding that barriers such as railroads, freeways, existing buildings, topographic variations, or designated Significant Resource Overlay Zone areas will prevent street extensions meeting this standard. [Amended by Ord. 682, 9/9/10]*
3. *Maximum block length without pedestrian and bicycle crossing: 330 feet, unless waived by the Development Review Board upon finding that barriers such as railroads, freeways, existing buildings, topographic variations, or designated Significant Resource Overlay Zone areas will prevent pedestrian and bicycle facility extensions meeting this standard.*

**Response:** As shown in Sheet P3.00, streets and private drives are located less than 530 ft. apart, and block lengths range from ~200 ft. to ~250 ft. The proposed land division creates partial blocks that are expected to be completed with future land divisions to the west. It is anticipated that the north-south street connection shown in Figure 18. Street Demonstration Plan will also be completed with future development to the west.

**(.07) Signs.** *Per the requirements of Sections 4.156.01 through 4.156.11.  
[Amended by Ord. No. 704, 6/18/12]*

**Response:** No signs are currently proposed with this application.

**(.08) Parking.** *Per the requirements of Section 4.155.*

**Response:** The standards of 4.155 are addressed in Section V of this narrative.

**(.09) Corner Vision Clearance.** *Per the requirements of Section 4.177.*

**Response:** The standards of 4.177 are addressed in Section V of this narrative.

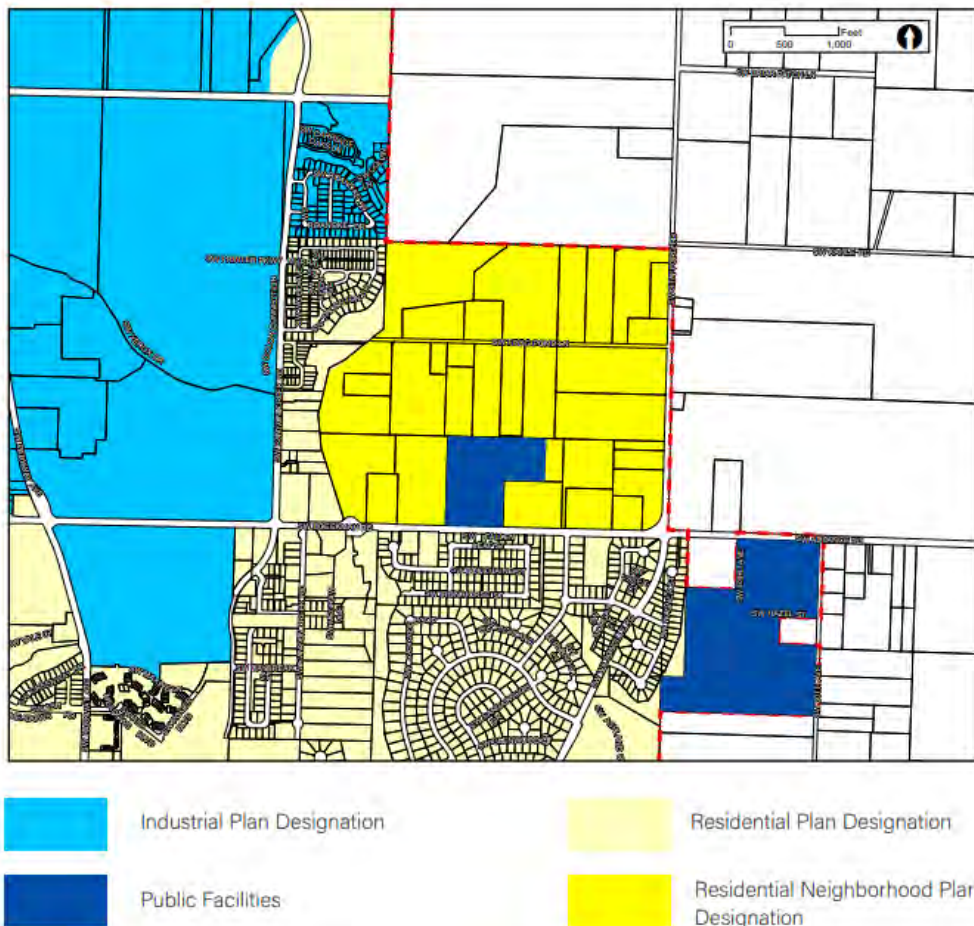


## E. Section 4.127. Residential Neighborhood (RN) Zone.

- (.01) **Purpose.** The Residential Neighborhood (RN) zone applies to lands within Residential Neighborhood Comprehensive Plan Map designation. The RN zone is a Planned Development zone, subject to applicable Planned Development regulations, except as superseded by this section or in legislative master plans. The purposes of the RN Zone are to:
- A. Implement the Residential Neighborhood policies and implementation measures of the Comprehensive Plan.
  - B. Implement legislative master plans for areas within the Residential Neighborhood Comprehensive Plan Map designation.
  - C. Create attractive and connected neighborhoods in Wilsonville.
  - D. Regulate and coordinate development to result in cohesive neighborhoods that include: walkable and active streets; a variety of housing appropriate to each neighborhood; connected paths and open spaces; parks and other non-residential uses that are focal points for the community; and, connections to and integration with the larger Wilsonville community.
  - E. Encourage and require quality architectural and community design as defined by the Comprehensive Plan and applicable legislative master plans.
  - F. Provide transportation choices, including active transportation options.
  - G. Preserve and enhance natural resources so that they are an asset to the neighborhoods, and there is visual and physical access to nature.

**Response:** Per Figure 5 of the Frog Pond West Master Plan (below), the Frog Pond Estates site is located within the RN Comprehensive Plan Map designation and is subject to these provisions and to applicable Planned Development regulations of Section 4.118.

**Figure 5.** Comprehensive Plan Designations



**(.02) Permitted uses:**

- A. Open Space.
- B. Single-Family Dwelling Unit.
- C. Attached Single-Family Dwelling Unit. In the Frog Pond West Neighborhood, a maximum of 2 dwelling units, not including ADU's [sic], may be attached.
- D. Duplex.
- E. Multiple-Family Dwelling Units, except when not permitted in a legislative master plan, subject to the density standards of the zone. Multi-family dwelling units are not permitted within the Frog Pond West Master Plan area.
- F. Cohousing.
- G. Cluster Housing.
- H. Public or private parks, playgrounds, recreational and community buildings and grounds, tennis courts, and similar recreational uses, all of a non-commercial nature, provided that any principal building or public swimming pool shall be located not less than forty-five (45) feet from any other lot.
- I. Manufactured homes.

**Response:** As shown on Sheet P2.00, the proposed development includes 17 detached single-family dwelling units and a private open space within Tract A. None of the proposed dwellings exceed one dwelling unit.

**(.03) Permitted accessory uses to single family dwellings:**

- A. Accessory uses, buildings and structures customarily incidental to any of the principal permitted uses listed above and located on the same lot.
- B. Living quarters without kitchen facilities for persons employed on the premises or for guests. Such facilities shall not be rented or otherwise used as a separate dwelling unless approved as an accessory dwelling unit or duplex.
- C. Accessory Dwelling Units, subject to the standards of Section 4.113 (.11).
- D. Home occupations.
- E. A private garage or parking area.
- F. Keeping of not more than two (2) roomers or boarders by a resident family.
- G. Temporary buildings for uses incidental to construction work, which buildings shall be removed upon completion or abandonment of the construction work.
- H. Accessory buildings and uses shall conform to front and side yard setback requirements. If the accessory buildings and uses do not exceed 120 square feet or ten (10) feet in height, and they are detached and located behind the rear-most line of the main buildings, the side and rear yard setbacks may be reduced to three (3) feet.
- I. Livestock and farm animals, subject to the provisions of Section 4.162.

**Response:** No accessory uses are proposed at this time.

**(.04) Uses permitted subject to Conditional Use Permit requirements:**

- A. Public and semi-public buildings and/or structures essential to the physical and economic welfare of an area, such as fire stations, sub-stations and pump stations.
- B. Commercial Recreation, including public or private clubs, lodges or meeting halls, golf courses, driving ranges, tennis clubs, community centers and similar commercial recreational uses. Commercial Recreation will be permitted upon a finding that it is compatible with the surrounding residential uses and promotes the creation of an attractive, healthful, efficient and stable environment for living, shopping or working. All such uses except golf courses and tennis courts shall conform to the requirements of Section 4.124(.04)(D) (Neighborhood Commercial Centers).
- C. Churches; public, private and parochial schools; public libraries and public museums.
- D. Neighborhood Commercial Centers limited to the provisions of goods and services primarily for the convenience of and supported by local residents. Neighborhood Commercial Centers are only permitted where designated on an approved legislative master plan.

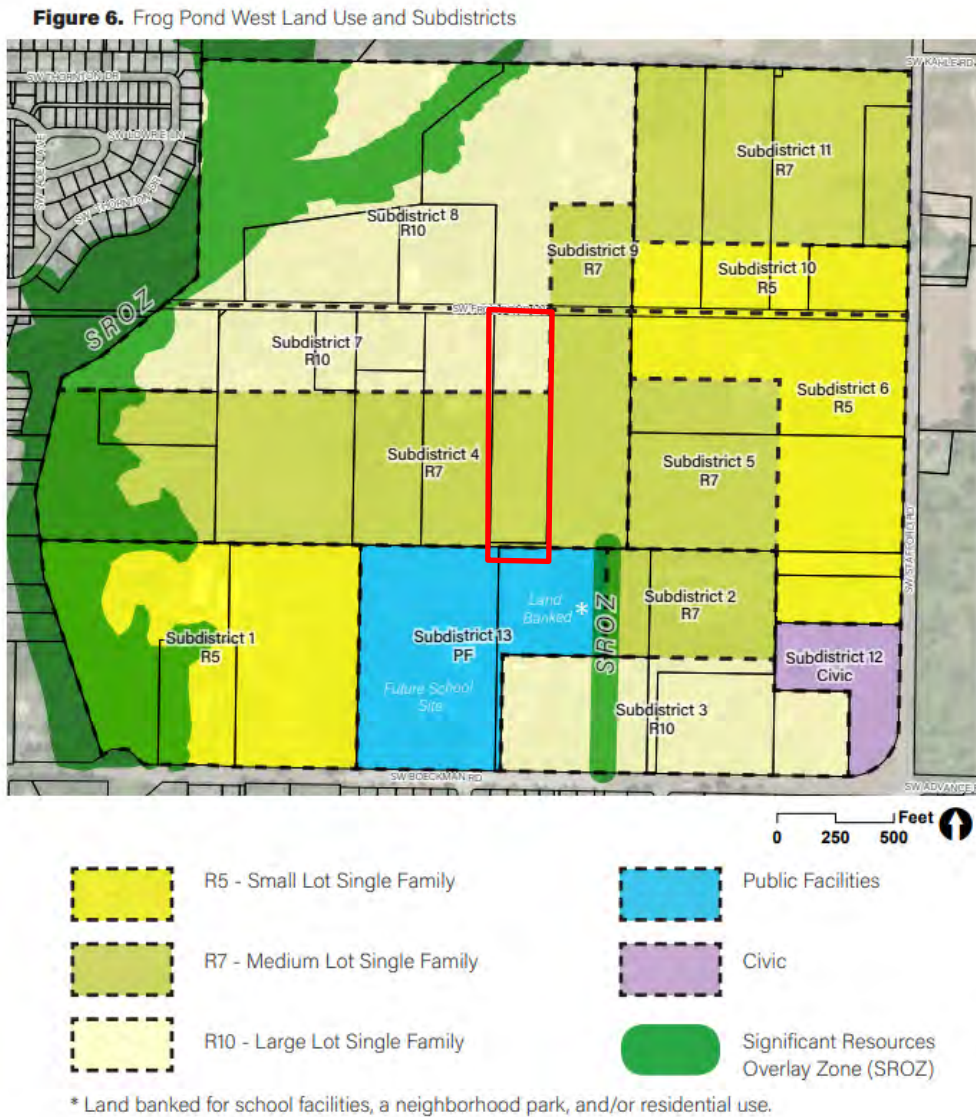
**Response:** No Conditional Uses are proposed.

**(.05) Residential Neighborhood Zone Sub-districts:**

A. RN Zone sub-districts may be established to provide area-specific regulations that implement legislative master plans.

1. For the Frog Pond West Neighborhood, the sub-districts are listed in Table 1 of this code and mapped on Figure 6 of the Frog Pond West Master Plan. The Frog Pond West Master Plan Sub-District Map serves as the official sub-district map for the Frog Pond West Neighborhood.

**Response:** The Frog Pond Estates site includes properties within Sub-districts 4 and 7, as shown in Figure 6 of the Frog Pond West Master Plan (below) and in Table 1 above. The school site is located within Sub-district 13.



**(.06) Minimum and Maximum Residential Units:**

A. The minimum and maximum number of residential units approved shall be consistent with this code and applicable provisions of an approved legislative master plan.

1. For the Frog Pond West Neighborhood, Table 1 in this code and Frog Pond West Master Plan Table 1 establish the minimum and maximum number of residential units for the sub-districts.
2. For parcels or areas that are a portion of a sub-district, the minimum and maximum number of residential units are established by determining the proportional gross acreage and applying that proportion to the minimums and maximums listed in Table 1. The maximum density on a parcel

may be increased, up to a maximum of 10% of what would otherwise be permitted, based on an adjustment to an SROZ boundary that is consistent with 4.139.06.

**Response:** As shown in Tables 1, 2, and 3 above and described in the findings in response to the Comprehensive Plan policies, the proposed Frog Pond Estates development includes 17 lots/dwelling units (5 within Subdistrict 7 and 12 within Subdistrict 4), which meets the density requirements for Subdistricts 7 and 12 as described earlier in this narrative.

B. *The City may allow a reduction in the minimum density for a sub-district when it is demonstrated that the reduction is necessary due to topography, protection of trees, wetlands and other natural resources, constraints posed by existing development, infrastructure needs, provision of non-residential uses and similar physical conditions.*

**Response:** No reduction to minimum density is requested. This provision is not applicable.

**(.07) Development Standards Generally**

A. *Unless otherwise specified by this the regulations in this Residential Development Zone chapter, all development must comply with Section 4.113, Standards Applying to Residential Development in Any Zone.*

**Response:** Compliance with applicable regulations of Section 4.113 is addressed in Section IV of this narrative. Some regulations of 4.127 supersede the regulations of 4.113.

**(.08) Lot Development Standards:**

A. *Lot development shall be consistent with this code and applicable provisions of an approved legislative master plan.*

B. *Lot Standards Generally. For the Frog Pond West Neighborhood, Table 2 establishes the lot development standards unless superseded or supplemented by other provisions of the Development Code.*

C. *Lot Standards for Small Lot Sub-districts. The purpose of these standards is to ensure that development in the Small Lot Sub-districts includes varied design that avoids homogenous street frontages, creates active pedestrian street frontages and has open space that is integrated into the development pattern.*

*Standards. Planned developments in the Small Lot Sub-districts shall include one or more of the following elements on each block:*

1. *Alleys.*
2. *Residential main entries grouped around a common green or entry courtyard (e.g. cluster housing).*
3. *Four or more residential main entries facing a pedestrian connection allowed by an applicable legislative master plan.*
4. *Garages recessed at least 4 feet from the front façade or 6 feet from the front of a front porch.*

**Response:** Table 2 of the Frog Pond Master Plan establishes the following lot development standards for the Frog Pond West neighborhood. These standards supersede the setback standards of 4.113(.03). Lot dimensional standards are applied at the time of subdivision approval, while site development standards (setbacks, height, etc.) are applied at the time of building permit review. Sheet P2.00 illustrates the building envelopes for site and Appendix I provides examples of house plans.

As shown in Table 4 below, the proposed lots meet the relevant standards.

**Table 4. Compliance with Frog Pond West Neighborhood Lot Dimensional Standards**

| Standard                   | Required              | Proposed   | Required              | Proposed   | Comments         |
|----------------------------|-----------------------|------------|-----------------------|------------|------------------|
|                            | R-7 Medium Lot        |            | R-10 Large Lot        |            |                  |
| Min Lot Size (Detached SF) | 6,000 sf <sup>A</sup> | 6,101+sf   | 8,000 <sup>A</sup> sf | 9,208+ sf  | Meets standards. |
| Min Lot Depth              | 60 ft.                | 94.48+ ft. | 60 ft                 | 106.33+ ft | Meets standards. |
| Min Lot Width              | 35 ft                 | 45.2+ ft.  | 40 ft                 | 43.68+ ft  | Meets standards  |

A. *May be reduced to 80% of minimum lot size where necessary to preserve natural resources (e.g. trees, wetlands) and/or provide active open space. Cluster housing may be reduced to 80% of minimum lot size. Duplexes in the R-5 Sub-District have a 6,000 SF minimum lot size.*



D. *Lot Standards Specific to the Frog Pond West Neighborhood.*

1. *Lots adjacent to Boeckman Road and Stafford Road shall meet the following standards:*
  - a. *Rear or side yards adjacent to Boeckman Road and Stafford Road shall provide a wall and landscaping consistent with the standards in Figure 10 of the Frog Pond West Master Plan.*

**Response:** The subject site is not adjacent to Boeckman or Stafford Roads. This standard is not applicable.

2. *Lots adjacent to the collector-designated portions of Willow Creek Drive and Frog Pond Lane shall not have driveways accessing lots from these streets, unless no practical alternative exists for access. Lots in Large Lot Sub-districts are exempt from this standard.*

**Response:** The site abuts the local street-designated portion of Frog Pond Lane west of Willow Creek Drive and these provisions are not applicable.

**(.09) Open Space:**

A. *Purpose. The purposes of these standards for the Residential Neighborhood Zone are to:*

1. *Provide light, air, open space, and useable recreation facilities to occupants of each residential development.*
  2. *Retain and incorporate natural resources and trees as part of developments.*
  3. *Provide access and connections to trails and adjacent open space areas.*
- For Neighborhood Zones which are subject to adopted legislative master plans, the standards work in combination with, and as a supplement to, the park and open space recommendations of those legislative master plans. These standards supersede the Outdoor Recreational Area requirements in WC Section 4.113 (.01) and (02).*

B. *Within the Frog Pond West Neighborhood, the following standards apply:*

1. *Properties within the R-10 Large Lot Single Family sub-districts and R-7 Medium Lot Single Family sub-districts are exempt from the requirements of this section. If the Development Review Board finds, based upon substantial evidence in the record, that there is a need for open space, they may waive this exemption and require open space proportional to the need.*

**Response:** As shown in Figure 6 of the Frog Pond West Master Plan, the site consists of properties within the R-7 and R-10 sub-districts. Therefore, the subject site is exempt from these open space requirements.

**(.10) Block, access and connectivity standards:**

A. *Purpose. These standards are intended to regulate and guide development to create: a cohesive and connected pattern of streets, pedestrian connections and bicycle routes; safe, direct and convenient routes to schools and other community destinations; and, neighborhoods that support active transportation and Safe Routes to Schools.*

B. *Blocks, access and connectivity shall comply with adopted legislative master plans.*

1. *Within the Frog Pond West Neighborhood, streets shall be consistent with Figure 18, Street Demonstration Plan, in the Frog Pond West Master Plan. The Street Demonstration Plan is intended to be guiding, not binding. Variations from the Street Demonstration Plan may be approved by the Development Review Board, upon finding that one or more of the following justify the variation: barriers such as existing buildings and topography; designated Significant Resource Overlay Zone areas; tree groves, wetlands or other natural resources; existing or planned parks and other active open space that will serve as pedestrian connections for the public; alignment with property lines and ownerships that result in efficient use of land while providing substantially equivalent connectivity for the public; and/or site design that provides substantially equivalent connectivity for the public.*

**Response:** As shown in Figure 18, Street Demonstration Plan (below), one public street connection and one pedestrian connection are planned through the subject site, and north-south street connections are planned for the east site boundary and to the west. Generally, the street network is a modified grid, and access to this area of Frog Pond West is provided by Willow Creek Drive and Frog Pond Lane. The site has frontage on Frog Pond Lane, Brisband St, and SW Columbine Ave, the locations of which were approved with previous applications.

Sheet P8.00 illustrates the proposed blocks, access, and connectivity for Frog Pond Estates. Brisband St will extend to the west along the southern site boundary. Proposed Street A will provide an east-west connection to future development to the west and will be continued with future development. Proposed Street B will provide a continuation of the pedestrian walkway within Frog Pond Ridge from the east via a sidewalk connection and can be extended to the west with future development.

The proposed development will complete SW Columbine Ave, which will connect SW Frog Pond Ln to SW Brisband St to the south. The north-south street envisioned to the west of the site is not necessary for site access or frontage, and is anticipated to be completed with future developments to the west. The ultimate number of north-south street connections connecting Frog Pond Lane and Brisband St between Willow Creek Drive and Boeckman Creek is substantially equivalent to the connections shown in the Street Demonstration Plan.

The pattern differs from the Street Demonstration Plan in two respects:

- The approved existing block pattern of street stubs in Morgan Farm don't conform to the Master Plan alignments, as shown in Sheet P8.00. Aligning with these streets sets up a different block pattern than anticipated by the Street Demonstration Plan.
- The proposed shift of the north-south street connection partially on the project boundary sets up a different block pattern that extends the block pattern established by Morgan Farm streets.

The Street Demonstration Plan shows a north-south street running south from Frog Pond Lane to proposed Street A. A pedestrian access is also shown from Street B south to SW Brisband. Placing these facilities on the proposed site would result in the loss of four lots in Subdistrict 4 (Lots 6, 11, 12, and 17) as shown in Sheet P10.00, and which would be below the required minimum density for this subdistrict as shown on Sheet P11.00. The development site is approximately 220 ft. wide. The parcel immediately to the west is approximately 45 feet wider than the subject parcel and is more able to accommodate this future street right of way and pedestrian access. See Sheet P9.00 for a potential layout for this adjacent parcel.

In addition, as shown in Sheet P10.00, extending a street from Frog Pond Lane south to the proposed Street A would result in the removal of a 50" DBH Giant Sequoia, a 49" DBH Ponderosa Pine, a 48" DBH Oregon White Oak (Gary Oak) and a 53" Oregon White Oak (Gary Oak), all of which are viable and proposed for protection.

Though not listed as an approval criterion, staff notes that Figure 13 of the Frog Pond West Master Plan is also relevant. This figure illustrates sight lines from the interior of the Frog Pond West neighborhood to Boeckman Creek to the west.

As proposed, the sight lines remain along Frog Pond Lane and Brisband Street. Between these two streets, the east-west sight lines have been shortened. As conceptually shown on Figure 13, these two sight lines begin at Willow Creek Drive. The proposed plan would shorten these sight lines so that they begin at Columbine Street and continue west approximately 1,500 feet to the edge of the Boeckman Creek corridor.

The southernmost of these two sight lines is truncated by the approved, under-construction Frog Pond Ridge subdivision to the east between Columbine Ave and Willow Creek Drive. The northern pedestrian access (Tract/Street B and Tract A) is shifted off-axis from the approved pedestrian access on Frog Pond Ridge to preserve the existing 54" oak tree as an open space/natural amenity in Tract A and to respond to the dimensional requirements of minimum lot size, width and depth of Subdistrict 12 to the south.

As illustrated in Sheet P9.00 Sight Lines and Connectivity, the potential future street and lot layout complies with the Frog Pond West Master Plan and the RN zone. The layout shown accommodates four east-west streets terminating at the Boeckman Creek corridor and five north-south streets extending from Frog Pond Lane to SW Brisband. The westernmost north-south

street is truncated short of Frog Pond Lane due to the steepness of the existing slope of the Boeckman creek corridor.

**(.011) Signs.** *Per the requirements of Sections 4.156.01 through 4.156.11 and applicable provisions from adopted legislative master plans.*

**Response:** The requirements of Sections 4.156.01 through 4.156.11 are addressed in Section V of this narrative.

**(.012) Parking.** *Per the requirements of Section 4.155 and applicable provisions from adopted legislative master plans.*

**Response:** The requirements of Section 4.155 are addressed in Section V of this narrative. The adopted legislative master plan applicable to this site is the Frog Pond West Master Plan, which has been codified in the zoning ordinance.

**(.013) Corner Vision Clearance.** *Per the requirements of Section 4.177.*

**Response:** The requirements of Section 4.177 are addressed in Section V of this narrative.

**(.014) Main Entrance Standards**

A. *Purpose. These standards:*

1. *Support a physical and visual connection between the living area of the residence and the street;*
2. *Enhance public safety for residents and visitors and provide opportunities for community interaction;*
3. *Ensure that the pedestrian entrance is visible or clearly identifiable from the street by its orientation or articulation; and*
4. *Ensure a connection to the public realm for development on lots fronting both private and public streets by making the pedestrian entrance visible or clearly identifiable from the public street.*

B. *Location. At least one main entrance for each structure must:*

1. *Be within 12 feet of the longest street-facing front wall of the dwelling unit; and*
2. *Either:*
  - a. *Face the street*
  - b. *Be at an angle of up to 45 degrees from the street; or*
  - c. *Open onto a porch. The porch must:*
    - (i) *Be at least 6 feet deep*
    - (ii) *Have at least one entrance facing the street; and*
    - (iii) *Be covered with a roof or trellis*

**Response:** The individual dwelling designs will be reviewed at the time of building permit submittal. As shown in Appendix I, all example dwellings will include a main entrance that meets the standards of this section.

**(.015) Garage Standards**

A. *Purpose. These standards:*

1. *Ensure that there is a physical and visual connection between the living area of the residence and the street;*
2. *Ensure that the location and amount of the living area of the residence, as seen from the street, is more prominent than the garage;*
3. *Prevent garages from obscuring the main entrance from the street and ensure that the main entrance for pedestrians, rather than automobiles, is the prominent entrance;*
4. *Provide for a pleasant pedestrian environment by preventing garages and vehicle areas from dominating the views of the neighborhood from the sidewalk; and*
5. *Enhance public safety by preventing garages from blocking views of the street from inside the residence.*

B. *Street-Facing Garage Walls*

1. *Where these regulations apply. Unless exempted, the regulations of this subsection apply to garages accessory to residential units.*

2. Exemptions:
  - a. Garages on flag lots.
  - b. Development on lots which slope up or down from the street with an average slope of 20 percent or more.
3. Standards.
  - a. The length of the garage wall facing the street may be up to 50 percent of the length of the street-facing building façade. For duplexes, this standard applies to the total length of the street-facing façades. For all other lots and structures, the standards apply to the street-facing façade of each unit. For corner lots, this standard applies to only one street side of the lot. For lots less than 50 feet wide at the front lot line, the standard in (b) below applies.
  - b. For lots less than 50 wide at the front lot line, the following standards apply:
    - (i) The width of the garage door may be up to 50 percent of the length of the street-facing façade.
    - (ii) The garage door must be recessed at least 4 feet from the front façade or 6 feet from the front of a front porch.
    - (iii) The maximum driveway width is 18 feet.
  - a. Where a dwelling abuts a rear or side alley or a shared driveway, the garage shall orient to the alley or shared drive.
  - b. Where three or more contiguous garage parking bays are proposed facing the same street, the garage opening closest to a side property line shall be recessed at least two feet behind the adjacent opening(s) to break up the street facing elevation and diminish the appearance of the garage from the street. Side-loaded garages, i.e., where the garage openings are turned away from the street, are exempt from this requirement.
  - c. A garage entry that faces a street may be no closer to the street than the longest street facing wall of the dwelling unit. There must be at least 20 feet between the garage door and the sidewalk. This standard does not apply to garage entries that do not face the street.

**Response:** As shown on Sheet P2.00, the site design does not include alleys. The individual dwelling designs will be reviewed at the time of building permit submittal. As shown on the plan sheets in Appendix I, all example dwellings will include garages that meet the standards of this section.

**(0.16) Residential Design Standards**

- A. Purpose. These standards:
  1. Support consistent quality standards so that each home contributes to the quality and cohesion of the larger neighborhood and community.
  2. Support the creation of architecturally varied homes, blocks and neighborhoods, whether a neighborhood develops all at once or one lot at a time, avoiding homogeneous street frontages that detract from the community's appearance.
- B. Applicability. These standards apply to all façades facing streets, pedestrian connections, or elsewhere as required by this Code or the Development Review Board. Exemptions from these standards include: (1) Additions or alterations adding less than 50% to the existing floor area of the structure; and, (2) Additions or alterations not facing a street.

**Response:** The individual dwelling designs will be reviewed at the time of building permit submittal. The standards of Subsection (0.16) are not applicable at this time.

**(0.17) Fences**

- A. Within Frog Pond West, fences shall comply with standards in 4.113 (.07) except as follows:
  1. Columns for the brick wall along Boeckman Road and Stafford Road shall be placed at lot corners where possible.
  2. A solid fence taller than 4 feet in height is not permitted within 8 feet of the brick wall along Boeckman Road and Stafford Road, except for fences placed on the side lot line that are perpendicular to the brick wall and end at a column of the brick wall.
  3. Height transitions for fences shall occur at fence posts.

**Response:** The subject site is not adjacent to Boeckman or Stafford Roads. In addition, no fences on residential lots are being proposed at this time. These standards are not applicable.

**(0.18) Homes Adjacent to Schools, Parks and Public Open Spaces**

- A. *Purpose.* The purpose of these standards is to ensure that development adjacent to schools and parks is designed to enhance those public spaces with quality design that emphasizes active and safe use by people and is not dominated by driveways, fences, garages, and parking.
- B. *Applicability.* These standards apply to development that is adjacent to or faces schools and parks. As used here, the term adjacent includes development that is across a street or pedestrian connection from a school or park.

**Response:** Lots 15-17 are adjacent to the future school planned for the property to the south, and is separated from the school site by the proposed Brisband St. Each of these lots are designed to be front-loaded homes.

- C. *Development must utilize one or more of the following design elements:*
  - 1. *Alley loaded garage access.*
  - 2. *On corner lots, placement of the garage and driveway on the side street that does not face the school, park, or public open space.*
  - 3. *Recess of the garage a minimum of four feet from the front façade of the home. A second story above the garage, with windows, is encouraged for this option.*

**Response:** There are no alleys proposed and none of the subject lots are corner lots. Compliance with C.3 above will be reviewed at the time of building permit.

- D. *Development must be oriented so that the fronts or sides of homes face adjacent schools or parks. Rear yards and rear fences may generally not face the schools or parks, unless approved through the waiver process of 4.118 upon a finding that there is no practicable alternative due to the size, shape or other physical constraint of the subject property.*

**Response:** Lots 15-17 are oriented so that the front of the homes will face the adjacent school.

**F. Section 4.136. Public Facility Zones**

**Response:** This application requests that the PF zone be applied to the School District parcel to the south. However, no development is proposed at this time. The standards of this section will be addressed at the time of site development.

**G. Section 4.140. Planned Development Regulations.**

[...]

**(.02) Lot Qualification.**

- A. *Planned Development may be established on lots which are suitable for and of a size to be planned and developed in a manner consistent with the purposes and objectives of Section 4.140.*
- B. *Any site designated for development in the Comprehensive Plan may be developed as a Planned Development, provided that it is zoned "PD." All sites which are greater than two (2) acres in size, and designated in the Comprehensive Plan for commercial, residential, or industrial use shall be developed as Planned Developments, unless approved for other uses permitted by the Development Code. Smaller sites may also be developed through the City's PD procedures, provided that the location, size, lot configuration, topography, open space and natural vegetation of the site warrant such development.*

**Response:** The subject site greater than 2 acres and is designated in the Comprehensive Plan for residential use and Planned Development is required. The proposed development will be developed as a residential Planned Development per the provisions of this section.

**(.03) Ownership.**

- A. *The tract or tracts of land included in a proposed Planned Development must be in one (1) ownership or control or the subject of a joint application by the owners of all the property included. The holder*



*of a written option to purchase, with written authorization by the owner to make applications, shall be deemed the owner of such land for the purposes of Section 4.140.*

- B. Unless otherwise provided as a condition for approval of a Planned Development permit, the permittee may divide and transfer units or parcels of any development. The transferee shall use and maintain each such unit or parcel in strict conformance with the approval permit and development plan.*

**Response:** The property included in the proposed PD is the subject of a joint application by the owners of all of the property included.

**(.04) Professional Design.**

- A. The applicant for all proposed Planned Developments shall certify that the professional services of the appropriate professionals have been utilized in the planning process for development.*
- B. Appropriate professionals shall include, but not be limited to the following to provide the elements of the planning process set out in Section 4.139:*
- 1. An architect licensed by the State of Oregon;*
  - 2. A landscape architect registered by the State of Oregon;*
  - 3. An urban planner holding full membership in the American Institute of Certified Planners, or a professional planner with prior experience representing clients before the Development Review Board, Planning Commission, or City Council; or*
  - 4. A registered engineer or a land surveyor licensed by the State of Oregon.*
- C. One of the professional consultants chosen by the applicant from either 1, 2, or 3, above, shall be designated to be responsible for conferring with the planning staff with respect to the concept and details of the plan.*
- D. The selection of the professional coordinator of the design team will not limit the owner or the developer in consulting with the planning staff.*

**Response:** The development team includes Keith Buisman, PE; Steve Dixon, PLA; Gabriel Kruse, PLA; and Li Alligood, AICP. Li Alligood has been designated as the applicant's representative and party responsible for conferring with the planning staff.

**(.05) Planned Development Permit Process.**

- A. All parcels of land exceeding two (2) acres in size that are to be used for residential, commercial or industrial development, shall, prior to the issuance of any building permit:*
- 1. Be zoned for planned development;*
  - 2. Obtain a planned development permit; and*
  - 3. Obtain Development Review Board, or, on appeal, City Council approval.*

**Response:** The subject site exceeds 2 acres in size and is proposed for residential development. This application includes a zoning map amendment to apply the RN zone to the site; Master Plan Stage I application; and Master Plan Stage II application.

- B. Zone change and amendment to the zoning map are governed by the applicable provisions of the Zoning Sections, inclusive of Section 4.197.*

**Response:** The requested zoning map amendment is subject to the applicable provisions of the Zoning Sections and 4.197. These provisions are addressed in Sections IV and V of this narrative.

- C. Development Review Board approval is governed by Sections 4.400 to 4.450*
- D. All planned developments require a planned development permit. The planned development permit review and approval process consists of the following multiple stages, the last two or three of which can be combined at the request of the applicant:*
- 1. Pre-application conference with Planning Department;*
  - 2. Preliminary (Stage I) review by the Development Review Board. When a zone change is necessary, application for such change shall be made simultaneously with an application for preliminary approval to the Board; and*
  - 3. Final (Stage II) review by the Development Review Board*

4. *In the case of a zone change and zone boundary amendment, City Council approval is required to authorize a Stage I preliminary plan.*

**Response:** A pre-application conference was held with the Planning Department on July 1, 2021. Concurrent zoning map amendment, Stage I, and Stage II applications (and a number of additional concurrent applications) have been submitted for review by the DRB.

[...]

**(.07) Preliminary Approval (Stage One):**

- A. *Applications for preliminary approval for planned developments shall:*
  1. *Be made by the owner of all affected property or the owner's authorized agent; and*
  2. *Be filed on a form prescribed by the City Planning Department and filed with said Department.*
  3. *Set forth the professional coordinator and professional design team as provided in subsection (.04), above.*
  4. *State whether the development will include mixed land uses, and if so, what uses and in what proportions and locations.*

**Response:** This submittal includes all the above information.

- B. *The application shall include conceptual and quantitatively accurate representations of the entire development sufficient to judge the scope, size, and impact of the development on the community; and, in addition to the requirements set forth in Section 4.035, shall be accompanied by the following information:*
  1. *A boundary survey or a certified boundary description by a registered engineer or licensed surveyor.*
  2. *Topographic information as set forth in Section 4.035*
  3. *A tabulation of the land area to be devoted to various uses, and a calculation of the average residential density per net acre.*
  4. *A stage development schedule demonstrating that the developer intends receive Stage II approval within two (2) years of receiving Stage I approval, and to commence construction within two (2) years after the approval of the final development plan, and will proceed diligently to completion; unless a phased development schedule has been approved; in which case adherence to that schedule shall be considered to constitute diligent pursuit of project completion.*
  5. *A commitment by the applicant to provide in the Final Approval (Stage II) a performance bond or other acceptable security for the capital improvements required by the project.*
  6. *If it is proposed that the final development plan will be executed in stages, a schedule thereof shall be provided.*
  7. *Statement of anticipated waivers from any of the applicable site development standards.*

**Response:** A boundary survey including topographic information is included as Sheet P1.10. A tabulation of land area and residential density is included in Table 1 within this narrative. Stage I and Stage II approvals are being requested concurrently, and a stage development schedule is not proposed.

**(.09) Final Approval (Stage Two):**

[Note: Outline Number is incorrect.]

- A. *Unless an extension has been granted by the Development Review Board, within two (2) years after the approval or modified approval of a preliminary development plan (Stage I), the applicant shall file with the City Planning Department a final plan for the entire development or when submission in stages has been authorized pursuant to Section 4.035 for the first unit of the development, a public hearing shall be held on each such application as provided in Section 4.013.*

**Response:** A Stage II application has been submitted concurrent with the Stage I application.

- B. *After such hearing, the Development Review Board shall determine whether the proposal conforms to the permit criteria set forth in this Code, and shall approve, conditionally approve, or disapprove the application.*
- C. *The final plan shall conform in all major respects with the approved preliminary development plan, and shall include all information included in the preliminary plan plus the following:*

1. *The location of water, sewerage and drainage facilities;*
2. *Preliminary building and landscaping plans and elevations, sufficient to indicate the general character of the development;*
3. *The general type and location of signs;*
4. *Topographic information as set forth in Section 4.035;*
5. *A map indicating the types and locations of all proposed uses; and*
6. *A grading plan.*

**Response:** A Preliminary Utility Plan is included as Sheet P4.00. Preliminary building elevations are included as Appendix I. Preliminary landscaping plans are included as Sheet L2.00. A Preliminary Grading Plan is included as Sheet P5.00. Sign locations and permits will be provided under separate application.

*D. The final plan shall be sufficiently detailed to indicate fully the ultimate operation and appearance of the development or phase of development. However, Site Design Review is a separate and more detailed review of proposed design features, subject to the standards of Section 4.400.*

**Response:** A concurrent Site Design Review application has been submitted. Section 4.400 Site Design Review criteria are addressed in Section VIII of this narrative.

*E. Copies of legal documents required by the Development Review Board for dedication or reservation of public facilities, or for the creation of a non-profit homeowner's association, shall also be submitted.*

**Response:** The recorded Declaration of Protective Covenants, Conditions, Restrictions and Easements for Stafford Meadows is included as Appendix F. Frog Pond Estates will be annexed into the existing Homeowners Association (HOA).

[...]

*J. A planned development permit may be granted by the Development Review Board only if it is found that the development conforms to all the following criteria, as well as to the Planned Development Regulations in Section 4.140:*

1. *The location, design, size and uses, both separately and as a whole, are consistent with the Comprehensive Plan, and with any other applicable plan, development map or Ordinance adopted by the City Council.*

**Response:** The site is located within the Frog Pond West neighborhood of the Frog Pond planning area. The Frog Pond West Master Plan has been incorporated into the Comprehensive Plan and designates the site for single-family residential development. Consistency with the Comprehensive Plan is addressed in Section III of this narrative. The RN zone is identified as the implementing zone for the Residential Neighborhood RN Comprehensive Plan designation; this zone requires that all development within it be approved as a Planned Development.

2. *That the location, design, size and uses are such that traffic generated by the development at the most probable used intersection(s) can be accommodated safely and without congestion in excess of Level of Service D, as defined in the Highway Capacity Manual published by the National Highway Research Board, on existing or immediately planned arterial or collector streets and will, in the case of commercial or industrial developments, avoid traversing local streets. Immediately planned arterial and collector streets are those listed in the City's adopted Capital Improvement Program, for which funding has been approved or committed, and that are scheduled for completion within two years of occupancy of the development or four year if they are an associated crossing, interchange, or approach street improvement to Interstate 5.*
  - a. *In determining levels of Service D, the City shall hire a traffic engineer at the applicant's expense who shall prepare a written report containing the following minimum information for consideration by the Development Review Board:*
    - i. *An estimate of the amount of traffic generated by the proposed development, the likely routes of travel of the estimated generated traffic, and the source(s) of information of the estimate of the traffic generated and the likely routes of travel; [Added by Ord. 561, adopted 12/15/03.]*

- ii. *What impact the estimate generated traffic will have on existing level of service including traffic generated by (1) the development itself, (2) all existing developments, (3) Stage II developments approved but not yet built, and (4) all developments that have vested traffic generation rights under section 4.140(.10), through the most probable used intersection(s), including state and county intersections, at the time of peak level of traffic. This analysis shall be conducted for each direction of travel if backup from other intersections will interfere with intersection operations. [Amended by Ord 561, adopted 12/15/03.]*
- b. *The following are exempt from meeting the Level of Service D criteria standard:*
  - i. *A planned development or expansion thereof which generates three (3) new p.m. peak hour traffic trips or less;*
  - ii. *A planned development or expansion thereof which provides an essential governmental service.*
- c. *Traffic generated by development exempted under this subsection on or after Ordinance No. 463 was enacted shall not be counted in determining levels of service for any future applicant. [Added by Ord 561, adopted 12/15/03.]*
- d. *Exemptions under 'b' of this subsection shall not exempt the development or expansion from payment of system development charges or other applicable regulations. [Added by Ord 561, adopted 12/15/03.]*
- e. *In no case will development be permitted that creates an aggregate level of traffic at LOS "F". [Added by Ord 561, adopted 12/15/03.]*

**Response:** The City's Traffic Engineer, DKS Associates has determined that a full Traffic Impact Study (TIS) is not necessary to evaluate traffic impacts from the proposed development. They have prepared a memo outlining the anticipated impacts. The memo is included as Appendix C and addresses the provisions above.

- 3. *That the location, design, size and uses are such that the residents or establishments to be accommodated will be adequately served by existing or immediately planned facilities and services.*

**Response:** The proposal will construct transportation infrastructure with site development and will dedicate public right-of-way to Frog Pond Ln, Columbine Ave, and Brisband St. The site will be adequately served.

[...]  
**(.10) Early Vesting of Traffic Generation. [...]**

**Response:** No early vesting of traffic generation is requested. This standard is not applicable.

## V. General Development Regulations

### A. Section 4.154. On-site Pedestrian Access and Circulation.

#### (.01) On-site Pedestrian Access and Circulation

- A. *The purpose of this section is to implement the pedestrian access and connectivity policies of the Transportation System Plan. It is intended to provide for safe, reasonably direct, and convenient pedestrian access and circulation.*

**Response:** Applicable standards include the Transportation System Plan as modified/amended by the Frog Pond West Master Plan.

- B. *Standards. Development shall conform to all of the following standards:*
  - 1. *Continuous Pathway System. A pedestrian pathway system shall extend throughout the development site and connect to adjacent sidewalks, and to all future phases of the development, as applicable.*
  - 2. *Safe, Direct, and Convenient. Pathways within developments shall provide safe, reasonably direct, and convenient connections between primary building entrances and all adjacent parking*

areas, recreational areas/playgrounds, and public rights-of-way and crosswalks based on all of the following criteria:

- a. *Pedestrian pathways are designed primarily for pedestrian safety and convenience, meaning they are free from hazards and provide a reasonably smooth and consistent surface.*
- b. *The pathway is reasonably direct. A pathway is reasonably direct when it follows a route between destinations that does not involve a significant amount of unnecessary out-of-direction travel.*
- c. *The pathway connects to all primary building entrances and is consistent with the Americans with Disabilities Act (ADA) requirements.*
- d. *All parking lots larger than three acres in size shall provide an internal bicycle and pedestrian pathway pursuant to Section 4.155(.03)(B.)(3.)(d.).*

**Response:** The site is a single-family residential development and includes a network of public sidewalks. In addition to the sidewalk system, pedestrian/bicycle connections are proposed through Tract/Street B and Tract A.

3. *Vehicle/Pathway Separation. Except as required for crosswalks, per subsection 4, below, where a pathway abuts a driveway or street it shall be vertically or horizontally separated from the vehicular lane. For example, a pathway may be vertically raised six inches above the abutting travel lane, or horizontally separated by a row of bollards.*

**Response:** The proposed pathways will be vertically separated from streets by a curb. This standard is met.

4. *Crosswalks. Where a pathway crosses a parking area or driveway, it shall be clearly marked with contrasting paint or paving materials (e.g., pavers, light-color concrete inlay between asphalt, or similar contrast).*

**Response:** The proposed pathway does not cross a parking area or driveway. This standard is met.

5. *Pathway Width and Surface. Primary pathways shall be constructed of concrete, asphalt, brick/masonry pavers, or other durable surface, and not less than five (5) feet wide. Secondary pathways and pedestrian trails may have an alternative surface except as otherwise required by the ADA.*

**Response:** The proposed pedestrian pathways will be constructed of concrete, asphalt, brick/masonry pavers, or other durable surface, and will be at least 5 ft. wide. The connection within Tract A is classified as a Pedestrian Connection per the Frog Pond West Master Plan and is subject to conformance with the cross-section of Figure 25. This cross-section calls for a 26-ft. width consisting of 10 ft. of paved walkway and an 8-ft. planter strip on each side. The Tract A connection includes a 10-ft. paved walkway.

6. *All pathways shall be clearly marked with appropriate standard signs.*  
[Added by Ord. #719, 6/17/13]

**Response:** The pedestrian pathways will be signed as required.

## **B. Section 4.155. General Regulations - Parking, Loading and Bicycle Parking.**

[...]

(.02) General Provisions:

- A. *The provision and maintenance of off-street parking spaces is a continuing obligation of the property owner. The standards set forth herein shall be considered by the Development Review Board as minimum criteria.*
  1. *The Board shall have the authority to grant variances or planned development waivers to these standards in keeping with the purposes and objectives set forth in the Comprehensive Plan and this Code.*
  2. *Waivers to the parking, loading, or bicycle parking standards shall only be issued upon a findings that the resulting development will have no significant adverse impact on the surrounding neighborhood, and the community, and that the development considered as a whole meets the purposes of this section.*
- B. *No area shall be considered a parking space unless it can be shown that the area is accessible and usable for that purpose, and has maneuvering area for the vehicles, as determined by the Planning Director.*
- C. *In cases of enlargement of a building or a change of use from that existing on the effective date of this Code, the number of parking spaces required shall be based on the additional floor area of the enlarged or additional building, or changed use, as set forth in this Section. Current development standards, including parking area landscaping and screening, shall apply only to the additional approved parking area.*
- D. *In the event several uses occupy a single structure or parcel of land, the total requirement for off-street parking shall be the sum of the requirements of the several uses computed separately, except as modified by subsection "E," below. Within the TC Zone, the cumulative number of parking spaces required by this subsection may be reduced by 25 percent. [Amended by Ord. 835, 6/5/19]*
- E. *Owners of two (2) or more uses, structures, or parcels of land may utilize jointly the same parking area when the peak hours of operation do not overlap, provided satisfactory legal evidence is presented in the form of deeds, leases, or contracts securing full and permanent access to such parking areas for all the parties jointly using them. [Amended by Ord. # 674 11/16/09]*
- F. *Off-street parking spaces existing prior to the effective date of this Code may be included in the amount necessary to meet the requirements in case of subsequent enlargement of the building or use to which such spaces are necessary.*
- G. *Off-Site Parking. Except for single-family dwellings, the vehicle parking spaces required by this Chapter may be located on another parcel of land, provided the parcel is within 500 feet of the use it serves and the DRB has approved the off-site parking through the Land Use Review. The distance from the parking area to the use shall be measured from the nearest parking space to the main building entrance, following a sidewalk or other pedestrian route. Within the TC Zone there is no maximum distance to an off-site location provided the off-site parking is located within the TC Zone. The right to use the off-site parking must be evidenced in the form of recorded deeds, easements, leases, or contracts securing full and permanent access to such parking areas for all the parties jointly using them. Within the TC zone, there is no maximum distance to an off-site location provided the off-site parking is located within the TC Zone. [Amended by Ord. 835, 6/5/19]*
- H. *The conducting of any business activity shall not be permitted on the required parking spaces, unless a temporary use permit is approved pursuant to Section 4.163.*
- I. *Where the boundary of a parking lot adjoins or is within a residential district, such parking lot shall be screened by a sight-obscuring fence or planting. The screening shall be continuous along that boundary and shall be at least six (6) feet in height.*
- J. *Parking spaces along the boundaries of a parking lot shall be provided with a sturdy bumper guard or curb at least six (6) inches high and located far enough within the boundary to prevent any portion of a car within the lot from extending over the property line or interfering with required screening or sidewalks.*
- K. *All areas used for parking and maneuvering of cars shall be surfaced with asphalt, concrete, or other surface, such as pervious materials (i. e. pavers, concrete, asphalt) that is found by the City's authorized representative to be suitable for the purpose. In all cases, suitable drainage, meeting standards set by the City's authorized representative, shall be provided. [Amended by Ord. # 674 11/16/09]*
- L. *Artificial lighting which may be provided shall be so limited or deflected as not to shine into adjoining structures or into the eyes of passers-by.*



- M. *Off-street parking requirements for types of uses and structures not specifically listed in this Code shall be determined by the Development Review Board if an application is pending before the Board. Otherwise, the requirements shall be specified by the Planning Director, based upon consideration of comparable uses.*
- N. *Up to forty percent (40%) of the off-street spaces may be compact car spaces as identified in Section 4.001 - "Definitions," and shall be appropriately identified.*
- O. *Where off-street parking areas are designed for motor vehicles to overhang beyond curbs, planting areas adjacent to said curbs shall be increased to a minimum of seven (7) feet in depth. This standard shall apply to a double row of parking, the net effect of which shall be to create a planted area that is a minimum of seven (7) feet in depth.*
- P. *Parklets are permitted within the TC Zone on up to two parking spaces per block and shall be placed in front of the business. Placement of parklet requires a temporary right-of-way use permit and approval by the City Engineer. [Added by Ord. 835, 6/5/19]*

**Response:** Generally, these provisions apply to multifamily and commercial development, which is not proposed within Frog Pond Estates. These provisions are not applicable.

**(.03) Minimum and Maximum Off-Street Parking Requirements:**

- A. *Parking and loading or delivery areas shall be designed with access and maneuvering area adequate to serve the functional needs of the site and shall:*
  - 1. *Separate loading and delivery areas and circulation from customer and/or employee parking and pedestrian areas. Circulation patterns shall be clearly marked.*
  - 2. *To the greatest extent possible, separate vehicle and pedestrian traffic.*
- B. *Parking and loading or delivery areas shall be landscaped to minimize the visual dominance of the parking or loading area, as follows: [...]*

**Response:** There is no off-street loading required or proposed for the proposed single-family development. These provisions are not applicable.

- C. *Off Street Parking shall be designed for safe and convenient access that meets ADA and ODOT standards. All parking areas which contain ten (10) or more parking spaces, shall for every fifty (50) standard spaces., provide one ADA-accessible parking space that is constructed to building code standards, Wilsonville Code 9.000.*
- D. *Where possible, parking areas shall be designed to connect with parking areas on adjacent sites so as to eliminate the necessity for any mode of travel of utilizing the public street for multiple accesses or cross movements. In addition, on-site parking shall be designed for efficient on-site circulation and parking.*
- E. *In all multi-family dwelling developments, there shall be sufficient areas established to provide for parking and storage of motorcycles, mopeds and bicycles. Such areas shall be clearly defined and reserved for the exclusive use of these vehicles.*
- F. *On-street parking spaces, directly adjoining the frontage of and on the same side of the street as the subject property, may be counted towards meeting the minimum off-street parking standards.*

**Response:** There are no parking areas required or proposed for the proposed single-family development. The required parking spaces are being provided on-site and on-street parking spaces are not requested to count toward the minimum standards.

- G. *Tables 5 shall be used to determine the minimum and maximum parking standards for various land uses. The minimum number of required parking spaces shown on Tables 5 shall be determined by rounding to the nearest whole parking space. For example, a use containing 500 square feet, in an area where the standard is one space for each 400 square feet of floor area, is required to provide one off-street parking space. If the same use contained more than 600 square feet, a second parking space would be required. Structured parking and on-street parking are exempted from the parking maximums in Table 5. [Amended by Ordinance No. 538, 2/21/02.]*

**Response:** Table 5 requires that single units provide one parking space per dwelling unit. There is no maximum number listed. Each single-family dwelling unit will be provided with at least two off-street parking spaces within garages. This standard is met.

**H. Electrical Vehicle Charging Stations:**

1. *Parking spaces designed to accommodate and provide one or more electric vehicle charging stations on site may be counted towards meeting the minimum off-street parking standards.*
2. *Modification of existing parking spaces to accommodate electric vehicle charging stations on site is allowed outright.*

**Response:** No electrical vehicle charging stations are proposed at this time.

**I. Motorcycle parking:**

1. *Motorcycle parking may substitute for up to 5 spaces or 5 percent of required automobile parking, whichever is less. For every 4 motorcycle parking spaces provided, the automobile parking requirement is reduced by one space.*
2. *Each motorcycle space must be at least 4 feet wide and 8 feet deep. Existing parking may be converted to take advantage of this provision. [Amended by Ord. #719, 6/17/13]*

**Response:** No motorcycle parking is proposed.

**(.04) Bicycle Parking:**

**A. Required Bicycle Parking - General Provisions.**

1. *The required minimum number of bicycle parking spaces for each use category is shown in Table 5, Parking Standards.[...]*

**Response:** Table 5 states that there is no minimum bicycle parking requirement for detached or attached single-family homes. These provisions are not applicable.

**(.05) Minimum Off-Street Loading Requirements: [...]**

**Response:** There is no off-street loading requirement for single-family homes. These provisions are not applicable.

**(.06) Carpool and Vanpool Parking Requirements: [...]**

**Response:** There is no carpool or vanpool parking requirement for single-family homes. These provisions are not applicable.

**C. Section 4.156. Sign Code Regulations.**

**Section 4.156.07. Sign Regulations In Residential Zones.**

**[...]**

**Response:** No signs are proposed at this time. Future signs will be subject to these regulations.

**D. Section 4.167. General Regulations - Access, Ingress and Egress.**

**(.01)** *Each access onto streets or private drives shall be at defined points as approved by the City and shall be consistent with the public's health, safety and general welfare. Such defined points of access shall be approved at the time of issuance of a building permit if not previously determined in the development permit. [Amended by Ord. 682, 9/9/10]*

**Response:** Proposed driveways access onto streets and private drives is shown in Sheet P2.00.

**E. Section 4.169. General Regulations – Double-Frontage Lots.**

**(.01)** *Buildings on double frontage lots (i.e., through lots) and corner lots must meet the front yard setback for principal buildings on both streets or tracts with a private drive. [Amended by Ord. 682, 9/9/10]*

**(.02)** *Given that double-frontage lots tend to have one end that is regarded as a rear yard by the owner, the Development Review Board may establish special maintenance conditions to apply to such areas. Such conditions may include the requirement that the subject homeowners association, if any, be responsible for the on-going maintenance of the street frontage areas of double-frontage lots.*

**Response:** No double-frontage lots are proposed.

#### F. Section 4.175. Public Safety and Crime Prevention.

- (.01) All developments shall be designed to deter crime and insure public safety.*
- (.02) Addressing and directional signing shall be designed to assure identification of all buildings and structures by emergency response personnel, as well as the general public.*
- (.03) Areas vulnerable to crime shall be designed to allow surveillance. Parking and loading areas shall be designed for access by police in the course of routine patrol duties.*
- (.04) Exterior lighting shall be designed and oriented to discourage crime.*

**Response:** The Frog Pond Estates development has been designed to deter crime and ensure public safety. Streets and pedestrian connections will be lit for visibility and safety. Homes will be oriented toward these streets to provide “eyes on the street.” All dwellings will be addressed per Building and Fire Department requirements to allow identification for emergency response personnel. No parking and loading areas are proposed. Dwellings will have exterior porch lighting, which will complement the streetlights and add to safety and visibility. These standards are met.

#### G. Section 4.176. Landscaping, Screening, and Buffering.

[...]

*(.02) Landscaping and Screening Standards.*

[...]

C. General Landscaping Standard.

[...]

- 2. *Required materials. Shrubs and trees, other than street trees, may be grouped. Ground cover plants must fully cover the remainder of the landscaped area (see Figure 21: General Landscaping). The General Landscaping Standard has two different requirements for trees and shrubs:*
  - a. *Where the landscaped area is less than 30 feet deep, one tree is required for every 30 linear feet.*
  - b. *Where the landscaped area is 30 feet deep or greater, one tree is required for every 800 square feet and two high shrubs or three low shrubs are required for every 400 square feet.*

**Response:** The proposed development consists of single-family dwellings, which are generally subject to the General Landscape Standard. The proposed Tracts A, B, C, and D include landscaped area of more than 30 ft. deep and are subject to 2.b above. All areas not planted with trees or shrubs is planted with ground cover.

As shown on Sheet P2.00, Tract A is 3,529 sq. ft. in area, and 4.4 trees and 8.8 shrubs are required. As shown on Sheet L1.00, two trees will be retained on site. As shown on Sheet L2.00, two additional trees and 119 shrubs are proposed. Tract C is 11,999 sq. ft. in area, and 14.9 trees and 29.9 shrubs are required. As shown on Sheet L2.10, 16 trees and 178 shrubs are proposed. Tract D is 1,802 sq. ft. in area, and 2.25 trees and 4.5 shrubs are required. As shown on Sheet L2.00, 6 trees and 100 shrubs are proposed. These standards are met.

D. Low Screen Landscaping Standard.

- 1. *Intent. The Low Screen Landscaping Standard is a landscape treatment that uses a combination of distance and low screening to separate uses or developments. It is intended to be applied in situations where low screening is adequate to soften the impact of one use or development on another, or where visibility between areas is more important than a total visual screen. The Low Screen Landscaping Standard is usually applied along street lot lines or in the area separating parking lots from street rights-of-way.*
- 2. *Required materials. The Low Screen Landscaping Standard requires sufficient low shrubs to form a continuous screen three (3) feet high and 95% opaque, year-round. In addition, one tree is required for every 30 linear feet of landscaped area, or as otherwise required to provide a tree canopy over the landscaped area. Ground cover plants must fully cover the remainder of the landscaped area. A three (3) foot high masonry wall or a berm may be substituted for the shrubs, but the trees and ground cover plants are still required. When applied along street lot lines, the*

screen or wall is to be placed along the interior side of the landscaped area. (See Figure 22: Low Screen Landscaping).

**Response:** The proposed development consists of single-family dwellings, which are generally subject to the General Landscape Standard. Sheet L2.00 provides details of proposed landscaping in these areas.

**E. Low Berm Landscaping Standard.**

1. *Intent.* The Low Berm Standard is intended to be applied in situations where moderate screening to reduce both visual and noise impacts is needed to protect abutting uses or developments from one-another, and where it is desirable and practical to provide separation by both distance and sight-obscuring materials. This screening is most important where either, or both, of the abutting uses or developments can be expected to be particularly sensitive to noise or visual impacts.
2. *Required materials.* The Low Berm Standard requires a berm at least two feet six inches (2' 6") high along the interior side of the landscaped area (see Figure 23: Low Berm Landscaping). If the berm is less than three (3) feet high, low shrubs meeting the Low Screen Landscaping Standard, above, are to be planted along the top of the berm, assuring that the screen is at least three (3) feet in height. In addition, one tree is required for every 30 linear feet of berm, or as otherwise required to provide a tree canopy over the landscaped area. Ground cover plants must fully cover the remainder of the landscaped area.

**Response:** The proposed residential development is located adjacent to approved and future residential development. No screening is required or provided between uses.

**F. High Screen Landscaping Standard.**

1. *Intent.* The High Screen Landscaping Standard is a landscape treatment that relies primarily on screening to separate uses or developments. It is intended to be applied in situations where visual separation is required.
2. *Required materials.* The High Screen Landscaping Standard requires sufficient high shrubs to form a continuous screen at least six (6) feet high and 95% opaque, year-round. In addition, one tree is required for every 30 linear feet of landscaped area, or as otherwise required to provide a tree canopy over the landscaped area. Ground cover plants must fully cover the remainder of the landscaped area. A six (6) foot high masonry wall or a berm may be substituted for the shrubs, but the trees and ground cover plants are still required. When applied along street lot lines, the screen or wall is to be placed along the interior side of the landscaped area. (See Figure 23: High Screen Landscaping).

**Response:** The proposed residential development is located adjacent to future residential development. No screening is required or provided between uses.

**G. High Wall Standard.**

1. *Intent.* The High Wall Standard is intended to be applied in situations where extensive screening to reduce both visual and noise impacts is needed to protect abutting uses or developments from one-another. This screening is most important where either, or both, of the abutting uses or developments can be expected to be particularly sensitive to noise or visual impacts, or where there is little space for physical separation.
2. *Required materials.* The High Wall Standard requires a masonry wall at least six (6) feet high along the interior side of the landscaped area (see Figure 24: High Wall Landscaping). In addition, one tree is required for every 30 linear feet of wall, or as otherwise required to provide a tree canopy over the landscaped area. Ground cover plants must fully cover the remainder of the landscaped area.

**Response:** There are no visual or noise impacts anticipated from the proposed development, and high walls are not required or proposed.

**H. High Berm Standard.**

1. *Intent.* The High Berm Standard is intended to be applied in situations where extensive screening to reduce both visual and noise impacts is needed to protect abutting uses or developments from one-another, and where it is desirable and practical to provide separation by both distance and

sight-obscuring materials. This screening is most important where either, or both, of the abutting uses or developments can be expected to be particularly sensitive to noise or visual impacts.

2. *Required materials. The High Berm Standard requires a berm at least four (4) feet high along the interior side of the landscaped area (see Figure 25: High Berm Landscaping). If the berm is less than six (6) feet high, low shrubs meeting the Low Screen Landscaping Standard, above, are to be planted along the top of the berm, assuring that the screen is at least six (6) feet in height. In addition, one tree is required for every 30 linear feet of berm, or as otherwise required to provide a tree canopy over the landscaped area. Ground cover plants must fully cover the remainder of the landscaped area.*

**Response:** There are no visual or noise impacts anticipated from the proposed development, and a high berm is not required or provided.

*I. Partially Sight-Obscuring Fence Standard.*

1. *Intent. The Partially Sight-Obscuring Fence Standard is intended to provide a tall, but not totally blocked, visual separation. The standard is applied where a low level of screening is adequate to soften the impact of one use or development on another, and where some visibility between abutting areas is preferred over a total visual screen. It can be applied in conjunction with landscape plantings or applied in areas where landscape plantings are not necessary and where nonresidential uses are involved.*
2. *Required materials. Partially Sight-Obscuring Fence Standard are to be at least six (6) feet high and at least 50% sight-obscuring. Fences may be made of wood (other than plywood or particle-board), metal, bricks, masonry or other permanent materials (see Figure 26: Partially Sight-Obscuring Fence).*

*J. Fully Sight-Obscuring Fence Standard.*

1. *Intent. The Fully Sight-Obscuring Fence Standard is intended to provide a totally blocked visual separation. The standard is applied where full visual screening is needed to reduce the impact of one use or development on another. It can be applied in conjunction with landscape plantings or applied in areas where landscape plantings are not necessary.*
2. *Required materials. Fully sight-obscuring fences are to be at least six (6) feet high and 100% sight-obscuring. Fences may be made of wood (other than plywood or particle-board), metal, bricks, masonry or other permanent materials (see Figure 27: Totally Sight-Obscuring Fence).*

**Response:** There is no need for partially or totally blocked visual separation. Sight-obscuring fencing is not provided.

**(.03) Landscape Area.** *Not less than fifteen percent (15%) of the total lot area, shall be landscaped with vegetative plant materials. The ten percent (10%) parking area landscaping required by section 4.155.03(B)(1) is included in the fifteen percent (15%) total lot landscaping requirement. Landscaping shall be located in at least three separate and distinct areas of the lot, one of which must be in the contiguous frontage area. Planting areas shall be encouraged adjacent to structures. Landscaping shall be used to define, soften or screen the appearance of buildings and off-street parking areas. Materials to be installed shall achieve a balance between various plant forms, textures, and heights. The installation of native plant materials shall be used whenever practicable. (For recommendations refer to the Native Plant List maintained by the City of Wilsonville). [Amended by Ord. # 674 11/16/09]*

**Response:** At least 15 percent of the total lot area for each single-family dwelling will be landscaped; conformance with this standard will be reviewed at the time of building permit submittal. There are no parking areas proposed and no parking area landscaping is required. The landscape plan included as Sheet L2.00 illustrates the location and type of landscaping within public rights-of-way and tracts.

**(.04) Buffering and Screening.** *Additional to the standards of this subsection, the requirements of the Section 4.137.5 (Screening and Buffering Overlay Zone) shall also be applied, where applicable.*

- A. *All intensive or higher density developments shall be screened and buffered from less intense or lower density developments.*
- B. *Activity areas on commercial and industrial sites shall be buffered and screened from adjacent residential areas. Multi-family developments shall be screened and buffered from single-family areas.*

- C. All exterior, roof and ground mounted, mechanical and utility equipment shall be screened from ground level off-site view from adjacent streets or properties.
- D. All outdoor storage areas shall be screened from public view, unless visible storage has been approved for the site by the Development Review Board or Planning Director acting on a development permit.
- E. In all cases other than for industrial uses in industrial zones, landscaping shall be designed to screen loading areas and docks, and truck parking.
- F. In any zone any fence over six (6) feet high measured from soil surface at the outside of fenceline shall require Development Review Board approval.

**Response:** The requirements of 4.137.5 are applicable along the edge of nonresidential zones abutting, or located directly across the street from, residential zones. The proposed development is located within a residential zone and abuts residential zones to the west, north, and east. The proposed development will abut the PF zone to the south, and these provisions may be triggered at the time of future development in the PF zone. These provisions are not applicable to this application.

**(.05) Sight-Obscuring Fence or Planting.** *The use for which a sight-obscuring fence or planting is required shall not begin operation until the fence or planting is erected or in place and approved by the City. A temporary occupancy permit may be issued upon a posting of a bond or other security equal to one hundred ten percent (110%) of the cost of such fence or planting and its installation. (See Sections 4.400 to 4.470 for additional requirements.)*

**Response:** No sight-obscuring fences or planting are required between the proposed residential use and adjacent uses. This standard is not applicable.

**(.06) Plant Materials.**

- A. *Shrubs and Ground Cover. All required ground cover plants and shrubs must be of sufficient size and number to meet these standards within three (3) years of planting. Non-horticultural plastic sheeting or other impermeable surface shall not be placed under mulch. Native topsoil shall be preserved and reused to the extent feasible. Surface mulch or bark dust are to be fully raked into soil of appropriate depth, sufficient to control erosion, and are confined to areas around plantings. Areas exhibiting only surface mulch, compost or barkdust are not to be used as substitutes for plant areas. [Amended by Ord. # 674 11/16/09]*
  - 1. *Shrubs. All shrubs shall be well branched and typical of their type as described in current AAN Standards and shall be equal to or better than 2-gallon containers and 10" to 12" spread.*
  - 2. *Ground cover. Shall be equal to or better than the following depending on the type of plant materials used: gallon containers spaced at 4 feet on center minimum, 4" pot spaced 2 feet on center minimum, 2-1/4" pots spaced at 18 inch on center minimum. No bare root planting shall be permitted. Ground cover shall be sufficient to cover at least 80% of the bare soil in required landscape areas within three (3) years of planting. Where wildflower seeds are designated for use as a ground cover, the City may require annual re-seeding as necessary.*
  - 3. *Turf or lawn in non-residential developments. Shall not be used to cover more than ten percent (10%) of the landscaped area, unless specifically approved based on a finding that, due to site conditions and availability of water, a larger percentage of turf or lawn area is appropriate. Use of lawn fertilizer shall be discouraged. Irrigation drainage runoff from lawns shall be retained within lawn areas.*
  - 4. *Plant materials under trees or large shrubs. Appropriate plant materials shall be installed beneath the canopies of trees and large shrubs to avoid the appearance of bare ground in those locations.*
  - 5. *Integrate compost-amended topsoil in all areas to be landscaped, including lawns, to help detain runoff, reduce irrigation and fertilizer needs, and create a sustainable, low-maintenance landscape. [Added by Ord. # 674 11/16/09]*

**Response:** The landscape plan included as Sheets L2.00-L2.10 addresses these requirements.



- B. *Trees. All trees shall be well-branched and typical of their type as described in current American Association of Nurserymen (AAN) Standards and shall be balled and burlapped. The trees shall be grouped as follows:*
1. *Primary trees which define, outline or enclose major spaces, such as Oak, Maple, Linden, and Seedless Ash, shall be a minimum of 2" caliper.*
  2. *Secondary trees which define, outline or enclose interior areas, such as Columnar Red Maple, Flowering Pear, Flame Ash, and Honeylocust, shall be a minimum of 1-3/4" to 2" caliper.*
  3. *Accent trees which, are used to add color, variation and accent to architectural features, such as Flowering Pear and Kousa Dogwood, shall be 1-3/4" minimum caliper.*
  4. *Large conifer trees such as Douglas Fir or Deodar Cedar shall be installed at a minimum height of eight (8) feet.*
  5. *Medium-sized conifers such as Shore Pine, Western Red Cedar or Mountain Hemlock shall be installed at a minimum height of five to six (5 to 6) feet.*

**Response:** The landscape plan included as Sheet L2.00 addresses these requirements.

- C. *Where a proposed development includes buildings larger than twenty-four (24) feet in height or greater than 50,000 square feet in footprint area, the Development Review Board may require larger or more mature plant materials:*
1. *At maturity, proposed trees shall be at least one-half the height of the building to which they are closest, and building walls longer than 50 feet shall require tree groups located no more than fifty (50) feet on center, to break up the length and height of the façade.*
  2. *Either fully branched deciduous or evergreen trees may be specified depending upon the desired results. Where solar access is to be preserved, only solar-friendly deciduous trees are to be used. Where year-round sight obscuring is the highest priority, evergreen trees are to be used.*
  3. *The following standards are to be applied:*
    - a. *Deciduous trees:*
      - i. *Minimum height of ten (10) feet; and*
      - ii. *Minimum trunk diameter (caliper) of 2 inches (measured at four and one-half [4 1/2] feet above grade).*
    - b. *Evergreen trees: Minimum height of twelve (12) feet.*

**Response:** Some of the proposed residential dwellings will exceed 24 ft. in height but will be far less than 50,000 sq. ft. in footprint area. Requirements for larger or more mature plant materials are not warranted.

- D. *Street Trees. In order to provide a diversity of species, the Development Review Board may require a mix of street trees throughout a development. Unless the Board waives the requirement for reasons supported by a finding in the record, different types of street trees shall be required for adjoining blocks in a development.*
1. *All trees shall be standard base grafted, well branched and typical of their type as described in current AAN Standards and shall be balled and burlapped (b&b). Street trees shall be planted at sizes in accordance with the following standards:*
    - a. *Arterial streets - 3" minimum caliper*
    - b. *Collector streets - 2" minimum caliper.*
    - c. *Local streets or residential private access drives - 1-3/4" minimum caliper. [Amended by Ord. 682, 9/9/10]*
    - d. *Accent or median tree - 1-3/4" minimum caliper.*

**Response:** Requirements for street trees are provided by the Section 201.2.28 of the City's 2017 Public Works Construction Standards. These standards reference Section 4.176.06(D) of the WC and to Detail No. RD-1240. This section of the WC identifies minimum sizes and preferred types of trees, and Detail No. RD-1240 provides street tree location and clearances. This detail indicates that at least 30 ft. must be provided between a street tree and an intersection; at least 15 ft. must be provided between a street tree and a catch basin; at least 10 ft. must be provided between a street tree and a fire hydrant, street light or driveway; and at least 5 ft. must be provided between a street tree and a lateral or water meter.

As shown on Sheet L2.00 Street Tree Plan, these required distances limit the area that is available for street trees. Thirty-one street trees are proposed: 19 on Columbine Ave; 3 on Brisband St; 4 on Street A; and 5 on Frog Pond Ln.

Frog Pond Lane in this location is classified as a Local Street; the other streets within the development are classified as Local Streets or Private Access Drives. As shown in Sheet L2.00, 2-in. caliper balled and burlapped street trees are proposed for all streets within the development, which are larger than required.

2. *The following trees and varieties thereof are considered satisfactory street trees in most circumstances; however, other varieties and species are encouraged and will be considered:*
  - a. *Trees over 50 feet mature height: Quercus garryana (Native Oregon White Oak), Quercus rubra borealis (Red Oak), Acer Macrophyllum (Native Big Leaf Maple), Acer nigrum (Green Column Black Maple), Fraxinus americanus (White Ash), Fraxinus pennsylvannica 'Marshall' (Marshall Seedless Green Ash), Quercus coccinea (Scarlet Oak), Quercus pulustris (Pin Oak), Tilia americana (American Linden).*
  - b. *Trees under 50 feet mature height: Acer rubrum (Red Sunset Maple), Cornus nuttallii (Native Pacific Dogwood), Gleditsia triacanthos (Honey Locust), Pyrus calleryana 'Bradford' (Bradford Pear), Tilia cordata (Little Leaf Linden), Fraxinus oxycarpa (Flame Ash).*
  - c. *Other street tree species. Other species may be specified for use in certain situations. For instance, evergreen species may be specified where year-round color is desirable and no adverse effect on solar access is anticipated. Water-loving species may be specified in low locations where wet soil conditions are anticipated.*

*[Section 4.176(.06)(D.) amended by Ordinance No. 538, 2/21/02.]*

**Response:** The proposed street trees include a mix of Tilia americana (American Linden), Tilia cordata 'Glenleven' (Glenleven Littleleaf Linden), Liriodendron tulipifera gastigiatum (Tulip Tree) and Cercidiphyllum Japonicum (Katsura Tree). All trees listed here have been chosen from the approved street tree list for the Frog Pond West Master Plan, and they have been selected for the qualities that cause them to be frequently specified as street trees: predictable form, disease resistance, tidiness, and visual interest.

**E. Types of Plant Species.**

1. *Existing landscaping or native vegetation may be used to meet these standards, if protected and maintained during the construction phase of the development and if the plant species do not include any that have been listed by the City as prohibited. The existing native and non-native vegetation to be incorporated into the landscaping shall be identified.*
2. *Selection of plant materials. Landscape materials shall be selected and sited to produce hardy and drought-tolerant landscaping. Selection shall be based on soil characteristics, maintenance requirements, exposure to sun and wind, slope and contours of the site, and compatibility with other vegetation that will remain on the site. Suggested species lists for street trees, shrubs and groundcovers shall be provided by the City of Wilsonville.*
3. *Prohibited plant materials. The City may establish a list of plants that are prohibited in landscaped areas. Plants may be prohibited because they are potentially damaging to sidewalks, roads, underground utilities, drainage improvements, or foundations, or because they are known to be invasive to native vegetation.*

*[Section 4.176(.06)(E.) amended by Ordinance No. 538, 2/21/02.]*

**Response:** As shown on Sheet L2.00, the proposed landscape materials include a mix of native trees, shrubs, and groundcovers. No prohibited plant materials are proposed.

**F. Tree Credit.**

*Existing trees that are in good health as certified by an arborist and are not disturbed during construction may count for landscaping tree credit as follows (measured at four and one-half feet above grade and rounded to the nearest inch):*

|                                |                               |
|--------------------------------|-------------------------------|
| <b>Existing trunk diameter</b> | <b>Number of Tree Credits</b> |
| 18 to 24 inches in diameter    | 3 tree credits                |
| 25 to 31 inches in diameter    | 4 tree credits                |
| 32 inches or greater           | 5 tree credits                |

[Amended by Ord. # 674 11/16/09]

1. It shall be the responsibility of the owner to use reasonable care to maintain preserved trees. Trees preserved under this section may only be removed if an application for removal permit under Section 4.610.10(01)(H) has been approved. Required mitigation for removal shall be replacement with the number of trees credited to the preserved and removed tree.
2. Within five years of occupancy and upon notice from the City, the property owner shall replace any preserved tree that cannot be maintained due to disease or damage, or hazard or nuisance as defined in Chapter 6 of this code. The notice shall be based on complete information provided by an arborist. Replacement with the number of trees credited shall occur within one (1) growing season of notice.

**Response:** As shown on Sheet L1.00 and described in Appendix D, there are 46 trees on the site and five (5) trees will be protected on site; three (3) additional trees will be protected off-site. Per the calculations above and shown in Table 3 below, 20 tree credits are provided by protected trees. Tree easements will be placed on Lots 1, 5, and 6 to preserve the root crowns of protected trees in the back yards of these lots. Additional protections are outlined in the Tree Plan included as Appendix D.

**Table 5. Tree Credits**

| Count        | Tag # | Existing Trunk Diameter | Number of Tree Credits |
|--------------|-------|-------------------------|------------------------|
| 1            | 50553 | 50 in.                  | 5                      |
| 2            | 50554 | 49 in.                  | 5                      |
| 3            | 50555 | 48 in.                  | 5                      |
| 4            | 50725 | 15 in.                  | 0                      |
| 5            | 50726 | 53 in.                  | 5                      |
| <b>Total</b> |       |                         | <b>20</b>              |

**(.07) Installation and Maintenance.**

- A. *Installation.* Plant materials shall be installed to current industry standards and shall be properly staked to assure survival. Support devices (guy wires, etc.) shall not be allowed to interfere with normal pedestrian or vehicular movement.
- B. *Maintenance.* Maintenance of landscaped areas is the on-going responsibility of the property owner. Any landscaping installed to meet the requirements of this Code, or any condition of approval established by a City decision-making body acting on an application, shall be continuously maintained in a healthy, vital and acceptable manner. Plants that die are to be replaced in kind, within one growing season, unless appropriate substitute species are approved by the City. Failure to maintain landscaping as required in this Section shall constitute a violation of this Code for which appropriate legal remedies, including the revocation of any applicable land development permits, may result.
- C. *Irrigation.* The intent of this standard is to assure that plants will survive the critical establishment period when they are most vulnerable due to a lack of watering and also to assure that water is not wasted through unnecessary or inefficient irrigation. Approved irrigation system plans shall specify one of the following:
  1. A permanent, built-in, irrigation system with an automatic controller. Either a spray or drip irrigation system, or a combination of the two, may be specified.
  2. A permanent or temporary system designed by a landscape architect licensed to practice in the State of Oregon, sufficient to assure that the plants will become established and drought-tolerant.
  3. Other irrigation system specified by a licensed professional in the field of landscape architecture or irrigation system design.
  4. A temporary permit issued for a period of one year, after which an inspection shall be conducted to assure that the plants have become established. Any plants that have died, or that appear to the Planning Director to not be thriving, shall be appropriately replaced within one growing season. An inspection fee and a maintenance bond or other security sufficient to cover all costs of replacing the plant materials shall be provided, to the satisfaction of the Community

*Development Director. Additionally, the applicant shall provide the City with a written license or easement to enter the property and cause any failing plant materials to be replaced.*

- D. Protection. All required landscape areas, including all trees and shrubs, shall be protected from potential damage by conflicting uses or activities including vehicle parking and the storage of materials.*

**Response:** As detailed on Sheet L2.00, all landscape areas will be watered by a fully automatic underground irrigation system. These standards are met.

**(.08) Landscaping on Corner Lots.** *All landscaping on corner lots shall meet the vision clearance standards of Section 4.177. If high screening would ordinarily be required by this Code, low screening shall be substituted within vision clearance areas. Taller screening may be required outside of the vision clearance area to mitigate for the reduced height within it.*

**Response:** High screening is not required on any corner lots and is not proposed. This standard is not applicable.

**(.09) Landscape Plans.** *Landscape plans shall be submitted showing all existing and proposed landscape areas. Plans must be drawn to scale and show the type, installation size, number and placement of materials. Plans shall include a plant material list. Plants are to be identified by both their scientific and common names. The condition of any existing plants and the proposed method of irrigation are also to be indicated. Landscape plans shall divide all landscape areas into the following categories based on projected water consumption for irrigation:*

- A. High water usage areas (+/- two (2) inches per week): small convoluted lawns, lawns under existing trees, annual and perennial flower beds, and temperamental shrubs;*
- B. Moderate water usage areas (+/- one (1) inch per week): large lawn areas, average water-using shrubs, and trees;*
- C. Low water usage areas (Less than one (1) inch per week, or gallons per hour): seeded fieldgrass, swales, native plantings, drought-tolerant shrubs, and ornamental grasses or drip irrigated areas.*
- D. Interim or unique water usage areas: areas with temporary seeding, aquatic plants, erosion control areas, areas with temporary irrigation systems, and areas with special water-saving features or water harvesting irrigation capabilities. These categories shall be noted in general on the plan and on the plant material list.*

**Response:** A landscape plan is included as Sheet L2.00 and water consumption categories are noted and shown on Sheet L2.10. The proposed site development plan includes street tree plantings, which consist of native vegetation that requires low water usage. Individual lot landscaping will be proposed at the time of building permit submittal and will likely include grass and ground coverings. These standards are met.

**(.10) Completion of Landscaping.** *The installation of plant materials may be deferred for a period of time specified by the Board or Planning Director acting on an application, in order to avoid hot summer or cold winter periods, or in response to water shortages. In these cases, a temporary permit shall be issued, following the same procedures specified in subsection (.07)(C)(3), above, regarding temporary irrigation systems. No final Certificate of Occupancy shall be granted until an adequate bond or other security is posted for the completion of the landscaping, and the City is given written authorization to enter the property and install the required landscaping, in the event that the required landscaping has not been installed. The form of such written authorization shall be submitted to the City Attorney for review.*

**Response:** Acknowledged. No deferral is requested at this time but may be requested in the future subject to the scenarios above.

**(.11) Street Trees Not Typically Part of Site Landscaping.** *Street trees are not subject to the requirements of this Section and are not counted toward the required standards of this Section. Except, however, that the Development Review Board may, by granting a waiver or variance, allow for special landscaping within the right-of-way to compensate for a lack of appropriate on-site locations for landscaping. See subsection (.06), above, regarding street trees.*

**Response:** No waiver or variance for on-site landscaping is requested. This standard is not applicable.

**(.12) Mitigation and Restoration Plantings.** *A mitigation plan is to be approved by the City's Development Review Board before the destruction, damage, or removal of any existing native plants. Plantings intended to mitigate the loss of native vegetation are subject to the following standards. Where these standards conflict with other requirements of this Code, the standards of this Section shall take precedence. The desired effect of this section is to preserve existing native vegetation.*

- A. *Plant Sources. Plant materials are to be native and are subject to approval by the City. They are to be non-clonal in origin; seed source is to be as local as possible, and plants must be nursery propagated or taken from a pre-approved transplantation area. All of these requirements are to be addressed in any proposed mitigation plan.*
- B. *Plant Materials. The mitigation plan shall specify the types and installation sizes of plant materials to be used for restoration. Practices such as the use of pesticides, fungicides, and fertilizers shall not be employed in mitigation areas unless specifically authorized and approved.*
- C. *Installation. Install native plants in suitable soil conditions. Plant materials are to be supported only when necessary because of extreme winds at the site. Where support is necessary, all stakes, guy wires or other measures are to be removed as soon as the plants can support themselves. Protect from animal and fowl predation and foraging until establishment.*
- D. *Irrigation. Permanent irrigation systems are generally not appropriate in restoration situations, and manual or temporary watering of new plantings is often necessary. The mitigation plan shall specify the method and frequency of manual watering, including any that may be necessary after the first growing season.*
- E. *Monitoring and Reporting. Monitoring of native landscape areas is the on-going responsibility of the property owner. Plants that die are to be replaced in kind and quantity within one year. Written proof of the survival of all plants shall be required to be submitted to the City's Planning Department one year after the planting is completed.*

*[Section 4.176 amended by Ordinance No. 536, 1/7/02]*

**Response:** The site is currently in residential and agricultural use, and site plantings consist primarily of grass and clustered trees. The existing grass and many of the trees will be removed for site development, specifically to accommodate the planned street network and desired lotting pattern. Tree removal will be mitigated as detailed in the response to Section 4.610.40. These standards are not applicable.

## **H. Section 4.177. Street Improvement Standards.**

*This section contains the City's requirements and standards for pedestrian, bicycle, and transit facility improvements to public streets, or within public easements. The purpose of this section is to ensure that development, including redevelopment, provides transportation facilities that are safe, convenient, and adequate in rough proportion to their impacts.*

**(.01)** *Development and related public facility improvements shall comply with the standards in this section, the Wilsonville Public Works Standards, and the Transportation System Plan, in rough proportion to the potential impacts of the development. Such improvements shall be constructed at the time of development or as provided by Section 4.140, except as modified or waived by the City Engineer for reasons of safety or traffic operations.*

**Response:** The proposed public facility improvements are designed to comply with the standards in this section, the Wilsonville Public Works Standards, and the Transportation System Plan as modified by the Frog Pond Master Plan.

**(.02) Street Design Standards.**

- A. *All street improvements and intersections shall provide for the continuation of streets through specific developments to adjoining properties or subdivisions.*
  - 1. *Development shall be required to provide existing or future connections to adjacent sites through the use of access easements where applicable. Such easements shall be required in addition to required public street dedications as required in Section 4.236(.04).*

**Response:** The street network has been designed per the Frog Pond West Street Demonstration Plan with minor modifications. Future connections to adjacent sites are anticipated to the west. This standard is met.

*B. The City Engineer shall make the final determination regarding right-of-way and street element widths using the ranges provided in Chapter 3 of the Transportation System Plan and the additional street design standards in the Public Works Standards.*

**Response:** No modifications to the proposed rights-of-way and street elements widths are requested. The development will construct the northern portion of Brisband Street, including a curb on the southern side of the street. Future development on the parcels owned by the School District will construct the remaining improvements, including a sidewalk and planting strip. See Sheet P2.10.

*C. Rights-of-way.*

- 1. Prior to issuance of a Certificate of Occupancy Building permits or as a part of the recordation of a final plat, the City shall require dedication of rights-of-way in accordance with the Transportation System Plan. All dedications shall be recorded with the County Assessor's Office.*
- 2. The City shall also require a waiver of remonstrance against formation of a local improvement district, and all non-remonstrances shall be recorded in the County Recorder's Office as well as the City's Lien Docket, prior to issuance of a Certificate of Occupancy Building Permit or as a part of the recordation of a final plat.*
- 3. In order to allow for potential future widening, a special setback requirement shall be maintained adjacent to all arterial streets. The minimum setback shall be 55 feet from the centerline or 25 feet from the right-of-way designated on the Master Plan, whichever is greater.*

**Response:** This proposal includes the following right-of-way dedications as shown in Sheet P2.10:

- ROW dedication of 40 feet along the site's frontage with SW Brisband Street
- ROW dedication of 6 feet along the site's frontage with SW Columbine Avenue
- ROW dedication of 9.5 feet along the site's frontage with SW Frog Pond Lane
- ROW dedication of 52 feet for Street A

The site does not have frontage on an arterial street; therefore, the special setback does not apply. These standards are met.

*D. Dead-end Streets. New dead-end streets or cul-de-sacs shall not exceed 200 feet in length, unless the adjoining land contains barriers such as existing buildings, railroads or freeways, or environmental constraints such as steep slopes, or major streams or rivers, that prevent future street extension and connection. A central landscaped island with rainwater management and infiltration are encouraged in cul-de-sac design. No more than 25 dwelling units shall take access to a new dead-end or cul-de-sac street unless it is determined that the traffic impacts on adjacent streets will not exceed those from a development of 25 or fewer units. All other dimensional standards of dead-end streets shall be governed by the Public Works Standards. Notification that the street is planned for future extension shall be posted on the dead-end street. [Amended by Ord. # 674 11/16/09]*

**Response:** Proposed Street B is a private dead-end street. It is approximately 150 ft. long and serves four lots. Proposed Street A will stub at the western property line of the site and is expected to be extended with future development. In the interim, it will be approximately 187 ft. long and serve six lots. This standard is met.

*E. Corner or clear vision area.*

- 1. A clear vision area which meets the Public Works Standards shall be maintained on each corner of property at the intersection of any two streets, a street and a railroad or a street and a driveway. However, the following items shall be exempt from meeting this requirement:*
  - a. Light and utility poles with a diameter less than 12 inches.*
  - b. Trees less than 6" d.b.h., approved as a part of the Stage II Site Design, or administrative review.*
  - c. Except as allowed by b., above, an existing tree, trimmed to the trunk, 10 feet above the curb.*
  - d. Official warning or street sign.*



- e. *Natural contours where the natural elevations are such that there can be no cross-visibility at the intersection and necessary excavation would result in an unreasonable hardship on the property owner or deteriorate the quality of the site.*
- F. *Vertical clearance - a minimum clearance of 12 feet above the pavement surface shall be maintained over all streets and access drives.*

**Response:** Clear vision areas will be maintained at the corner of each property.

- G. *Interim improvement standard. It is anticipated that all existing streets, except those in new subdivisions, will require complete reconstruction to support urban level traffic volumes. However, in most cases, existing and short-term projected traffic volumes do not warrant improvements to full Master Plan standards. Therefore, unless otherwise specified by the Development Review Board, the following interim standards shall apply.[...]*

**Response:** There are no existing streets within the development site. These standards are not applicable.

- (.03) Sidewalks.** *Sidewalks shall be provided on the public street frontage of all development. Sidewalks shall generally be constructed within the dedicated public right-of-way, but may be located outside of the right-of-way within a public easement with the approval of the City Engineer.*
- A. *Sidewalk widths shall include a minimum through zone of at least five feet. The through zone may be reduced pursuant to variance procedures in Section 4.196, a waiver pursuant to Section 4.118, or by authority of the City Engineer for reasons of traffic operations, efficiency, or safety.*
  - B. *Within a Planned Development, the Development Review Board may approve a sidewalk on only one side. If the sidewalk is permitted on just one side of the street, the owners will be required to sign an agreement to an assessment in the future to construct the other sidewalk if the City Council decides it is necessary.*

**Response:** As shown on Sheets P2.00 and P2.10, all sidewalks within the development site are at least 5 ft. wide. No adjustments are requested. These standards are met.

- (.04) Bicycle Facilities.** *Bicycle facilities shall be provided to implement the Transportation System Plan, and may include on-street and off-street bike lanes, shared lanes, bike boulevards, and cycle tracks. The design of on-street bicycle facilities will vary according to the functional classification and the average daily traffic of the facility.*

**Response:** The proposed street cross-sections shown on Sheet P2.10 comply All of the streets within and adjacent to the proposed development are Local streets and bikes will share the vehicular lane with vehicles. These standards are met.

- (.05) Multiuse Pathways.** *Pathways may be in addition to, or in lieu of, a public street. Paths that are in addition to a public street shall generally run parallel to that street, and shall be designed in accordance with the Public Works Standards or as specified by the City Engineer. Paths that are in lieu of a public street shall be considered in areas only where no other public street connection options are feasible, and are subject to the following standards.*
- A. *Paths shall be located to provide a reasonably direct connection between likely pedestrian and bicyclist destinations. Additional standards relating to entry points, maximum length, visibility, and path lighting are provided in the Public Works Standards.*
  - B. *To ensure ongoing access to and maintenance of pedestrian/bicycle paths, the City Engineer will require dedication of the path to the public and acceptance of the path by the City as public right-of-way; or creation of a public access easement over the path.*

**Response:** A multiuse pathway (Pedestrian Connection) is proposed through Tract A and will be extended to the west with future development. This pathway is subject to compliance with the cross-section of Figure 25 of the Frog Pond West Master Plan, which calls for a 26-ft. width that includes a 10-ft. paved walkway and an 8-ft. planter strip on each side. Since the walkway is located within Tract A, a vegetated open space that contains landscaping and trees, a defined planter strip is not proposed.

The Frog Pond West Master Plan references the City's Public Works Standards related to Pedestrian Connection lighting. These standards provide illumination minimums for multiuse pathway. As noted elsewhere in this narrative, lighting within Tract A is not proposed. Full compliance with the Public Works Standards will be verified at the time of development.

**(.06) Transit Improvements**

*Development on sites that are adjacent to or incorporate major transit streets shall provide improvements as described in this section to any bus stop located along the site's frontage, unless waived by the City Engineer for reasons of safety or traffic operations. Transit facilities include bus stops, shelters, and related facilities. Required transit facility improvements may include the dedication of land or the provision of a public easement.[...]*

**Response:** The site is not adjacent to nor incorporates a major transit street. These standards are not applicable.

**(.07) Residential Private Access Drives.** *Residential Private Access Drives shall meet the following standards:*

A. *Residential Private Access Drives shall provide primary vehicular access to no more than four (4) dwelling units, excluding accessory dwelling units.*

**Response:** Street B will be a private access drive. It will provide primary vehicular access to four lots (lots 5-8). This standard is met.

B. *The design and construction of a Residential Private Access Drive shall ensure a useful lifespan and structural maintenance schedule comparable, as determined by the City Engineer or City's Authorized Representative, to a local street constructed in conformance to current public works standards.*

1. *The design of residential private access drives shall be stamped by a professional engineer registered in the state of Oregon and shall be approved by the City Engineer or City's Authorized Representative to ensure the above requirement is met.*
2. *Prior to issuing a certificate of occupancy for any residential dwelling unit whose primary vehicular access is from a Residential Private Access Drive the City Engineer or City's Authorized Representative shall certify construction of the Residential Private Access Drive substantially conforms the design approved by the City Engineer or City's Authorized Representative.*

**Response:** At the time of construction document submittal, the design shall be stamped by a professional engineer registered in the state of Oregon. These standards will be met.

C. *Residential Private Access Drives shall be named for addressing purposes. All Residential Private Access Drives shall use the suffix "Lane", i.e. SW Oakview Lane.*

D. *Residential Private Access Drives shall meet or exceed the standards for access drives and travel lanes established in Subsection (.08) of this Section.*

*[Amended by Ord. 682, 9/1/10]*

**Response:** Street B private access drive will meet the appropriate standards as detailed below.

P. *Unless constrained by topography, natural resources, rail lines, freeways, existing or planned or approved development, or easements or covenants, driveways proposed as part of a residential or mixed-use development shall meet local street spacing standards and shall be constructed to align with existing or planned streets, if the driveway.*

1. *Intersects with a public street that is controlled, or is to be controlled in the planning period, by a traffic signal;*
2. *Intersects with an existing or planned arterial or collector street; or*
3. *Would be an extension of an existing or planned local street, or of another major driveway.*

**Response:** Street B is located to comply with local street spacing standards, as shown in Sheet P2.00.

**(.08). Access Drive and Driveway Approach Development Standards.**

**Response:** There is one private access drive, Street B, proposed on the site. The access drive provisions of this section are applicable.

- A. *An access drive to any proposed development shall be designed to provide a clear travel lane free from any obstructions.*
- B. *Access drive travel lanes shall be constructed with a hard surface capable of carrying a 23-ton load.*
- C. *Where emergency vehicle access is required, approaches and driveways shall be designed and constructed to accommodate emergency vehicle apparatus and shall conform to applicable fire protection requirements. The City may restrict parking, require signage, or require other public safety improvements pursuant to the recommendations of an emergency service provider.*
- D. *Secondary or emergency access lanes may be improved to a minimum 12 feet with an all-weather surface as approved by the Fire District. All fire lanes shall be dedicated easements.*

**Response:** As shown on Sheet P2.10, the Street B access drive is designed to be improved with two 10-ft travel lanes and will be constructed with a hard surface. A public access easement will be applied across the access drive. These standards are met.

- E. *Minimum access requirements shall be adjusted commensurate with the intended function of the site based on vehicle types and traffic generation.*
- F. *The number of approaches on higher classification streets (e.g., collector and arterial streets) shall be minimized; where practicable, access shall be taken first from a lower classification street.*

**Response:** The TSP does not identify minimum access requirements for local streets and all access is being taken from local streets. These standards are met.

- G. *The City may limit the number or location of connections to a street, or impose access restrictions where the roadway authority requires mitigation to alleviate safety or traffic operations concerns.*
- H. *The City may require a driveway to extend to one or more edges of a parcel and be designed to allow for future extension and inter-parcel circulation as adjacent properties develop. The City may also require the owner(s) of the subject site to record an access easement for future joint use of the approach and driveway as the adjacent property(ies) develop(s).*
- I. *Driveways shall accommodate all projected vehicular traffic on-site without vehicles stacking or backing up onto a street.*
- J. *Driveways shall be designed so that vehicle areas, including but not limited to drive-up and drive-through facilities and vehicle storage and service areas, do not obstruct any public right-of-way.*
- K. *Approaches and driveways shall not be wider than necessary to safely accommodate projected peak hour trips and turning movements, and shall be designed to minimize crossing distances for pedestrians.*
- L. *As it deems necessary for pedestrian safety, the City, in consultation with the roadway authority, may require traffic-calming features, such as speed tables, textured driveway surfaces, curb extensions, signage or traffic control devices, or other features, be installed on or in the vicinity of a site.*
- M. *Approaches and driveways shall be located and designed to allow for safe maneuvering in and around loading areas, while avoiding conflicts with pedestrians, parking, landscaping, and buildings.*
- N. *Where a proposed driveway crosses a culvert or drainage ditch, the City may require the developer to install a culvert extending under and beyond the edges of the driveway on both sides of it, pursuant applicable Public Works standards.*
- O. *Except as otherwise required by the applicable roadway authority or waived by the City Engineer, temporary driveways providing access to a construction site or staging area shall be paved or graveled to prevent tracking of mud onto adjacent paved streets.*

**Response:** The described conditions do not apply to Street B. The applicant acknowledges that the City may apply additional requirements.

- P. *Unless constrained by topography, natural resources, rail lines, freeways, existing or planned or approved development, or easements or covenants, driveways proposed as part of a residential or*

*mixed-use development shall meet local street spacing standards and shall be constructed to align with existing or planned streets, if the driveway.*

1. *Intersects with a public street that is controlled, or is to be controlled in the planning period, by a traffic signal;*
2. *Intersects with an existing or planned arterial or collector street; or*
3. *Would be an extension of an existing or planned local street, or of another major driveway.*

**Response:** Street B is located to comply with local street spacing standards, as shown in Sheet P2.00.

**(.09) Minimum street intersection spacing standards.**

- A. *New streets shall intersect at existing street intersections so that centerlines are not offset. Where existing streets adjacent to a proposed development do not align properly, conditions shall be imposed on the development to provide for proper alignment.*
- B. *Minimum intersection spacing standards are provided in Transportation System Plan Table 3-2.*

**Response:** The streets within and adjacent to the development are local streets. Per Table 3-2 of the TSP, there is no minimum access spacing standard for Local Streets and access is permitted to each lot. Access to each lot is proposed from local streets. These standards are met.

**(.10) Exceptions and Adjustments.** *The City may approve adjustments to the spacing standards of subsections (.08) and (.09) above through a Class II process, or as a waiver per Section 4.118(.03)(A.), where an existing connection to a City street does not meet the standards of the roadway authority, the proposed development moves in the direction of code compliance, and mitigation measures alleviate all traffic operations and safety concerns. Mitigation measures may include consolidated access (removal of one access), joint use driveways (more than one property uses same access), directional limitations (e.g., one-way), turning restrictions (e.g., right in/out only), or other mitigation. [Section 4.177 amended by Ord. 719, 6/17/13]*

**Response:** No exceptions or adjustments to the spacing standards are requested.

**I. Section 4.180. Exceptions and Modifications - Projections into Required Yards.**

**(.01)** *Certain non-structural architectural features are permitted to project into required yards or courts, without requiring the approval of a Variance or Reduced Setback Agreement, as follows:*

- A. *Into any required yard:*
  1. *Architectural features may project into the required yard not more than two (2) inches for each foot of required setback.*
  2. *Open, unenclosed fire escapes may project a distance not exceeding forty-eight (48) inches.*
- B. *Into any required yard, adjoining a street or tract with a private drive: [Amended by Ord. 682, 9/9/10]*
  1. *Architectural features may project a distance not exceeding forty (40) inches.*
  2. *An uncovered porch, terrace, or patio extending no more than two and one-half (2 1/2) feet above the finished elevation may extend within three (3) feet of an interior side lot line, or within ten (10) feet of a front lot line or of an exterior side lot line.*

**Response:** No buildings are proposed with this application. These provisions are not applicable.

**J. Section 4.181. Exceptions & Modifications - Height Limits.**

*Except as stipulated in Sections 4.800 through 4.804, height limitations specified elsewhere in this Code shall not apply to barns, silos or other farm buildings or structures on farms; to church spires; belfries; cupolas; and domes; monuments; water towers; windmills; chimneys; smokestacks; fire and hose towers; flag poles; above-ground electric transmission, distribution, communication and signal lines, towers and poles; and properly screened mechanical and elevator structures.*

**Response:** No listed structures are proposed at this time. These provisions are not applicable.

## K. Section 4.182. Exceptions and Modifications - Setback Modifications.

*In any residential zone where the average depth of at least two (2) existing front yards on adjoining lots or within one hundred fifty (150) feet of the lot in question and within the same block front is less or greater than the minimum or maximum front yard depth prescribed elsewhere in this Code, the required depth of the front yard on such lot shall be modified. In such case, the front yard depth shall not be less than the average depth, nor more than the greater depth, of existing front yards on at least two (2) adjoining lots within one hundred and fifty (150) feet. In the case of a corner lot, the depth of the front yard may be reduced to that of the lot immediately adjoining, provided, however, that the depth of a front yard on any corner lot shall be at least ten (10) feet.*

**Response:** No setback modifications are requested under the provisions of this section.

## L. Section 4.197. Zone Changes and Amendments To This Code – Procedures.

*(.01) The following procedure shall be followed in applying for an amendment to the text of this Chapter:[...]*

**Response:** No zoning text amendments are proposed. This procedure is not applicable.

*(.02) The following procedures shall be followed for zone map amendments. :*

**Response:** An amendment to the zoning map is proposed as part of this project. Therefore, the criteria in this section apply.

*[...]*

*(C) In recommending approval or denial of a proposed zone map amendment, the Planning Commission or Development Review Board shall at a minimum, adopt findings addressing the following criteria:*

*1. That the application before the Commission or Board was submitted in accordance with the procedures set forth in Section 4.008, Section 4.125 (.18)(B)(2) or, in the case of a Planned Development, Section 4.140; and [Amended by Ord 557, adopted 9/5/03]*

**Response:** The zone map amendment is being requested concurrent with a Planned Development. The application has been submitted in accordance with the procedures set forth in Section 4.140. This criterion is met.

*2. That the proposed amendment is consistent with the Comprehensive Plan map designation and substantially complies with the applicable goals, policies and objectives, set forth in the Comprehensive Plan text; and*

**Response:** The Comprehensive Plan map designation for the Frog Pond Estates site is Residential Neighborhood RN, which is implemented by the requested Residential Neighborhood RN zone. The Comprehensive Plan map designation for the School District property to the south is Public Facilities PF, which is implemented by the Public Facilities zone.

The applicable goals, policies, and objectives of the Comprehensive Plan text are addressed in Section III of this narrative. This criterion is met.

*3. In the event that the subject property, or any portion thereof, is designated as "Residential" on the City's Comprehensive Plan Map; specific findings shall be made addressing substantial compliance with Implementation Measures 4.1.4.b, d, e, q, and x of Wilsonville's Comprehensive Plan text; and*

**Response:** The Frog Pond Estates site is designated "Residential" on the City's Comprehensive Plan Map. Compliance with Implementation Measures 4.1.4.b, d, e, q, and x is addressed in Section III of this narrative. This criterion is met.

4. *That the existing primary public facilities, i.e., roads and sidewalks, water, sewer and storm sewer are available and are of adequate size to serve the proposed development; or, that adequate facilities can be provided in conjunction with project development. The Planning Commission and Development Review Board shall utilize any and all means to insure that all primary facilities are available and are adequately sized; and*

**Response:** As addressed elsewhere in this narrative, the development will extend roads and sidewalks, water, sewer, and storm sewer to serve the proposed development. This criterion is met.

5. *That the proposed development does not have a significant adverse effect upon Significant Resource Overlay Zone areas, an identified natural hazard, or an identified geologic hazard. When Significant Resource Overlay Zone areas or natural hazard, and/or geologic hazard are located on or about the proposed development, the Planning Commission or Development Review Board shall use appropriate measures to mitigate and significantly reduce conflicts between the development and identified hazard or Significant Resource Overlay Zone and*

**Response:** The site does not contain an SROZ area. This criterion is not applicable.

6. *That the applicant is committed to a development schedule demonstrating that development of the property is reasonably expected to commence within two (2) years of the initial approval of the zone change; and*

**Response:** The zone change request is being submitted concurrently with a planned development, subdivision, and site plan review application. The applicant is committed to develop the property as soon as these applications and related site development permits are approved, which is expected to occur by fall 2022. This criterion is met.

7. *That the proposed development and use(s) can be developed in compliance with the applicable development standards or appropriate conditions are attached that insure that the project development substantially conforms to the applicable development standards.*

**Response:** The proposed development and use is single-family residential in accordance with the Frog Pond West Master Plan. Compliance with the applicable development standards of the RN zone is addressed Section IV of this narrative. No development is proposed within the PF-zoned parcel at this time.

8. *Adequate public facilities, services, and transportation networks are in place, or are planned to be provided concurrently with the development of the property. The applicant shall demonstrate compliance with the Transportation Planning Rule, specifically by addressing whether the proposed amendment has a significant effect on the transportation system pursuant to OAR 660-012-0060. A Traffic Impact Analysis (TIA) shall be prepared pursuant to the requirements in Section 4.133.05.(01).*

**Response:** Adequate public facilities, services, and transportation networks are in place, or are planned to be provided concurrently with the proposed development. The development will extend sewer and water infrastructure into the development from existing lines in Frog Pond Lane, Columbine Avenue, and Brisband Street, and will provide storm drainage facilities to serve the development. See Sheet P4.00 and Appendix B Preliminary Drainage Report.

DKS, the City's traffic engineer, determined that a full Traffic Impact Analysis was not required for this development due to the small number of dwelling units proposed. Compliance with the TPR is included in the Frog Pond Area Plan and assumes full development of the Frog Pond area. The Frog Pond Area Plan determined that the anticipated development within Frog Pond would comply with the TPR with the addition of a traffic signal at the intersection of Stafford Road and Frog Pond Lane.

This criterion is met.

- (.03)** *If affirmative findings cannot be made for all applicable criteria listed above the Planning Commission or Development Review Board shall recommend that the proposed text or map amendment, as the case may be, be denied.*
- (.04)** *City Council action approving a change in zoning shall be in the form of a Zoning Order.*
- (.05)** *In cases where a property owner or other applicant has requested a change in zoning and the City Council has approved the change subject to conditions, the owner or applicant shall sign a statement accepting, and agreeing to complete the conditions of approval before the zoning shall be changed.*

**Response:** The proposed development meets the applicable criteria as described above.

## VI. Land Divisions

### A. Section 4.210. Application Procedure.

- (.01) Pre-application conference.** *Prior to submission of a tentative condominium, partition, or subdivision plat, a person proposing to divide land in the City shall contact the Planning Department to arrange a pre-application conference as set forth in Section 4.010.*
- A. *Preparation of Tentative Plat. The Planning staff shall provide information regarding procedures and general information having a direct influence on the proposed development, such as elements of the Comprehensive Plan, existing and proposed streets, roads and public utilities. The applicant shall cause to be prepared a tentative plat, together with improvement plans and other supplementary material as specified in this Section. The Tentative Plat shall be prepared by an Oregon licensed professional land surveyor or engineer. An affidavit of the services of such surveyor or engineer shall be furnished as part of the submittal.*
- B. *Tentative Plat Submission. The purpose of the Tentative Plat is to present a study of the proposed subdivision to the Planning Department and Development Review Board and to receive approval or recommendations for revisions before preparation of a final Plat. The design and layout of this plan plat shall meet the guidelines and requirements set forth in this Code. The Tentative Plat shall be submitted to the Planning Department with the following information:*
1. *Site development application form completed and signed by the owner of the land or a letter of authorization signed by the owner. A preliminary title report or other proof of ownership is to be included with the application form.*
  2. *Application fees as established by resolution of the City Council.*
  3. *Ten (10) copies and one (1) sepia or suitable reproducible tracing of the Tentative Plat shall be submitted with the application. Paper size shall be eighteen inch (18") by twenty-four inch (24"), or such other size as may be specified by the City Engineer.*
  4. *Name of the subdivision. No subdivision name shall duplicate or resemble the name of any other subdivision in Clackamas or Washington County. Names may be checked through the county offices.*
  5. *Names, addresses, and telephone numbers of the owners and applicants, and engineer or surveyor.*
  6. *Date, north point and scale of drawing.*
  7. *Location of the subject property by Section, Township, and Range.*
  8. *Legal road access to subject property shall be indicated as City, County, or other public roads.*
  9. *Vicinity map showing the relationship to the nearest major highway or street.*
  10. *Lots: Dimensions of all lots, minimum lot size, average lot size, and proposed lot and block numbers.*
  11. *Gross acreage in proposed plat.*
  12. *Proposed uses of the property, including sites, if any, for multi-family dwellings, shopping centers, churches, industries, parks, and playgrounds or other public or semi-public uses.*
  13. *Improvements: Statement of the improvements to be made or installed including streets, private drives, sidewalks, lighting, tree planting, and times such improvements are to be made or completed. [Amended by Ord. 682, 9/9/10]*
  14. *Trees. Locations, types, sizes, and general conditions of all existing trees, as required in Section 4.600.*
  15. *Utilities such as electrical, gas, telephone, on and abutting the tract.*
  16. *Easements: Approximate width, location, and purpose of all existing and proposed easements on, and known easements abutting the tract.*



17. *Deed Restrictions: Outline of proposed deed restrictions, if any.*
  18. *Written Statement: Information which is not practical to be shown on the maps may be shown in separate statements accompanying the Tentative Plat.*
  19. *If the subdivision is to be a "Planned Development," a copy of the proposed Home Owners Association By-Laws must be submitted at the time of submission of the application. The Tentative Plat shall be considered as the Stage I Preliminary Plan. The proposed By-Laws must address the maintenance of any parks, common areas, or facilities.*
  20. *Any plat bordering a stream or river shall indicate areas subject to flooding and shall comply with the provisions of Section 4.172.*
  21. *Proposed use or treatment of any property designated as open space by the City of Wilsonville.*
  22. *A list of the names and addresses of the owners of all properties within 250 feet of the subject property, printed on self-adhesive mailing labels. The list shall be taken from the latest available property ownership records of the Assessor's office of the affected county.*
  23. *A completed "liens and assessments" form, provided by the City Finance Department.*
  24. *Locations of all areas designated as a Significant Resource Overlay Zone by the City, as well as any wetlands shall be shown on the tentative plat.*
  25. *Locations of all existing and proposed utilities, including but not limited to domestic water, sanitary sewer, storm drainage, and any private utilities crossing or intended to serve the site. Any plans to phase the construction or use of utilities shall be indicated. [Amended by Ord. 682, 9/9/10]*
  26. *A traffic study, prepared under contract with the City, shall be submitted as part of the tentative plat application process, unless specifically waived by the Community Development Director.*
- C. *Action on proposed tentative plat:*  
[...]
- D. *Land division phases to be shown. Where the applicant intends to develop the land in phases, the schedule of such phasing shall be presented for review at the time of the tentative plat. In acting on an application for tentative plat approval, the Planning Director or Development Review Board may set time limits for the completion of the phasing schedule which, if not met, shall result in an expiration of the tentative plat approval.*
- E. *Remainder tracts to be shown as lots or parcels. Tentative plats shall clearly show all affected property as part of the application for land division. All remainder tracts, regardless of size, shall be shown and counted among the parcels or lots of the division.*  
[...]

**Response:** A Subdivision is requested to create the lots proposed by the Planned Development. The information described above is included with this submittal. A Preliminary Plat is included as Sheet 3.00; a Preliminary Utility Plan is included as Sheet P4.00; a Tree Removal and Protection Plan is included as Sheet L1.00; Preliminary Street Cross-Sections are included as Sheets P2.10; Street Lighting Plans are included as Sheets IL-1 to IL-4; a traffic memo is included as Appendix C; and draft Homeowner Association Bylaws and CC&Rs are included as Appendix F.

## **B. Section 4.236. General Requirements - Streets.**

**(.01)** *Conformity to the Transportation System Plan. Land divisions shall conform to and be in harmony with the Transportation Systems Plan, the Bicycle and Pedestrian Master Plan, and the Parks and Recreation Master Plan.*

**Response:** As confirmed by the TIS, the proposed street plan conforms to the Transportation System Plan and the Frog Pond West Master Plan.

The 2018 Parks and Recreation Master Plan identifies a Future School and a Future Outdoor Recreation Location (defined in the Frog Pond West Master Plan as a neighborhood park) south of the subject site and east of the future school site. The 2017 Frog Pond West Master Plan defines the types of parks and open space anticipated within the Frog Pond West area. Proposed street improvements will provide access to the future neighborhood park location, identified southeast of the site.

**(.02) Relation to Adjoining Street System.**

- A. *A land division shall provide for the continuation of the principal streets existing in the adjoining area, or of their proper projection when adjoining property is not developed, and shall be of a width not less than the minimum requirements for streets set forth in these regulations. Where, in the opinion of the Planning Director or Development Review Board, topographic conditions make such continuation or conformity impractical, an exception may be made. In cases where the Board or Planning Commission has adopted a plan or plat of a neighborhood or area of which the proposed land division is a part, the subdivision shall conform to such adopted neighborhood or area plan.*
- B. *Where the plat submitted covers only a part of the applicant's tract, a sketch of the prospective future street system of the unsubmitted part shall be furnished and the street system of the part submitted shall be considered in the light of adjustments and connections with the street system of the part not submitted.*
- C. *At any time when an applicant proposes a land division and the Comprehensive Plan would allow for the proposed lots to be further divided, the city may require an arrangement of lots and streets such as to permit a later resubdivision in conformity to the street plans and other requirements specified in these regulations.*

**Response:** As shown in Sheet P8.00, the proposed street network is designed for future continuation per the Frog Pond West Master Plan. These standards are met.

**(.03)** *All streets shall conform to the standards set forth in Section 4.177 and the block size requirements of the zone.*

**Response:** The standards of Section 4.177 are addressed in Section V of this narrative. These standards are met.

**(.04) Creation of Easements:** *The Planning Director or Development Review Board may approve an easement to be established without full compliance with these regulations, provided such an easement is the only reasonable method by which a portion of a lot large enough to allow partitioning into two (2) parcels may be provided with vehicular access and adequate utilities. If the proposed lot is large enough to divide into more than two (2) parcels, a street dedication may be required.*  
[Amended by Ord. 682, 9/9/10]

**Response:** No street easements are proposed. This standard is not applicable.

**(.05) Topography:** *The layout of streets shall give suitable recognition to surrounding topographical conditions in accordance with the purpose of these regulations.*

**Response:** The street layout recognizes topographical conditions, specifically existing trees. This standard is met.

**(.06) Reserve Strips:** *The Planning Director or Development Review Board may require the applicant to create a reserve strip controlling the access to a street. Said strip is to be placed under the jurisdiction of the City Council, when the Director or Board determine that a strip is necessary:*

- A. *To prevent access to abutting land at the end of a street in order to assure the proper extension of the street pattern and the orderly development of land lying beyond the street; or*
- B. *To prevent access to the side of a street on the side where additional width is required to meet the right-of-way standards established by the City; or*
- C. *To prevent access to land abutting a street of the land division but not within the tract or parcel of land being divided; or*
- D. *To prevent access to land unsuitable for building development.*

**Response:** No reserve strip is proposed. The applicant acknowledges that the DRB may require that the applicant create a reserve strip.

**(.07) Future Expansion of Street:** *When necessary to give access to, or permit a satisfactory future division of, adjoining land, streets shall be extended to the boundary of the land division and the resulting*

*dead-end street may be approved without a turn-around. Reserve strips and street plugs shall be required to preserve the objective of street extension. Notification that the street is planned for future extension shall be posted on the stub street. [Amended by Ord. #719, 6/17/13]*

**Response:** Street A and Brisband Street have been extended to the boundaries of the site and are intended for future extension. For that reason, no turnarounds are proposed for these streets. The applicant will comply with any requirements related to signage street extension objectives. This standard is met.

**(.08) Existing Streets:** *Whenever existing streets adjacent to or within a tract are of inadequate width, additional right-of-way shall conform to the designated width in this Code or in the Transportation Systems Plan.*

**Response:** The project will dedicate 41.45 ft. of additional right-of-way along Brisband Street; 9 ft. of additional right-of-way along Frog Pond Lane; and 6 ft. of additional right-of-way along Columbine Avenue. This standard is met.

**(.09) Street Names:** *No street names will be used which will duplicate or be confused with the names of existing streets, except for extensions of existing streets. Street names and numbers shall conform to the established name system in the City, and shall be subject to the approval of the City Engineer.*

**Response:** Brisband Lane, Frog Pond Lane, and Columbine Street have been established by previous development applications. Streets A and B will conform to the City's established name system and will be subject to approval by the City Engineer. This standard is met.

### **C. Section 4.237. General Requirements – Other.**

**(.01) Blocks:**

- A. *The length, width, and shape of blocks shall be designed with due regard to providing adequate building sites for the use contemplated, consideration of needs for convenient access, circulation, control, and safety of pedestrian, bicycle, and motor vehicle traffic, and recognition of limitations and opportunities of topography.*
- B. *Sizes: Blocks shall not exceed the sizes and lengths specified for the zone in which they are located unless topographical conditions or other physical constraints necessitate larger blocks. Larger blocks shall only be approved where specific findings are made justifying the size, shape, and configuration.*

**Response:** The length, width, and shape of blocks have been designed to accommodate the development established by the Frog Pond West Master Plan and to comply with the standards of Section 4.177. These standards are addressed in Section V.I of this narrative. The site is located within the RN zone and is also subject to the block, access, and connectivity standards of Section 4.127(.10). Those standards are addressed in Section IV.C of this narrative. These standards are met.

**(.02) Easements:**

- A. *Utility lines. Easements for sanitary or storm sewers, drainage, water mains, electrical lines or other public utilities shall be dedicated wherever necessary. Easements shall be provided consistent with the City's Public Works Standards, as specified by the City Engineer or Planning Director. All of the public utility lines within and adjacent to the site shall be installed within the public right-of-way or easement; with underground services extending to the private parcel constructed in conformance to the City's Public Works Standards. All franchise utilities shall be installed within a public utility easement. All utilities shall have appropriate easements for construction and maintenance purposes. [Amended by Ord. 682, 9/9/10]*
- B. *Water courses. Where a land division is traversed by a water course, drainage way, channel or stream, there shall be provided a storm water easement or drainage right-of-way conforming substantially with the lines of the water course, and such further width as will be adequate for the purposes of conveying storm water and allowing for maintenance of the facility or channel. Streets or parkways parallel to water courses may be required.*

**Response:** Public utilities are proposed to be placed within public rights-of-way or within public utility easements (PUE) adjacent to the public streets. There are proposed stormwater facility easements where these facilities are located on private property and are intended to be shared between more than one lot (Tract C). There are no water courses on site.

**(.03) Pedestrian and bicycle pathways.** *An improved public pathway shall be required to transverse the block near its middle if that block exceeds the length standards of the zone in which it is located.*

- A. *Pathways shall be required to connect to cul-de-sacs or to pass through unusually shaped blocks.*
- B. *Pathways required by this subsection shall have a minimum width of ten (10) feet unless they are found to be unnecessary for bicycle traffic, in which case they are to have a minimum width of six (6) feet.*

**Response:** Per Section 4.124(.06), the maximum block length for new Planned Development land divisions is 330 ft. The three blocks that will be created by this proposal are all less than 330 ft. Bicycle and pedestrian pathways are not required or proposed. This standard is met.

**(.04) Tree planting.** *Tree planting plans for a land division must be submitted to the Planning Director and receive the approval of the Director or Development Review Board before the planting is begun. Easements or other documents shall be provided, guaranteeing the City the right to enter the site and plant, remove, or maintain approved street trees that are located on private property.*

**Response:** Tree planting plans are included as Sheet L2.00. Proposed street trees are located within public right-of-way with the exception of Street B, and additional easements may be needed. This standard is met.

**(.05) Lot Size and shape.** *The lot size, width, shape and orientation shall be appropriate for the location of the land division and for the type of development and use contemplated. Lots shall meet the requirements of the zone where they are located.*

- A. *In areas that are not served by public sewer, an on-site sewage disposal permit is required from the City. If the soil structure is adverse to on-site sewage disposal, no development shall be permitted until sewer service can be provided.*
- B. *Where property is zoned or deeded for business or industrial use, other lot widths and areas may be permitted at the discretion of the Development Review Board. Depth and width of properties reserved or laid out for commercial and industrial purposes shall be adequate to provide for the off-street service and parking facilities required by the type of use and development contemplated.*
- C. *In approving an application for a Planned Development, the Development Review Board may waive the requirements of this section and lot size, shape, and density shall conform to the Planned Development conditions of approval.*

**Response:** The site is served by public sewer, and no on-site sewage disposal is proposed. The property is zoned for residential purposes and is subject to an application for a Planned Development. The site is located within the RN zone and is subject to the standards of that zone. The proposed lots meet the dimensional standards of the RN zone and the R-7 and R-10 sub-districts. These standards are met.

**(.06) Access.** *The division of land shall be such that each lot shall have a minimum frontage on a street or private drive, as specified in the standards of the relative zoning districts. This minimum frontage requirement shall apply with the following exceptions:*

- A. *A lot on the outer radius of a curved street or tract with a private drive, or facing the circular end of a cul-de-sac shall have frontage of not less than twenty-five (25) feet upon a street or tract with a private drive, measured on the arc.*
- B. *The Development Review Board may waive lot frontage requirements where in its judgment the waiver of frontage requirements will not have the effect of nullifying the intent and purpose of this regulation or if the Board determines that another standard is appropriate because of the characteristics of the overall development.*

**Response:** The minimum lot width in the RN zone/R-7 subdistrict is 35 ft; and the minimum lot width in the RN zone/R-10 subdistrict is 40 ft. As detailed in the response to Section 4.127 and shown on Sheet P3.00, each lot has frontage of at least 40 ft. on a public street. These standards are met.

**(.07) Through lots.** *Through lots shall be avoided except where essential to provide separation of residential development from major traffic arteries or adjacent non-residential activity or to overcome specific disadvantages of topography and orientation. A planting screen easement of at least ten (10) feet, across which there shall be no access, may be required along the line of lots abutting such a traffic artery or other disadvantageous use. Through lots with planting screens shall have a minimum average depth of one hundred (100) feet. The Development Review Board may require assurance that such screened areas be maintained as specified in Section 4.176.*

**Response:** No through lots are proposed with this subdivision. This standard is not applicable.

**(.08) Lot side lines.** *The side lines of lots, as far as practicable for the purpose of the proposed development, shall run at right angles to the street or tract with a private drive upon which the lots face. [Amended by Ord. 682, 9/9/10]*

**Response:** All side lot lines run at right angles to the street or the tract upon which they face. This standard is met.

**(.09) Large lot land divisions.** *In dividing tracts which at some future time are likely to be re-divided, the location of lot lines and other details of the layout shall be such that re-division may readily take place without violating the requirements of these regulations and without interfering with the orderly development of streets. Restriction of buildings within future street locations shall be made a matter of record if the Development Review Board considers it necessary.*

**Response:** No future development tracts are proposed.

**(.10) Building line.** *The Planning Director or Development Review Board may establish special building setbacks to allow for the future redivision or other development of the property or for other reasons specified in the findings supporting the decision. If special building setback lines are established for the land division, they shall be shown on the final plat.*

**Response:** No special building setbacks are proposed.

**(.11) Build-to line.** *The Planning Director or Development Review Board may establish special build to lines for the development, as specified in the findings and conditions of approval for the decision. If special build-to lines are established for the land division, they shall be shown on the final plat.*

**Response:** There is no maximum setback in the RN zones, and no build-to-lines are proposed.

**(.12) Land for public purposes.** *The Planning Director or Development Review Board may require property to be reserved for public acquisition, or irrevocably offered for dedication, for a specified period of time.*

**Response:** The City has not identified any requirements for property to be reserved for public acquisition. The development will dedicate right-of-way for the public street network.

**(.13) Corner lots.** *Lots on street intersections shall have a corner radius of not less than ten (10) feet.*

**Response:** As shown on Sheet P3.00, lots on street intersections have corner radii of at least 20 ft. This standard is met.

#### **D. Section 4.262. Improvements - Requirements.**

**(.01) Streets.** *Streets within or partially within the development shall be graded for the entire right-of-way width, constructed and surfaced in accordance with the Transportation Systems Plan and City Public Works Standards. Existing streets which abut the development shall be graded, constructed, reconstructed, surfaced or repaired as determined by the City Engineer.*

**(.02) Curbs.** *Curbs shall be constructed in accordance with standards adopted by the City.*

**(.03) Sidewalks.** *Sidewalks shall be constructed in accordance with standards adopted by the City.*

**Response:** As shown on Sheet P2.10, streets will be graded, constructed, and surfaced according to the TSP, the cross-sections incorporated into the Frog Pond West Master Plan, and the City's Public Works Standards as modified by the City Engineer. These standards are met.

**(.04) Sanitary sewers.** *When the development is within two hundred (200) feet of an existing public sewer main, sanitary sewers shall be installed to serve each lot or parcel in accordance with standards adopted by the City. When the development is more than two hundred (200) feet from an existing public sewer main, the City Engineer may approve an alternate sewage disposal system.*

**(.05) Drainage.** *Storm drainage, including detention or retention systems, shall be provided as determined by the City Engineer.*

**Response:** The proposed development will be served by public sanitary sewer. Storm drainage systems are being provided as outlined in the City's Site Assessment and Planning standards. LIDA facilities are proposed within the Frog Pond Ln street frontage.

See Sheet P2.00 for the location of LIDA facilities within the planter strips of Frog Pond Ln and Sheet P4.00 for the location of stormwater facilities within Tract C. See Sheet L2.00 for details of the Frog Pond Ln LIDA facility planting; see Sheet L2.10 for details of the Tract C stormwater facility planting; and see Appendix B for the Preliminary Drainage Plan, including a downstream analysis and evaluation of capacity. This standard is met.. These standards are met.

**(.06) Underground utility and service facilities.** *All new utilities shall be subject to the standards of Section 4.300 (Underground Utilities). The developer shall make all necessary arrangements with the serving utility to provide the underground services in conformance with the City's Public Works Standards.*

**Response:** The standards of Section 4.300 are addressed in Section VII of this narrative. These standards are met.

**(.07) Streetlight standards.** *Streetlight standards shall be installed in accordance with regulations adopted by the City.*

**Response:** Streetlights will be installed per the Frog Pond West Master Plan and regulations adopted by the City. Figure 42 of the Frog Pond West Master Plan identifies the streets within the development site (Frog Pond Ln, Columbine Ave, and Brisband St) as Local Streets. The proposed Tract/Street B and Tract A are shown as Pedestrian Connections in this figure. Tract/Street B is proposed as a local street in place of a Pedestrian Connection and the local street lighting standard is proposed for Tract/Street B. The Master Plan calls for the use of the Philips Hadco LED Westbrooke fixture for local streets. As shown in Sheets IL-1 to IL-4, these fixtures are proposed on all public and private streets.

Tract A is proposed as a Pedestrian Connection. The Master Plan calls for compliance with City of Wilsonville Public Works Standards Chapter 201.9.02 Shared-Use Path Lighting for Pedestrian Connections. These standards do not reference a preferred light fixture but refer to horizontal and vertical illuminance and uniformity values. Because a street light is proposed at the westernmost end of Tract/Street B, no additional lights are proposed within Tract A. A photometric analysis can be provided prior to site permitting to verify compliance with the City's Public Works Standards.

**(.08) Street signs.** *Street name signs shall be installed at all street intersections and dead-end signs at the entrance to all dead-end streets and cul-de-sacs in accordance with standards adopted by the City. Other signs may be required by the City Engineer.*

**Response:** Street signs will be installed per City standards.

**(.09) Monuments.** *Monuments shall be placed at all lot and block corners, angle points, points of curves in streets, at intermediate points and shall be of such material, size and length as required by State Law. Any monuments that are disturbed before all improvements are completed by the developer and accepted by the City shall be replaced to conform to the requirements of State Law.*

**Response:** Monuments will be placed per State, Clackamas County, and City requirements.

**(.10) Water.** *Water mains and fire hydrants shall be installed to serve each lot in accordance with City standards.*

**Response:** Water mains and fire hydrants are proposed to serve each lot in accordance with City and Fire Department standards. See Sheet P4.00.

## VII. Underground Utilities

### A. Section 4.300 General.

**(.01)** *The City Council deems it reasonable and necessary in order to accomplish the orderly and desirable development of land within the corporate limits of the City, to require the underground installation of utilities in all new developments.*

**(.02)** *After the effective date of this Code, the approval of any development of land within the City will be upon the express condition that all new utility lines, including but not limited to those required for power, communication, street lighting, gas, cable television services and related facilities, shall be placed underground.*

**(.03)** *The construction of underground utilities shall be subject to the City's Public Works Standards and shall meet applicable requirements for erosion control and other environmental protection.*

**Response:** The proposed development is subject to the requirements of this section.

### B. Section 4.320. Requirements.

**(.01)** *The developer or subdivider shall be responsible for and make all necessary arrangements with the serving utility to provide the underground services (including cost of rearranging any existing overhead facilities). All such underground facilities as described shall be constructed in compliance with the rules and regulations of the Public Utility Commission of the State of Oregon relating to the installation and safety of underground lines, plant, system, equipment and apparatus.*

**(.02)** *The location of the buried facilities shall conform to standards supplied to the subdivider by the City. The City also reserves the right to approve location of all surface-mounted transformers.*

**(.03)** *Interior easements (back lot lines) will only be used for storm or sanitary sewers, and front easements will be used for other utilities unless different locations are approved by the City Engineer. Easements satisfactory to the serving utilities shall be provided by the developer and shall be set forth on the plat.*

**Response:** New utilities will be installed underground in accordance with City and other agency requirements. These standards are met.

## VIII. Site Design Review

### A. Section 4.400. Purpose.

**(.01)** *Excessive uniformity, inappropriateness or poor design of the exterior appearance of structures and signs and the lack of proper attention to site development and landscaping in the business, commercial, industrial and certain residential areas of the City hinders the harmonious development of the City, impairs the desirability of residence, investment or occupation in the City, limits the opportunity to attain the optimum use in value and improvements, adversely affects the stability and value of property, produces degeneration of property in such areas and with attendant deterioration of conditions affecting the peace, health and welfare, and destroys a proper relationship between the taxable value of property and the cost of municipal services therefor.*

**(.02)** *The City Council declares that the purposes and objectives of site development requirements and the site design review procedure are to:*

A. *Assure that Site Development Plans are designed in a manner that insures proper functioning of the site and maintains a high quality visual environment.*



- B. *Encourage originality, flexibility and innovation in site planning and development, including the architecture, landscaping and graphic design of said development;*
- C. *Discourage monotonous, drab, unsightly, dreary and inharmonious developments;*
- D. *Conserve the City's natural beauty and visual character and charm by assuring that structures, signs and other improvements are properly related to their sites, and to surrounding sites and structures, with due regard to the aesthetic qualities of the natural terrain and landscaping, and that proper attention is given to exterior appearances of structures, signs and other improvements;*
- E. *Protect and enhance the City's appeal and thus support and stimulate business and industry and promote the desirability of investment and occupancy in business, commercial and industrial purposes;*
- F. *Stabilize and improve property values and prevent blighted areas and, thus, increase tax revenues;*
- G. *Insure that adequate public facilities are available to serve development as it occurs and that proper attention is given to site planning and development so as to not adversely impact the orderly, efficient and economic provision of public facilities and services.*
- H. *Achieve the beneficial influence of pleasant environments for living and working on behavioral patterns and, thus, decrease the cost of governmental services and reduce opportunities for crime through careful consideration of physical design and site layout under defensible space guidelines that clearly define all areas as either public, semi-private, or private, provide clear identity of structures and opportunities for easy surveillance of the site that maximize resident control of behavior -- particularly crime;*
- I. *Foster civic pride and community spirit so as to improve the quality and quantity of citizen participation in local government and in community growth, change and improvements;*
- J. *Sustain the comfort, health, tranquility and contentment of residents and attract new residents by reason of the City's favorable environment and, thus, to promote and protect the peace, health and welfare of the City.*

**Response:** The City Council adopted the Frog Pond West Master Plan to guide development in this area. The Master Plan addresses visual appeal, infrastructure provisions, and protection of the natural areas within the development site. The proposed development is intended to advance the vision for Frog Pond West by incorporating the natural areas on site, providing attractive streetscapes, and enhancing the existing neighborhood. The intent of this purpose statement is incorporated into the proposed site design.

Per City staff, the project elements subject to the standards of this section include: tracts and their landscaping; landscaping in the public right-of-way; retaining walls; and public furnishings.

## **B. Section 4.421. Criteria and Application of Design Standards.**

*(.01) The following standards shall be utilized by the Board in reviewing the plans, drawings, sketches and other documents required for Site Design Review. These standards are intended to provide a frame of reference for the applicant in the development of site and building plans as well as a method of review for the Board. These standards shall not be regarded as inflexible requirements. They are not intended to discourage creativity, invention and innovation. The specifications of one or more particular architectural styles is not included in these standards. (Even in the Boones Ferry Overlay Zone, a range of architectural styles will be encouraged.)*

- A. *Preservation of Landscape. The landscape shall be preserved in its natural state, insofar as practicable, by minimizing tree and soils removal, and any grade changes shall be in keeping with the general appearance of neighboring developed areas.*

**Response:** Tract A includes a 53-in. oak (#50725). Minimal grade changes are proposed for Tract A and the trees within and adjacent to the tract will be protected and preserved. The remainder of the site will need to be graded to extend utilities from adjacent development to the east. This standard is met.

- B. *Relation of Proposed Buildings to Environment. Proposed structures shall be located and designed to assure harmony with the natural environment, including protection of steep slopes, vegetation and other naturally sensitive areas for wildlife habitat and shall provide proper buffering from less intensive uses in accordance with Sections 4.171 and 4.139 and 4.139.5. The achievement of such relationship may include the enclosure of space in conjunction with other existing buildings or other*

*proposed buildings and the creation of focal points with respect to avenues of approach, street access or relationships to natural features such as vegetation or topography.*

**Response:** Two structures are proposed within Tract A: a picnic table and split rail fence. A chain link fence is proposed around the stormwater facility in Tract C. No buildings are proposed with this application. The split rail fence is intended to provide separation from adjacent lots while minimizing visual impact, and the chain link fence around the stormwater facility is intended to provide protection for the public. See Sheet L2.00 and L2.20 for details. These standards are met.

*C. Drives, Parking and Circulation. With respect to vehicular and pedestrian circulation, including walkways, interior drives and parking, special attention shall be given to location and number of access points, general interior circulation, separation of pedestrian and vehicular traffic, and arrangement of parking areas that are safe and convenient and, insofar as practicable, do not detract from the design of proposed buildings and structures and the neighboring properties.*

**Response:** The drives, parking, and circulation within the development is subject to the requirements of the RN Zone, the Planned Development overlay, and Land Division requirements. The parking to serve single-family dwellings will be provided on site. Pedestrian and vehicular traffic is separated vertically by curbs. These standards are met.

*D. Surface Water Drainage. Special attention shall be given to proper site surface drainage so that removal of surface waters will not adversely affect neighboring properties of the public storm drainage system.*

**Response:** See Sheet P2.00 for the location of LIDA facilities within the planter strips of Frog Pond Ln and Sheet P4.00 for the location of stormwater facilities within Tract C. See Sheet L2.00 for details of the Frog Pond Ln LIDA facility planting; see Sheet L2.10 for details of the Tract C stormwater facility planting; and see Appendix B for the Preliminary Drainage Plan, including a downstream analysis and evaluation of capacity. This standard is met.

*E. Utility Service. Any utility installations above ground shall be located so as to have a harmonious relation to neighboring properties and site. The proposed method of sanitary and storm sewage disposal from all buildings shall be indicated.*

**Response:** As shown on Sheet P4.00, each lot will be served by a sanitary sewer line. Storm sewage disposal is provided by a storm drain system connecting to each on-site stormwater facility. Above ground utilities will be limited to electrical vaults if required by PGE. Utilities will be extended to the property where possible. This standard is met.

*F. Advertising Features. In addition to the requirements of the City's sign regulations, the following criteria should be included: the size, location, design, color, texture, lighting and materials of all exterior signs and outdoor advertising structures or features shall not detract from the design of proposed buildings and structures and the surrounding properties.*

**Response:** No signs or outdoor advertising structures or features are proposed with this application. This standard is not applicable.

*G. Special Features. Exposed storage areas, exposed machinery installations, surface areas, truck loading areas, utility buildings and structures and similar accessory areas and structures shall be subject to such setbacks, screen plantings or other screening methods as shall be required to prevent their being incongruous with the existing or contemplated environment and its surrounding properties. Standards for screening and buffering are contained in Section 4.176.*

**Response:** The proposed development is a single-family residential development, and no storage areas, machinery installations, surface areas, truck loading areas, or utility buildings or structures are proposed. This standard is not applicable.

*(.02) The standards of review outlined in Sections (a) through (g) above shall also apply to all accessory buildings, structures, exterior signs and other site features, however related to the major buildings or structures.*

**Response:** Two structures are proposed in Tract A: a picnic table and a split rail fence. A black chain link fence is proposed for Tract C. Applicable standards have been addressed above.

*(.03) The Board shall also be guided by the purpose of Section 4.400, and such objectives shall serve as additional criteria and standards.*

**Response:** The purpose of Section 4.400 is addressed earlier in this section. This standard is met.

*(.04) Conditional application. The Planning Director, Planning Commission, Development Review Board or City Council may, as a Condition of Approval for a zone change, subdivision, land partition, variance, conditional use, or other land use action, require conformance to the site development standards set forth in this Section.*

**Response:** This application includes a zone change and planned development, among other applications, and includes responses to the site development standards of those sections. Per City staff, the project elements subject to Site Design Review and the standards of this chapter are: tracts and their landscaping; and landscaping in the public right-of-way.

*(.05) The Board may attach certain development or use conditions in granting an approval that are determined necessary to insure the proper and efficient functioning of the development, consistent with the intent of the Comprehensive Plan, allowed densities and the requirements of this Code. In making this determination of compliance and attaching conditions, the Board shall, however, consider the effects of this action on the availability and cost of needed housing. The provisions of this section shall not be used in such a manner that additional conditions either singularly or accumulatively have the effect of unnecessarily increasing the cost of housing or effectively excluding a needed housing type.*

**Response:** The development has been designed in accordance with the Frog Pond West Master Plan, which is part of, and consistent with, the Comprehensive Plan. The proposed development plan is consistent with the densities and other requirements established by the Frog Pond West Master Plan and the implementing RN zone. No additional conditions are needed to ensure that the development remains consistent with the City's adopted policies.

*(.06) The Board or Planning Director may require that certain paints or colors of materials be used in approving applications. Such requirements shall only be applied when site development or other land use applications are being reviewed by the City.*

- A. Where the conditions of approval for a development permit specify that certain paints or colors of materials be used, the use of those paints or colors shall be binding upon the applicant. No Certificate of Occupancy shall be granted until compliance with such conditions has been verified.*
- B. Subsequent changes to the color of a structure shall not be subject to City review unless the conditions of approval under which the original colors were set included a condition requiring a subsequent review before the colors could be changed.*

**Response:** The proposed development is detached single-family residential development and two tracts. No paints or colors of materials are identified in the design standards of the Frog Pond West Master Plan. It is anticipated that building elevations, including paint and material colors, will be evaluated at the time of building permit review.

### **C. Section 4.440. Procedure.**

*(.01) Submission of Documents. A prospective applicant for a building or other permit who is subject to site design review shall submit to the Planning Department, in addition to the requirements of Section 4.035, the following:*

- A. *A site plan, drawn to scale, showing the proposed layout of all structures and other improvements including, where appropriate, driveways, pedestrian walks, landscaped areas, fences, walls, off-street parking and loading areas, and railroad tracks. The site plan shall indicate the location of entrances and exits and direction of traffic flow into and out of off-street parking and loading areas, the location of each parking space and each loading berth and areas of turning and maneuvering vehicles. The site plan shall indicate how utility service and drainage are to be provided.*

**Response:** Sheet P2.00 shows the proposed layout of improvements, driveways, pedestrian walks, fences, and walls. Sheets L2.00 – L2.10 shows landscaped areas.

- B. *A Landscape Plan, drawn to scale, showing the location and design of landscaped areas, the variety and sizes of trees and plant materials to be planted on the site, the location and design of landscaped areas, the varieties, by scientific and common name, and sizes of trees and plant materials to be retained or planted on the site, other pertinent landscape features, and irrigation systems required to maintain trees and plant materials. An inventory, drawn at the same scale as the Site Plan, of existing trees of 4" caliper or more is required. However, when large areas of trees are proposed to be retained undisturbed, only a survey identifying the location and size of all perimeter trees in the mass is necessary.*

**Response:** Sheet L1.00 provides an inventory of existing trees. Sheets L2.00– L2.10 shows landscaped areas and landscape schedules and Sheet L3.00 shows planting details.

- C. *Architectural drawings or sketches, drawn to scale, including floor plans, in sufficient detail to permit computation of yard requirements and showing all elevations of the proposed structures and other improvements as they will appear on completion of construction. Floor plans shall also be provided in sufficient detail to permit computation of yard requirements based on the relationship of indoor versus outdoor living area, and to evaluate the floor plan's effect on the exterior design of the building through the placement and configuration of windows and doors.*

**Response:** Example building elevations are included as Appendix I.

- D. *A Color Board displaying specifications as to type, color, and texture of exterior surfaces of proposed structures. Also, a phased development schedule if the development is constructed in stages.*  
E. *A sign Plan, drawn to scale, showing the location, size, design, material, color and methods of illumination of all exterior signs.*  
F. *The required application fee.*

**Response:** A color board is not included, as exterior dwelling design will be evaluated at the time of building permit review. No signs are proposed at this time. The required application fee has been submitted with this application.

## IX. Tree Preservation and Protection

### A. Section 4.600.20. Applicability of Subchapter

*(.01) The provisions of this subchapter apply to the United States and the State of Oregon, and to their agencies and subdivisions, including the City of Wilsonville, and to the employees and agents thereof.*

*(.02) By this subchapter, the City of Wilsonville regulates forest practices on all lands located within its urban growth boundary, as provided by ORS 527.722.*

*(.03) The provisions of this subchapter apply to all land within the City limits, including property designated as a Significant Resource Overlay Zone or other areas or trees designated as protected by the Comprehensive Plan, City zoning map, or any other law or ordinance; except that any tree activities in the Willamette River Greenway that are regulated by the provisions of WC 4.500 - 4.514 and requiring a conditional use permit shall be reviewed by the DRB under the application and review procedures set forth for Tree Removal Permits.*

**Response:** Upon annexation and at the time of development, the site will be located within City limits and this subchapter will be applicable.

**Section 4.600.30. Tree Removal Permit Required**

*(.01) Requirement Established. No person shall remove any tree without first obtaining a Tree Removal Permit (TRP) as required by this subchapter.*

*(.02) Tree Removal Permits will be reviewed according to the standards provided for in this subchapter, in addition to all other applicable requirements of Chapter 4.*

*(.03) Although tree activities in the Willamette River Greenway are governed by WC 4.500 - 4.514, the application materials required to apply for a conditional use shall be the same as those required for a Type B or C permit under this subchapter, along with any additional materials that may be required by the Planning Department. An application for a Tree Removal Permit under this section shall be reviewed by the Development Review Board.*

**Response:** As shown on Sheet L1.00 and described in Appendix D, the development will remove trees and a Tree Removal Permit is required.

**Section 4.600.40. Exceptions**

*(.01) Exception from requirement. Notwithstanding the requirement of WC 4.600.30(1), the following activities are allowed without a Tree Removal Permit, unless otherwise prohibited:*

- A. Agriculture, Commercial Tree Farm or Orchard. Tree removal or transplanting occurring during use of land for commercial purposes for agriculture, orchard(s), or tree farm(s), such as Christmas tree production.*
- B. Emergencies. Actions made necessary by an emergency, such as tornado, windstorm, flood, freeze, utility damage or other like disasters, in order to prevent imminent injury or damage to persons or property or restore order and it is impractical due to circumstances to apply for a permit.
  - 1. When an emergency has occurred, a Tree Removal Permit must be applied for within thirty (30) days following the emergency tree removal under the application procedures established in this subchapter.*
  - 2. In addition to complying with the permit application requirements of this subchapter, an applicant shall provide a photograph of any tree removed and a brief description of the conditions that necessitated emergency removal. Such photograph shall be supplied within seven days of application for a permit. Based on good cause shown arising out of the emergency, the Planning Director may waive any or all requirements of this section.*
  - 3. Where a Type A Permit is granted for emergency tree removal, the permittee is encouraged to apply to the City Tree Fund for replanting assistance.**
- C. City utility or road work in utility or road easements, in utility or road right-of-ways, or in public lands. However, any trees removed in the course of utility work shall be mitigated in accordance with the standards of this subchapter.*
- D. Nuisance abatement. The City is not required to apply for a Tree Removal Permit to undertake nuisance abatement as provided in WC 6.200 et seq. However, the owner of the property subject to nuisance abatement is subject to all the provisions of this subchapter in addition to the requirements of WC 6.200 et seq.*
- E. The removal of filbert trees is exempt from the requirements of this subchapter.*
- F. The Charbonneau District, including its golf course, is exempt from the requirements of WC 4.600.30(1) on the basis that by and through the current CC&R's of the Charbonneau Country Club, the homeowners' association complies with all requirements of WC 4.610.30(1)(C)(1). This exception has been based upon the Tree Maintenance and Protection Plan that has been submitted by the Charbonneau Country Club and approved by the Planning Director. Tree removal activities remain subject to all applicable standards of this subchapter. Unless authorized by the City, this exception does not include tree removal upon any public easements or public property within the district. In the event that the CC&R's are changed relative to the effect of the Tree Maintenance and Protection Plan, then the Planning Director shall review whether such effect is material, whether it can be mitigated, and if not, may disallow the exemption.*

**Response:** The proposed tree removal is not listed as exempt. The provisions of this chapter are applicable.

**Section 4.600.50. Application For Tree Removal Permit**

*(.01) Application for Permit. A person seeking to remove one or more trees shall apply to the Director for a Tree Removal Permit for a Type A, B, C, or D permit, depending on the applicable*

standards as provided in this subchapter.

- A. An application for a tree removal permit that does not meet the requirements of Type A may be submitted as a Type B application.

**(.02) Time of Application.** Application for a Tree Removal Permit shall be made before removing or transplanting trees, except in emergency situations as provided in WC 4.600.40 (1)(B) above. Where the site is proposed for development necessitating site plan or plat review, application for a Tree Removal Permit shall be made as part of the site development application as specified in this subchapter.

**(.03) Fees.** A person applying for a Tree Removal Permit shall pay a non-refundable application fee; as established by resolution of the City Council.

- A. By submission of an application, the applicant shall be deemed to have authorized City representatives to have access to applicant's property as may be needed to verify the information provided, to observe site conditions, and if a permit is granted, to verify that terms and conditions of the permit are followed.

**Response:** The site is proposed for development necessitating site plan and plat review, and this application includes a request for a Type C Tree Removal Permit. The application fee has been submitted with this application.

## **B. Section 4.610.00. Application Review Procedure**

**(.01)** The permit applicant shall provide complete information as required by this subchapter in order for the City to review the application.

**(.02) Departmental Review.** All applications for Tree Removal Permits must be deemed complete by the City Planning Department before being accepted for review. When all required information has been supplied, the Planning Department will verify whether the application is complete. Upon request of either the applicant or the City, the City may conduct a field inspection or review meeting. City departments involved in the review shall submit their report and recommendations to the Planning Director who shall forward them to the appropriate reviewing authority.

**(.03) Reviewing Authority.**

- A. Type A or B. Where site plan review or plat approval by the Development Review Board is not required by City ordinance, the grant or denial of the Tree Removal Permit application shall be the responsibility of the Planning Director. The Planning Director has the authority to refer a Type B permit application to the DRB under the Class II administrative review procedures of this Chapter. The decision to grant or deny a permit shall be governed by the applicable review standards enumerated in WC 4.610.10
- B. Type C. Where the site is proposed for development necessitating site plan review or plat approval by the Development Review Board, the Development Review Board shall be responsible for granting or denying the application for a Tree Removal Permit, and that decision may be subject to affirmation, reversal or modification by the City Council, if subsequently reviewed by the Council.
- C. Type D. Type D permit applications shall be subject to the standards and procedures of Class I administrative review and shall be reviewed for compliance with the Oregon Forest Practice Rules and Statutes. The Planning Director shall make the decision to grant or deny an application for a Type D permit.
- D. Review period for complete applications. Type A permit applications shall be reviewed within 10 (ten) working days. Type B permit applications shall be reviewed by the Planning Director within thirty (30) calendar days, except that the DRB shall review any referred application within sixty (60) calendar days. Type C permit applications shall be reviewed within the time frame established by this Chapter. Type D permit applications shall be reviewed within 15 calendar days.

**Response:** The application is for a Type C Tree Removal Permit and is subject to review and approval by the DRB.

[...]

### **Section 4.610.10. Standards For Tree Removal, Relocation Or Replacement**

**(.01)** Except where an application is exempt, or where otherwise noted, the following standards shall govern the review of an application for a Type A, B, C or D Tree Removal Permit:

A. *Standard for the Significant Resource Overlay Zone. The standard for tree removal in the Significant Resource Overlay Zone shall be that removal or transplanting of any tree is not inconsistent with the purposes of this Chapter.*

**Response:** The site does not contain SROZ area. The standard is not applicable.

B. *Preservation and Conservation. No development application shall be denied solely because trees grow on the site. Nevertheless, tree preservation and conservation as a design principle shall be equal in concern and importance to other design principles.*

**Response:** As shown on Sheet L1.0, most of the trees to be removed are located within the grading limits of SW Frog Pond Lane and within future building footprints. The locations of those streets were determined by the Frog Pond West Master Plan and the City's block length and perimeter standards. The remainder of the trees to be removed is located within the building footprint of the individual lots, as determined by minimum setbacks and driveway depth requirements. Forty-nine (49) trees are located on site; 5 trees will be preserved on site and 2 trees will be protected off-site.

C. *Developmental Alternatives. Preservation and conservation of wooded areas and trees shall be given careful consideration when there are feasible and reasonable location alternatives and design options on-site for proposed buildings, structures or other site improvements.*

**Response:** The Frog Pond West Master Plan provides clear direction for street connections, residential densities, and preservation of the SROZ. The subject site does not contain mapped SROZ areas or designated tree groves. A 53-in. oak tree will be preserved within Tract A and tree preservation easements will be placed on the rear of lots to protect existing trees. This standard is met.

D. *Land Clearing. Where the proposed activity requires land clearing, the clearing shall be limited to designated street rights-of-way and areas necessary for the construction of buildings, structures or other site improvements.*

**Response:** The proposed land clearing is limited to designated street rights-of-way and areas necessary for the construction of single-family homes. This standard is met.

E. *Residential Development. Where the proposed activity involves residential development, residential units shall, to the extent reasonably feasible, be designed and constructed to blend into the natural setting of the landscape.*

**Response:** The proposed development is a single-family residential development. The units will be designed and constructed, as much as possible, to blend into the natural areas on the site. This standard is met.

F. *Compliance With Statutes and Ordinances. The proposed activity shall comply with all applicable statutes and ordinances.*

**Response:** Applicable statutes and ordinances include the City's Development Code. The proposed activity will comply with this code and any other applicable statutes and ordinances. This standard is met.

G. *Relocation or Replacement. The proposed activity shall include necessary provisions for tree relocation or replacement, in accordance with WC 4.620.00, and the protection of those trees that are not to be removed, in accordance with WC 4.620.10.*

**Response:** As shown in Sheet L1.00 and described in Appendix D, trees to be retained will be protected per the provisions of 4.620.10 and trees will be replaced in accordance with 4.620.00. Those provisions are addressed in the responses to Section 4.620.00 later in this narrative. This standard is met.

H. *Limitation. Tree removal or transplanting shall be limited to instances where the applicant has provided completed information as required by this Chapter and the reviewing authority determines that removal or transplanting is necessary based on the criteria of this subsection.*



1. *Necessary For Construction. Where the applicant has shown to the satisfaction of the reviewing authority that removal or transplanting is necessary for the construction of a building, structure or other site improvement, and that there is no feasible and reasonable location alternative or design option on-site for a proposed building, structure or other site improvement; or a tree is located too close to existing or proposed buildings or structures, or creates unsafe vision clearance.*

**Response:** Per the arborist's report included as Appendix D, there are 49 trees on site. Five (5) of the trees are identified for protection on site; 2 more trees not located on site will require tree protection to ensure off-site tree health (7 total). In total, 42 trees will be removed from the site and 7 trees will be protected and retained.

Removal of the trees on site is necessary for construction of site improvements, including utilities, streets, and detached residential dwellings. The location of streets and connections was determined by the Frog Pond West Master Plan and the block perimeter requirements of the RN zone. In addition, the designation of the site as a single-family area requires the grading of each lot to accommodate single-family dwellings and associated site improvements (driveways and walkways, stormwater management, outdoor yard areas, etc.). Reducing building footprints by increasing height is not a viable alternative as the height limit in the RN zone is 35 ft., or 2.5 stories.

This standard is met.

2. *Disease, Damage, or Nuisance, or Hazard. Where the tree is diseased, damaged, or in danger of falling, or presents a hazard as defined in WC 6.208, or is a nuisance as defined in WC 6.200 et seq., or creates unsafe vision clearance as defined in this Code.*
  - (a) *As a condition of approval of Stage II development, filbert trees must be removed if they are no longer commercially grown or maintained.*

**Response:** No filbert trees were identified. This standard is not applicable.

3. *Interference. Where the tree interferes with the healthy growth of other trees, existing utility service or drainage, or utility work in a previously dedicated right-of-way, and it is not feasible to preserve the tree on site.*

**Response:** As shown on Sheet L1.00, many of the trees proposed for removal are located within the SW Frog Pond Lane right-of-way to be dedicated with the plat. The remainder are located along the western property line. The construction of SW Frog Pond Lane and associated sidewalks and utilities requires their removal. These trees cannot be preserved while providing the street network required by the Frog Pond West Master Plan and established by previous approvals.

4. *Other. Where the applicant shows that tree removal or transplanting is reasonable under the circumstances.*

**Response:** The proposed development is anticipated by the Frog Pond West Master Plan. While the development requires removal of trees on site, the trees removed will be mitigated, and street trees appropriate for the size and location of the planter strips within the public right-of-way will be planted. These trees will serve to soften the urban environment, contribute to stormwater management, and provide shade and protection for pedestrians.

I. *Additional Standards for Type C Permits.*

1. *Tree survey. For all site development applications reviewed under the provisions of Chapter 4 Planning and Zoning, the developer shall provide a Tree Survey before site development as required by WC 4.610.40, and provide a Tree Maintenance and Protection plan, unless specifically exempted by the Planning Director or DRB, prior to initiating site development.*

**Response:** A tree survey has been completed and incorporated into the Tree Removal and Protection Plan includes as Sheet L1.00. This standard is met.

2. *Platted Subdivisions. The recording of a final subdivision plat whose preliminary plat has been reviewed and approved after the effective date of Ordinance 464 by the City and that conforms*

*with this subchapter shall include a Tree Survey and Maintenance and Protection Plan, as required by this subchapter, along with all other conditions of approval.*

**Response:** A tree survey has been completed and incorporated into the Tree Removal and Protection Plan included as Sheet L1.00. A Tree Maintenance and Protection Plan is included as Appendix D and Sheet L1.00. This standard is met.

3. *Utilities. The City Engineer shall cause utilities to be located and placed wherever reasonably possible to avoid adverse environmental consequences given the circumstances of existing locations, costs of placement and extensions, the public welfare, terrain, and preservation of natural resources. Mitigation and/or replacement of any removed trees shall be in accordance with the standards of this subchapter.*

**Response:** The utilities will be located and placed within rights-of-way or adjacent PUEs whenever possible. Trees removed from the site will be mitigated and/or replaced per the provisions of 4.620.00. This standard is met.

[...]

**Section 4.610.40. Type C Permit**

**(.01)** *Approval to remove any trees on property as part of a site development application may be granted in a Type C permit. A Type C permit application shall be reviewed by the standards of this subchapter and all applicable review criteria of Chapter 4. Application of the standards of this section shall not result in a reduction of square footage or loss of density, but may require an applicant to modify plans to allow for buildings of greater height. If an applicant proposes to remove trees and submits a landscaping plan as part of a site development application, an application for a Tree Removal Permit shall be included. The Tree Removal Permit application will be reviewed in the Stage II development review process, and any plan changes made that affect trees after Stage II review of a development application shall be subject to review by DRB. Where mitigation is required for tree removal, such mitigation may be considered as part of the landscaping requirements as set forth in this Chapter. Tree removal shall not commence until approval of the required Stage II application and the expiration of the appeal period following that decision. If a decision approving a Type C permit is appealed, no trees shall be removed until the appeal has been settled.*

**Response:** The proposed development requires removal of trees; a landscaping plan has been submitted as part of the site development application, and the application includes a request for a Tree Removal Permit. Mitigation is required and addressed in the responses to Section 4.620.00.

**(.02)** *The applicant must provide ten copies of a Tree Maintenance and Protection Plan completed by an arborist that contains the following information:*

- A. *A plan, including a topographical survey bearing the stamp and signature of a qualified, registered professional containing all the following information:*
  1. *Property Dimensions. The shape and dimensions of the property, and the location of any existing and proposed structure or improvement.*

**Response:** See Sheets P1.00 and P1.10 Existing Conditions for the location of existing structures and improvements; see Sheet 2.00 Preliminary Site Plan for the location of proposed improvements.

2. *Tree survey. The survey must include:*
  - a. *An accurate drawing of the site based on accurate survey techniques at a minimum scale of one inch (1") equals one hundred feet (100') and which provides a) the location of all trees having six inches (6") or greater d.b.h. likely to be impacted, b) the spread of canopy of those trees, (c) the common and botanical name of those trees, and d) the approximate location and name of any other trees on the property.*
  - b. *A description of the health and condition of all trees likely to be impacted on the site property. In addition, for trees in a present or proposed public street or road right-of-way that are described as unhealthy, the description shall include recommended actions to restore such trees to full health. Trees proposed to remain, to be transplanted or to be removed shall be so designated. All trees to remain on the site are to be designated with metal tags that are to*

remain in place throughout the development. Those tags shall be numbered, with the numbers keyed to the tree survey map that is provided with the application.

- c. Where a stand of twenty (20) or more contiguous trees exist on a site and the applicant does not propose to remove any of those trees, the required tree survey may be simplified to accurately show only the perimeter area of that stand of trees, including its drip line. Only those trees on the perimeter of the stand shall be tagged, as provided in "b," above.
- d. All Oregon white oaks, native yews, and any species listed by either the state or federal government as rare or endangered shall be shown in the tree survey.

**Response:** See Sheet L1.00 for a tree survey indicating the location of trees greater than 6-in DBH. See Appendix D Tree Plan and Sheet L1.10 for information about the condition of the trees, crown diameter, and proposed action for each tree. Three garry oak/Oregon white oak trees were identified on the site and are shown on the tree survey; two will be protected.

3. *Tree Protection.* A statement describing how trees intended to remain will be protected during development, and where protective barriers are necessary, that they will be erected before work starts. Barriers shall be sufficiently substantial to withstand nearby construction activities. Plastic tape or similar forms of markers do not constitute "barriers."

**Response:** See Appendix D page 1 for a description of activities permitted and prohibited within the root protection zone of trees to be protected. See also the Tree Protection Detail and note on Sheet L1.00.

4. *Easements and Setbacks.* Location and dimension of existing and proposed easements, as well as all setbacks required by existing zoning requirements.

**Response:** See Sheet P2.00 Preliminary Site Plan for setbacks required by zoning requirements. See Sheet P3.00 for the location and dimensions of proposed easements.

5. *Grade Changes.* Designation of grade changes proposed for the property that may impact trees.

**Response:** Sheet L1.00 Tree Removal and Protection Plan includes proposed grading contours.

6. *Cost of Replacement.* A cost estimate for the proposed tree replacement program with a detailed explanation including the number, size and species.

**Response:** No payment into the tree replacement fund is proposed.

7. *Tree Identification.* A statement that all trees being retained will be identified by numbered metal tags, as specified in subsection "A," above in addition to clear identification on construction documents.

**Response:** The Tree Plan Legend on Sheet L1.00 includes a statement identifying the purpose of the tree tags.

### C. Section 4.620.00. Tree Relocation, Mitigation, Or Replacement

**(.01) Requirement Established.** A Type B or C Tree Removal Permit grantee shall replace or relocate each removed tree having six (6) inches or greater d.b.h. within one year of removal.

**(.02) Basis For Determining Replacement.** The permit grantee shall replace removed trees on a basis of one (1) tree replanted for each tree removed. All replacement trees must measure two inches (2") or more in diameter. Alternatively, the Planning Director or Development Review Board may require the permit grantee to replace removed trees on a per caliper inch basis, based on a finding that the large size of the trees being removed justifies an increase in the replacement trees required. Except, however, that the Planning Director or Development Review Board may allow the use of replacement Oregon white oaks and other uniquely valuable trees with a smaller diameter.

**Response:** The proposed tree removal requires replacement of each tree having 6 inches or greater dbh within one year of removal. As noted on Sheet L1.00, 42 trees of 6 inches or greater dbh are proposed for removal. There are 31 street trees proposed on site, 2 trees proposed within Tract A, and 19 trees proposed within Tract C, and 6 trees proposed within Tract D (a total of 58 trees). The standard is met.

**(.03) Replacement Tree Requirements.** A mitigation or replacement tree plan shall be reviewed by the City prior to planting and according to the standards of this subsection.

- A. Replacement trees shall have shade potential or other characteristics comparable to the removed trees, shall be appropriately chosen for the site from an approved tree species list supplied by the City, and shall be state Department of Agriculture Nursery Grade No. 1 or better.
- B. Replacement trees must be staked, fertilized and mulched, and shall be guaranteed by the permit grantee or the grantee's successors-in-interest for two (2) years after the planting date.
- C. A "guaranteed" tree that dies or becomes diseased during that time shall be replaced.
- D. Diversity of tree species shall be encouraged where trees will be replaced, and diversity of species shall also be maintained where essential to preserving a wooded area or habitat.

**Response:** There are 58 replacement trees proposed, including street trees. The replacement street trees have been selected from the City's Frog Pond Master Pond street tree list. Replacement trees will be maintained and replaced if they die within the two-year establishment period.

**(.04)** All trees to be planted shall consist of nursery stock that meets requirements of the American Association of Nurserymen (AAN) American Standards for Nursery Stock (ANSI Z60.1) for top grade.

**(.05) Replacement Tree Location.**

- A. *City Review Required.* The City shall review tree relocation or replacement plans in order to provide optimum enhancement, preservation and protection of wooded areas. To the extent feasible and desirable, trees shall be relocated or replaced on-site and within the same general area as trees removed.
- B. *Relocation or Replacement Off-Site.* When it is not feasible or desirable to relocate or replace trees on-site, relocation or replacement may be made at another location approved by the City.

**Response:** The tree replacement plan/landscaping plan is included as Sheet L2.00. Replacement trees consist of street trees and trees within Tracts A, C, and D. Trees will likely be planted on the individual dwelling lots at the time of site development but are not proposed to be included in the replacement tree plans. The standard is met.

**(.06) City Tree Fund.** Where it is not feasible to relocate or replace trees on site or at another approved location in the City, the Tree Removal Permit grantee shall pay into the City Tree Fund, which fund is hereby created, an amount of money approximately the value as defined by this subchapter, of the replacement trees that would otherwise be required by this subchapter. The City shall use the City Tree Fund for the purpose of producing, maintaining and preserving wooded areas and heritage trees, and for planting trees within the City.

- A. The City Tree Fund shall be used to offer trees at low cost on a first-come, first-serve basis to any Type A Permit grantee who requests a tree and registers with the City Tree Fund.
- B. In addition, and as funds allow, the City Tree Fund shall provide educational materials to assist with tree planting, mitigation, and relocation.

**Response:** There are 58 trees proposed on site. This exceeds the 42 trees required for replacement. Payment into the City Tree Fund is not requested.

**(.07) Exception.** Tree replacement may not be required for applicants in circumstances where the Director determines that there is good cause to not so require. Good cause shall be based on a consideration of preservation of natural resources, including preservation of mature trees and diversity of ages of trees. Other criteria shall include consideration of terrain, difficulty of replacement and impact on adjacent property.

**Response:** The applicant is not requesting an exception to the tree replacement requirement.

#### **Section 4.620.10. Tree Protection During Construction**

**(.01)** Where tree protection is required by a condition of development under Chapter 4 or by a Tree Maintenance and Protection Plan approved under this subchapter, the following standards apply:

- A. All trees required to be protected must be clearly labeled as such.
- B. *Placing Construction Materials Near Tree.* No person may conduct any construction activity likely to be injurious to a tree designated to remain, including, but not limited to, placing solvents, building material, construction equipment, or depositing soil, or placing irrigated landscaping, within the drip

line, unless a plan for such construction activity has been approved by the Planning Director or Development Review Board based upon the recommendations of an arborist.

- C. *Attachments to Trees During Construction.* Notwithstanding the requirement of WC 4.620.10(1)(A), no person shall attach any device or wire to any protected tree unless needed for tree protection.
- D. *Protective Barrier.* Before development, land clearing, filling or any land alteration for which a Tree Removal Permit is required, the developer shall erect and maintain suitable barriers as identified by an arborist to protect remaining trees. Protective barriers shall remain in place until the City authorizes their removal or issues a final certificate of occupancy, whichever occurs first. Barriers shall be sufficiently substantial to withstand nearby construction activities. Plastic tape or similar forms of markers do not constitute "barriers." The most appropriate and protective barrier shall be utilized. Barriers are required for all trees designated to remain, except in the following cases:
  - 1. *Right-of-Ways and Easements.* Street right-of-way and utility easements may be cordoned by placing stakes a minimum of fifty (50) feet apart and tying ribbon, plastic tape, rope, etc., from stake to stake along the outside perimeters of areas to be cleared.
  - 2. Any property area separate from the construction or land clearing area onto which no equipment will venture may also be cordoned off as described in paragraph (D) of this subsection, or by other reasonable means as approved by the reviewing authority.

**Response:** Sheet L1.00 and the Tree Plan included as Appendix D provide direction regarding the protection of trees on the site.

## X. Annexations and Urban Growth Boundary Amendments

### A. Section 4.700. Procedures Relating To The Processing Of Requests For Annexation And Urban Growth Boundary Amendments.

*(.01) The City of Wilsonville is located within the Portland Metropolitan Area, and is therefore subject to regional government requirements affecting changes to the city limits and changes to the Urban Growth Boundary (UGB) around Wilsonville. The City has the authority to annex properties as prescribed in State law, but the City's role in determining the UGB is primarily advisory to Metro, as provided in Oregon Revised Statutes. The following procedures will be used to aid the City Council in formulating recommendations to those regional entities. [Amended by Ordinance No. 538, 2/21/02.]*

- A. *Proponents of such changes shall provide the Planning Director with all necessary maps and written information to allow for review by city decision-makers. The Planning Director, after consultation with the City Attorney, will determine whether each given request is quasi-judicial or legislative in nature and will make the necessary arrangements for review based upon that determination.*

**Response:** The applicant has provided the required information. The Planning Director has determined that the annexation request is subject to quasi-judicial review.

- B. *Written information submitted with each request shall include an analysis of the relationship between the proposal and the City's Comprehensive Plan, applicable statutes, as well as the Statewide Planning Goals and any officially adopted regional plan that may be applicable.*

**Response:** See Section III of this narrative for a discussion of the relationship between the proposed annexation and the City's Comprehensive Plan.

## XI. Conclusion

The request for the Frog Pond Estates development and related approvals has been shown to be consistent with the applicable standards of the City of Wilsonville. West Hills Land Development LLC respectfully requests approval of the applications.

# **Appendix A**

City of Wilsonville Annexation Petitions and Certifications



**CERTIFICATION OF PROPERTY OWNERSHIP OF  
100% OF LAND AREA**

I hereby certify that the attached petition contains the names of the owners<sup>1</sup> (as shown on the last available complete assessment roll) of 100% of the land area of the territory proposed for annexation as described in the attached petition.



NAME Carlton Smith  
TITLE GIS Cartographer 3  
DEPARTMENT Tax Assessors Office  
COUNTY OF Clackamas  
DATE 11/4/2021

<sup>1</sup> Owner means the legal owner of record or, where there is a recorded land contract which is in force, the purchaser thereunder. If a parcel of land has multiple owners, each consenting owner shall be counted as a percentage of their ownership interest in the land. That same percentage shall be applied to the parcel's land mass and assessed value for purposes of the consent petition. If a corporation owns land in territory proposed to be annexed, the corporation shall be considered the individual owner of that land.



**CERTIFICATION OF REGISTERED VOTERS**

I hereby certify that the attached petition contains the names of at least 50% of the electors registered in the territory proposed for annexation as described in the attached petition.

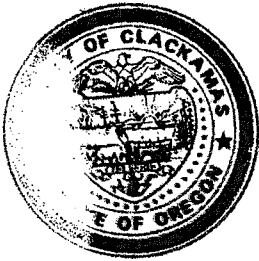
NAME Jennifer Wessels

TITLE Elections Specialist, Sr.

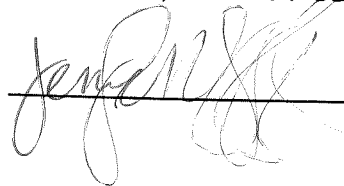
DEPARTMENT Clerk - Elections

COUNTY OF Clackamas

DATE 11-4-21



**CERTIFIED COPY OF THE ORIGINAL  
SHERRY HALL, COUNTY CLERK**

BY: 



**CERTIFICATION OF LEGAL DESCRIPTION AND MAP**

I hereby certify that the description of the property included within the attached petition (located on Assessor's Map 31W12D) has been checked by me and it is a true and exact description of the property under consideration, and the description corresponds to the attached map indicating the property under consideration.

NAME JOSHUA BOLL  
TITLE GIS CARTOGRAPHER II  
DEPARTMENT ASSESSMENT  
COUNTY OF CLACKAMAS  
DATE: 2/16/22



**EXHIBIT A**  
**LEGAL DESCRIPTION**  
**FROG POND ESTATES ANNEXATION**

February 10, 2022 (Otak #20141)

That property described in Quitclaim Deed to Amy Thurmond recorded March 5, 1999 as Document No. 99-022102, Clackamas County Records, in the southeast quarter of Section 12, Township 3 South, Range 1 West, Willamette Meridian, Clackamas County, Oregon, more particularly described as follows:

BEGINNING at the northeast corner of said Thurmond property from which a 5/8 inch iron rod with no cap was found bearing South 01°39'15" West a distance of 0.09 feet, said POINT OF BEGINNING also being a point on the south right of way line of 33.00 foot wide S.W. Frog Pond Lane, North 01°40'13" East a distance of 1715.96 feet and North 88°35'30" West a distance of 1343.53 feet from the southeast corner of said Section 12;

thence along said south right of way line, North 88°35'30" West a distance of 209.57 feet to the northeast corner of that property described in Statutory Warranty Deed to Paul V. and Susan M. Woebkenberg recorded July 24, 1991 as Document No. 91-036369, Clackamas County Records;

thence along the east line of said Woebkenberg property, South 01°40'13" West a distance of 842.32 feet to the northwest corner of the strip of land in the southerly portion of that property described as Parcel 4 in Special Warranty Deed to Venture Properties, Inc recorded June 1, 2021 as Document No. 2021-053929, Clackamas County Records;

thence along the north line of said strip of land, South 88°31'31" East a distance of 209.81 feet to a 5/8 inch iron rod found at the southeast corner of said Thurmond property, also being an angle point in said Venture Properties, Inc. property;

thence along the west line of the northerly portion of said Venture Properties, Inc. property;

North 01°39'15" East a distance of 842.56 feet to the POINT OF BEGINNING.

Contains 4.06 acres, more or less.

DOC. NO. 2018-036152

(C.R. NO. 2362)

S.W. FROG POND LANE

33.00'

33.00'

N88°35'30"W  
209.57'

N88°35'30"W 1343.53'

**POINT OF BEGINNING**

5/8" IRON ROD WITH  
NO CAP FOUND  
S01°39'15"W 0.09'  
OF CORNER / P.O.B.

DOC. NO.  
91-036369

S01°40'13"W 842.32'

THURMOND  
DOC. NO.  
99-022102

PARCEL 4  
DOC. NO.  
2021-053929

N01°39'15"E 842.56'

S.W. WILLOW CREEK DRIVE

209.81'  
S88°31'31"E

FOUND 5/8" IRON  
ROD WITH NO CAP

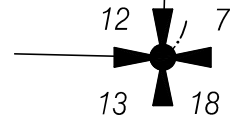
S.W. BRISBAND STREET

S.W. STAFFORD ROAD  
(MARKET ROAD NO. 12)

N01°40'13"E 1715.96'



SCALE: 1"=200'



# Otak

808 SW 3rd Ave., Ste. 800  
Portland, Oregon 97204  
Phone: (503) 287-6825  
www.otak.com  
project: 20141

## EXHIBIT A

PAGE 2 OF 2

FROG POND ESTATES ANNEXATION AREA  
IN THE SOUTHEAST QUARTER, SECTION 12, TOWNSHIP 3 SOUTH,  
RANGE 1 WEST, WILLAMETTE MERIDIAN  
CITY OF WILSONVILLE, CLACKAMAS COUNTY, OREGON

FEBRUARY 10, 2022

**CERTIFICATION OF PROPERTY OWNERSHIP OF  
100% OF LAND AREA**

I hereby certify that the attached petition contains the names of the owners<sup>1</sup> (as shown on the last available complete assessment roll) of 100% of the land area of the territory proposed for annexation as described in the attached petition.



NAME Carlton Smith  
TITLE GIS Cartographer 3  
DEPARTMENT Tax Assessors Office  
COUNTY OF Clackamas  
DATE 11/4/2021

<sup>1</sup> Owner means the legal owner of record or, where there is a recorded land contract which is in force, the purchaser thereunder. If a parcel of land has multiple owners, each consenting owner shall be counted as a percentage of their ownership interest in the land. That same percentage shall be applied to the parcel's land mass and assessed value for purposes of the consent petition. If a corporation owns land in territory proposed to be annexed, the corporation shall be considered the individual owner of that land.



**CERTIFICATION OF REGISTERED VOTERS**

I hereby certify that the attached petition contains the names of at least 50% of the electors registered in the territory proposed for annexation as described in the attached petition.

NAME Jennifer Wessels  
TITLE Elections Specialist, Sr.  
DEPARTMENT Clerk - Elections  
COUNTY OF Clackamas  
DATE 11-4-2021



**CERTIFIED COPY OF THE ORIGINAL  
HERRY HALL, COUNTY CLERK**

BY: \_\_\_\_\_

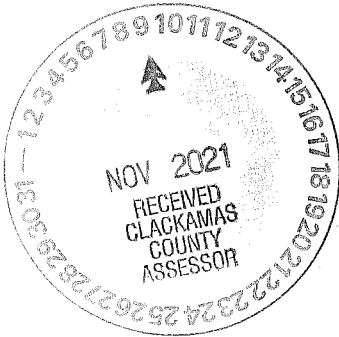
A handwritten signature in black ink is written over a horizontal line. The signature is cursive and appears to be "J. Herry".





**CERTIFICATION OF LEGAL DESCRIPTION AND MAP**

I hereby certify that the description of the property included within the attached petition (located on Assessor's Map 31W12DC) has been checked by me and it is a true and exact description of the property under consideration, and the description corresponds to the attached map indicating the property under consideration.



NAME Carlton Smith  
TITLE GIS Cartographer 3  
DEPARTMENT Tax Assessors Office  
COUNTY OF Clackamas  
DATE: 11/9/2021

**EXHIBIT A**  
**LEGAL DESCRIPTION**  
**SCHOOL DISTRICT PROPERTY ANNEXATION**

November 1, 2021 (Otak #20141)

A portion of that property described as Parcel I in Warranty Deed to Clackamas County School District 3, West Linn-Wilsonville School District 3JT recorded May 24, 1999 as Document No. 99-052396, Clackamas County Records, in the southeast quarter of Section 12, Township 3 South, Range 1 West, Willamette Meridian, Clackamas County, Oregon, described as follows:

BEGINNING at a 5/8 inch iron rod with yellow plastic cap marked "OTAK INC" found on the north right of way line of S.W. Boeckman Road (County Road 80) North 01°24'30" East a distance of 30.00 feet from a point on the centerline of said S.W. Boeckman Road, said centerline also being the south line of said southeast quarter, said point being North 88°35'30" West a distance of 1518.77 feet from the southeast corner of said Section 12, said POINT OF BEGINNING also being the southwest corner of Partition Plat No. 2019-047, Clackamas County Records;

thence along the west line of said Partition Plat, North 01°39'45" East a distance of 828.00 feet to a 5/8 inch iron rod with yellow plastic cap marked "DEA" found at the northwest corner of said Partition Plat, also being on the south line of that property described as Parcel 4 in Special Warranty Deed to Venture Properties, Inc. recorded as Document No. 2021-053929, Clackamas County Records;

thence along said south line and the south lines of those properties described in Document No. 91-036369 and Document No. 2021-041768, both of Clackamas County Records, North 88°35'30" West a distance of 483.16 feet to a point on the east right of way line of S.W. Sherman Drive as dedicated in Document No. 2019-010342, Clackamas County Records, said east right of way line being a line parallel with and 28.00 feet easterly of the east line of MORGAN FARM, recorded as Plat No. 4566, Clackamas County Records;

thence along said east right of way line, South 01°39'45" West a distance of 828.00 feet to a point on said north right of way line;

thence along said south right of way line, South 88°35'30" East a distance of 483.16 feet to the POINT OF BEGINNING.

Contains 9.18 acres, more or less.

REGISTERED  
PROFESSIONAL  
LAND SURVEYOR

DIGITALLY SIGNED  
2021.11.02 07:10:20-07'00'

OREGON  
NOVEMBER 12, 2013  
MICHAEL D. SPELTS  
87475PLS

RENEWES: JUNE 30, 2022

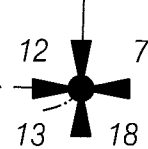
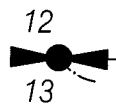
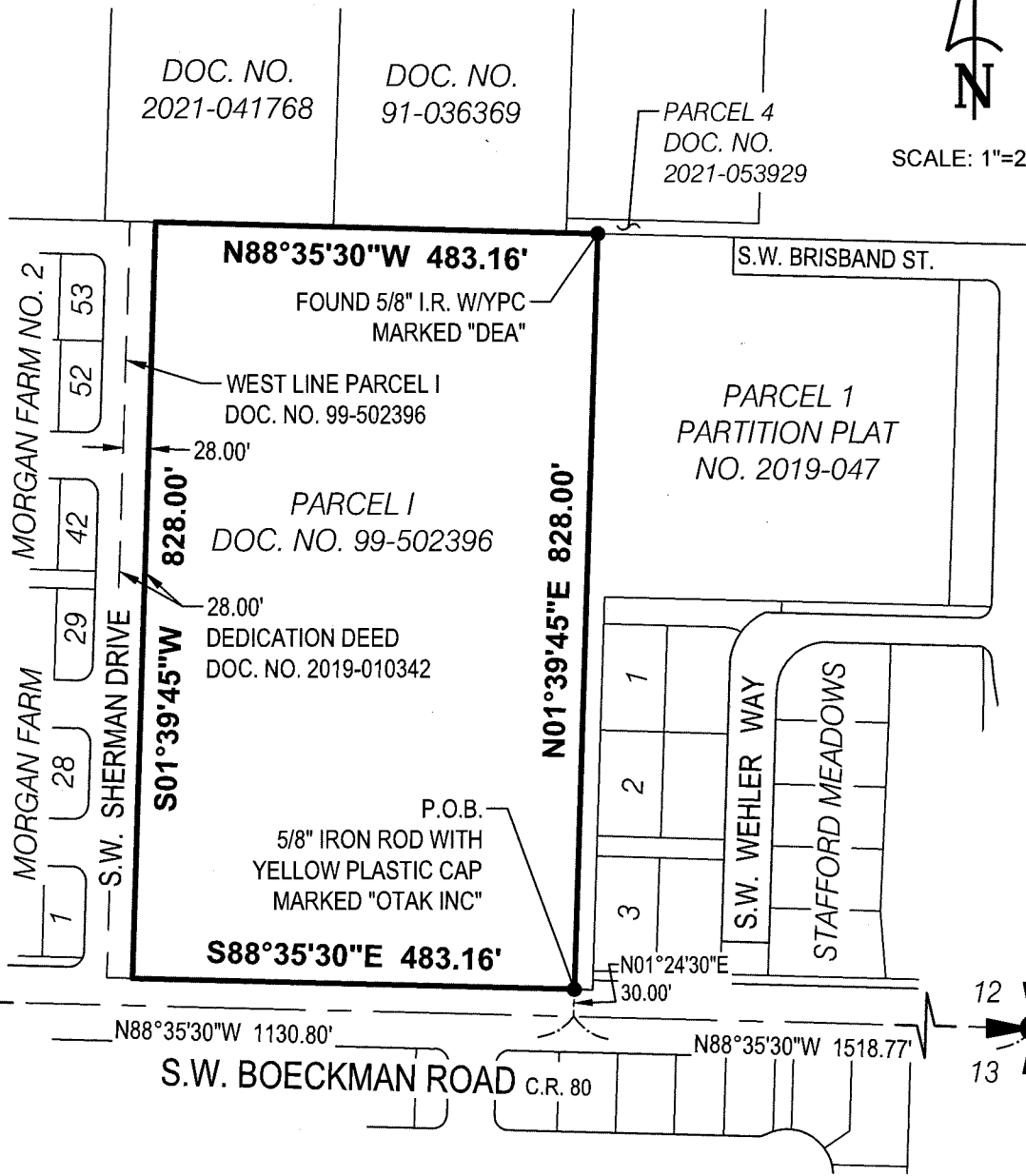


SCALE: 1"=200'

DOC. NO.  
2021-041768

DOC. NO.  
91-036369

PARCEL 4  
DOC. NO.  
2021-053929



# Otak

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project: 20141

## EXHIBIT A

PAGE 2 OF 2

SCHOOL DISTRICT PROPERTY ANNEXATION  
IN THE SOUTHEAST QUARTER, SECTION 12, TOWNSHIP 3 SOUTH,  
RANGE 1 WEST, WILLAMETTE MERIDIAN  
CITY OF WILSONVILLE, CLACKAMAS COUNTY, OREGON

NOVEMBER 1, 2021

**Appendix B**  
Stormwater Preliminary Drainage Report dated  
February 2022, by Otak, Inc.





**Frog Pond Estates**  
**Preliminary Storm Drainage Report**  
Land Use

**Submitted to:**

City of Wilsonville  
29799 SW Town Center Loop E.  
Wilsonville, OR 97070

February 2022

**Prepared by:**

Otak, Inc.  
808 SW Third Avenue, Suite 800  
Portland, OR 97204

Project No. 20141

# TABLE OF CONTENTS

|  | Page     |
|--|----------|
| <b>Section 1. Introduction</b> .....               | <b>1</b> |
| <b>Section 2. Project Description</b> .....        | <b>1</b> |
| Permitting.....                                    | 1        |
| Existing Conditions .....                          | 2        |
| Proposed Conditions .....                          | 2        |
| <b>Section 3. Hydrology</b> .....                  | <b>2</b> |
| Rainfall Depth .....                               | 2        |
| Pollutants of Concern .....                        | 2        |
| Wetlands.....                                      | 3        |
| Soils .....  | 3        |
| Flood Hazard .....                                 | 3        |
| <b>Section 4. Methodology</b> .....                | <b>3</b> |
| BMP Sizing Tool Hydrology .....                    | 4        |
| Columbine Swales.....                              | 4        |
| Drainage .....                                     | 5        |
| Conveyance.....                                    | 5        |
| <b>Section 5. Water Quality Treatment</b> .....    | <b>5</b> |
| Low Impact Development .....                       | 5        |
| Water Quality Facilities .....                     | 5        |
| <b>Section 6. Flow Control</b> .....               | <b>5</b> |
| <b>Section 7. Conveyance</b> .....                 | <b>6</b> |
| <b>Section 8. Operations and Maintenance</b> ..... | <b>7</b> |
| <b>Section 9. Conclusion</b> .....                 | <b>7</b> |
| <b>Section 10. References</b> .....                | <b>7</b> |

## TABLES

|         |   |   |
|---------|---|---|
| Table 1 | 24 Hour Precipitation Depths .....                          | 2 |
| Table 2 | Pollutants of Concern .....                                 | 3 |
| Table 3 | LID Facility Adjustments along SW Columbine Avenue.....     | 4 |
| Table 4 | Facility Summary Table .....                                | 6 |
| Table 5 | Frog Pond Ridge Original Facility Sizing Requirements ..... | 6 |

## FIGURES

|          |                              |
|----------|------------------------------|
| Figure 1 | Frog Pond Estates – Existing |
| Figure 2 | Frog Pond Estates – Proposed |

## APPENDICES

|            |                                  |
|------------|----------------------------------|
| Appendix A | Hydrology                        |
| Appendix B | Geotechnical Report              |
| Appendix C | Downstream Analysis              |
| Appendix D | BMP Sizing Tool Output           |
| Appendix E | Pipe Conveyance Calculations     |
| Appendix F | Operations and Maintenance Plans |

## **Acknowledgements**

**Project Name:** Frog Pond Estates  
**Type of Report:** Preliminary  
**Submittal Level:** Land Use

## **Site Information**

**Subject Property:** Thurmond  
**Applicant Information:** Dan Grimberg  
West Hills Land Development  
3330 NW Yeon St., Suite 200  
Portland, OR 97210  
503-789-0358

## **Project Development Team**

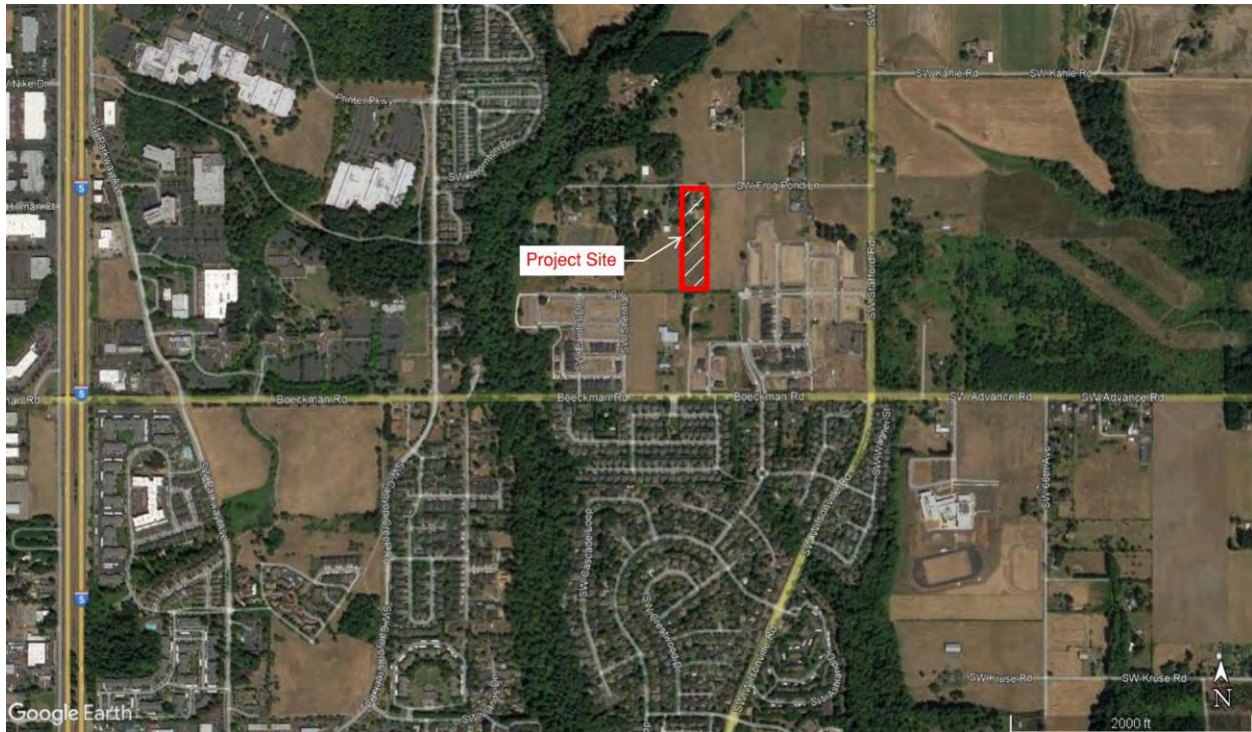
**Stormwater Lead:** Rose Horton, PE  
**Stormwater Designer:** Roger Tiffany, EIT



## Section 1. Introduction

The Frog Pond Estates site is a proposed residential development located within the West Neighborhood of the Frog Pond Area Plan. The 4.06-acre property is comprised Tax map 31W12D lot 01501 in Clackamas County within the City of Wilsonville Urban Growth Boundary (UGB) (see Vicinity Map). The Frog Pond Estates development will consist of 17 single-family residential dwellings as well as associated public infrastructure improvements including frontage improvements on SW Frog Pond Lane, resulting in a 1.94-acres of impervious surface area.

The purpose of this document is to demonstrate compliance of the Frog Pond Estates stormwater management system with the City of Wilsonville Stormwater and Surface Water Design and Construction Standards (2015). Descriptions of the existing and proposed hydrologic conditions, as well as documentation showing compliance of the proposed onsite stormwater management system with City of Wilsonville standards for water quality and quantity are included in this report.



## Section 2. Project Description

The Frog Pond Estates proposed residential development consists of 17 new single-family lots, local street extensions, as well as sidewalks, public roadway improvements, utilities, and stormwater management systems that discharge to Willow Creek. Additionally, this project will include frontage improvements to SW Frog Pond Lane.

### Permitting

The following permit applications will be required for this project: City of Wilsonville Development Permit; Section 401 water quality certification from DEQ and NPDES 1200C Permit.

## Existing Conditions

The project site is primarily agricultural and includes a house and outbuildings that comprise 0.30 acres of impervious area. Most of the project site (4.24 acres) slopes southeast at about 2% towards Willow Creek while 0.29 acres slopes at about 3% towards the Boeckman Creek drainage to the west. Both creeks are tributaries that flow to the Willamette River. This proposed project will maintain drainage patterns.

## Proposed Conditions

Site improvements will include construction of approximately 1.94 acres of new impervious surfaces in the form of roof, roadway, and sidewalk area. Vegetated stormwater facilities are proposed to be constructed within the right-of-way and within tracts to provide low impact development, water quality treatment, and flow control throughout the proposed residential development.

Swales are proposed along SW Frog Pond Lane and SW Columbine Avenue to manage runoff. Six large lots on the north end of the development and the adjacent right-of-way are proposed to be directed to an existing rain garden in the Frog Pond Ridge development (Tract B, Rain Garden 1). Runoff from five lots on the south end of the site will be directed to a vegetated swale. A portion of the SW Columbine Avenue frontage will be collected and managed in the Frog Pond Ridge development (Tract B, Rain Garden 2). The remaining lots and right-of-way are conveyed to a rain garden. The Frog Pond Estates stormwater system discharges to Willow Creek at the culvert under SW Brisband Street. A vegetated 0.15 acres will continue to drain towards Boeckman Creek.

## Section 3. Hydrology

### Rainfall Depth

The following rainfall depths listed in Table 1 are provided in the City of Wilsonville Public Works Standards (2015). These depths correspond to design recurrence intervals which are used in hydrologic calculations for various aspects of stormwater management design.

**Table 1 24 Hour Precipitation Depths**

| Recurrence Interval (Years) | Total Precipitation Depth (inches) |
|-----------------------------|------------------------------------|
| 2                           | 2.50                               |
| 10                          | 3.45                               |
| 25                          | 3.90                               |
| 100                         | 4.50                               |

### Pollutants of Concern

The pollutants of concern are those typically found in roadway runoff. These include sediment, oil and grease, polycyclic aromatic hydrocarbons (PAHs), metals such as Copper, Zinc, and Lead as well as pesticides and other nutrients (DEQ, 2016). Table 2 lists each waterway affected by this project and DEQ listing status.

**Table 2 Pollutants of Concern**

| Waterway                  | Parameter     | Listing Status      |
|---------------------------|---------------|---------------------|
| Willow Creek              | N/A           | None                |
| Boeckman Creek            | N/A           | None                |
| Willamette River (Middle) | Chlorophyll a | 303(d), TMDL needed |
| Willamette River (Middle) | E. Coli       | TMDL approved       |
| Willamette River (Middle) | Mercury       | 303(d), TMDL needed |
| Willamette River (Middle) | Temperature   | TMDL approved       |

## Wetlands

No wetlands or sensitive areas exist on the site.

## Soils

The Web Soil Survey published by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) was referenced to determine the soil names, symbols, and hydrologic soil groups found on the project site. The soil type identified within the project area is identified as Aloha silt loam (1A). These soils are classified as hydrologic soil type C/D, which in an undrained condition generally exhibit very slow infiltration rates when thoroughly wet. The USDA soil survey map and the corresponding hydrologic soil group (HSG) for the area of interest are provided in Appendix A.

A geotechnical investigation was conducted to more accurately determine the site strata and infiltration rates. The geotechnical investigation estimates the static groundwater approximately twenty feet below ground surface. The onsite Geotechnical Memorandum by Hardman Geotechnical Services is included in Appendix B.

## Flood Hazard

The proposed development for this site is located outside the 100-year floodplain boundary designated by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Clackamas County, Oregon and Incorporated Areas, Panel 234, June 17, 2008 and in non-printed Flood Map Boundary Area. See Appendix A for the FIRMette of the proposed site.

## Section 4. Methodology

The stormwater system for the proposed Frog Pond Estates development was modeled using the following methods and design standards:

- **Water Quality:** The City of Wilsonville requires capture and treatment of 80% of the average annual runoff (approximately 1-inch in 24 hours). The City of Wilsonville has adopted a BMP Sizing Tool that was developed to aid in the design of detention and water quality low impact development facilities. The City of Wilsonville BMP Sizing Tool was used to size minimum facility footprint areas to meet the water quality treatment standard.
- **Flow Control:** The BMP sizing tool was also simultaneously used to calculate facility sizes to include flow control. This tool provides the necessary calculations to design a facility to meet City flow duration matching standards whereby the “duration of peak flow rates from post development conditions shall

be less than or equal to the duration of peak flow rates from pre-development conditions for all peak flows between 42% of the 2-year storm peak flow rate up to the 10-year peak flow rate.”

- Conveyance: The Santa Barbara Urban Hydrograph (SBUH) method was used to calculate design conveyance flow rates and XP-SWMM software was used to size the project conveyance system. The City’s design event for pipe conveyance is the 25-year, 24-hour storm, requiring 1-foot of freeboard between the hydraulic grade line and finished grade at structure rims.

## BMP Sizing Tool Hydrology

The BMP Sizing Tool was created to aid in designing low impact development facilities for both treating stormwater runoff and matching flow durations between target conditions and developed conditions. City standards consider target conditions to be pre-development, prior to any human settlement. City of Wilsonville standards stipulate that the pre-developed vegetation of Oak Savannah, which applies to the project site, should be modeled in the sizing tool as grass. Proposed conditions were set to paved conditions for roof, roadway, and sidewalk, and set to landscaped conditions for landscaped and other disturbed pervious areas within the project boundary.

A vegetated filtration swale and rain gardens will function to provide both water quality and flow control mitigation. The BMP Sizing Tool provides minimum facility footprint areas for treatment and flow control. The BMP Sizing Tool also provides the required orifice sizes for incorporating the flow control component into these facilities.

## Columbine Swales

Special considerations were made for the Low Impact Development (LID) facilities located on SW Columbine Avenue. The City prefers to have localized LID facilities along SW Columbine Avenue to comply with their NPDES permit. The storm line depth is shallow here due to grade constraints at the Frog Pond Ridge discharge location and this creates challenges complying with depths shown in the City’s standard detail ST-6045 and being able to drain the facility underdrain to the storm system.

Several options were presented to and approved by the City to provide LID facilities along SW Columbine Avenue while still being able to drain the underdrain to the storm system. These included the following in descending order:

1. Reduce manhole drop along SW Columbine Avenue from 0.2-foot to 0.1-foot.
2. Remove 3-inch gravel separation layer in LID facility and use geotextile fabric instead.
3. Reduce ponding depth in LID facility from 12 inches to 6 inches.

Otak reviewed these options and, along with reducing manhole drops from 0.2-foot to 0.1-foot along SW Columbine Avenue, adjusted each facility accordingly with a variation of these options to achieve positive drainage from the underdrain. Adjustments to the LID facilities can be seen in Table 3.

**Table 3 LID Facility Adjustments along SW Columbine Avenue**

| LIDA Facility ID | Removal of 3-inch Gravel Separation Layer | Ponding Reduced from 12-in to 6-in |
|------------------|---|------------------------------------|
| Swale 3          | No  | No                                 |
| Swale 4          | Yes                                       | Yes                                |
| Swale 5          | Yes                                       | No                                 |
| Swale 6          | Yes                                       | Yes                                |

## Drainage

The developed site ultimately drains to Willow Creek over a mile north of its discharge point at the Willamette River. A portion of vegetated area will continue to shed toward Boeckman Creek. Otak conducted a downstream impact analysis on the downstream section of Willow Creek per City of Wilsonville standards and the downstream impact analysis is included in Appendix C. A conveyance analysis of the pipe network, including the culvert under SW Brisband Street that outfalls into Willow Creek, can be found in Appendix E.

## Conveyance

The proposed development will include a piped conveyance network that will convey flows to Willow Creek. Pipes draining the project site will be designed to meet City of Wilsonville conveyance standards.

The City of Wilsonville Public Works Standards (2015) identifies the 25-year, 24-hour storm to be used for conveyance design, maintaining 1-foot of clearance between the hydraulic grade line and conveyance structure rim elevations. The City also requires an assessment of the 100-year storm event impacts to the proposed system. Flow rates during the 100-year may be conveyed overland but are not expected to inundate structures.

## Section 5. Water Quality Treatment

### Low Impact Development

The City of Wilsonville promotes the use of Low Impact Development (LID) approaches to meet water quality treatment standards. Locations of LID facilities for water quality treatment for the Frog Pond Estates project site are shown on Figure 2.

### Water Quality Facilities

Water quality treatment will be provided through filtration vegetated swales and rain gardens. The BMP Sizing Tool was used to calculate minimum facility sizes to satisfy water quality requirements. Facility sizing calculation reports from the BMP Sizing Tool are provided in Appendix D.

## Section 6. Flow Control

City of Wilsonville Public Works Standards (2015) requires the use of flow attenuation when a proposed development increases impervious surface area by more than 5,000 square feet. Therefore, this project site will require flow control mitigation prior to discharging site runoff to downstream conveyance systems (open or closed channels or conduits). Per City requirements, the “post-development conditions shall be less than or equal to the duration of peak flow rates from pre-development conditions for all peak flows between 42% of the 2-year storm peak flow rate up to the 10-year peak flow rate.”

Flow control structures will be located immediately downstream of vegetated filtration swales and rain gardens, per the City’s standard detail. These facilities provide flow control by installing orifices at the end of their corresponding underdrain pipes to backwater flows into the available storage and voids present in facility soil and rock layers. Water is released from the facility through the orifice, which is sized to meter flows at a rate that meets flow control standards.

Orifices are provided for flow control purposes only. Construction details of the flow control structures are provided on the plan sheets. A summary of facilities to serve this project is presented in Table 4.



**Table 4 Facility Summary Table**

| Basin ID                         | Facility ID                           | Function | LID Min. Size, BMP Output (sf) | LID Treatment Size, Site Plan (sf) | Orifice Diameter (in) |
|----------------------------------|---------------------------------------|----------|--------------------------------|------------------------------------|-----------------------|
| E-C1, C2, C3, F1, L1, L2, L3     | Frog Pond Ridge Tract B Rain Garden 1 | WQ, FC   | 6101                           | 6152                               | 4.2                   |
| E-C6                             | Frog Pond Ridge Tract B Rain Garden 2 | WQ, FC   | 1954                           | 2501                               | 2.4                   |
| E-L7                             | Swale 1                               | WQ, FC   | 1233                           | 1367                               | 2.1                   |
| E-F2                             | Swale 2                               | WQ, FC   | 119                            | 400                                | 0.6                   |
| E-C1*, R1                        | Swale 3                               | WQ       | 180                            | 320                                | 0.6                   |
| E-C2*, R2                        | Swale 4                               | WQ       | 57                             | 128                                | 0.3                   |
| E-C4*, R4                        | Swale 5                               | WQ       | 60                             | 128                                | 0.4                   |
| E-C5*, R5                        | Swale 6                               | WQ       | 52                             | 128                                | 0.3                   |
| E-A1, B2, C4, C5, L4, L5, L6, S1 | Estates Rain Garden                   | WQ, FC   | 3505                           | 3550                               | 3.3                   |

\*Swales are sized for water quality treatment. Flow control provided by downstream rain gardens.

To serve both developments, the two Frog Pond Ridge rain garden facility footprints would remain the same and only the flow control orifice would need to change. Table 5 provides a summary of the two Frog Pond Ridge Facilities as they were originally designed to serve only the Frog Pond Ridge development area.

**Table 5 Frog Pond Ridge Original Facility Sizing Requirements**

| Facility ID                           | LID Min. Size, BMP Output (sf) | LID Treatment Size, Site Plan (sf) | Orifice Diameter (in) |
|---------------------------------------|--------------------------------|------------------------------------|-----------------------|
| Frog Pond Ridge Tract B Rain Garden 1 | 5316                           | 6152                               | 3.9                   |
| Frog Pond Ridge Tract B Rain Garden 2 | 2058                           | 2501                               | 2.4                   |

## Section 7. Conveyance

The proposed development will include a piped conveyance network that will convey flows to Willow Creek. Pipes draining runoff from the project site to these locations were designed to meet City of Wilsonville conveyance standards.

The Santa Barbara Urban Hydrograph (SBUH) method was used to calculate runoff rates generated under proposed conditions by contributing areas. Stormwater runoff rates for each basin under proposed conditions were calculated using XP-SWMM and are included in the output tables from the Runoff Mode of XP-SWMM (see Appendix E). Runoff from each of these proposed basins was routed via the proposed conveyance system.

The City of Wilsonville Public Works Standards (2015) identifies the 25-year, 24-hour storm to be used for conveyance design, maintaining 1-foot of clearance between the hydraulic grade line and conveyance structure rim elevations. The pipe conveyance system was sized to meet these requirements within piped systems, while open channel water quality and flow control facilities were designed to meet a 4-inch freeboard requirement between the roadway gutter line and the facility overflow rim as identified in the City's standard details. The 100-year flow is contained within the street network. A Manning's n value of 0.013 was applied to the storm conveyance pipes in the network. Appendix E includes output information from the XP-SWMM models, summarizing the pipe network characteristics and results of the hydraulic routing during the conveyance design storm event and other events of interest.

Two flow splits are proposed in the conveyance system in SW Columbine Avenue. The first flow split occurs at the intersection with the Tract G sidewalk to split off flows intended to receive treatment in the existing Frog Pond Ridge Rain Garden 1. The desired flow split is achieved by raising the invert of the southerly pipe 0.09-foot higher than the pipe to the east.

The second flow split occurs adjacent to the Frog Pond Estates rain garden in Tract B and directs the remaining flows generated by Frog Pond Estates to the new facility and allows the Frog Pond Ridge Rain Garden 2 to continue to receive this intended flows. This flow split is achieved with a 4.5-inch orifice to control flows less than the 2-year and then a weir for the larger events. This scheme limits flows in the SW Columbine Ave pipe south of the flow split to less than 0.02 cfs for flow events less than the 10-year event.

## Section 8. Operations and Maintenance

Vegetated facilities will be maintained by the private development. Operations and Maintenance requirements are included in Appendix F in conjunction with corresponding standard details for each type of facility. The following representative will be responsible for ongoing maintenance of onsite facilities: Dan Grimberg 503-641-7342.

## Section 9. Conclusion

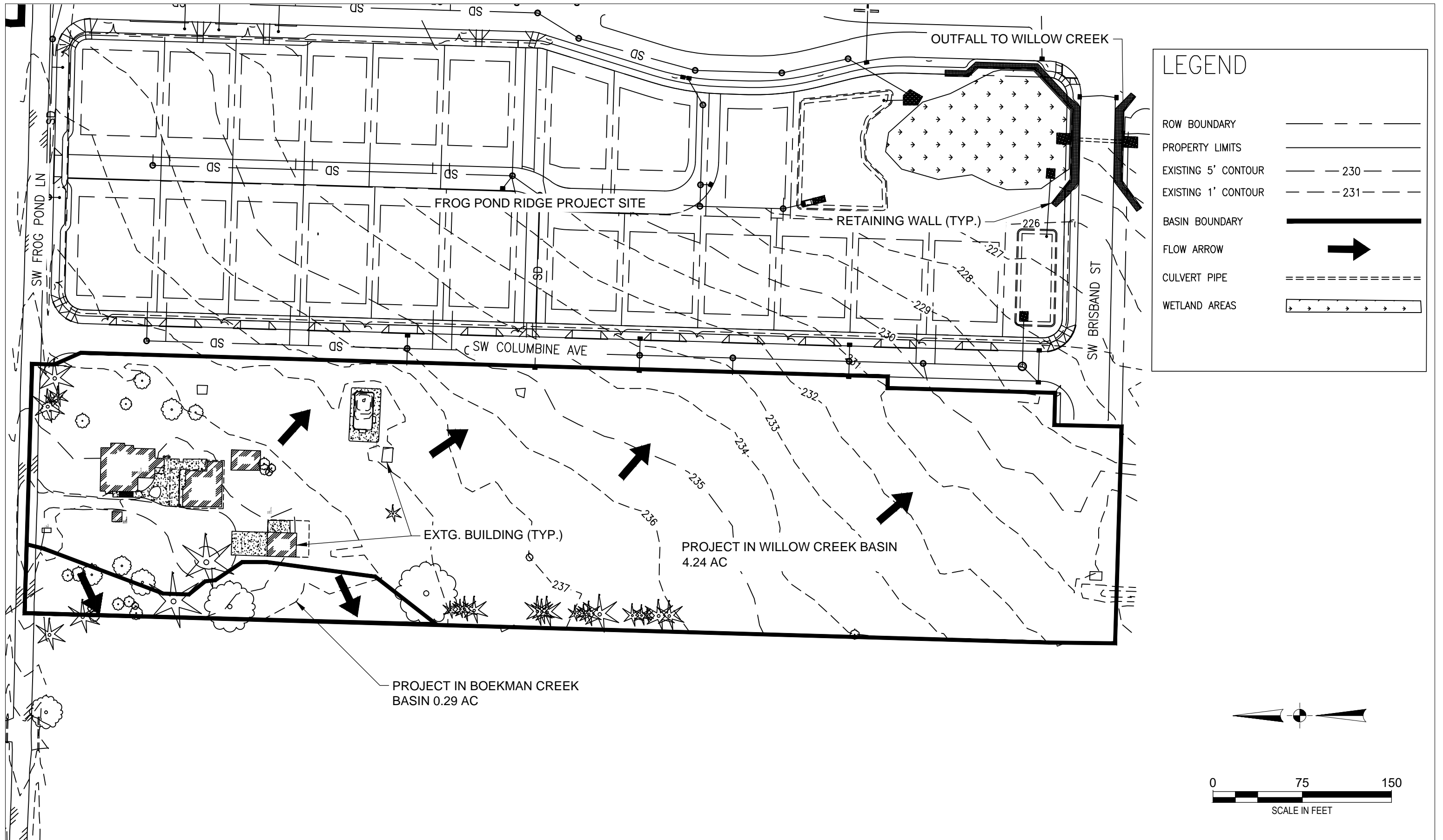
The proposed Frog Pond Estates development will include a stormwater management system designed to comply with standards set forth by the City of Wilsonville. The proposed development will create 1.94 acres of impervious area. Runoff from impervious areas will be treated by LID facilities, including vegetated filtration swales and rain gardens. Flow control requirements will also be met by adding orifices at the downstream end of underdrain pipes to regulate outflows from the vegetated swale and rain gardens. The BMP Sizing Tool was used to calculate minimum facility and orifice sizes to satisfy water quality and flow control requirements. In accordance with City of Wilsonville standards, the conveyance system was sized to convey the 25-year, 24-hour storm event with a minimum of 1-foot of freeboard between the hydraulic grade line (HGL) and the finished grade elevation.

## Section 10. References

- City of Wilsonville, 2015. *City of Wilsonville Public Works Standards. Section 3, Stormwater & Surface Water Design and Construction Standards 2015*; Revised December 2015.
- DEQ, 2016. *Section 401 Water Quality Certification*, State of Oregon Department of Environmental Quality, May 2016.
- FEMA, 2017. *FEMA Map Service Center*. <<http://msc.fema.gov/>> Accessed: December 11, 2019.
- National Resource Conservation Services, 2018. *United States Department of Agriculture. Web Soil Survey*. <<http://websoilsurvey.nrcs.usda.gov/>> Accessed: September 7, 2021.
- SCS, 1986. *Technical Release 55: Urban Hydrology for Small Watersheds*, United States Department of Agriculture Soil Conservation Service, June 1986.
- USACE, 2014. *Standard Local Operating Procedures for Endangered Species (SLOPES V) to Administer Maintenance or Improvement of Stormwater, Transportation or Utility Actions*, United States Army Corps of Engineers, March 14, 2014.

## Figures

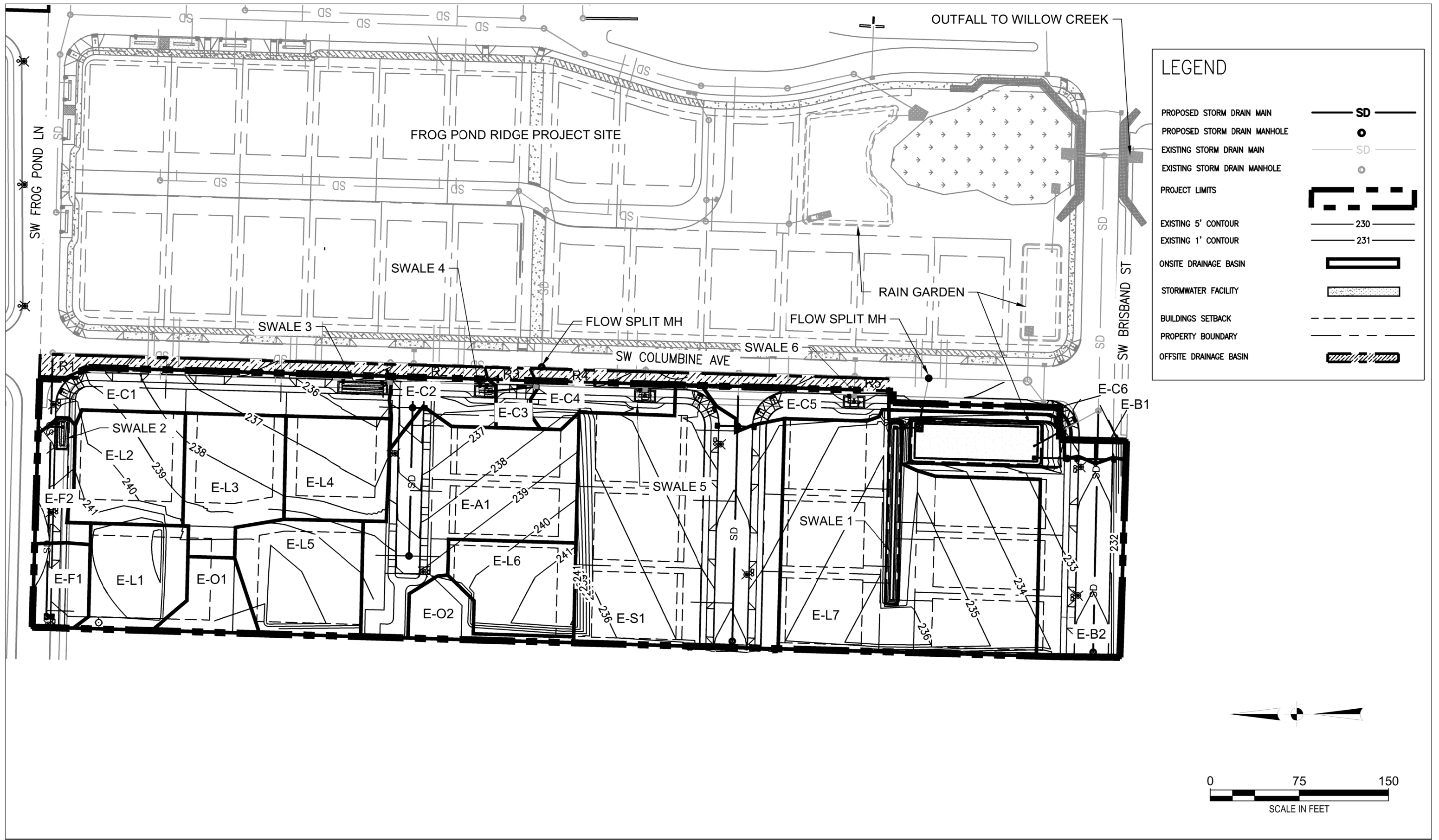




# FROG POND ESTATES | PRELIMINARY DESIGN | EXISTING CONDITIONS

FIG 1 | DATE: 10/07/2021 | PROJECT NUMBER: 20141





FROG POND ESTATES | PRELIMINARY DESIGN | PROPOSED CONDITIONS



# Appendix A

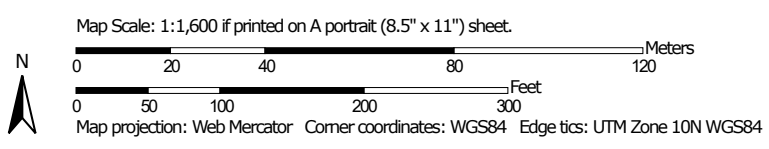
Hydrology



Hydrologic Soil Group—Clackamas County Area, Oregon



Soil Map may not be valid at this scale.



## MAP LEGEND

### Area of Interest (AOI)









 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Lines


 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Points





 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available

### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

**Warning:** Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon  
 Survey Area Data: Version 16, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 1, 2019—Sep 12, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Hydrologic Soil Group

| Map unit symbol                    | Map unit name                          | Rating | Acres in AOI | Percent of AOI |
|------------------------------------|--|--------|--------------|----------------|
| 1A                                 | Aloha silt loam, 0 to 3 percent slopes | C/D    | 5.1          | 100.0%         |
| <b>Totals for Area of Interest</b> |  |        | <b>5.1</b>   | <b>100.0%</b>  |

### Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

### Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher





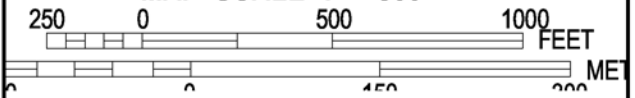
J

JOINS PANEL 0253

Site located in non-printed area



MAP SCALE 1" = 500'



NFIP  
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0234D

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**CLACKAMAS COUNTY,**  
**OREGON**  
**AND INCORPORATED AREAS**

**PANEL 234 OF 1175**  
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| <u>COMMUNITY</u>     | <u>NUMBER</u> | <u>PANEL</u> | <u>SUFFIX</u> |
|----------------------|---------------|--------------|---------------|
| CLACKAMAS COUNTY     | 415588        | 0234         | D             |
| WILSONVILLE, CITY OF | 410025        | 0234         | D             |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.



**MAP NUMBER**  
**41005C0234D**  
**EFFECTIVE DATE**  
**JUNE 17, 2008**

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)



## Drainage Basin Areas

20141 Frog Pond Estates

### Existing Conditions:

| Basin Name     | Impervious Area |             | Pervious Area  |             | Total Area     |             |
|----------------|-----------------|-------------|----------------|-------------|----------------|-------------|
|                | Total (sf)      | Total (ac)  | Total (sf)     | Total (ac)  | (sf)           | (ac)        |
| Boeckman Creek | 0               | 0.00        | 12,467         | 0.29        | 12467          | 0.29        |
| Willow Creek   | 13,187          | 0.30        | 171,701        | 3.94        | 184,888        | 4.24        |
| <b>TOTAL</b>   | <b>13,187</b>   | <b>0.30</b> | <b>171,701</b> | <b>3.94</b> | <b>197,439</b> | <b>4.53</b> |

Large Impervious Area per Lot  
Impervious Area per Lot

3,050 SF  
2,750 SF (2015 Public Works Stds 301.4.01)

### Proposed Conditions:

17.0 lots

| Basin               | Drains To    | Treated By    | Impervious Area |           |            |            | Pervious Area |      | Total Area |      |
|---------------------|--------------|---------------|-----------------|-----------|------------|------------|---------------|------|------------|------|
|                     |              |               | Roadway (sf)    | Roof (sf) | Total (sf) | Total (ac) | (sf)          | (ac) | (sf)       | (ac) |
| <b>Total Onsite</b> |              |               | 35,897          | 48,550    | 84,447     | 1.94       | 112,992       | 2.59 | 197,439    | 4.53 |
| E-L1                | SDMH 2A      | FP Ridge RG 1 | 0               | 3,050     | 3,050      | 0.07       | 3,946         | 0.09 | 6,996      | 0.16 |
| E-L2                | ST 167A      | FP Ridge RG 1 | 0               | 3,050     | 3,050      | 0.07       | 5,780         | 0.13 | 8,830      | 0.20 |
| E-L3                | ST 167A      | FP Ridge RG 1 | 0               | 3,050     | 3,050      | 0.07       | 5,862         | 0.13 | 8,912      | 0.20 |
| E-L4                | SDMH 4A      | FP Estates RG | 0               | 3,050     | 3,050      | 0.07       | 4,511         | 0.10 | 7,561      | 0.17 |
| E-L5                | SDMH 4B      | FP Estates RG | 0               | 3,050     | 3,050      | 0.07       | 6,496         | 0.15 | 9,546      | 0.22 |
| E-L6                | SDMH 4B      | FP Estates RG | 0               | 3,050     | 3,050      | 0.07       | 4,498         | 0.10 | 7,548      | 0.17 |
| E-O1                | offsite west | NA            | 0               | 0         | 0          | 0.00       | 3,553         | 0.08 | 3,553      | 0.08 |
| E-O2                | offsite west | NA            | 0               | 0         | 0          | 0.00       | 2,923         | 0.07 | 2,923      | 0.07 |
| E-F1                | SDMH 2A      | FP Ridge RG 1 | 2,587           | 0         | 2,587      | 0.06       | 684           | 0.02 | 3,271      | 0.08 |
| E-F2                | SDMH 2A      | Swale 2       | 2,076           | 0         | 2,076      | 0.05       | 1,298         | 0.03 | 3,374      | 0.08 |
| E-C1                | ST 1676A     | Swale 3       | 4,091           | 0         | 4,091      | 0.09       | 6,593         | 0.15 | 10,684     | 0.25 |
| E-C2                | ST 1668      | Swale 4       | 1,717           | 0         | 1,717      | 0.04       | 1,726         | 0.04 | 3,443      | 0.08 |
| E-A1                | SDMH 4A      | FP Estates RG | 5,160           | 5,500     | 10,660     | 0.24       | 9,597         | 0.22 | 20,257     | 0.47 |
| E-S1                | SDMH 3B      | FP Estates RG | 8,874           | 8,250     | 17,124     | 0.39       | 16,986        | 0.39 | 34,110     | 0.78 |
| E-L7                | ST 1642      | Swale 1       | 0               | 16,500    | 16,500     | 0.38       | 20,463        | 0.47 | 36,963     | 0.85 |
| E-C3                | ST 1668      | FP Ridge RG   | 433             | 0         | 433        | 0.01       | 887           | 0.02 | 1,320      | 0.03 |
| E-C4                | ST 1667      | Swale 5       | 1,050           | 0         | 1,050      | 0.02       | 2,438         | 0.06 | 3,488      | 0.08 |
| E-C5                | ST 1665      | Swale 6       | 2,430           | 0         | 2,430      | 0.06       | 1,514         | 0.03 | 3,944      | 0.09 |
| E-C6                | ST 1663      | FP Ridge RG 2 | 1,260           | 0         | 1,260      | 0.03       | 217           | 0.00 | 1,477      | 0.03 |
| E-B1                | FPR          | SMEadows pond | 241             | 0         | 241        | 0.01       | 172           | 0.00 | 413        | 0.01 |
| E-B2                | SDMH 6A      | FP Estates RG | 5,978           | 0         | 5,978      | 0.14       | 12,848        | 0.29 | 18,826     | 0.43 |
| R1 (Offsite)        | ST 1676A     | Swale 3       | 3,267           | 0         | 3,267      | 0.08       | 0             | 0.00 | 3,267      | 0.08 |
| R2 (Offsite)        | ST 1668      | Swale 4       | 855             | 0         | 855        | 0.02       | 0             | 0.00 | 855        | 0.02 |
| R3 (Offsite)        | ST 1668      | FP Ridge RG   | 403             | 0         | 403        | 0.01       | 0             | 0.00 | 403        | 0.01 |
| R4 (Offsite)        | ST 1667      | Swale 5       | 5,978           | 0         | 1,233      | 0.03       | 0             | 0.00 | 1,233      | 0.03 |

# **Appendix B**

Geotech Report





October 8, 2021  
HGSI Project No. 21-2830

Dan Grimberg / Kristi Hosea  
**West Hills Land Development**  
3330 NW Yeon Avenue, Suite 200  
Portland, Oregon 97210

Via e-mail (pdf format); hard copies mailed upon request

**Subject: GEOTECHNICAL ENGINEERING AND INFILTRATION TESTING REPORT  
FROG POND ESTATES  
THURMOND PROPERTY  
7070 SW FROG POND LANE  
WILSONVILLE, CLACKAMAS COUNTY, OREGON**

This report presents the results of a geotechnical engineering study conducted by Hardman Geotechnical Services Inc. (HGSI) for Frog Pond Estates (Thurmond Property) at 7070 SW Frog Pond Lane in Wilsonville, Oregon (Figure 1). The purpose of this study was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for site development.

#### **SITE DESCRIPTION AND PROPOSED DEVELOPMENT**

The subject property is currently occupied by a residential house, detached garage and deteriorating barn building; all located within the northern third of the site. The site is listed as 4.05 acres and is rectangular in shape. The areas surrounding the house and other structures are landscaped with lawn and a few trees, although this area is becoming overgrown with blackberries, etc. The southern two-thirds of the site remain undeveloped and are vegetated with tall grasses and shrubbery as well as a few young fruit trees. Along the western edge of the site is a line of older, mature deciduous and coniferous trees.

Preliminary plans indicate the site will be developed into a 17-lot residential subdivision that will include two separate tracts with the intention of having one or both serve as water quality/detention facilities. Site development will also include construction of on-site streets and underground utilities.

#### **REGIONAL GEOLOGY AND SEISMIC SETTING**

The subject site lies within the heart of the Portland Basin, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. The Portland Basin is a northwest-southwest trending structural basin produced by broad regional downwarping of the area. The Portland Basin is approximately 20 miles wide and 45 miles long and is filled with consolidated and unconsolidated sedimentary rocks of late Miocene, Pliocene and Pleistocene age.

Geologic maps indicate the subject site is underlain by Quaternary age (last 1.6 million years) silt, fine flood deposits that mantles basalt bedrock (Madin, 1990). This generally consists of massive fine sand and silt deposited following repeated catastrophic flooding events in the Willamette Valley, the last of which occurred between 15,000 and 10,000 years ago. In localized areas, the tan or white sandy silts include buried paleosols that developed between depositional events. Regionally, the total thickness of fine flood deposits range from 5 feet to greater than 100 feet.

October 8, 2021

HGSI Project No. 21-2830

The loess is underlain by residual soil formed by in place weathering of the underlying Columbia River Basalt Formation (Madin, 1990). The Miocene aged (about 14.5 to 16.5 million years ago) Columbia River Basalts are a thick sequence of lava flows which form the crystalline basement of the Tualatin Valley. The basalts are composed of dense, finely crystalline rock that is commonly fractured along blocky and columnar vertical joints. Individual basalt flow units typically range from 25 to 125 feet thick and interflow zones are typically vesicular, scoriaceous, brecciated, and sometimes include sedimentary rocks.

At least three major fault zones capable of generating damaging earthquakes are known to exist in the region. These include the Portland Hills Fault Zone, Gales Creek-Newberg-Mt. Angel Structural Zone, and the Cascadia Subduction Zone. These potential earthquake source zones are included in the determination of seismic design values for structures, as presented in the *Seismic Design* section. None of the known faults extend beneath the site.

## **FIELD EXPLORATION**

### **Exploratory Hand Auger Borings**

The site-specific exploration for this study was conducted on September 27 and October 7, 2021 and consisted of six hand auger borings (designated HA-1 through HA-6) at the approximate locations shown on the attached Site Plan, Figure 2. These borings were performed using a manually-operated hand auger.

Explorations were conducted under the full-time observation of HGSI personnel. Soil samples obtained from the borings were classified in the field and representative portions were placed in relatively air-tight plastic bags. These soil samples were then returned to the laboratory for further examination. Pertinent information including soil sample depths, stratigraphy, soil engineering characteristics, and groundwater occurrence was recorded. Soils were classified in general accordance with the Unified Soil Classification System.

Summary exploration logs are attached to this report. The stratigraphic contacts shown on the individual exploration logs represent the approximate boundaries between soil types. The actual transitions may be more gradual. The soil and groundwater conditions depicted are only for the specific dates and locations reported, and therefore, are not necessarily representative of other locations and times.

### **Infiltration Testing**

On September 27, 2021, HGSI performed falling head infiltration tests using the open-hole method in hand auger borings HA-1 and HA-2. The infiltration testing was performed by measuring the water level at ten-second intervals using HOBOTM data loggers, which measures water pressure corrected for temperature and barometric pressure. See attached HOBOTM water level data logger plot. The infiltration rate was determined based on the slope of the water depth line near the end of the test. Table 1 presents the results of the falling head infiltration tests.

**Table 1. Summary of Infiltration Test Results**

| <b>Boring</b> | <b>Depth (feet)</b> | <b>Soil Type</b> | <b>Infiltration Rate (in/hr)*</b> | <b>Hydraulic Head Range during Testing (inches)</b> |
|---------------|---------------------|------------------|-----------------------------------|---|
| HA-1          | 6.3                 | Clayey Silt (ML) | 0.7                               | 19.2 – 10.8   |
| HA-2          | 4.2                 | Clayey Silt (ML) | ---                               | ---   |

\*It should be noted that HA-2 experienced heavy caving due to rainy weather and the intrusion of surface water into the boring that rendered collected data unreliable. Data from HA-1 are representative of the similar soil conditions encountered in HA-2.

**SUBSURFACE CONDITIONS**

The following discussion is a summary of subsurface conditions encountered in our explorations. For more detailed information regarding subsurface conditions at specific exploration locations, refer to the attached hand auger logs. Also, please note that subsurface conditions can vary between exploration locations, as discussed in the *Uncertainty and Limitations* section below.

**Soil**

On-site soils are anticipated to consist of undocumented fill, topsoil, and Willamette silt soils as described below.

***Undocumented Fill*** – At the surface and termination points of HA-6 our exploration uncovered a layer of medium dense to dense, poorly graded gravel that was subangular in shape. HA-6 was terminated in the undocumented fill at shallow depth.

***Topsoil*** – Beginning at the surface level, all borings except HA-6 encountered a soft, wet to moist layer of dark brown silt that was inundated with short and tall grass roots. This highly organic unit was found to be between 6 to 12 inches thick.

***Willamette Silt*** – Beneath the topsoil in the hand augers, we encountered stiff to very stiff, moist to dry, brown silt to clayey silt. The upper several feet of this unit exhibited orange and gray mottling. Beyond depths of about 5.5 to 6 feet bgs the borings revealed an increasing amount of clay particles intermixed with the silt.

**Groundwater**

During the field exploration, no seepage or static groundwater table was encountered to the maximum depth of exploration at 10.2 feet bgs. Based on nearby water well data, depth to static groundwater is about 20 feet below the ground surface. Perched groundwater conditions often occur over fine-grained native deposits such as those beneath the site, particularly during the wet season. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors. The groundwater conditions reported above are for the specific date and locations indicated, and therefore may not necessarily be indicative of other times and/or locations.

## **CONCLUSIONS AND RECOMMENDATIONS**

Results of this study indicate that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. Recommendations are presented below regarding site preparation and undocumented fill removal, engineered fill, wet weather earthwork, spread footing foundations, below grade structural retaining walls, concrete slabs-on-grade, perimeter footing drains, seismic design, excavating conditions and utility trench backfill, stormwater infiltration systems, and erosion control considerations.

### **Site Preparation and Undocumented Fill Removal**

The areas of the site to be graded should first be cleared of vegetation, undocumented fill, and any loose debris; and debris from clearing should be removed from the site. Organic-rich topsoil should then be removed to competent native soils. We anticipate that the average depth of topsoil stripping will be about 6 to 12 inches over most of the site, however deeper stripping may be needed in localized areas. The final depth of stripping removal may vary depending on local subsurface conditions and the contractor's methods, and should be determined on the basis of site observations after the initial stripping has been performed. Stripped organic soil should be stockpiled only in designated areas or removed from the site and stripping operations should be observed and documented by HGSI. Existing subsurface structures (tile drains, old utility lines, septic leach fields, etc.) beneath areas of proposed structures and pavement should be removed and the excavations backfilled with engineered fill.

Undocumented fill was encountered in HA-6, which was terminated at shallow depth. There is potential for old fills to be present on site in other areas beyond our explorations. Where encountered beneath proposed structures, pavements, or other settlement-sensitive improvements, undocumented fill should be removed down to firm inorganic native soils and the removal area backfilled with engineered fill (see below). HGSI should observe removal excavations (if any) prior to fill placement to verify that overexcavations are adequate and an appropriate bearing stratum is exposed.

In construction areas, once stripping has been verified, the area should be ripped or tilled to a depth of 12 inches, moisture conditioned, and compacted in-place prior to the placement of engineered fill. Exposed subgrade soils should be evaluated by HGSI. For large areas, this evaluation is normally performed by proof-rolling the exposed subgrade with a fully loaded scraper or dump truck. For smaller areas where access is restricted, the subgrade should be evaluated by probing the soil with a steel probe. Soft/loose soils identified during subgrade preparation should be compacted to a firm and unyielding condition or over-excavated and replaced with engineered fill, as described below. The depth of overexcavation, if required, should be evaluated by HGSI at the time of construction.

### **Engineered Fill**

In general, we anticipate that on-site soils will be suitable for use as engineered fill in dry weather conditions, provided they are relatively free of organics and are properly moisture conditioned for compaction. Imported fill material must be approved by the geotechnical engineer prior to being imported to the site. Oversize material greater than 6 inches in size should not be used within 3 feet of foundation footings, and material greater than 12 inches in diameter should not be used in engineered fill.

Engineered fill should be compacted in horizontal lifts not exceeding 8 inches using standard compaction equipment. We recommend that engineered fill be compacted to at least 90 percent of the maximum dry density determined by ASTM D1557 (Modified Proctor) or equivalent. On-site soils may be wet or dry of optimum; therefore, we anticipate that moisture conditioning of native soil will be necessary for compaction operations.

October 8, 2021

HGSI Project No. 21-2830

Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill. Field density testing should conform to ASTM D2922 and D3017, or D1556. Engineered fill should be periodically observed and tested by the project geotechnical engineer or his representative. Typically, one density test is performed for at least every 2 vertical feet of fill placed or every 500 yd<sup>3</sup>, whichever requires more testing.

### **Wet Weather Earthwork**

The on-site soils are moisture sensitive and may be difficult to handle or traverse with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. Earthwork performed during the wet-weather season will probably require expensive measures such as cement treatment or imported granular material to compact fill to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Material used as engineered fill should consist of clean, granular soil containing less than about 7 percent fines. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;
- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and
- Bales of straw and/or geotextile silt fences should be strategically located to control erosion.

If cement or lime treatment is used to facilitate wet weather construction, HGSI should be contacted to provide additional recommendations and field monitoring.

### **Spread Footing Foundations**

Shallow, conventional isolated or continuous spread footings may be used to support the proposed structures, provided they are founded on competent native soils, or compacted engineered fill placed directly upon the competent native soils. We recommend a maximum allowable bearing pressure of 2,000 pounds per square foot (psf) for designing spread footings bearing on undisturbed native soils or engineered fill. The recommended maximum allowable bearing pressure may be increased by a factor of 1.33 for short term transient conditions such as wind and seismic loading. Exterior footings should be founded at least 18 inches below the lowest adjacent finished grade. Minimum footing widths should be determined by the project engineer/architect in accordance with applicable design codes.

Assuming construction is accomplished as recommended herein, and for the foundation loads anticipated, we estimate total settlement of spread foundations of less than about 1 inch and differential settlement between two adjacent load-bearing components supported on competent soil of less than about ½ inch. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied.

October 8, 2021

HGSI Project No. 21-2830

Wind, earthquakes, and unbalanced earth loads will subject the proposed structure to lateral forces. Lateral forces on a structure will be resisted by a combination of sliding resistance of its base or footing on the underlying soil and passive earth pressure against the buried portions of the structure. For use in design, a coefficient of friction of 0.5 may be assumed along the interface between the base of the footing and subgrade soils. Passive earth pressure for buried portions of structures may be calculated using an equivalent fluid weight of 390 pounds per cubic foot (pcf), assuming footings are cast against dense, natural soils or engineered fill. The recommended coefficient of friction and passive earth pressure values do not include a safety factor. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

Footing excavations should be trimmed neat and the bottom of the excavation should be carefully prepared. Loose, wet or otherwise softened soil should be removed from the footing excavation prior to placing reinforcing steel bars. HGSI should observe foundation excavations prior to placing crushed rock, to verify that adequate bearing soils have been reached. Due to the high moisture sensitivity of on-site soils, construction during wet weather may require overexcavation of footings and backfill with compacted, crushed aggregate.

### **Below-Grade Structural Retaining Walls**

Lateral earth pressures against below-grade retaining walls will depend upon the inclination of any adjacent slopes, type of backfill, degree of wall restraint, method of backfill placement, degree of backfill compaction, drainage provisions, and magnitude and location of any adjacent surcharge loads. At-rest soil pressure is exerted on a retaining wall when it is restrained against rotation. In contrast, active soil pressure will be exerted on a wall if its top is allowed to rotate or yield a distance of roughly 0.001 times its height or greater. If the subject retaining walls will be free to rotate at the top, they should be designed for an active earth pressure equivalent to that generated by a fluid weighing 35 pcf for level backfill against the wall. For restrained walls, an at-rest equivalent fluid pressure of 54 pcf should be used in design, again assuming level backfill against the wall. These values assume that the recommended drainage provisions are incorporated, and hydrostatic pressures are not allowed to develop against the wall.

During a seismic event, lateral earth pressures acting on below-grade structural walls will increase by an incremental amount that corresponds to the earthquake loading. Based on the Mononobe-Okabe equation and peak horizontal accelerations appropriate for the site location, seismic loading should be modeled using the active or at-rest earth pressures recommended above, plus an incremental rectangular-shaped seismic load of magnitude  $5H$ , where  $H$  is the total height of the wall.

We assume relatively level ground surface below the base of the walls. As such, we recommend passive earth pressure of 390 pcf for use in design, assuming wall footings are cast against competent native soils or engineered fill. If the ground surface slopes down and away from the base of any of the walls, a lower passive earth pressure should be used and HGSI should be contacted for additional recommendations.

A coefficient of friction of 0.5 may be assumed along the interface between the base of the wall footing and subgrade soils. The recommended coefficient of friction and passive earth pressure values do not include a safety factor, and an appropriate safety factor should be included in design. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

The above recommendations for lateral earth pressures assume that the backfill behind the subsurface walls will consist of properly compacted structural fill, and no adjacent surcharge loading. If the walls will be subjected to the influence of surcharge loading within a horizontal distance equal to or less than the height of the wall, the walls should be designed for the additional horizontal pressure. For uniform surcharge pressures, a uniformly distributed lateral pressure of 0.3 times the surcharge pressure should be added.



October 8, 2021

HGSI Project No. 21-2830

The recommended equivalent fluid densities assume a free-draining condition behind the walls so that hydrostatic pressures do not build up. This can be accomplished by placing a 12-inch wide zone of crushed drain rock containing less than 5 percent fines against the walls. A 3-inch minimum diameter perforated, plastic drain pipe should be installed at the base of the walls and connected to a sump to remove water from the crushed drain rock zone. The drain pipe should be wrapped in filter fabric (Mirafi 140N or other as approved by the geotechnical engineer) to minimize clogging. The above drainage measures are intended to remove water from behind the wall to prevent hydrostatic pressures from building up. Additional drainage measures may be specified by the project architect or structural engineer, for damp-proofing or other reasons.

HGSI should be contacted during construction to verify subgrade strength in wall keyway excavations, to verify that backslope soils are in accordance with our assumptions, and to take density tests on the wall backfill materials.

### **Concrete Slabs-on-Grade**

Preparation of areas beneath concrete slab-on-grade floors should be performed as recommended in the *Site Preparation* section. Care should be taken during excavation for foundations and floor slabs, to avoid disturbing subgrade soils. If subgrade soils have been adversely impacted by wet weather or otherwise disturbed, the surficial soils should be scarified to a minimum depth of 8 inches, moisture conditioned to within about 3 percent of optimum moisture content, and compacted to engineered fill specifications. Alternatively, disturbed soils may be removed and the removal zone backfilled with additional crushed rock. For evaluation of the concrete slab-on-grade floors using the beam on elastic foundation method, a modulus of subgrade reaction of 200 kcf (115 pci) should be assumed for the soils anticipated at subgrade depth. This value assumes the concrete slab system is designed and constructed as recommended herein, with a minimum thickness of crushed rock of 8 inches beneath the slab.

Interior slab-on-grade floors should be provided with an adequate moisture break. The capillary break material should consist of ODOT open graded aggregate per ODOT Standard Specifications 02630-2. The minimum recommended thickness of capillary break materials on re-compacted soil subgrade is 8 inches. The total thickness of crushed aggregate will be dependent on the subgrade conditions at the time of construction, and should be verified visually by proof-rolling. Under-slab aggregate should be compacted to at least 90% of its maximum dry density as determined by ASTM D1557 or equivalent.

In areas where moisture will be detrimental to floor coverings or equipment inside the proposed structure, appropriate vapor barrier and damp-proofing measures should be implemented. A commonly applied vapor barrier system consists of a 10-mil polyethylene vapor barrier placed directly over the capillary break material. With this type of system, an approximately 2-inch thick layer of sand is often placed over the vapor barrier to protect it from damage, to aid in curing of the concrete, and also to help prevent cement from bleeding down into the underlying capillary break materials. Other damp/vapor barrier systems may also be feasible. Appropriate design professionals should be consulted regarding vapor barrier and damp proofing systems, ventilation, building material selection and mold prevention issues, which are outside HGSI's area of expertise.

### **Perimeter Footing Drains**

Due to the potential for perched surface water above fine grained deposits such as those encountered at the site, we recommend the outside edge of perimeter footings be provided with a drainage system consisting of 3-inch minimum diameter perforated PVC pipe embedded in a minimum of 1 ft<sup>3</sup> per lineal foot of clean, free-draining sand and gravel or 1"- 1/4" drain rock. The drain pipe and surrounding drain rock should be wrapped in non-woven geotextile (Mirafi 140N, or approved equivalent) to minimize the potential for clogging and/or ground loss due to piping. Water collected from the footing drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained

throughout the drain and non-perforated pipe outlet. The footing drains should include clean-outs to allow periodic maintenance and inspection.

Down spouts and roof drains should collect roof water in a system separate from the footing drains in order to reduce the potential for clogging. Roof drain water should be directed to an appropriate discharge point well away from structural foundations. Grades should be sloped downward and away from buildings to reduce the potential for ponded water near structures.

**Seismic Design**

Structures should be designed to resist earthquake loading in accordance with the methodology described in the current Oregon Residential Specialty Code (ORSC). We recommend Site Class D (Stiff Soils) be used for design per the ORSC. Design values determined for the site using the ASCE 7-16 Hazard Tool are summarized on Table 2, for Risk Category II.

**Table 2. Recommended Earthquake Ground Motion Parameters (ASCE 7-16)**

| Parameter   | Value              |
|---|--------------------|
| Location (Lat, Long), degrees                               | 45.3211, -122.7494 |
| Mapped Spectral Acceleration Values<br>(MCE, Site Class B): |                    |
| Short Period, $S_s$   | 0.82 g             |
| 1.0 Sec Period, $S_1$                                       | 0.381 g            |
| Design Values for <b>Site Class D</b> (Stiff Soils):        |                    |
| Peak Ground Acceleration $PGA_M$                            | 0.458              |
| $F_a$   | 1.172              |
| $SD_s = 2/3 \times F_a \times S_s$                          | 0.641 g            |
| Seismic Design Category (2021 ORSC)                         | $D_0$              |

Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to earthquake shaking. Soil liquefaction is generally limited to loose, granular soils located below the water table. Following development, on-site soils will consist predominantly of stiff to very stiff silt which are not considered susceptible to liquefaction. Therefore, it is our opinion that special design or construction measures are not required to mitigate the effects of liquefaction.

**Excavating Conditions and Utility Trench Backfill**

We anticipate that on-site soils can be excavated using conventional heavy equipment such as scrapers and trackhoes to a depth of 10 feet and likely greater. Maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the contractor. Actual slope inclinations at the time of construction should be determined based on safety requirements and actual soil and groundwater conditions. All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Health Administration (OSHA) regulations (29 CFR Part 1926), or be shored. The existing native soils classify as Type B Soil and temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. This cut slope inclination is applicable to excavations above the water table only.

Perched groundwater conditions often occur over fine-grained native deposits such as those beneath the site, particularly during the wet season. If encountered, the contractor should be prepared to implement an

October 8, 2021

HGSI Project No. 21-2830

appropriate dewatering system for installation of the utilities. At this time, we anticipate that dewatering systems consisting of ditches, sumps and pumps would be adequate for control of groundwater where encountered during construction conducted during the dry season. Regardless of the dewatering system used, it should be installed and operated such that in-place soils are prevented from being removed along with the groundwater.

Vibrations created by traffic and construction equipment may cause some caving and raveling of excavation walls. In such an event, lateral support for the excavation walls should be provided by the contractor to prevent loss of ground support and possible distress to existing or previously constructed structural improvements.

Utility trench backfill should consist of ¾"-0 crushed rock, compacted to at least 90% of the maximum dry density obtained by Modified Proctor (ASTM D1557) or equivalent. Initial backfill lift thicknesses for a ¾"-0 crushed aggregate base may need to be as great as 4 feet to reduce the risk of flattening underlying flexible pipe. Subsequent lift thickness should not exceed 1 foot. If imported granular fill material is used, then the lifts for large vibrating plate-compaction equipment (e.g. hoe compactor attachments) may be up to 2 feet, provided that proper compaction is being achieved and each lift is tested. Use of large vibrating compaction equipment should be carefully monitored near existing structures and improvements due to the potential for vibration-induced damage.

Adequate density testing should be performed during construction to verify that the recommended relative compaction is achieved. Typically, one density test is taken for every 4 vertical feet of backfill on each 200-lineal-foot section of trench.

### **Stormwater Infiltration Facilities**

On September 27, 2021, HGSI performed falling head infiltration tests using the open hole method in HA-1 and HA-2. Measured infiltration rate in HA-1 was 0.7 inches/hour, at a depth of 6.5 feet bgs. No useable data was obtained in HA-2, which caved during testing. Based on similarity of soil types, an infiltration rate of 0.7 inches/hour is also suitable for use at the location of HA-2. HGSI recommends an ultimate infiltration rate of 0.7 inches per hour for design of the stormwater facility in this area. The ultimate infiltration rate does not incorporate a factor of safety and the stormwater system designer should incorporate a suitable factor of safety in design.

Infiltration test methods and procedures attempt to simulate the as-built conditions of the planned disposal system. However, due to natural variations in soil properties, actual infiltration rates may vary from the measured and/or recommended design rates. All systems should be constructed such that potential overflow is discharged in a controlled manner away from structures, and all systems should include an adequate factor of safety. Infiltration rates presented in this report should not be applied to inappropriate or complex hydrological models such as a closed basin without extensive further studies.

### **Erosion Control Considerations**

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which should include judicious use of straw, bio-bags, silt fences, or other appropriate technology. Where used, erosion control devices should be in place and remain in place throughout site preparation and construction. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets.

## UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and his/her consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, HGSI should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, HGSI executed these services in accordance with generally accepted professional principles and practices in the field of geotechnical engineering at the time the report was prepared. No warranty, expressed or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.



We appreciate this opportunity to be of service.

Sincerely,

**HARDMAN GEOTECHNICAL SERVICES INC.**



Scott L. Hardman, P.E., G.E.  
Geotechnical Engineer

Attachments:   References  
                  Figure 1 – Vicinity Map  
                  Figure 2 – Site Plan  
                  Logs of Hand Auger Borings HA-1 through HA-6 (6 Pages)  
                  ASCE Seismic Design Hazards Report (3 Pages)



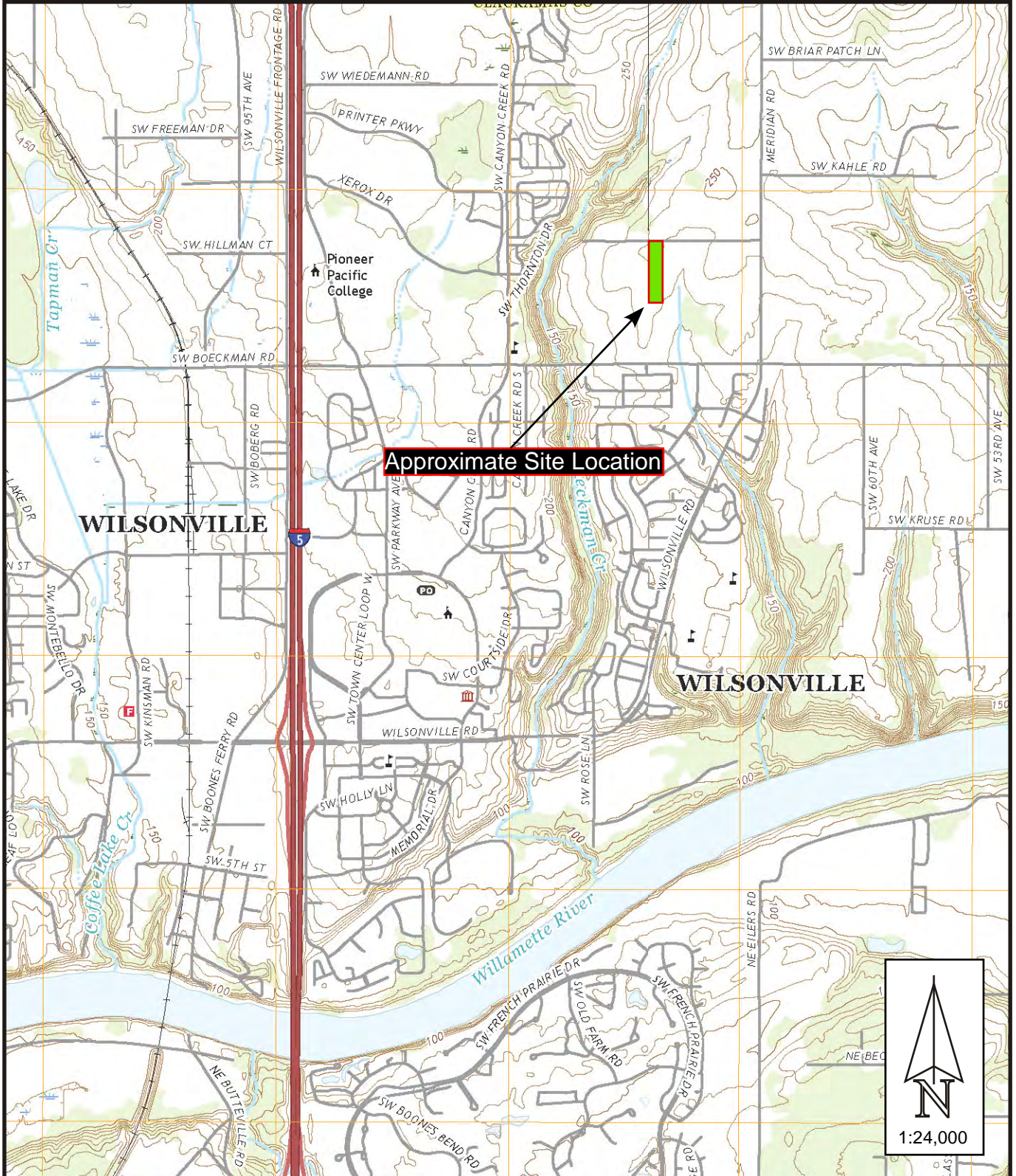
## REFERENCES

Madin, I.P., 1990, Earthquake hazard geology maps of the Portland metropolitan area, Oregon: Oregon Department of Geology and Mineral Industries Open-File Report 0-90-2, scale 1:24,000, 22 p.

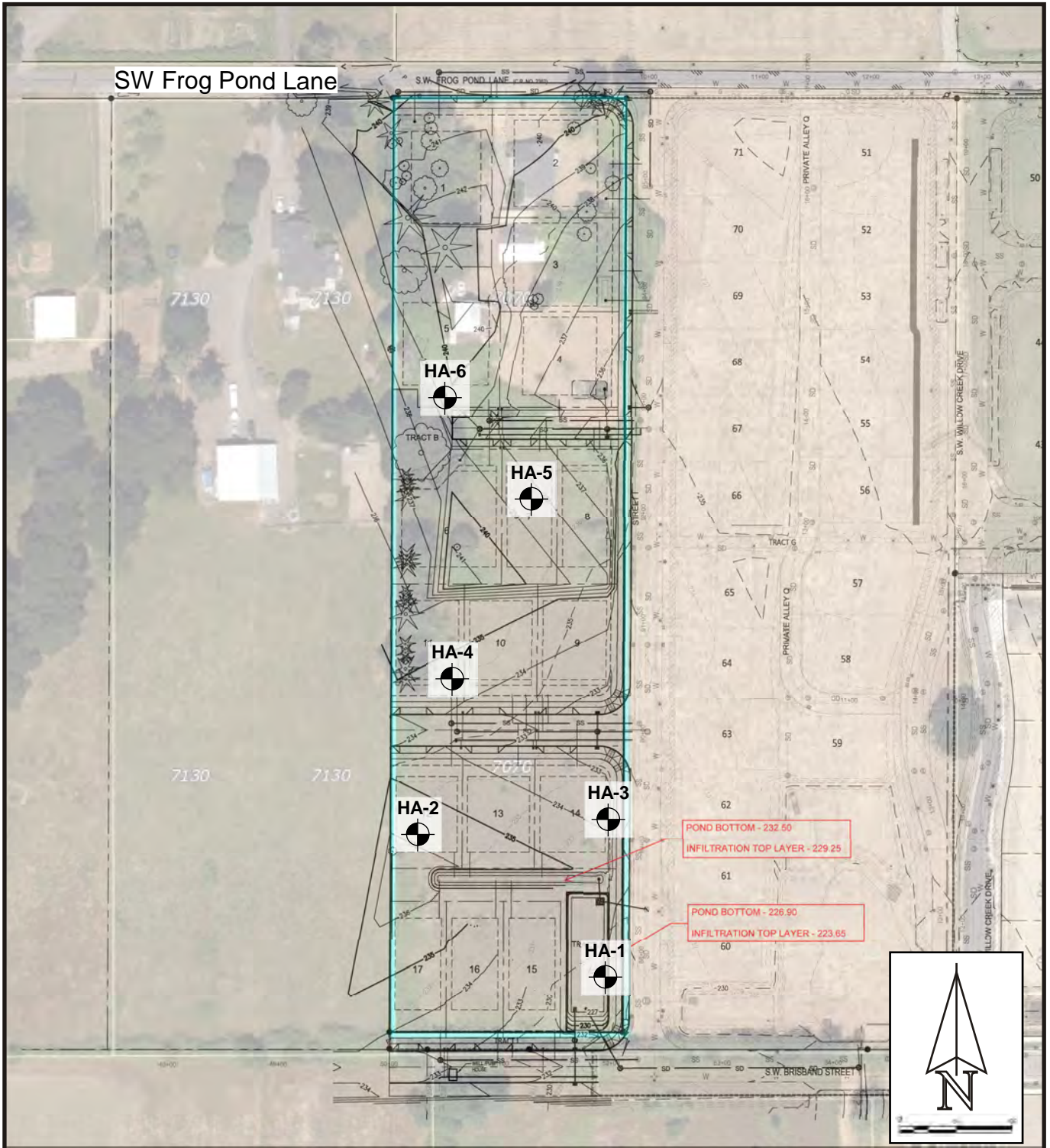
Schlicker, H.G. and Finlayson, C.T., 1979, Geology and geologic hazards of northwest Clackamas County, Oregon Department of Geology and Mineral Industries, Bulletin 99, 1:24,000

Yeats, R.S., Graven, E.P., Werner, K.S., Goldfinger, C., and Popowski, T., 1996, Tectonics of the Willamette Valley, Oregon: in Assessing earthquake hazards and reducing risk in the Pacific Northwest, Vol. 1: U.S. Geological Survey Professional Paper 1560, P. 183-222, 5 plates, scale 1:100,000.









— Approximate Site Boundary

HA-X  
Hand Auger Location

# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 1**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description  |
|------------|---|-----------------|--------------------|----------------------|-------------|---|
| 1          |   |                 |                    |                      |             | Wet to Moist, Nonplastic, Noncohesive, Soft, Dark Brown SILT (ML), Slightly Micaceous, Highly Organic with Grass Roots <i>[Native Willamette Silt]</i>  |
| 2          |   |                 |                    |                      |             | Slightly Moist to Dry, Nonplastic, Noncohesive, Stiff, Light Brown to Light Gray SILT (ML), Slightly Micaceous, with Heavy Orange & White Mottling <i>[Native Willamette Silt]</i>  |
| 3          |   |                 |                    |                      |             | Dry, Nonplastic, Noncohesive, Stiff to Very Stiff, Light Brown SILT (ML), Slightly Micaceous, With Some Orange & Gray Mottles <i>[Native Willamette Silt]</i>   |
| 4          |   |                 |                    |                      |             | Slightly Moist, Nonplastic, Noncohesive to Slightly Cohesive, Stiff, Light Brown to Light Orange-Brown SILT to Clayey SILT (ML), Slightly Micaceous, with Moderate Orange to Gray Mottles <i>[Native Willamette Silt]</i> |
| 5          |   |                 |                    |                      |             |   |
| 6          |   |                 |                    |                      |             |   |
| 7          |   |                 |                    |                      |             | <i>Boring terminated at 6.25 feet (75 inches)<br/>No groundwater or seepage encountered<br/>No caving</i>   |
| 8          |   |                 |                    |                      |             |   |
| 9          |   |                 |                    |                      |             |   |
| 10         |   |                 |                    |                      |             |   |

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LEGEND



S-#



Soil Sample Depth  
Interval and Designation

Water Level at  
Time of Excavation

Date Bored: 09/27/2021

Logged By: JAC

Surface Elevation:



# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 2**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description  |
|------------|---|-----------------|--------------------|----------------------|-------------|---|
| 1          |   |                 |                    |                      |             | Wet to Moist, Nonplastic, Noncohesive, Soft, Dark Brown SILT (ML), Slightly Micaceous, Top 6" Highly Organic with Grass Roots <i>[Native Willamette Silt]</i> |
| 2          |   |                 |                    |                      |             | Dry, Nonplastic, Noncohesive, Stiff to Very Stiff, Light Brown SILT (ML), Slightly Micaceous, With Some Orange & Gray Mottels <i>[Native Willamette Silt]</i> |
| 3          |   |                 |                    |                      |             |   |
| 4          |   |                 |                    |                      |             | <i>Boring terminated at 4.0 feet (48 inches)<br/>No groundwater or seepage encountered<br/>No caving</i>  |
| 5          |   |                 |                    |                      |             |   |
| 6          |   |                 |                    |                      |             |   |
| 7          |   |                 |                    |                      |             |   |
| 8          |   |                 |                    |                      |             |   |
| 9          |   |                 |                    |                      |             |   |
| 10         |   |                 |                    |                      |             |   |

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S-#



Soil Sample Depth  
Interval and Designation

Water Level at  
Time of Excavation

Date Bored: 09/27/2021

Logged By: JAC

Surface Elevation:

# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 3**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description  |
|------------|---|-----------------|--------------------|----------------------|-------------|---|
| 1          |   |                 |                    |                      |             | Moist, Nonplastic, Noncohesive, Soft, Dark Brown SILT (ML), Slightly Micaceous, Top 5" Highly Organic with Grass Roots <i>[Native Willamette Silt]</i>                    |
| 2          |   |                 |                    |                      |             | Dry, Nonplastic, Noncohesive, Stiff, Light Brown SILT (ML), Slightly Micaceous, with Heavy Orange Mottels <i>[Native Willamette Silt]</i>                                 |
| 3          |   |                 |                    |                      |             | Slightly Moist, Nonplastic, Noncohesive, Stiff, Light Brown SILT (ML), Slightly Micaceous, with Heavy Orange & Gray Mottling <i>[Native Willamette Silt]</i>              |
| 4          |   |                 |                    |                      |             | Slightly Moist, Nonplastic, Noncohesive, Medium Stiff, Brown SILT (ML), Slightly Micaceous <i>[Native Willamette Silt]</i>  |
| 5          |   |                 |                    |                      |             |   |
| 6          |   |                 |                    |                      |             |   |
| 7          |   |                 |                    |                      |             | Moist, Very Slightly Plastic, Cohesive, Medium Stiff, Brown Clayey SILT (ML), Slightly Micaceous, with Few Orange & Gray Mottels <i>[Native Willamette Silt]</i>          |
| 8          |   |                 |                    |                      |             | Moist, Slightly Plastic, Cohesive, Medium Stiff, Brown Silty CLAY (CL), Slightly Micaceous, with Heavy Orange & Gray Mottels <i>[Native Willamette Silt]</i>              |
| 9          |   |                 |                    |                      |             | Moist, Plastic, Cohesive, Medium Soft, Brown CLAY with Trace Silt (CL), Slightly Micaceous, with Heavy Orange, Dark Brown, & Gray Mottels <i>[Native Willamette Silt]</i> |
| 10         |   |                 |                    |                      |             | <i>Boring terminated at 10.2 feet (122 inches)<br/>No groundwater or seepage encountered<br/>No caving</i>  |

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S-#



Soil Sample Depth  
Interval and Designation

Water Level at  
Time of Excavation

Date Bored: 10/07/2021

Logged By: JAC

Surface Elevation:

# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 4**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description   |
|------------|---|-----------------|--------------------|----------------------|-------------|--|
| 1          |   |                 |                    |                      |             | Moist, Nonplastic, Noncohesive, Soft, Dark Brown SILT (ML), Slightly Micaceous <i>[Native Willamette Silt]</i>   |
| 2          |   |                 |                    |                      |             | Dry to Very Slightly Moist, Nonplastic, Noncohesive, Stiff, Light Brown SILT (ML), Slightly Micaceous, with Heavy Orange Mottels <i>[Native Willamette Silt]</i> |
| 3          |   |                 |                    |                      |             |  |
| 4          |   |                 |                    |                      |             |  |
| 5          |   |                 |                    |                      |             |  |
| 6          |   |                 |                    |                      |             |  |
| 7          |   |                 |                    |                      |             | <i>Boring terminated at 6.25 feet (75 inches)<br/>No groundwater or seepage encountered<br/>No caving</i>  |
| 8          |   |                 |                    |                      |             |  |
| 9          |   |                 |                    |                      |             |  |
| 10         |   |                 |                    |                      |             |  |

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S-#



Soil Sample Depth  
Interval and Designation

Water Level at  
Time of Excavation

Date Bored: 10/07/2021

Logged By: JAC

Surface Elevation:

# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 5**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description   |
|------------|---|-----------------|--------------------|----------------------|-------------|--|
| 1          |   |                 |                    |                      |             | Moist, Nonplastic, Noncohesive, Soft, Dark Brown SILT (ML), Slightly Micaceous, Top 6" Highly Organic with Grass Roots <i>[Native Willamette Silt]</i>       |
| 2          |   |                 |                    |                      |             | Dry, Nonplastic, Noncohesive, Stiff, Light Brown SILT (ML), Slightly Micaceous, with Heavy Orange Mottels <i>[Native Willamette Silt]</i>                    |
| 3          |   |                 |                    |                      |             |  |
| 4          |   |                 |                    |                      |             |  |
| 5          |   |                 |                    |                      |             | Slightly Moist, Nonplastic, Noncohesive, Stiff, Light Brown SILT (ML), Slightly Micaceous, with Heavy Orange & Gray Mottling <i>[Native Willamette Silt]</i> |
| 6          |   |                 |                    |                      |             | Slightly Moist, Nonplastic, Noncohesive, Medium Stiff, Brown SILT (ML), Slightly Micaceous <i>[Native Willamette Silt]</i>                                   |
| 7          |   |                 |                    |                      |             | <i>Boring terminated at 6.7 feet (80 inches)<br/>No groundwater or seepage encountered<br/>No caving</i>   |
| 8          |   |                 |                    |                      |             |  |
| 9          |   |                 |                    |                      |             |  |
| 10         |   |                 |                    |                      |             |  |

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S-#



Soil Sample Depth  
Interval and Designation

Water Level at  
Time of Excavation

Date Bored: 10/07/2021

Logged By: JAC

Surface Elevation:

# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 6**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description  |
|------------|---|-----------------|--------------------|----------------------|-------------|---|
| 1          |   |                 |                    |                      |             | Slightly Moist, Medium Dense, Poorly Graded, Subangular, 1"-0" GRAVEL (GP) in Dark Brown Silty Matrix, Top 3" Highly Organic with Grass Roots<br><i>[Undocumented Fill]</i> |
| 2          |   |                 |                    |                      |             | Boring refusal on gravel at 1.1 feet (13 inches)<br>No groundwater or seepage encountered<br>No caving  |
| 3          |   |                 |                    |                      |             |   |
| 4          |   |                 |                    |                      |             |   |
| 5          |   |                 |                    |                      |             |   |
| 6          |   |                 |                    |                      |             |   |
| 7          |   |                 |                    |                      |             |   |
| 8          |   |                 |                    |                      |             |   |
| 9          |   |                 |                    |                      |             |   |
| 10         |   |                 |                    |                      |             |   |

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S-#



Soil Sample Depth Interval and Designation

Water Level at Time of Excavation

Date Bored: 10/07/2021

Logged By: JAC

Surface Elevation:

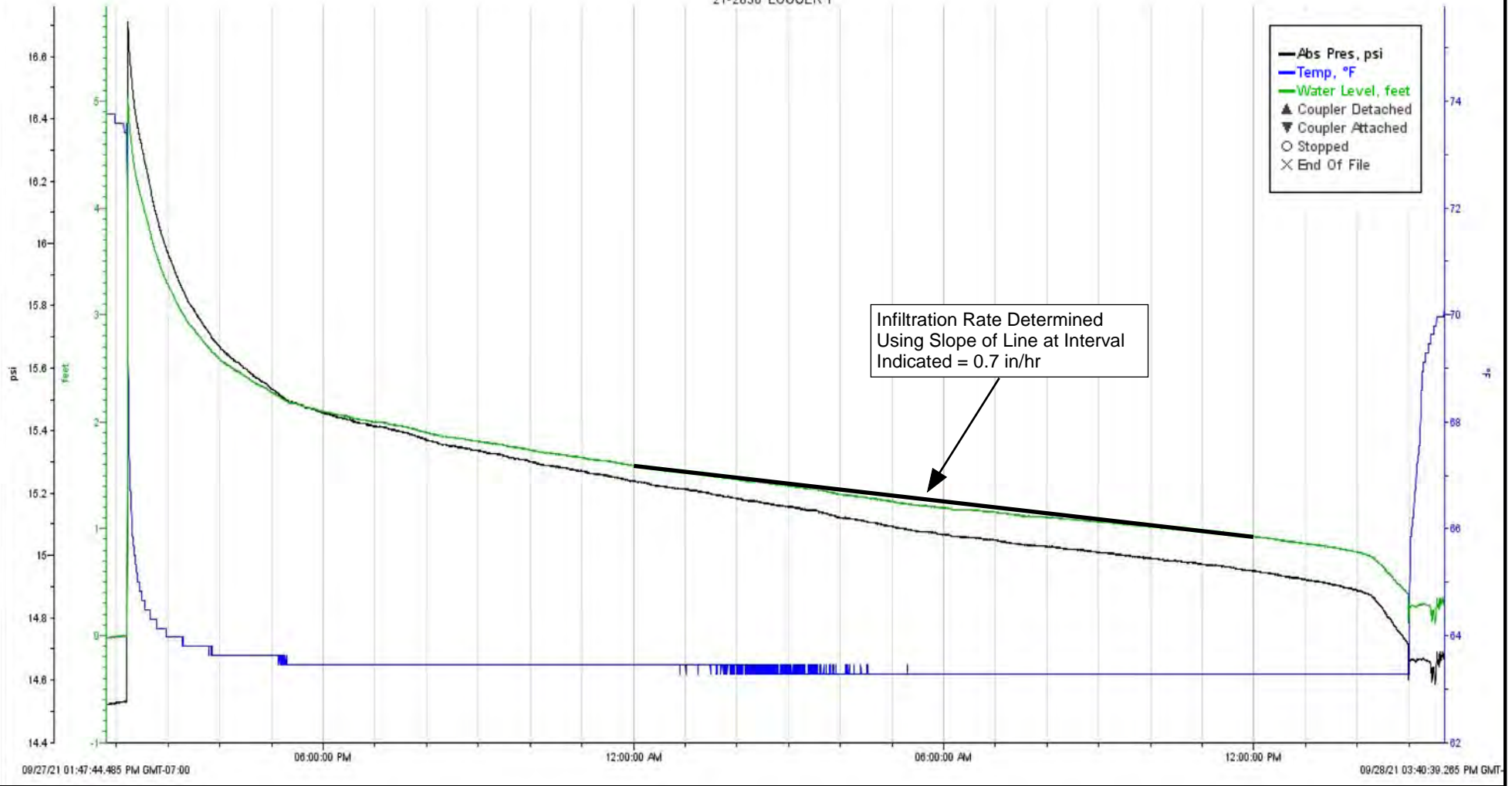


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# INFILTRATION TEST DATA

21-2830 LOGGER 1



Project: Frog Pond - Thurmond Property  
Wilsonville, Oregon

Date Tested: 09/27-28/2021  
Tested By: JAC  
Project No: 21-2830

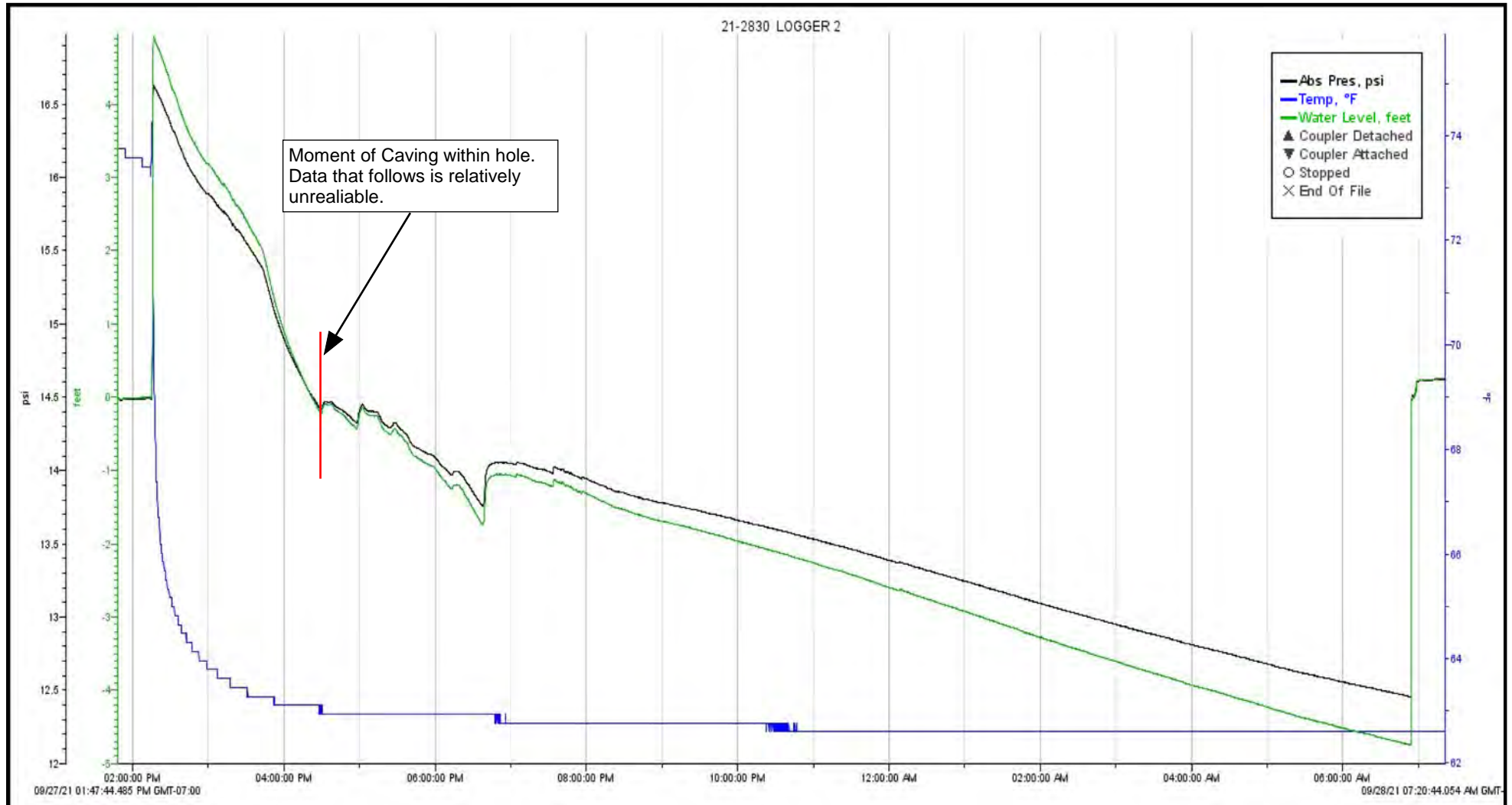
Boring: HA-1  
Depth: 6.25 Feet



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# INFILTRATION TEST DATA



Project: Frog Pond - Thurmond Property  
Wilsonville, Oregon

Date Tested: 09/27-28/2021  
Tested By: JAC  
Project No: 21-2830

Boring: HA-2  
Depth: 4.0 Feet



# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** III  
**Soil Class:** D - Stiff Soil

**Elevation:** 238.19 ft (NAVD 88)  
**Latitude:** 45.321147  
**Longitude:** -122.749391





**Site Soil Class:** D - Stiff Soil

**Results:**

|            |       |                    |       |
|------------|-------|--------------------|-------|
| $S_s$ :    | 0.82  | $S_{D1}$ :         | N/A   |
| $S_1$ :    | 0.381 | $T_L$ :            | 16    |
| $F_a$ :    | 1.172 | PGA :              | 0.373 |
| $F_v$ :    | N/A   | PGA <sub>M</sub> : | 0.458 |
| $S_{MS}$ : | 0.961 | F <sub>PGA</sub> : | 1.227 |
| $S_{M1}$ : | N/A   | $I_e$ :            | 1.25  |
| $S_{DS}$ : | 0.641 | $C_v$ :            | 1.21  |

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

**Data Accessed:** Thu Oct 07 2021

**Date Source:** [USGS Seismic Design Maps](#)

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# **Appendix C**

DownStream Analysis





## Memorandum

**To:** Keith Buisman, PE  
**From:** Rose Horton, PE  
**Copies:** FILES  
**Date:** October 8, 2021  
**Subject:** Downstream Impact Analysis of Willow Creek Full Buildout  
**Project No.:** 20141

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### Introduction

Otak has conducted a downstream impact analysis on the downstream storm conveyance system for the proposed Frog Pond Estates and Frog Pond Oaks developments, per City of Wilsonville standards. These proposed developments are located adjacent to SW Frog Pond Lane and west of SW Stafford Road, as shown on vicinity map.



Image 1- Vicinity Map

These developments will meet the City of Wilsonville Public Work Standards Section 301.4.04 which requires flow control from post-development conditions for peak flow rates generated by between 42% of the 2-year storm up to the 10-year storm.

To meet the requirements of City of Wilsonville Public Work Standards Section 301.5.01, a downstream analysis shall include:

- verifying that the downstream system has the capacity to convey the 25-year design storm
- extending the analysis downstream to a point in the drainage system where the proposed development site contributes 10% or less of the total tributary drainage flow or for one-quarter mile downstream of the approved point of discharge. The latter was applied in this case.

## Existing Conditions

The extent of the analysis of the existing conveyance system and the contributing drainage basins is shown on Figure 1. Details of the downstream conveyance system used to create the hydraulic model were primarily obtained from City GIS as-built information, and field observation. The proposed Frog Pond Estates and Frog Pond Oaks development will discharge runoff into the existing Willow Creek channel running south of the site. The creek is conveyed south under SW Boeckman Road through a pair of 18" culverts and then runs in a grassed channel through a neighborhood. The channel is collected in a 36" diameter pipe that crosses under SW Willow Creek Drive where it is joined by runoff from the neighborhood. This point is the end of the analysis. The combined flows then drain to a deep channel which outfalls to the Willamette River over a mile downstream.

## Hydrology

Peak runoff rates from the drainage basins delineated in Figure 1, during proposed conditions were calculated using XP-SWMM V19. The Santa Barbara Urban Hydrograph (SBUH) method was used to apply the conveyance design event (25-year recurrence interval, 24-hour duration, NRCS Type 1A rainfall distribution), per Section 301.5.01. Time of Concentration values were calculated for each delineated drainage basin using TR-55 equations. Time of Concentration (Tc) flow paths are shown in Figure 2 and corresponding calculations for each drainage basin are included in Appendix A. A time of concentration of 5 minutes, the minimum allowable, was applied to developed impervious areas.

Most of the study area is comprised of silt loam categorized in the hydrologic soil group (HSG) D. HSG D soils generally exhibit very slow infiltration rates when thoroughly wet. A small upland area is categorized as HSG C with low to moderate infiltration. A Curve Number (CN) of 98 was used for all impervious areas. The pervious areas were open space with good grass cover, thus a CN of 74 (HSG C) or 80 (HSG D) was used as applicable. A weighted pervious curve number was used for the one basin which contained a mix of both soil types. A weighted time of concentration was used in the XP-SWMM model for each drainage basin and the pervious area Tc calculations are included in Appendix A.

The basins downstream of the proposed project site are developed residential areas. Impervious percentages were estimated based on existing impervious surfaces captured in 2007 aerial imagery. Figure 1 shows that the Frog Pond (FP) Estates and Frog Pond Oaks development are currently agricultural with few homes, outbuildings, and driveways. Per the Frog Pond West Master Plan (Wilsonville, 2017), the area is primarily to be developed into a medium lot single family homes with some areas of small and large lot homes. The impervious percentage for the proposed developments were

calculated using the proposed site plans. Table 1 summarized the hydrologic inputs from each basin into the XP-SWMM model.

**Table 1 Hydrologic Basin Information**

| Basin            | Basin Area (ac) | Percent Impervious | Weighted Pervious CN | Weighted Tc (min) | XP-SWMM Node |
|------------------|-----------------|--------------------|----------------------|-------------------|--------------|
| FP Estates       | 4.36            | 43.3               | 80.0                 | 13.45             | C            |
| FP Oaks *        | 8.98            | 56.6               | 78.4                 | 14.37             | C            |
| FP Vista         | 1.17            | 58.0               | 80.0                 | 12.43             | C            |
| FP Crossing      | 1.23            | 58.0               | 80.0                 | 11.13             | C            |
| School           | 5.53            | 35.0               | 80.0                 | 5.00              | B            |
| FP Ridge WC      | 6.86            | 58.0               | 80.0                 | 11.85             | C            |
| FP Ridge P       | 4.25            | 63.5               | 80.0                 | 10.95             | 1            |
| FP Meadows WC    | 12.43           | 59.7               | 80.0                 | 9.35              | 1            |
| Stafford Meadows | 12.45           | 44.0               | 80.0                 | 12.85             | 1            |
| 2                | 5.84            | 60.0               | 80.0                 | 5.00              | 2            |
| 3                | 5.89            | 60.0               | 80.0                 | 7.72              | 3            |
| 4                | 11.87           | 60.0               | 80.0                 | 15.08             | 4            |

\* Soils in basin are 26% HSG C and all other soils are classified as HSG D.

Table 2 summarizes the 25-year peak flow rates in Willow Creek for proposed project conditions calculated in XP-SWMM.

**Table 2 Peak 25-Year Flow Rates**

| Node | Contributing Basin Area (ac) | Proposed Flow Rate (cfs) |
|------|------------------------------|--------------------------|
| C    | 22.60                        | 16.21                    |
| B    | 28.13                        | 20.61                    |
| 1    | 57.26                        | 42.83                    |
| 2    | 63.10                        | 48.43                    |
| 3    | 68.99                        | 53.61                    |
| 4    | 80.86                        | 62.15                    |

## Conveyance Modeling

The stormwater conveyance network was analyzed in XP-SWMM. The conveyance system was modeled to determine whether the existing downstream system has sufficient capacity to support the Frog Pond Estates and Frog Pond Oaks developments runoff undetained during the 25-year, 24-hour storm event. The pipe network reflects inverts from GIS As-built data. A pair of 18-inch diameter culverts convey Willow Creek beneath SW Boeckman Road (see Image 2). These culverts are approximately 80 feet long and invert elevations were obtained through survey. The open channel section and downstream pipe system were shown to have capacity for the developed flow rates. While the 25-yr event would not be conveyed across the crown of SW Boeckman Road, the headwater at the SW Boeckman culverts would spill onto the roadway at the low point. Appendix B includes output information from the XP-SWMM model, summarizing the pipe network characteristics and results of the hydraulic routing during the design storm.





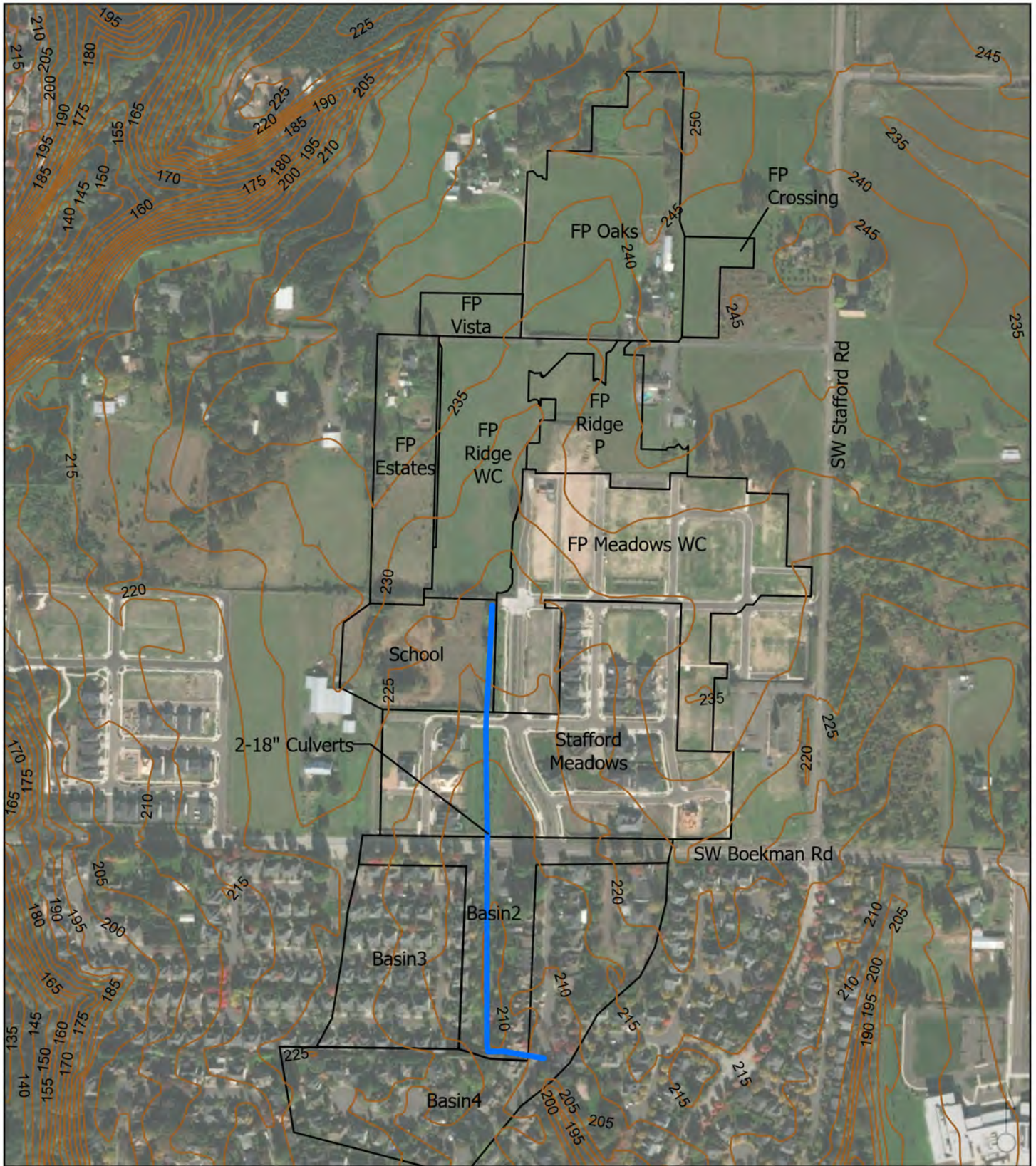
Image 2 – Existing 18" Culverts under SW Boeckman Road

The hydraulic capacity of the existing SW Boeckman Road pair of 18-inch culverts, referred to as Culvert West and Culvert East, were also modeled using HY-8 software. The peak flow rate entering the culverts is the 29.73 cfs from the upstream channel (XP-SWMM Link 1) under proposed conditions. The results of the hydraulic calculations (see Appendix C) show that the existing culverts do not have adequate capacity to convey the 25-year flow rate without spilling onto the existing roadway. Replacing the culverts with a 2-ft wide by 3-ft tall box would be able to convey the design event with headwater elevation less than 1.5 times the diameter.

## Conclusion

The conveyance capacity of Willow Creek was analyzed for approximately one quarter mile downstream of the proposed Frog Pond Estates and Frog Pond Oaks developments. The existing open channel and piped system was analyzed in XP-SWMM software. The capacity of the culverts under SW Boeckman Road were analyzed using HY-8 to determine that the 25-year event would spill onto the road surface. Rather than including onsite detention for all the upstream developments, it is preferable to replace existing culverts though it is undetermined when the culvert will be upsized.





**FIGURE 1**  
**WILLOW CREEK DOWNSTREAM ANALYSIS**  
**EXISTING CONDITIONS**

FROG POND ESTATES AND FROG POND OAKS | PROJECT 20141  
 WILSONVILLE, OREGON

**Legend**

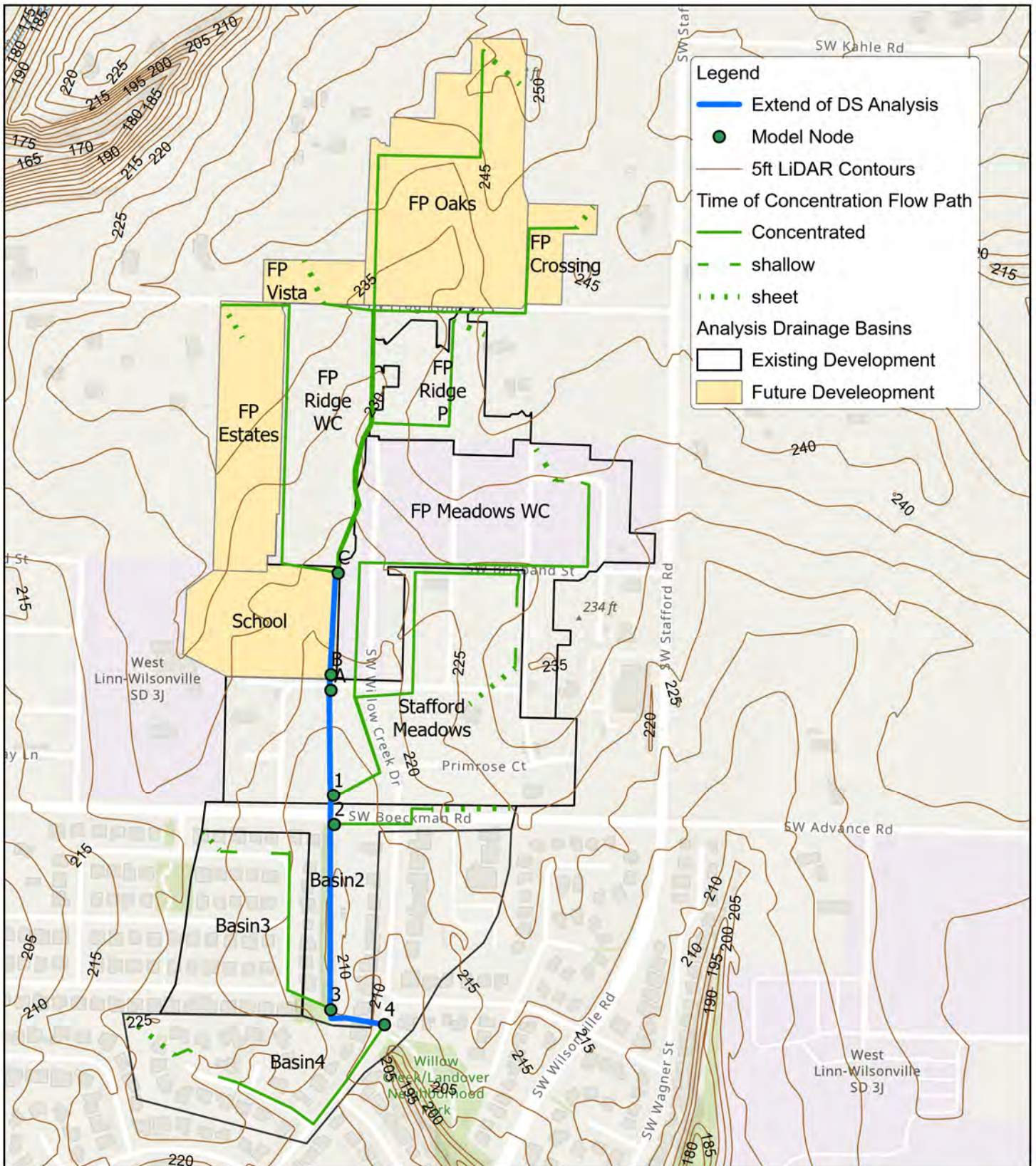
- 5ft LiDAR Contours
- Extent of Downstream Analysis
- Analysis Drainage Basins

0  100 ft

Data Sources:  
 Date: 10/11/2021  
 Disclaimer: This data is not to survey accuracy and is meant for planning purposes only  
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**FIGURE 2**  
**WILLOW CREEK DOWNSTREAM ANALYSIS**  
**PROPOSED CONDITIONS**

FROG POND ESTATES AND FROG POND OAKS | PROJECT 20141  
 WILSONVILLE, OREGON

Data Sources:  
 Date: 10/11/2021  
 Disclaimer: This data is not to survey accuracy and is meant for planning purposes only  
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## Time of Concentration Calculations

20141 Willow Creek Downstream Analysis

| <b>BASINS</b>                                     |                 | <b>2</b>    | <b>3</b>    | <b>4</b>    |
|---|-----------------|-------------|-------------|-------------|
| <b>SHEET FLOW</b>                                 |                 |             |             |             |
| INPUT   |                 |             |             |             |
| Surface Description (from Table 3-1)              |                 | paved       | short grass | Short grass |
| Manning's Roughness Coefficient                   |                 | 0.011       | 0.15        | 0.15        |
| Flow Length, L (<300 ft)                          | ft              | 268         | 82          | 228         |
| 2-Year, 24-Hour Rainfall, P <sub>2</sub>          | in              | 2.5         | 2.5         | 2.5         |
| Land Slope, s                                     | ft/ft           | 0.025       | 0.018       | 0.010       |
| OUTPUT  |                 |             |             |             |
| Travel Time                                       | hr              | 0.05        | 0.16        | 0.48        |
| <b>SHALLOW CONCENTRATED FLOW</b>                  |                 |             |             |             |
| INPUT   |                 |             |             |             |
| Surface Description (paved or unpaved)            |                 | paved       | paved       | paved       |
| Flow Length, L                                    | ft              | 0           | 231         | 243         |
| Watercourse Slope, s                              | ft/ft           | 0.000       | 0.011       | 0.029       |
| OUTPUT  |                 |             |             |             |
| Average Velocity, V                               | ft/s            | 0.00        | 2.16        | 3.45        |
| Travel Time                                       | hr              | 0.00        | 0.03        | 0.02        |
| <b>CHANNEL FLOW</b>                               |                 |             |             |             |
| INPUT   |                 |             |             |             |
| Cross Sectional Flow Area, a                      | ft <sup>2</sup> | 4.71        | 3.14        | 3.14        |
| Wetted Perimeter, p <sub>w</sub>                  | ft              | 1.77        | 0.79        | 0.79        |
| Channel Slope, s                                  | ft/ft           | 0.017       | 0.013       | 0.012       |
| Manning's Roughness Coefficient                   |                 | 0.035       | 0.013       | 0.013       |
| Flow Length, L                                    | ft              | 373         | 471         | 700         |
| OUTPUT  |                 |             |             |             |
| Average Velocity, V                               | ft/s            | 10.79       | 33.00       | 31.69       |
| Hydraulic Radius, r = a/p <sub>w</sub>            | ft              | 2.66        | 3.97        | 3.97        |
| Travel Time                                       | hr              | 0.010       | 0.004       | 0.006       |
|   |                 |             |             |             |
| <b>Basin Time of Concentration, T<sub>c</sub></b> | <b>hrs</b>      | <b>0.06</b> | <b>0.20</b> | <b>0.50</b> |
|   | <b>min</b>      | <b>3.3</b>  | <b>11.8</b> | <b>30.2</b> |

## Time of Concentration Calculations

20141 Willow Creek Downstream Analysis

| BASINS  |                 | Stafford Meadows | FP Ridge    | FP Meadows  |
|---|-----------------|------------------|-------------|-------------|
| <b>SHEET FLOW</b>                                 |                 |                  |             |             |
| INPUT   |                 |                  |             |             |
| Surface Description (from Table 3-1)              |                 | short grass      | Short grass | short grass |
| Manning's Roughness Coefficient                   |                 | 0.15             | 0.15        | 0.15        |
| Flow Length, L (<300 ft)                          | ft              | 120              | 115         | 115         |
| 2-Year, 24-Hour Rainfall, P <sub>2</sub>          | in              | 2.5              | 2.5         | 2.5         |
| Land Slope, s                                     | ft/ft           | 0.010            | 0.011       | 0.022       |
| OUTPUT  |                 |                  |             |             |
| Travel Time                                       | hr              | 0.28             | 0.26        | 0.20        |
| <b>SHALLOW CONCENTRATED FLOW</b>                  |                 |                  |             |             |
| INPUT   |                 |                  |             |             |
| Surface Description (paved or unpaved)            |                 | paved            | Unpaved     | paved       |
| Flow Length, L                                    | ft              | 265              | 0.0001      | 120         |
| Watercourse Slope, s                              | ft/ft           | 0.005            | 0.000       | 0.008       |
| OUTPUT  |                 |                  |             |             |
| Average Velocity, V                               | ft/s            | 1.42             | 0.05        | 1.86        |
| Travel Time                                       | hr              | 0.05             | 0.00        | 0.02        |
| <b>CHANNEL FLOW</b>                               |                 |                  |             |             |
| INPUT   |                 |                  |             |             |
| Cross Sectional Flow Area, a                      | ft <sup>2</sup> | 3.14             | 0.77        | 3.14        |
| Wetted Perimeter, p <sub>w</sub>                  | ft              | 0.79             | 2.64        | 0.79        |
| Channel Slope, s                                  | ft/ft           | 0.012            | 0.004       | 0.012       |
| Manning's Roughness Coefficient                   |                 | 0.035            | 0.013       | 0.035       |
| Flow Length, L                                    | ft              | 1345             | 1150        | 1905        |
| OUTPUT  |                 |                  |             |             |
| Average Velocity, V                               | ft/s            | 11.47            | 3.34        | 11.48       |
| Hydraulic Radius, r = a/p <sub>w</sub>            | ft              | 3.97             | 0.29        | 3.97        |
| Travel Time                                       | hr              | 0.033            | 0.096       | 0.046       |
|   |                 |                  |             |             |
| <b>Basin Time of Concentration, T<sub>c</sub></b> | <b>hrs</b>      | <b>0.37</b>      | <b>0.36</b> | <b>0.26</b> |
|   | <b>min</b>      | <b>22.0</b>      | <b>21.3</b> | <b>15.8</b> |

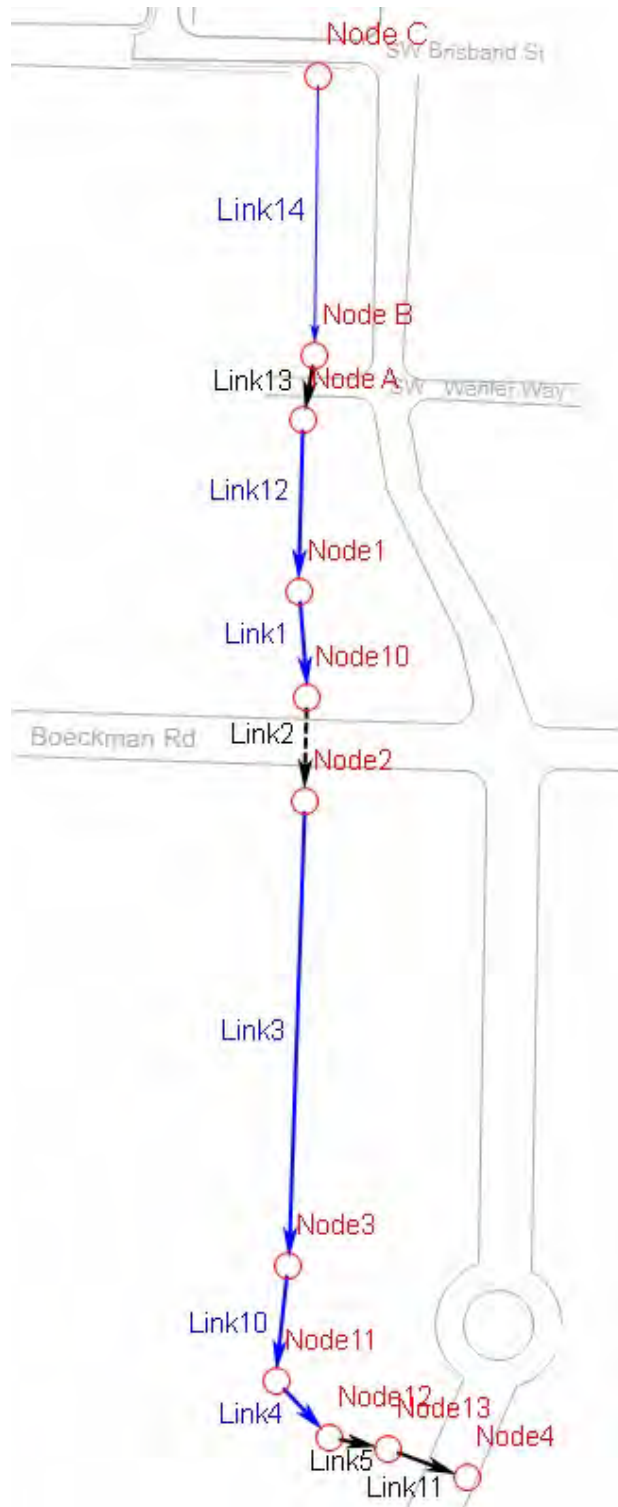
## Time of Concentration Calculations

20141 Willow Creek Downstream Analysis

| BASINS  |                 | FP Estates  | FP Oaks     | FP Vista    | FP Crossing |
|---|-----------------|-------------|-------------|-------------|-------------|
| <b>SHEET FLOW</b>                                 |                 |             |             |             |             |
| INPUT   |                 |             |             |             |             |
| Surface Description (from Table 3-1)              |                 | Short grass | Short grass | Short grass | Short grass |
| Manning's Roughness Coefficient                   |                 | 0.15        | 0.15        | 0.15        | 0.15        |
| Flow Length, L (<300 ft)                          | ft              | 130         | 170         | 165         | 90          |
| 2-Year, 24-Hour Rainfall, P <sub>2</sub>          | in              | 2.5         | 2.5         | 2.5         | 2.5         |
| Land Slope, s                                     | ft/ft           | 0.021       | 0.013       | 0.013       | 0.020       |
| OUTPUT  |                 |             |             |             |             |
| Travel Time                                       | hr              | 0.22        | 0.34        | 0.32        | 0.17        |
| <b>SHALLOW CONCENTRATED FLOW</b>                  |                 |             |             |             |             |
| INPUT   |                 |             |             |             |             |
| Surface Description (paved or unpaved)            |                 | Unpaved     | Unpaved     | Unpaved     | Unpaved     |
| Flow Length, L                                    | ft              | 0.0001      | 0.0001      | 0.0001      | 0.0001      |
| Watercourse Slope, s                              | ft/ft           | 0.000       | 0.000       | 0.000       | 0.000       |
| OUTPUT  |                 |             |             |             |             |
| Average Velocity, V                               | ft/s            | 0.05        | 0.05        | 0.05        | 0.05        |
| Travel Time                                       | hr              | 0.00        | 0.00        | 0.00        | 0.00        |
| <b>CHANNEL FLOW</b>                               |                 |             |             |             |             |
| INPUT   |                 |             |             |             |             |
| Cross Sectional Flow Area, a                      | ft <sup>2</sup> | 0.77        | 0.77        | 0.77        | 0.77        |
| Wetted Perimeter, p <sub>w</sub>                  | ft              | 2.64        | 2.64        | 2.64        | 2.64        |
| Channel Slope, s                                  | ft/ft           | 0.004       | 0.012       | 0.012       | 0.004       |
| Manning's Roughness Coefficient                   |                 | 0.013       | 0.013       | 0.013       | 0.013       |
| Flow Length, L                                    | ft              | 1295        | 2155        | 1085        | 1880        |
| OUTPUT  |                 |             |             |             |             |
| Average Velocity, V                               | ft/s            | 3.34        | 5.57        | 5.57        | 3.34        |
| Hydraulic Radius, r = a/p <sub>w</sub>            | ft              | 0.29        | 0.29        | 0.29        | 0.29        |
| Travel Time                                       | hr              | 0.108       | 0.108       | 0.054       | 0.156       |
|   |                 |             |             |             |             |
| <b>Basin Time of Concentration, T<sub>c</sub></b> | <b>hrs</b>      | <b>0.33</b> | <b>0.44</b> | <b>0.38</b> | <b>0.33</b> |
|   | <b>min</b>      | <b>19.9</b> | <b>26.6</b> | <b>22.7</b> | <b>19.6</b> |

# XP-SWMM Layout

## Willow Creek Downstream Analysis



**XP-SWMM RUNOFF DATA**  
**Willow Creek Downstream Analysis**  
**Proposed Conditions**

| <b>SCS Type IA 25-Year Storm Event</b> |                    |                 |                             |             |                           |                           |                                 |
|--|--------------------|-----------------|-----------------------------|-------------|---------------------------|---------------------------|---------------------------------|
| XP-SWMM Input Data                     |                    |                 |                             |             | XP-SWMM Output Data       |                           |                                 |
| Node Name                              | Total Area<br>(ac) | Impervious<br>% | Pervious<br>Curve<br>Number | Tc<br>(min) | Rainfall<br>Depth<br>(in) | Unit Hydrograph<br>Method | Surface<br>Runoff Flow<br>(cfs) |
| Node B                                 | 5.53               | 35              | 80                          | 5.00        | 3.9                       | Santa Barbara             | 4.40                            |
| Node C                                 | 8.98               | 56.6            | 78.44                       | 14.37       | 3.9                       | Santa Barbara             | 6.23                            |
| Node C                                 | 4.36               | 43.3            | 80                          | 13.45       | 3.9                       | Santa Barbara             | 2.87                            |
| Node C                                 | 1.23               | 58              | 80                          | 11.13       | 3.9                       | Santa Barbara             | 0.96                            |
| Node C                                 | 1.17               | 58              | 80                          | 12.43       | 3.9                       | Santa Barbara             | 0.88                            |
| Node C                                 | 6.86               | 58              | 80                          | 11.85       | 3.9                       | Santa Barbara             | 5.26                            |
| Node1                                  | 12.45              | 44              | 80                          | 12.85       | 3.9                       | Santa Barbara             | 8.37                            |
| Node1                                  | 4.25               | 63.5            | 80                          | 10.95       | 3.9                       | Santa Barbara             | 3.48                            |
| Node1                                  | 12.43              | 59.7            | 80                          | 9.35        | 3.9                       | Santa Barbara             | 10.38                           |
| Node2                                  | 5.84               | 60              | 80                          | 5.00        | 3.9                       | Santa Barbara             | 5.60                            |
| Node3                                  | 5.89               | 60              | 80                          | 7.72        | 3.9                       | Santa Barbara             | 5.18                            |
| Node4                                  | 11.87              | 60              | 80                          | 15.08       | 3.9                       | Santa Barbara             | 8.53                            |

**XP-SWMM HYDRAULICS DATA**  
**Willow Creek Downstream Analysis**  
**Proposed Conditions**

| SCS Type IA 25-Year Storm Event |             |        |                    |      |        |       |              |                       |        |                       |        |                           |        |                |      |                 |           |               |                 |            |      |
|---------------------------------|-------------|--------|--------------------|------|--------|-------|--------------|-----------------------|--------|-----------------------|--------|---------------------------|--------|----------------|------|-----------------|-----------|---------------|-----------------|------------|------|
| Location                        |             |        | Conduit Properties |      |        |       |              | Conduit Profile       |        |                       |        |                           |        |                |      | Conduit Results |           |               |                 |            |      |
| Link Name                       | Node Limits |        | Diameter           |      | Length | Slope | Conduit Type | Ground Elevation (ft) |        | Invert Elevation (ft) |        | Max. Water Elevation (ft) |        | Freeboard (ft) |      | Design Flow     | Max. Flow | Max. Velocity | Design Velocity | Max. Depth | y/d0 |
|                                 | From        | To     | in                 | ft   | ft     | %     |              | US                    | DS     | US                    | DS     | US                        | DS     | US             | DS   | (cfs)           | (cfs)     | (ft/s)        | (ft/s)          | (ft)       |      |
|                                 |             |        |                    |      |        |       |              |                       |        |                       |        |                           |        |                |      |                 |           |               |                 |            |      |
| Link1                           | Node1       | Node10 | 18                 | 1.50 | 35.00  | 0.2   | channel      | 216.20                | 216.00 | 212.70                | 212.63 | 215.29                    | 215.28 | 0.91           | 0.72 | 23.78           | 29.73     | 1.95          | 1.67            | 2.65       | 1.00 |
| Link2                           | Node10      | Node2  | 18                 | 1.50 | 80.00  | 2.0   | culvert      | 216.00                | 214.50 | 212.63                | 211.00 | 215.28                    | 212.02 | 0.72           | 2.48 | 14.99           | 14.80     | 8.58          | 8.48            | 2.65       | 1.77 |
| Link2                           | Node10      | Node2  | 18                 | 1.50 | 80.00  | 2.0   | culvert      | 216.00                | 214.50 | 212.64                | 211.06 | 215.28                    | 212.02 | 0.72           | 2.48 | 14.76           | 14.88     | 8.48          | 8.35            | 2.64       | 1.76 |
| Link3                           | Node2       | Node3  | 24                 | 2.00 | 540.00 | 1.2   | weir         | 214.50                | 209.00 | 211.00                | 204.40 | 212.02                    | 205.15 | 2.48           | 3.85 | 152.09          | 32.68     | 3.30          | 5.43            | 1.02       | 0.51 |
| Link4                           | Node11      | Node12 | 48                 | 4.00 | 15.00  | 3.3   | channel      | 208.00                | 207.60 | 203.10                | 202.60 | 203.78                    | 203.77 | 4.22           | 3.83 | 1736.29         | 37.25     | 3.78          | 16.38           | 1.17       | 0.29 |
| Link5                           | Node12      | Node13 | 36                 | 3.00 | 32.00  | 3.9   | culvert      | 207.60                | 206.00 | 202.52                | 201.27 | 203.77                    | 202.37 | 3.83           | 3.63 | 131.82          | 37.25     | 13.64         | 18.65           | 1.25       | 0.42 |
| Link10                          | Node3       | Node11 | 48                 | 4.00 | 110.00 | 1.2   | channel      | 209.00                | 208.00 | 204.40                | 203.10 | 205.15                    | 203.78 | 3.85           | 4.22 | 1033.85         | 37.25     | 3.74          | 9.75            | 0.75       | 0.19 |
| Link11                          | Node13      | Node4  | 36                 | 3.00 | 144.00 | 3.9   | channel      | 206.00                | 206.00 | 200.97                | 195.31 | 202.37                    | 196.19 | 3.63           | 9.81 | 132.23          | 37.25     | 11.84         | 18.71           | 1.40       | 0.47 |
| Link12                          | Node A      | Node1  | 26                 | 2.20 | 360.00 | 1.0   | channel      | 224.50                | 216.20 | 216.15                | 212.70 | 217.15                    | 215.29 | 7.35           | 0.91 | 344.23          | 19.48     | 1.79          | 3.91            | 2.59       | 1.18 |
| Link13                          | Node B      | Node A | 36                 | 3.00 | 35.03  | 1.1   | culvert      | 225.00                | 224.50 | 216.53                | 216.15 | 217.45                    | 217.15 | 7.55           | 7.35 | 88.45           | 20.30     | 7.33          | 9.83            | 1.00       | 0.33 |
| Link14                          | Node C      | Node B | 24                 | 2.00 | 360.00 | 1.5   | channel      | 224.00                | 225.00 | 221.96                | 216.53 | 222.77                    | 217.45 | 1.23           | 7.55 | 127.47          | 16.10     | 3.19          | 5.54            | 0.92       | 0.46 |



# HY-8 Culvert Analysis Report

## Tailwater Channel Data - SW Boeckman Road

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 6.00 ft

Side Slope (H:V): 4.00 (4:1)

Channel Slope: 0.0120

Channel Manning's n: 0.0350

Channel Invert Elevation: 211.00 ft

## Roadway Data for Crossing: SW Boeckman Road

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Roadway Surface: Paved

Roadway Top Width: 68.00 ft

## Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 20 cfs

Design Flow: 29.83 cfs

Maximum Flow: 33 cfs

**Table 1 - Downstream Channel Rating Curve (Crossing: SW Boeckman Road)**

| Flow (cfs) | Water Surface Elev (ft) | Depth (ft) | Velocity (ft/s) | Shear (psf) | Froude Number |
|------------|-------------------------|------------|-----------------|-------------|---------------|
| 20.00      | 211.73                  | 0.73       | 3.09            | 0.54        | 0.73          |
| 21.30      | 211.75                  | 0.75       | 3.14            | 0.56        | 0.74          |
| 22.60      | 211.78                  | 0.78       | 3.20            | 0.58        | 0.74          |
| 23.90      | 211.80                  | 0.80       | 3.25            | 0.60        | 0.74          |
| 25.20      | 211.82                  | 0.82       | 3.30            | 0.62        | 0.75          |
| 26.50      | 211.84                  | 0.84       | 3.35            | 0.63        | 0.75          |
| 27.80      | 211.87                  | 0.87       | 3.39            | 0.65        | 0.75          |
| 29.10      | 211.89                  | 0.89       | 3.44            | 0.66        | 0.75          |
| 29.83      | 211.90                  | 0.90       | 3.46            | 0.67        | 0.75          |
| 31.70      | 211.93                  | 0.93       | 3.52            | 0.69        | 0.76          |
| 33.00      | 211.95                  | 0.95       | 3.56            | 0.71        | 0.76          |

**Table 2 - Summary of Culvert Flows at Crossing: SW Boeckman Road**

| Headwater Elevation (ft) | Total Discharge (cfs) | Culvert West Discharge (cfs) | Culvert East Discharge (cfs) | Roadway Discharge (cfs) | Iterations  |
|--------------------------|-----------------------|------------------------------|------------------------------|-------------------------|-------------|
| 215.19                   | 20.00                 | 10.02                        | 9.99                         | 0.00                    | 6           |
| 215.41                   | 21.30                 | 10.64                        | 10.61                        | 0.00                    | 26          |
| 215.63                   | 22.60                 | 11.28                        | 11.25                        | 0.00                    | 34          |
| 215.77                   | 23.90                 | 11.65                        | 11.63                        | 0.53                    | 18          |
| 215.82                   | 25.20                 | 11.78                        | 11.76                        | 1.58                    | 9           |
| 215.85                   | 26.50                 | 11.87                        | 11.84                        | 2.71                    | 7           |
| 215.88                   | 27.80                 | 11.94                        | 11.91                        | 3.88                    | 6           |
| 215.90                   | 29.10                 | 11.99                        | 11.97                        | 5.05                    | 5           |
| 215.91                   | 29.83                 | 12.02                        | 12.00                        | 5.72                    | 4           |
| 215.94                   | 31.70                 | 12.09                        | 12.06                        | 7.49                    | 5           |
| 215.95                   | 33.00                 | 12.13                        | 12.10                        | 8.69                    | 4           |
| 215.69                   | 22.84                 | 11.43                        | 11.41                        | 0.00                    | Overtopping |

**Table 3 - Culvert Summary Table: Culvert West**

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth (ft) | Outlet Control Depth (ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|-----------------------|-------------------------|--------------------------|--------------------------|---------------------------|-----------|-------------------|---------------------|-------------------|----------------------|------------------------|---------------------------|
| 20.00                 | 10.02                   | 215.19                   | 2.563                    | 1.292                     | 5-S2n     | 0.892             | 1.218               | 0.907             | 0.728                | 8.973                  | 3.085                     |
| 21.30                 | 10.64                   | 215.41                   | 2.774                    | 1.509                     | 5-S2n     | 0.928             | 1.252               | 0.944             | 0.752                | 9.085                  | 3.142                     |
| 22.60                 | 11.28                   | 215.63                   | 3.003                    | 1.743                     | 5-S2n     | 0.966             | 1.283               | 0.983             | 0.776                | 9.187                  | 3.197                     |
| 23.90                 | 11.65                   | 215.77                   | 3.142                    | 1.885                     | 5-S2n     | 0.990             | 1.299               | 1.005             | 0.800                | 9.272                  | 3.249                     |
| 25.20                 | 11.78                   | 215.82                   | 3.190                    | 1.935                     | 5-S2n     | 0.997             | 1.305               | 1.013             | 0.822                | 9.292                  | 3.299                     |
| 26.50                 | 11.87                   | 215.85                   | 3.222                    | 1.968                     | 5-S2n     | 1.003             | 1.309               | 1.018             | 0.844                | 9.307                  | 3.348                     |
| 27.80                 | 11.94                   | 215.88                   | 3.248                    | 1.995                     | 5-S2n     | 1.007             | 1.311               | 1.022             | 0.866                | 9.320                  | 3.394                     |
| 29.10                 | 11.99                   | 215.90                   | 3.270                    | 2.017                     | 5-S2n     | 1.011             | 1.314               | 1.025             | 0.886                | 9.331                  | 3.439                     |
| 29.83                 | 12.02                   | 215.91                   | 3.281                    | 2.028                     | 5-S2n     | 1.012             | 1.315               | 1.027             | 0.898                | 9.337                  | 3.463                     |
| 31.70                 | 12.09                   | 215.94                   | 3.306                    | 2.055                     | 5-S2n     | 1.016             | 1.318               | 1.031             | 0.927                | 9.351                  | 3.524                     |
| 33.00                 | 12.13                   | 215.95                   | 3.322                    | 2.071                     | 5-S2n     | 1.019             | 1.319               | 1.033             | 0.946                | 9.360                  | 3.564                     |

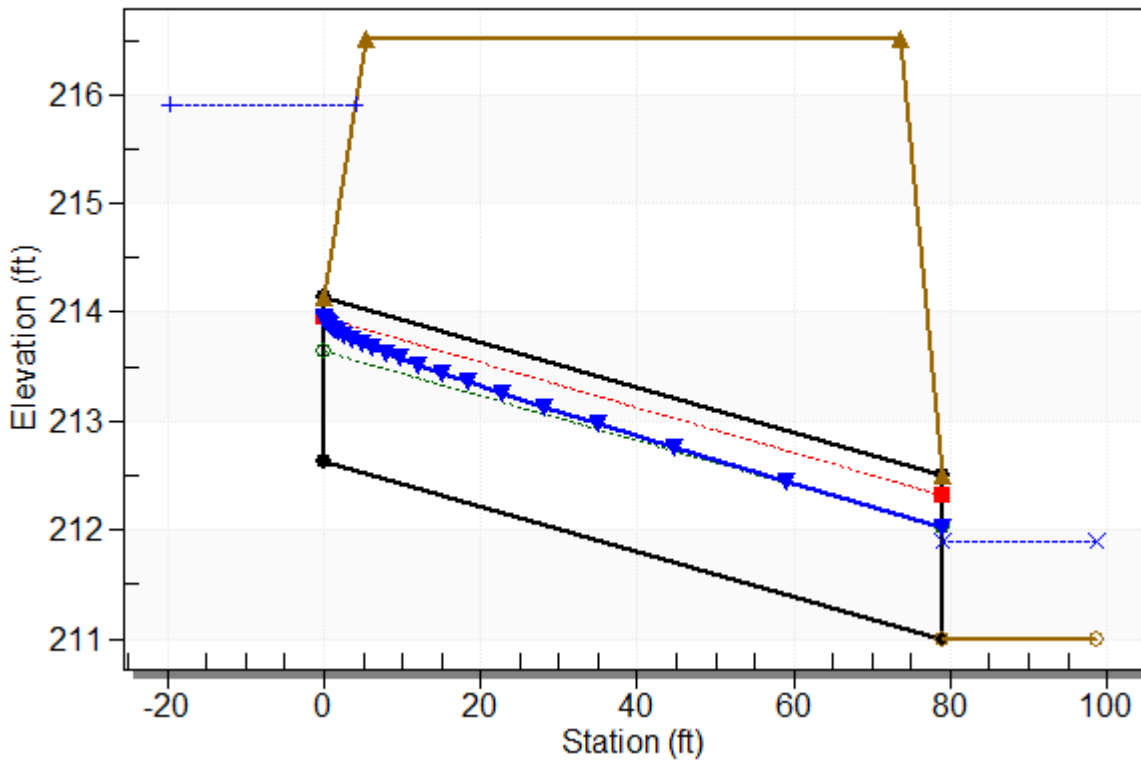
**Table 4 - Culvert Summary Table: Culvert East**

| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth (ft) | Outlet Control Depth (ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|-----------------------|-------------------------|--------------------------|--------------------------|---------------------------|-----------|-------------------|---------------------|-------------------|----------------------|------------------------|---------------------------|
| 20.00                 | 9.99                    | 215.19                   | 2.553                    | 1.331                     | 5-S2n     | 0.899             | 1.217               | 0.913             | 0.728                | 8.872                  | 3.085                     |
| 21.30                 | 10.61                   | 215.41                   | 2.764                    | 1.548                     | 5-S2n     | 0.936             | 1.250               | 0.951             | 0.752                | 8.982                  | 3.142                     |
| 22.60                 | 11.25                   | 215.63                   | 2.993                    | 1.782                     | 5-S2n     | 0.975             | 1.281               | 0.990             | 0.776                | 9.082                  | 3.197                     |
| 23.90                 | 11.63                   | 215.77                   | 3.132                    | 1.924                     | 5-S2n     | 0.999             | 1.298               | 1.012             | 0.800                | 9.182                  | 3.249                     |
| 25.20                 | 11.76                   | 215.82                   | 3.180                    | 1.973                     | 5-S2n     | 1.007             | 1.304               | 1.020             | 0.822                | 9.198                  | 3.299                     |
| 26.50                 | 11.84                   | 215.85                   | 3.212                    | 2.007                     | 5-S2n     | 1.012             | 1.307               | 1.026             | 0.844                | 9.207                  | 3.348                     |
| 27.80                 | 11.91                   | 215.88                   | 3.238                    | 2.033                     | 5-S2n     | 1.016             | 1.310               | 1.031             | 0.866                | 9.215                  | 3.394                     |
| 29.10                 | 11.97                   | 215.90                   | 3.260                    | 2.056                     | 5-S2n     | 1.020             | 1.313               | 1.034             | 0.886                | 9.222                  | 3.439                     |
| 29.83                 | 12.00                   | 215.91                   | 3.271                    | 2.067                     | 5-S2n     | 1.022             | 1.314               | 1.036             | 0.898                | 9.226                  | 3.463                     |
| 31.70                 | 12.06                   | 215.94                   | 3.296                    | 2.093                     | 5-S2n     | 1.026             | 1.317               | 1.040             | 0.927                | 9.235                  | 3.524                     |
| 33.00                 | 12.10                   | 215.95                   | 3.312                    | 2.109                     | 5-S2n     | 1.029             | 1.318               | 1.043             | 0.946                | 9.240                  | 3.564                     |

## Water Surface Profile Plot for Culvert: Culvert West

Crossing - SW Boeckman Road, Design Discharge - 29.8 cfs

Culvert - Culvert West, Culvert Discharge - 12.0 cfs



\*\*\*\*\*  
Straight Culvert

Inlet Elevation (invert): 212.63 ft, Outlet Elevation (invert): 211.00 ft

Culvert Length: 79.03 ft, Culvert Slope: 0.0206  
\*\*\*\*\*

### Culvert Data Summary - Culvert West

Barrel Shape: Circular  
Barrel Diameter: 1.50 ft  
Barrel Material: Concrete  
Embedment: 0.00 in  
Barrel Manning's n: 0.0130  
Culvert Type: Straight  
Inlet Configuration: Mitered to Conform to Slope  
Inlet Depression: NONE

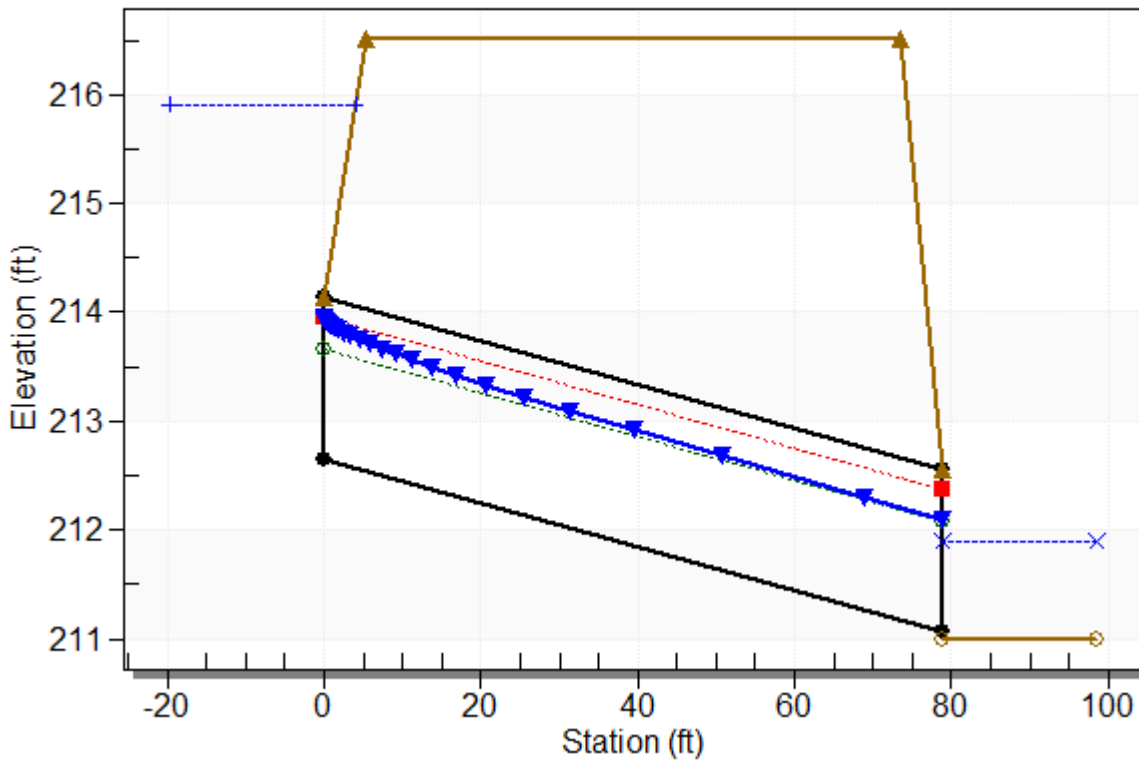
### Site Data - Culvert West

Site Data Option: Culvert Invert Data  
Inlet Station: 0.00 ft  
Inlet Elevation: 212.63 ft  
Outlet Station: 79.01 ft  
Outlet Elevation: 211.00 ft  
Number of Barrels: 1

## Water Surface Profile Plot for Culvert: Culvert East

Crossing - SW Boeckman Road, Design Discharge - 29.8 cfs

Culvert - Culvert East, Culvert Discharge - 12.0 cfs



\*\*\*\*\*

Straight Culvert

Inlet Elevation (invert): 212.64 ft, Outlet Elevation (invert): 211.06 ft

Culvert Length: 78.89 ft, Culvert Slope: 0.0200

\*\*\*\*\*

### Culvert Data Summary - Culvert East

Barrel Shape: Circular

Barrel Diameter: 1.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0130

Culvert Type: Straight

Inlet Configuration: Mitered to Conform to Slope

Inlet Depression: NONE

### Site Data - Culvert East

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 212.64 ft

Outlet Station: 78.87 ft

Outlet Elevation: 211.06 ft

Number of Barrels: 1

**Table 5 - Downstream Channel Rating Curve (Crossing: SW Boeckman Road)**

| Flow (cfs) | Water Surface Elev (ft) | Depth (ft) | Velocity (ft/s) | Shear (psf) | Froude Number |
|------------|-------------------------|------------|-----------------|-------------|---------------|
| 20.00      | 211.73                  | 0.73       | 3.09            | 0.54        | 0.73          |
| 21.30      | 211.75                  | 0.75       | 3.14            | 0.56        | 0.74          |
| 22.60      | 211.78                  | 0.78       | 3.20            | 0.58        | 0.74          |
| 23.90      | 211.80                  | 0.80       | 3.25            | 0.60        | 0.74          |
| 25.20      | 211.82                  | 0.82       | 3.30            | 0.62        | 0.75          |
| 26.50      | 211.84                  | 0.84       | 3.35            | 0.63        | 0.75          |
| 27.80      | 211.87                  | 0.87       | 3.39            | 0.65        | 0.75          |
| 29.10      | 211.89                  | 0.89       | 3.44            | 0.66        | 0.75          |
| 29.83      | 211.90                  | 0.90       | 3.46            | 0.67        | 0.75          |
| 31.70      | 211.93                  | 0.93       | 3.52            | 0.69        | 0.76          |
| 33.00      | 211.95                  | 0.95       | 3.56            | 0.71        | 0.76          |

### Tailwater Channel Data - SW Boeckman Road Improve

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 6.00 ft

Side Slope (H:V): 4.00 (4:1)

Channel Slope: 0.0120

Channel Manning's n: 0.0350

Channel Invert Elevation: 211.00 ft

### Roadway Data for Crossing: SW Boeckman Road Improve

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Roadway Surface: Paved

Roadway Top Width: 68.00 ft

### Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 20 cfs

Design Flow: 29.83 cfs

Maximum Flow: 33 cfs

**Table 6 - Summary of Culvert Flows at Crossing: SW Boeckman Road Improve**

| Headwater Elevation (ft) | Total Discharge (cfs) | 2H x3W Box Discharge (cfs) | Roadway Discharge (cfs) | Iterations  |
|--------------------------|-----------------------|----------------------------|-------------------------|-------------|
| 214.47                   | 20.00                 | 20.00                      | 0.00                    | 1           |
| 214.55                   | 21.30                 | 21.30                      | 0.00                    | 1           |
| 214.63                   | 22.60                 | 22.60                      | 0.00                    | 1           |
| 214.72                   | 23.90                 | 23.90                      | 0.00                    | 1           |
| 214.80                   | 25.20                 | 25.20                      | 0.00                    | 1           |
| 214.89                   | 26.50                 | 26.50                      | 0.00                    | 1           |
| 214.98                   | 27.80                 | 27.80                      | 0.00                    | 1           |
| 215.07                   | 29.10                 | 29.10                      | 0.00                    | 1           |
| 215.12                   | 29.83                 | 29.83                      | 0.00                    | 1           |
| 215.25                   | 31.70                 | 31.70                      | 0.00                    | 1           |
| 215.35                   | 33.00                 | 33.00                      | 0.00                    | 1           |
| 215.69                   | 37.24                 | 37.24                      | 0.00                    | Overtopping |

**Table 7 - Culvert Summary Table: 2H x3W Box**

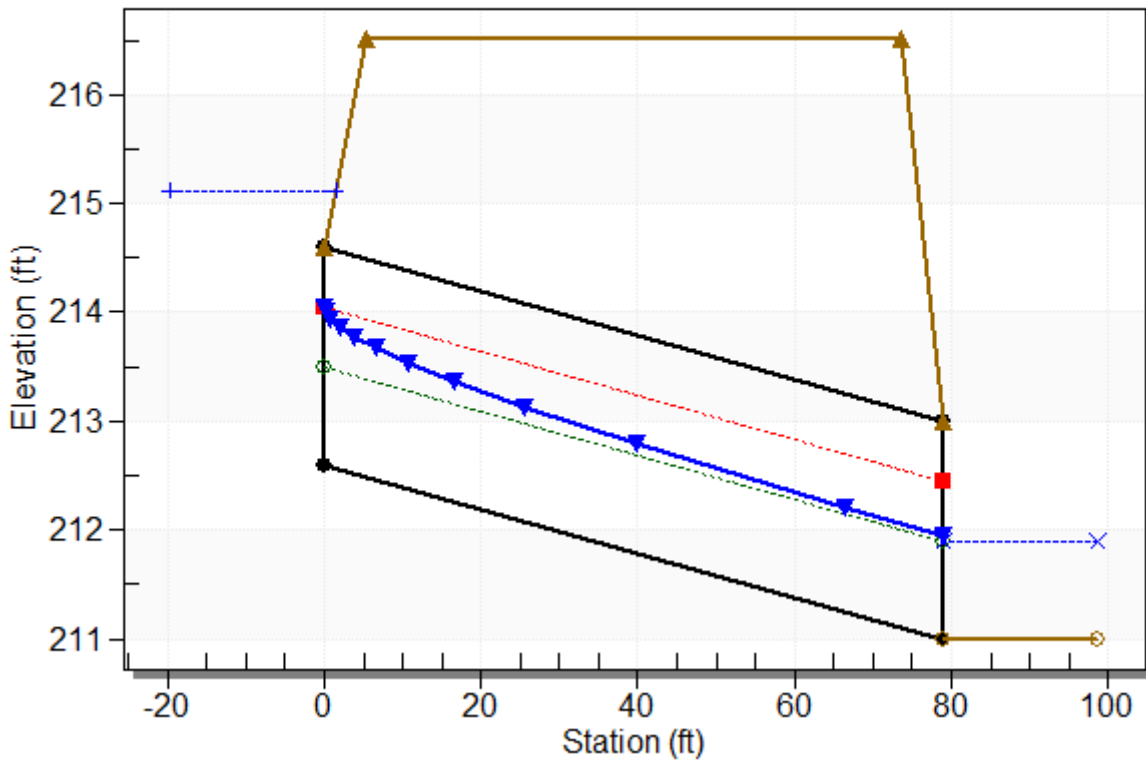
| Total Discharge (cfs) | Culvert Discharge (cfs) | Headwater Elevation (ft) | Inlet Control Depth (ft) | Outlet Control Depth (ft) | Flow Type | Normal Depth (ft) | Critical Depth (ft) | Outlet Depth (ft) | Tailwater Depth (ft) | Outlet Velocity (ft/s) | Tailwater Velocity (ft/s) |
|-----------------------|-------------------------|--------------------------|--------------------------|---------------------------|-----------|-------------------|---------------------|-------------------|----------------------|------------------------|---------------------------|
| 20.00                 | 20.00                   | 214.47                   | 1.865                    | 0.0*                      | 1-S2n     | 0.677             | 1.113               | 0.710             | 0.728                | 9.390                  | 3.085                     |
| 21.30                 | 21.30                   | 214.55                   | 1.949                    | 0.004                     | 1-S2n     | 0.708             | 1.161               | 0.742             | 0.752                | 9.571                  | 3.142                     |
| 22.60                 | 22.60                   | 214.63                   | 2.033                    | 0.107                     | 5-S2n     | 0.738             | 1.208               | 0.767             | 0.776                | 9.817                  | 3.197                     |
| 23.90                 | 23.90                   | 214.72                   | 2.118                    | 0.212                     | 5-S2n     | 0.767             | 1.254               | 0.802             | 0.800                | 9.934                  | 3.249                     |
| 25.20                 | 25.20                   | 214.80                   | 2.203                    | 0.319                     | 5-S2n     | 0.795             | 1.299               | 0.837             | 0.822                | 10.033                 | 3.299                     |
| 26.50                 | 26.50                   | 214.89                   | 2.290                    | 0.429                     | 5-S2n     | 0.823             | 1.343               | 0.867             | 0.844                | 10.189                 | 3.348                     |
| 27.80                 | 27.80                   | 214.98                   | 2.378                    | 0.542                     | 5-S2n     | 0.852             | 1.387               | 0.893             | 0.866                | 10.374                 | 3.394                     |
| 29.10                 | 29.10                   | 215.07                   | 2.468                    | 0.657                     | 5-S2n     | 0.880             | 1.430               | 0.926             | 0.886                | 10.471                 | 3.439                     |
| 29.83                 | 29.83                   | 215.12                   | 2.519                    | 0.723                     | 5-S2n     | 0.896             | 1.453               | 0.946             | 0.898                | 10.514                 | 3.463                     |
| 31.70                 | 31.70                   | 215.25                   | 2.655                    | 1.139                     | 5-S2n     | 0.935             | 1.514               | 0.990             | 0.927                | 10.673                 | 3.524                     |
| 33.00                 | 33.00                   | 215.35                   | 2.752                    | 1.241                     | 5-S2n     | 0.962             | 1.555               | 1.018             | 0.946                | 10.808                 | 3.564                     |

\* Full Flow Headwater elevation is below inlet invert.

**Water Surface Profile Plot for Culvert: 2H x3W Box**

Crossing - SW Boeckman Road Improve, Design Discharge - 29.8 cfs

Culvert - 2H x3W Box, Culvert Discharge - 29.8 cfs





\*\*\*\*\*  
Straight Culvert  
Inlet Elevation (invert): 212.60 ft, Outlet Elevation (invert): 211.00 ft  
Culvert Length: 79.02 ft, Culvert Slope: 0.0203  
\*\*\*\*\*

**Culvert Data Summary - 2H x3W Box**

Barrel Shape: Concrete Box  
Barrel Span: 3.00 ft  
Barrel Rise: 2.00 ft  
Barrel Material: Concrete  
Embedment: 0.00 in  
Barrel Manning's n: 0.0130  
Culvert Type: Straight  
Inlet Configuration: Square Edge (90°) Headwall  
Inlet Depression: NONE

**Site Data - 2H x3W Box**

Site Data Option: Culvert Invert Data  
Inlet Station: 0.00 ft  
Inlet Elevation: 212.60 ft  
Outlet Station: 79.00 ft  
Outlet Elevation: 211.00 ft  
Number of Barrels: 1

# **Appendix D**

BMP Sizing Tool Analysis



## WES BMP Sizing Report

## Project Information

|                            |                   |
|----------------------------|-------------------|
| Project Name               | Frog Pond Estates |
| Project Type               | Subdivision       |
| Location                   | Frog Pond lane    |
| Stormwater Management Area | 4950              |
| Project Applicant          |                   |
| Jurisdiction               | CCSD1NCSA         |

## Drainage Management Area

| Name                                     | Area (sq-ft) | Pre-Project Cover | Post-Project Cover   | DMA Soil Type | BMP        |
|--|--------------|-------------------|----------------------|---------------|------------|
| E-L7 swale imp                           | 16,500       | Grass             | Roofs                | D             | Swale 1    |
| E-L7 swale perv                          | 20,463       | Grass             | LandscapeDsoil       | D             | Swale 1    |
| E-A1, L4, L5, L6, S1, C5, B2, C4 RG imp  | 46,392       | Grass             | Roofs                | D             | Estates RG |
| E-A1, L4, L5, L6, S1, C5, B2, C4 RG perv | 58,888       | Grass             | LandscapeDsoil       | D             | Estates RG |
| E-F2 swale imp                           | 2,076        | Grass             | ConventionalConcrete | D             | Swale 2    |
| E-F2 swale perv                          | 1,298        | Grass             | LandscapeDsoil       | D             | Swale 2    |
| E-C1, R1 swale imp                       | 7,358        | Grass             | ConventionalConcrete | D             | Swale 3    |
| E-C1, R1 swale perv                      | 6,593        | Grass             | LandscapeDsoil       | D             | Swale 3    |
| E-C2, R2 swale imp                       | 2,572        | Grass             | ConventionalConcrete | D             | Swale 4    |
| E-C2, R2 swale perv                      | 1,726        | Grass             | LandscapeDsoil       | D             | Swale 4    |
| E-C4, R4 swale imp                       | 2,283        | Grass             | ConventionalConcrete | D             | Swale 5    |
| E-C4, R4 swale perv                      | 2,438        | Grass             | LandscapeDsoil       | D             | Swale 5    |
| E-C5 Swale imp                           | 2,430        | Grass             | ConventionalConcrete | D             | Swale 6    |
| E-C5 Swale perv                          | 1,514        | Grass             | LandscapeDsoil       | D             | Swale 6    |

### LID Facility Sizing Details

| LID ID     | Design Criteria         | BMP Type                     | Facility Soil Type | Minimum Area (sq-ft) | Planned Areas (sq-ft) | Orifice Diameter (in) |
|------------|-------------------------|------------------------------|--------------------|----------------------|-----------------------|-----------------------|
| Estates RG | FlowControlAndTreatment | Rain Garden - Filtration     | D1                 | 3,504.5              | 3,550.0               | 3.3                   |
| Swale 1    | FlowControlAndTreatment | Vegetated Swale - Filtration | D1                 | 1,233.0              | 1,367.0               | 2.1                   |
| Swale 2    | FlowControlAndTreatment | Vegetated Swale - Filtration | D1                 | 119.4                | 400.0                 | 0.6                   |
| Swale 3    | WaterQuality            | Vegetated Swale - Filtration | D1                 | 179.6                | 320.0                 | 0.6                   |
| Swale 4    | WaterQuality            | Vegetated Swale - Filtration | D1                 | 56.7                 | 128.0                 | 0.3                   |
| Swale 5    | WaterQuality            | Vegetated Swale - Filtration | D1                 | 59.8                 | 128.0                 | 0.4                   |
| Swale 6    | WaterQuality            | Vegetated Swale - Filtration | D1                 | 52.3                 | 128.0                 | 0.3                   |

### Pond Sizing Details

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only
2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).
3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.
4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a 40 percent porosity.

## WES BMP Sizing Report

### Project Information

|                            |                                       |
|----------------------------|---------------------------------------|
| Project Name               | Frog Pond Ridge & Estates - WC basins |
| Project Type               | Subdivision                           |
| Location                   |                                       |
| Stormwater Management Area | 22583                                 |
| Project Applicant          |                                       |
| Jurisdiction               | CCSD1NCSA                             |

Estates Basins

### Drainage Management Area

| Name                 | Area (sq-ft) | Pre-Project Cover | Post-Project Cover   | DMA Soil Type | BMP         |
|----------------------|--------------|-------------------|----------------------|---------------|-------------|
| WC 13 - Per          | 6,126        | Grass             | LandscapeDsoil       | D             | Tract B RG2 |
| WC 14 - Imp ROW      | 8,442        | Grass             | ConventionalConcrete | D             | Tract B RG2 |
| WC 14 - Imp Roof     | 5,500        | Grass             | Roofs                | D             | Tract B RG1 |
| WC 14 - Per          | 8,923        | Grass             | LandscapeDsoil       | D             | Tract B RG2 |
| WC 19A, B - Imp ROW  | 12,447       | Grass             | ConventionalConcrete | D             | Tract B RG1 |
| WC 19A - Imp Roof    | 11,000       | Grass             | Roofs                | D             | Tract B RG1 |
| WC 19A - Per         | 11,595       | Grass             | LandscapeDsoil       | D             | Tract B RG1 |
| WC 15 - Imp ROW      | 8,066        | Grass             | ConventionalConcrete | D             | Tract B RG2 |
| WC 16 - Imp ROW      | 7,380        | Grass             | ConventionalConcrete | D             | Tract B RG1 |
| WC 16 - Per          | 11,589       | Grass             | LandscapeDsoil       | D             | Tract B RG1 |
| E-C1,C2, C3,F1 - Imp | 8,828        | Grass             | ConventionalConcrete | D             | Tract B RG1 |
| E-C1,C2,C3,F1 - perv | 9,890        | Grass             | LandscapeDsoil       | D             | Tract B RG1 |
| WC 28, 29 - Imp Roof | 16,500       | Grass             | Roofs                | D             | Tract B RG1 |
| WC 16 - Imp Roof     | 5,500        | Grass             | Roofs                | D             | Tract B RG1 |
| WC 28, 29 - Imp ROW  | 12,280       | Grass             | ConventionalConcrete | D             | Tract B RG1 |
| WC 28, 29 - Per      | 26,974       | Grass             | LandscapeDsoil       | D             | Tract B RG1 |

|                         |        |       |                      |   |             |
|-------------------------|--------|-------|----------------------|---|-------------|
| WC 15C - Imp Roof       | 5,500  | Grass | Roofs                | D | Tract B RG1 |
| WC 15A - Imp Roof       | 5,500  | Grass | Roofs                | D | Tract B RG1 |
| WC 15 - Per             | 9,088  | Grass | LandscapeDsoil       | D | Tract B RG2 |
| WC 13 - Imp Roof        | 5,500  | Grass | Roofs                | D | Tract B RG2 |
| WC 13 - Imp ROW         | 8,526  | Grass | ConventionalConcrete | D | Tract B RG2 |
| E-L1, E-L2, E-L3 - imp  | 9,150  | Grass | Roofs                | D | Tract B RG1 |
| E-L1, E-L2, E-L3 - perv | 15,588 | Grass | LandscapeDsoil       | D | Tract B RG1 |
| E-C6 -Imp               | 1,260  | Grass | ConventionalConcrete | D | Tract B RG2 |
| E- C6 - Per             | 217    | Grass | LandscapeDsoil       | D | Tract B RG2 |

#### LID Facility Sizing Details

| LID ID      | Design Criteria         | BMP Type                 | Facility Soil Type | Minimum Area (sq-ft) | Planned Areas (sq-ft) | Orifice Diameter (in) |
|-------------|-------------------------|--------------------------|--------------------|----------------------|-----------------------|-----------------------|
| Tract B RG2 | FlowControlAndTreatment | Rain Garden - Filtration | D1                 | 1,953.7              | 2,501.0               | 2.4                   |
| Tract B RG1 | FlowControlAndTreatment | Rain Garden - Filtration | D1                 | 6,101.2              | 6,152.0               | 4.2                   |

#### Pond Sizing Details

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only
2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).
3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.
4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a 40 percent porosity.

# **Appendix E**

Pipe Conveyance

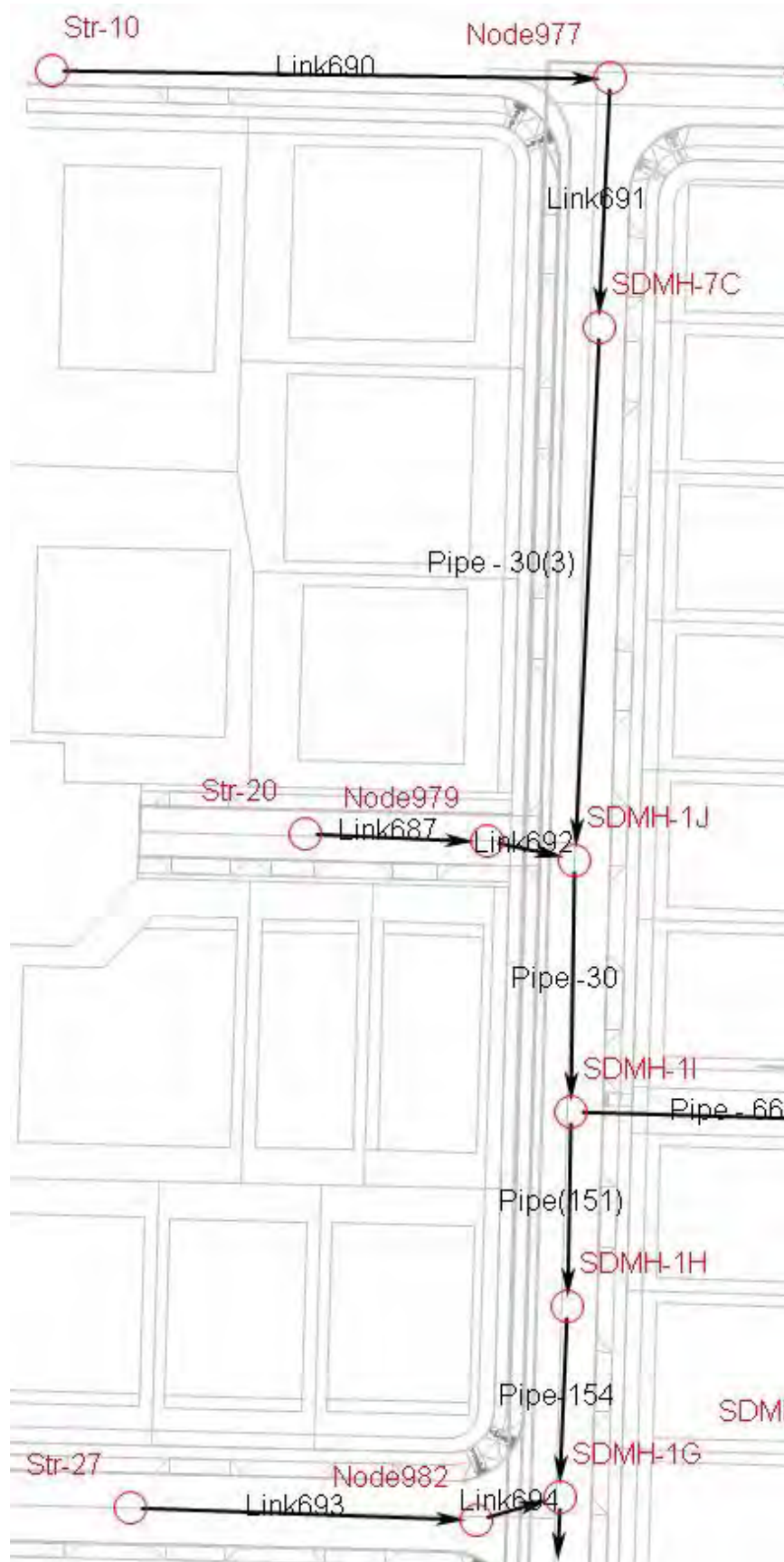






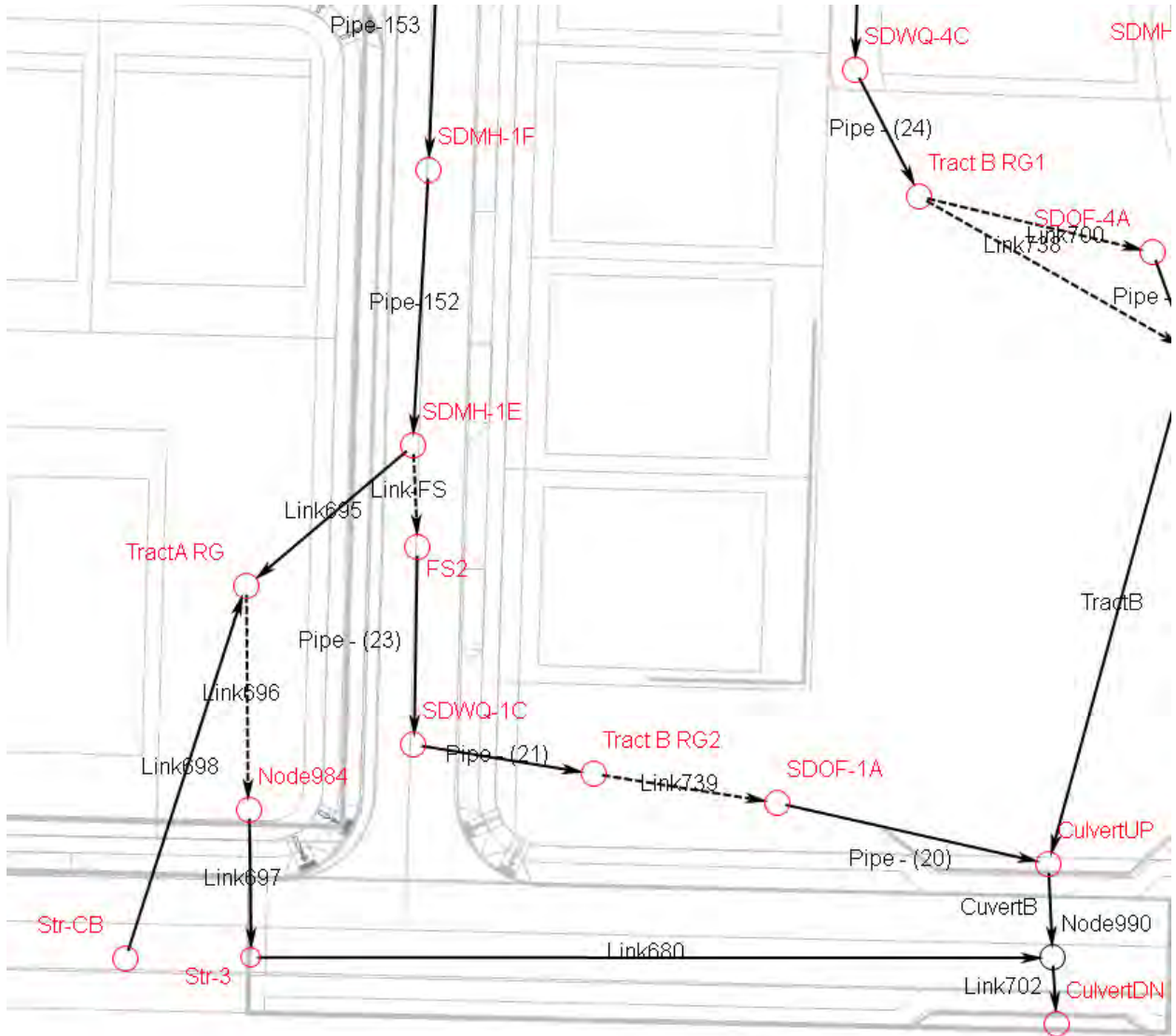
# XP-SWMM Layout

## Frog Pond Estates

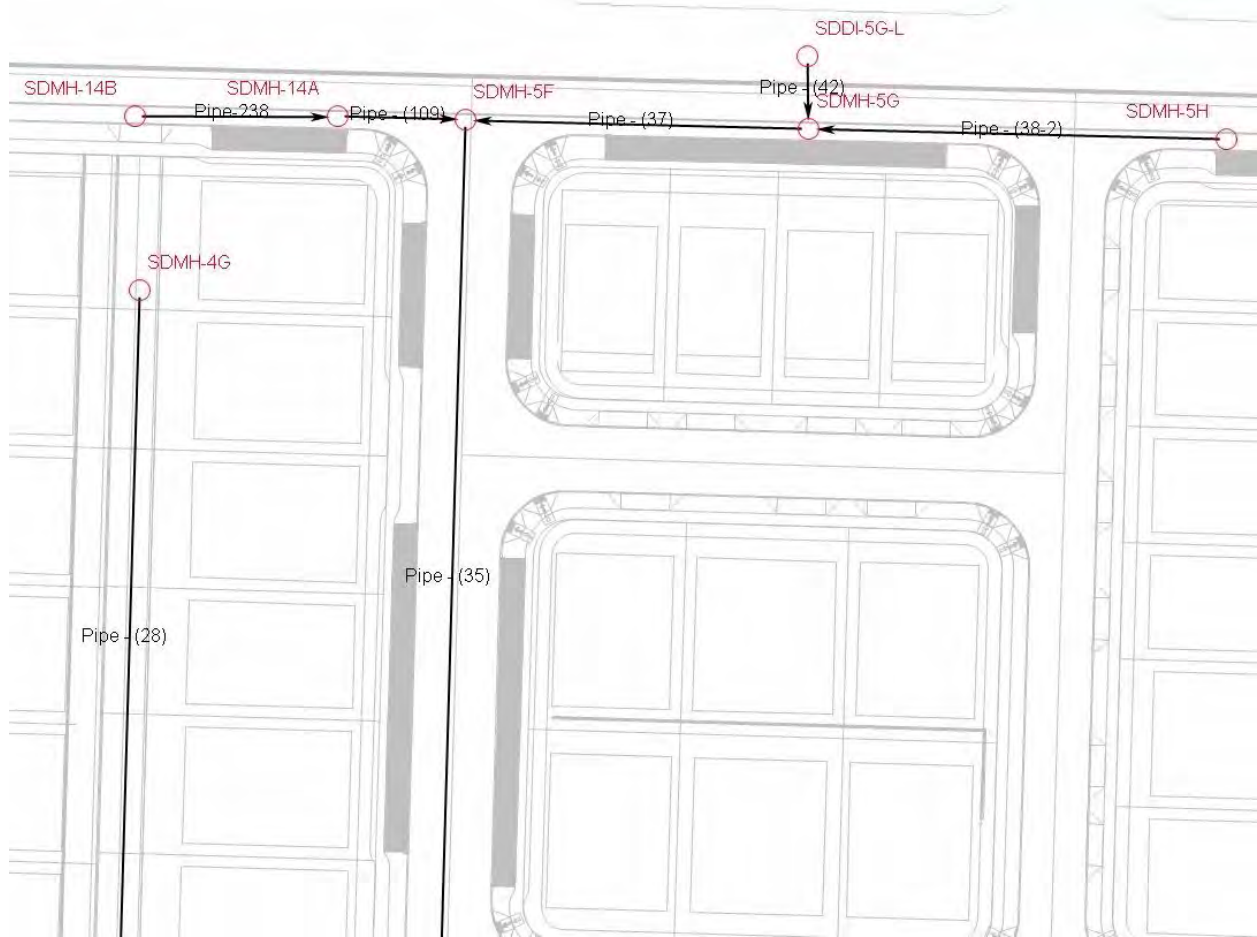


# XP-SWMM Layout

## Frog Pond Estates

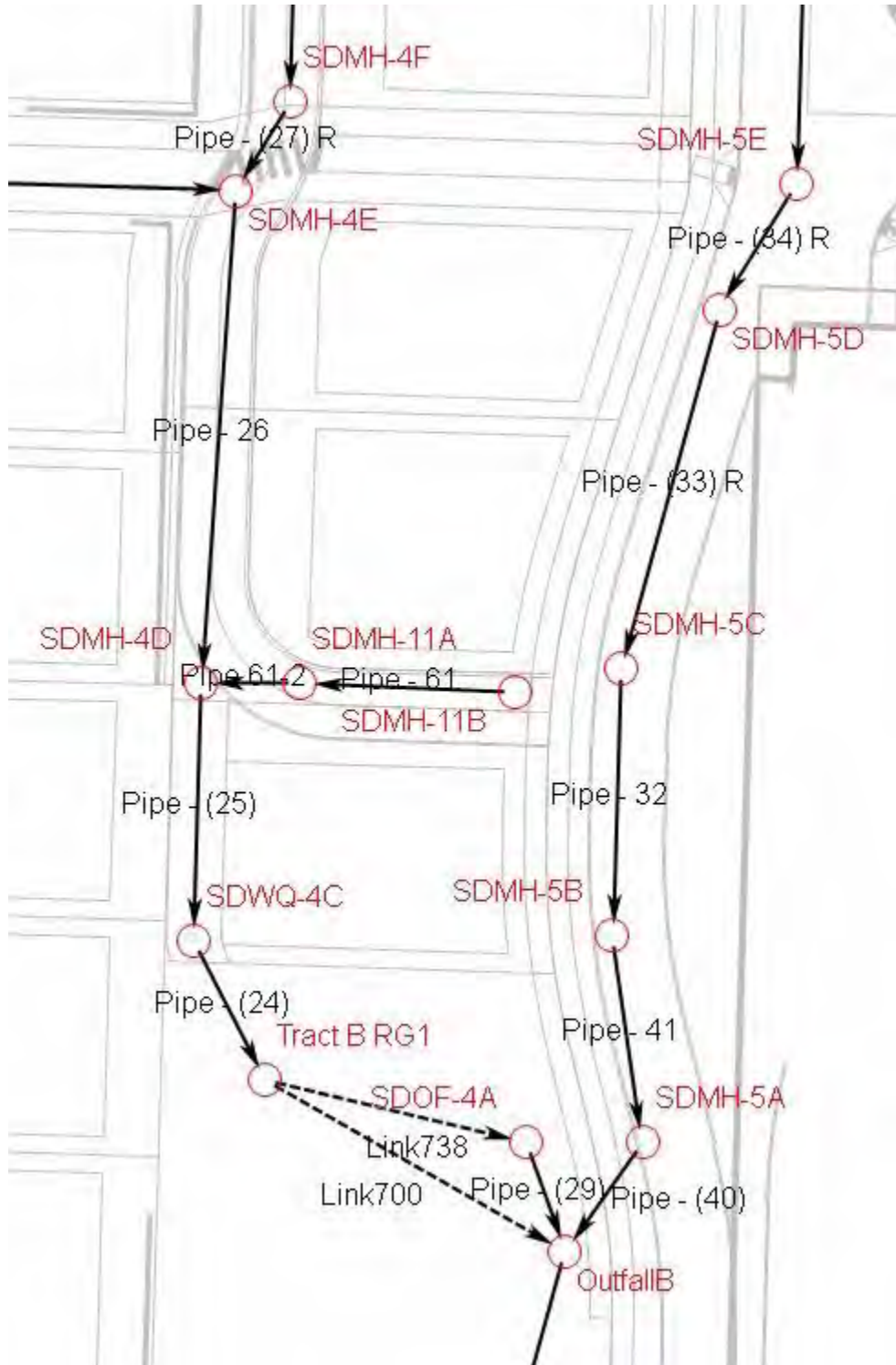


# XP-SWMM Layout Frog Pond Estates



# XP-SWMM Layout

## Frog Pond Estates



**XP-SWMM RUNOFF DATA**  
**Frog Pond Estates**  
**Proposed Conditions**

| <b>SCS Type IA 25-Year Storm Event</b> |                    |                 |                             |             |                           |                           |                                 |
|--|--------------------|-----------------|-----------------------------|-------------|---------------------------|---------------------------|---------------------------------|
| XP-SWMM Input Data                     |                    |                 |                             |             | XP-SWMM Output Data       |                           |                                 |
| Node Name                              | Total Area<br>(ac) | Impervious<br>% | Pervious<br>Curve<br>Number | Tc<br>(min) | Rainfall<br>Depth<br>(in) | Unit Hydrograph<br>Method | Surface<br>Runoff Flow<br>(cfs) |
| CulvertUP                              | 0.43               | 0               | 80                          | 5           | 3.9                       | Santa Barbara             | 0.25                            |
| SDMH-5H                                | 0.28               | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 0.33                            |
| SDMH-5H                                | 0.11               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 0.06                            |
| SDMH-7C                                | 0.14               | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 0.16                            |
| SDMH-7C                                | 0.27               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 0.16                            |
| SDMH-7C                                | 0.43               | 100             | 98                          | 5           | 0.0                       | Santa Barbara             | 0.50                            |
| SDMH-7C                                | 0.27               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 0.16                            |
| SDMH-4G                                | 0.57               | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 0.67                            |
| SDMH-4G                                | 0.46               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 0.27                            |
| SDMH-14A                               | 0.09               | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 0.11                            |
| SDMH-14A                               | 0.03               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 0.02                            |
| SDMH-5F                                | 0.45               | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 0.53                            |
| SDMH-5F                                | 0.24               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 0.14                            |
| SDMH-5G                                | 0.33               | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 0.39                            |
| SDMH-5G                                | 0.06               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 0.04                            |
| SDMH-1I                                | 0.03               | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 0.04                            |
| SDMH-1I                                | 0.01               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 0.01                            |
| SDMH-1I                                | 0.20               | 100             | 98                          | 5           | 0.0                       | Santa Barbara             | 0.24                            |
| SDDI-5G-L                              | 10.31              | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 12.09                           |
| SDDI-5G-L                              | 7.17               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 4.14                            |
| SDWQ-4C                                | 0.13               | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 0.15                            |
| SDMH-11B                               | 0.17               | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 0.20                            |
| SDMH-11B                               | 0.27               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 0.16                            |
| SDMH-1E                                | 0.38               | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 0.45                            |
| SDMH-1E                                | 0.50               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 0.29                            |
| SDMH-1E                                | 0.22               | 100             | 98                          | 5           | 0.0                       | Santa Barbara             | 0.26                            |
| SDMH-1E                                | 0.14               | 0               | 80                          | 5           | 0.0                       | Santa Barbara             | 0.08                            |
| SDWQ-1C                                | 0.03               | 100             | 98                          | 5           | 3.9                       | Santa Barbara             | 0.04                            |

**XP-SWMM RUNOFF DATA**  
**Frog Pond Estates**  
**Proposed Conditions**

| <b>SCS Type IA 25-Year Storm Event</b> |                 |              |                       |          |                     |                        |                           |
|--|-----------------|--------------|-----------------------|----------|---------------------|------------------------|---------------------------|
| XP-SWMM Input Data                     |                 |              |                       |          | XP-SWMM Output Data |                        |                           |
| Node Name                              | Total Area (ac) | Impervious % | Pervious Curve Number | Tc (min) | Rainfall Depth (in) | Unit Hydrograph Method | Surface Runoff Flow (cfs) |
| SDWQ-1C                                | 0.02            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.01                      |
| SDWQ-1C                                | 0.10            | 100          | 98                    | 5        | 0.0                 | Santa Barbara          | 0.12                      |
| SDMH-1J                                | 0.11            | 100          | 98                    | 5        | 0.0                 | Santa Barbara          | 0.13                      |
| SDMH-1J                                | 0.09            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.05                      |
| SDMH-1J                                | 0.19            | 100          | 98                    | 5        | 3.9                 | Santa Barbara          | 0.22                      |
| SDMH-1J                                | 0.14            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.08                      |
| SDMH-11A                               | 0.15            | 100          | 98                    | 5        | 3.9                 | Santa Barbara          | 0.18                      |
| SDMH-11A                               | 0.16            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.09                      |
| SDMH-1H                                | 0.03            | 100          | 98                    | 5        | 0.0                 | Santa Barbara          | 0.04                      |
| SDMH-1H                                | 0.01            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.01                      |
| SDMH-1H                                | 0.12            | 100          | 98                    | 5        | 3.9                 | Santa Barbara          | 0.14                      |
| SDMH-1H                                | 0.07            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.04                      |
| SDMH-1F                                | 0.07            | 100          | 98                    | 5        | 0.0                 | Santa Barbara          | 0.08                      |
| SDMH-1F                                | 0.03            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.02                      |
| SDMH-1F                                | 0.19            | 0.2          | 98                    | 5        | 3.9                 | Santa Barbara          | 0.22                      |
| SDMH-1F                                | 0.20            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.12                      |
| SDMH-14B                               | 0.07            | 100          | 98                    | 5        | 3.9                 | Santa Barbara          | 0.08                      |
| SDMH-14B                               | 0.03            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.02                      |
| Str-20                                 | 0.45            | 100          | 98                    | 5        | 3.9                 | Santa Barbara          | 0.53                      |
| Str-20                                 | 0.66            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.38                      |
| Str-10                                 | 0.17            | 100          | 98                    | 5        | 3.9                 | Santa Barbara          | 0.20                      |
| Str-10                                 | 0.17            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.10                      |
| Str-27                                 | 0.38            | 100          | 98                    | 5        | 3.9                 | Santa Barbara          | 0.45                      |
| Str-27                                 | 0.39            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.23                      |
| Str-CB                                 | 0.16            | 100          | 98                    | 5        | 0.0                 | Santa Barbara          | 0.19                      |
| Str-CB                                 | 0.24            | 0            | 80                    | 5        | 0.0                 | Santa Barbara          | 0.14                      |



**XP-SWMM HYDRAULICS DATA**

**Frog Pond Estates**

**Proposed Conditions**

| SCS Type IA 10-Year Storm Event |             |             |                    |      |        |       |              |                       |        |                       |        |                           |        |                |      |                 |           |               |                 |            |      |
|---------------------------------|-------------|-------------|--------------------|------|--------|-------|--------------|-----------------------|--------|-----------------------|--------|---------------------------|--------|----------------|------|-----------------|-----------|---------------|-----------------|------------|------|
| Location                        |             |             | Conduit Properties |      |        |       |              | Conduit Profile       |        |                       |        |                           |        |                |      | Conduit Results |           |               |                 |            |      |
| Link Name                       | Node Limits |             | Diameter           |      | Length | Slope | Conduit Type | Ground Elevation (ft) |        | Invert Elevation (ft) |        | Max. Water Elevation (ft) |        | Freeboard (ft) |      | Design Flow     | Max. Flow | Max. Velocity | Design Velocity | Max. Depth | y/d0 |
|                                 | From        | To          | in                 | ft   | ft     | %     |              | US                    | DS     | US                    | DS     | US                        | DS     | US             | DS   | (cfs)           | (cfs)     | (ft/s)        | (ft/s)          | (ft)       |      |
|                                 |             |             |                    |      |        |       |              |                       |        |                       |        |                           |        |                |      |                 |           |               |                 |            |      |
| CulvertB                        | CulvertUP   | Node990     | 30                 | 2.50 | 25.50  | 0.15  | Pipe         | 229.00                | 229.00 | 222.03                | 221.99 | 224.53                    | 224.47 | 4.47           | 4.53 | 15.62           | 19.34     | 3.95          | 3.18            | 2.50       | 1.00 |
| Pipe - (38-2)                   | SDMH-5H     | SDMH-5G     | 12                 | 1.00 | 180.52 | 0.00  | Pipe         | 238.51                | 235.38 | 232.88                | 231.07 | 233.08                    | 232.29 | 5.42           | 3.10 | 3.56            | 0.34      | 1.80          | 4.54            | 1.22       | 1.22 |
| Pipe - 30(3)                    | SDMH-7C     | SDMH-1J     | 12                 | 1.00 | 218.86 | 0.44  | Pipe         | 237.47                | 234.82 | 232.22                | 231.26 | 232.69                    | 231.82 | 4.78           | 3.00 | 2.36            | 1.06      | 2.86          | 3.00            | 0.56       | 0.56 |
| Pipe - (28)                     | SDMH-4G     | SDMH-4F     | 12                 | 1.00 | 302.18 | 0.44  | Pipe         | 237.19                | 233.32 | 231.46                | 230.13 | 231.87                    | 230.52 | 5.32           | 2.80 | 2.36            | 0.78      | 2.69          | 3.01            | 0.41       | 0.41 |
| Pipe - (109)                    | SDMH-14A    | SDMH-5F     | 12                 | 1.00 | 55.31  | 0.99  | Pipe         | 236.71                | 236.04 | 230.57                | 230.02 | 231.09                    | 231.07 | 5.62           | 4.98 | 3.55            | 0.30      | 1.93          | 4.52            | 1.05       | 1.05 |
| Pipe - (35)                     | SDMH-5F     | SDMH-5E     | 24                 | 2.00 | 398.00 | 0.30  | Pipe         | 236.04                | 234.97 | 229.02                | 227.83 | 231.07                    | 229.18 | 4.98           | 5.79 | 12.39           | 14.72     | 4.84          | 3.94            | 2.04       | 1.02 |
| Pipe - (37)                     | SDMH-5G     | SDMH-5F     | 24                 | 2.00 | 148.36 | 0.57  | Pipe         | 235.38                | 236.04 | 230.87                | 230.02 | 232.29                    | 231.07 | 3.10           | 4.98 | 17.15           | 14.54     | 6.18          | 5.46            | 1.41       | 0.71 |
| Pipe - (34) R                   | SDMH-5E     | SDMH-5D     | 24                 | 2.00 | 40.62  | 0.00  | Pipe         | 234.97                | 234.12 | 227.63                | 227.51 | 229.18                    | 228.94 | 5.79           | 5.18 | 12.38           | 14.71     | 5.70          | 3.94            | 1.54       | 0.77 |
| Pipe - (27) R                   | SDMH-4F     | SDMH-4E     | 12                 | 1.00 | 28.21  | 0.43  | Pipe         | 233.32                | 233.40 | 229.93                | 229.81 | 230.52                    | 230.50 | 2.80           | 2.90 | 2.32            | 0.76      | 2.12          | 2.96            | 0.69       | 0.69 |
| Pipe - 66                       | SDMH-1I     | SDMH-4E     | 12                 | 1.00 | 131.88 | 0.44  | Pipe         | 233.75                | 233.40 | 230.39                | 229.81 | 230.99                    | 230.50 | 2.77           | 2.90 | 2.36            | 1.52      | 3.13          | 3.01            | 0.69       | 0.69 |
| Pipe(151)                       | SDMH-1I     | SDMH-1H     | 12                 | 1.00 | 229.81 | 0.29  | Pipe         | 233.75                | 232.95 | 230.48                | 229.81 | 230.99                    | 230.09 | 2.77           | 2.86 | 1.92            | 0.91      | 2.35          | 2.45            | 0.51       | 0.51 |
| Pipe - 26                       | SDMH-4E     | SDMH-4D     | 12                 | 1.00 | 134.69 | 0.44  | Pipe         | 233.40                | 233.01 | 229.61                | 229.02 | 230.50                    | 230.01 | 2.90           | 3.00 | 2.36            | 2.25      | 3.13          | 3.00            | 0.99       | 0.99 |
| Pipe - (42)                     | SDDI-5G-L   | SDMH-5D     | 18                 | 1.50 | 29.82  | 3.01  | Pipe         | 234.61                | 235.38 | 231.97                | 231.07 | 233.01                    | 232.29 | 1.59           | 3.10 | 18.25           | 13.89     | 10.42         | 10.32           | 1.22       | 0.81 |
| Pipe - (25)                     | SDMH-4D     | SDWQ-4C     | 12                 | 1.00 | 69.93  | 0.44  | Pipe         | 233.01                | 233.11 | 228.82                | 228.51 | 230.01                    | 229.64 | 3.00           | 3.47 | 2.37            | 2.71      | 3.31          | 3.02            | 1.19       | 1.19 |
| Pipe - (33) R                   | SDMH-5D     | SDMH-5C     | 24                 | 2.00 | 101.43 | 0.00  | Pipe         | 234.12                | 232.60 | 227.31                | 227.01 | 228.94                    | 228.39 | 5.18           | 4.21 | 12.39           | 14.71     | 5.47          | 3.94            | 1.63       | 0.81 |
| Pipe - (24)                     | SDWQ-4C     | Tract B RG1 | 12                 | 1.00 | 16.10  | 0.43  | Pipe         | 233.11                | 229.60 | 228.31                | 228.24 | 229.64                    | 229.54 | 3.47           | 0.06 | 2.35            | 2.82      | 3.59          | 2.99            | 1.33       | 1.33 |
| Pipe - 61                       | SDMH-11B    | SDMH-11A    | 12                 | 1.00 | 67.24  | 0.45  | Pipe         | 233.09                | 232.42 | 229.60                | 229.30 | 230.02                    | 230.01 | 3.07           | 2.41 | 2.38            | 0.28      | 1.59          | 3.03            | 0.71       | 0.71 |
| Pipe - 32                       | SDMH-5C     | SDMH-5B     | 24                 | 2.00 | 72.69  | 0.00  | Pipe         | 232.60                | 231.54 | 226.81                | 226.59 | 228.39                    | 227.94 | 4.21           | 3.60 | 12.39           | 14.71     | 5.61          | 3.94            | 1.58       | 0.79 |
| Link738                         | Tract B RG1 | SDOF-4A     |                    |      | NA     |       |              | 229.60                | 229.60 | 0.00                  | 0.00   | 229.54                    | 226.70 | 0.06           | 2.90 |                 |           |               |                 |            | NA   |
| Link700                         | Tract B RG1 | OutfallB    |                    |      | NA     |       |              | 229.60                | 230.00 | 0.00                  | 0.00   | 229.54                    | 226.06 | 0.06           | 3.94 |                 |           |               |                 |            | NA   |
| Link695                         | SDMH-1E     | TractA RG   | 12                 | 1.00 | 38.50  | 0.44  | Pipe         | 231.61                | 232.00 | 227.97                | 227.80 | 229.10                    | 228.99 | 2.51           | 3.01 | 2.37            | 1.99      | 2.62          | 3.01            | 1.19       | 1.19 |
| Link-FS                         | SDMH-1E     | FS2         |                    |      | NA     |       |              | 231.61                | 231.61 | 0.00                  | 0.00   | 229.10                    | 228.87 | 2.51           | 2.74 |                 |           |               |                 |            | NA   |
| Link-FS                         | SDMH-1E     | FS2         |                    |      | NA     |       |              | 231.61                | 231.61 | 0.00                  | 0.00   | 229.10                    | 228.87 | 2.51           | 2.74 |                 |           |               |                 |            | NA   |
| Pipe - 41                       | SDMH-5B     | SDMH-5A     | 24                 | 2.00 | 56.99  | 0.00  | Pipe         | 231.54                | 230.71 | 226.39                | 226.22 | 227.94                    | 227.56 | 3.60           | 3.15 | 12.38           | 14.72     | 5.71          | 3.94            | 1.55       | 0.78 |
| Pipe - (21)                     | SDWQ-1C     | Tract B RG2 | 12                 | 1.00 | 38.00  | 0.40  | Pipe         | 230.80                | 230.00 | 227.23                | 227.06 | 228.83                    | 228.80 | 1.97           | 1.20 | 2.38            | 0.99      | 2.27          | 3.03            | 1.74       | 1.74 |
| Pipe - (40)                     | SDMH-5A     | OutfallB    | 24                 | 2.00 | 57.92  | 0.32  | Pipe         | 230.71                | 230.00 | 226.02                | 225.84 | 227.56                    | 226.06 | 3.15           | 3.94 | 12.83           | 14.73     | 5.74          | 4.08            | 1.54       | 0.77 |
| Pipe - (29)                     | SDOF-4A     | OutfallB    | 12                 | 1.00 | 16.43  | 0.43  | Pipe         | 229.60                | 230.00 | 225.91                | 225.84 | 226.70                    | 226.06 | 2.90           | 3.94 | 2.33            | 2.82      | 4.30          | 2.96            | 0.79       | 0.79 |
| Link739                         | Tract B RG2 | SDOF-1A     |                    |      | NA     |       |              | 230.00                | 229.30 | 0.00                  | 0.00   | 228.80                    | 225.64 | 1.20           | 3.66 |                 |           |               |                 |            | NA   |
| Link739                         | Tract B RG2 | SDOF-1A     |                    |      | NA     |       |              | 230.00                | 229.30 | 0.00                  | 0.00   | 228.80                    | 225.64 | 1.20           | 3.66 |                 |           |               |                 |            | NA   |
| Pipe - (20)                     | SDOF-1A     | CulvertUP   | 12                 | 1.00 | 49.00  | 0.40  | Pipe         | 229.30                | 229.00 | 225.18                | 224.99 | 225.64                    | 224.53 | 3.66           | 4.47 | 2.25            | 0.96      | 2.81          | 2.87            | 0.46       | 0.46 |
| Pipe - 30                       | SDMH-1J     | SDMH-1I     | 12                 | 1.00 | 107.64 | 0.44  | Pipe         | 234.82                | 233.75 | 231.06                | 230.59 | 231.82                    | 230.99 | 3.00           | 2.77 | 2.35            | 2.21      | 3.52          | 3.00            | 0.76       | 0.76 |
| Link680                         | Str-3       | Node990     | 12                 | 1.00 | 214.73 | 0.43  | Pipe         | 231.45                | 229.00 | 223.91                | 222.99 | 225.17                    | 224.47 | 6.29           | 4.53 | 2.33            | 2.08      | 3.08          | 2.97            | 1.50       | 1.50 |
| Pipe 61-2                       | SDMH-11A    | SDMH-4D     | 12                 | 1.00 | 17.96  | 0.45  | Pipe         | 232.42                | 233.01 | 229.10                | 229.02 | 230.01                    | 230.01 | 2.41           | 3.00 | 2.38            | 0.49      | 0.76          | 3.03            | 0.99       | 0.99 |
| Pipe-154                        | SDMH-1H     | SDMH-1G     | 12                 | 1.00 | 78.30  | 0.43  | Pipe         | 232.95                | 232.61 | 229.61                | 229.27 | 230.09                    | 229.69 | 2.86           | 2.92 | 2.35            | 1.09      | 2.93          | 2.99            | 0.48       | 0.48 |
| Pipe-153                        | SDMH-1G     | SDMH-1F     | 12                 | 1.00 | 97.61  | 0.44  | Pipe         | 232.61                | 231.70 | 229.07                | 228.64 | 229.69                    | 229.27 | 2.92           | 2.43 | 2.36            | 1.64      | 3.23          | 3.01            | 0.63       | 0.63 |
| Pipe-152                        | SDMH-1F     | SDMH-1E     | 12                 | 1.00 | 62.18  | 0.43  | Pipe         | 231.70                | 231.61 | 228.44                | 228.17 | 229.27                    | 229.10 | 2.43           | 2.51 | 2.35            | 1.99      | 2.84          | 2.99            | 0.93       | 0.93 |
| Pipe-238                        | SDMH-14B    | SDMH-14A    | 12                 | 1.00 | 109.35 | 1.00  | Pipe         | 237.75                | 236.71 | 231.86                | 230.77 | 231.97                    | 231.09 | 5.78           | 5.62 | 3.56            | 0.09      | 1.86          | 4.53            | 0.32       | 0.32 |
| Link687                         | Str-20      | Node979     | 12                 | 1.00 | 101.13 | 0.44  | Pipe         | 237.96                | 235.43 | 232.08                | 231.63 | 232.48                    | 231.88 | 5.49           | 3.56 | 2.38            | 0.76      | 2.66          | 3.03            | 0.40       | 0.40 |
| TractB                          | OutfallB    | CulvertUP   | 24                 | 2.00 | 120.00 | 3.17  | Chanel       | 230.00                | 229.00 | 225.80                | 222.00 | 226.06                    | 224.53 | 3.94           | 4.47 | 693.57          | 17.53     | 1.81          | 13.87           | 2.53       | 1.00 |
| Link691                         | Node977     | SDMH-7C     | 12                 | 1.00 | 82.60  | 0.44  | Pipe         | 238.92                | 237.47 | 232.78                | 232.42 | 233.00                    | 232.69 | 5.92           | 4.78 | 2.36            | 0.25      | 1.88          | 3.01            | 0.27       | 0.27 |
| Link690                         | Str-10      | Node977     | 12                 | 1.00 | 227.21 | 0.44  | Pipe         | 239.46                | 238.92 | 233.98                | 232.98 | 234.20                    | 233.00 | 5.26           | 5.92 | 2.36            | 0.25      | 1.89          | 3.01            | 0.22       | 0.22 |
| Link692                         | Node979     | SDMH-1J     | 12                 | 1.00 | 35.19  | 0.48  | Pipe         | 235.43                | 234.82 | 231.43                | 231.26 | 231.88                    | 231.82 | 3.56           | 3.00 | 2.48            | 0.76      | 2.28          | 3.15            | 0.56       | 0.56 |
| Link693                         | Str-27      | Node982     | 12                 | 1.00 | 126.51 | 0.44  | Pipe         | 233.70                | 232.91 | 230.23                | 229.67 | 230.57                    | 229.82 | 3.13           | 3.09 | 2.37            | 0.56      | 2.43          | 3.02            | 0.34       | 0.34 |
| Link694                         | Node982     | SDMH-1G     | 12                 | 1.00 | 45.12  | 0.44  | Pipe         | 232.91                | 232.61 | 229.47                | 229.27 | 229.82                    | 229.69 | 3.09           | 2.92 | 2.37            | 0.56      | 2.30          | 3.02            | 0.42       | 0.42 |
| Link696                         | TractA RG   | Node984     |                    |      | NA     |       |              | 232.00                | 231.10 | 0.00                  | 0.00   | 228.99                    | 225.35 | 3.01           | 5.75 |                 |           |               |                 |            | NA   |
| Link696                         | TractA RG   | Node984     |                    |      | NA     |       |              | 232.00                | 231.10 | 0.00                  | 0.00   | 228.99                    | 225.35 | 3.01           | 5.75 |                 |           |               |                 |            | NA   |
| Link697                         | Node984     | Str-3       | 12                 | 1.00 | 61.54  | 0.44  | Pipe         | 231.10                | 231.45 | 224.38                | 224.11 | 225.35                    | 225.17 | 5.75           | 6.29 | 2.36            | 2.13      | 3.55          | 3.00            | 1.06       | 1.06 |
| Link698                         | Str-CB      | TractA RG   | 12                 | 1.00 | 25.60  | 0.44  | Pipe         | 231.50                | 232.00 | 227.91                | 227.80 | 228.99                    | 228.99 | 2.51           | 3.01 | 2.37            | 0.27      | 1.42          | 3.01            | 1.19       | 1.19 |
| Pipe - (23)                     | FS2         | SDWQ-1C     | 12                 | 1.00 | 83.30  | 0.65  | Pipe         | 231.61                | 230.80 | 227.97                | 227.43 | 228.87                    | 228.83 | 2.74           | 1.97 | 2.87            | 0.86      | 2.62          | 3.65            | 1.40       | 1.40 |
| Link702                         | Node990     | CulvertDN   | 30                 | 2.50 | 22.68  | 0.15  | Pipe         | 229.00                | 229.00 | 221.99                | 221.96 | 224.47                    | 224.40 | 4.53           | 4.60 | 15.65           | 21.34     | 4.37          | 3.19            | 2.50       | 1.00 |



**XP-SWMM HYDRAULICS DATA**  
**Frog Pond Estates**  
**Proposed Conditions**

| SCS Type IA 25-Year Storm Event |             |             |                    |      |        |       |              |                       |        |                       |        |                           |        |                |      |                 |           |               |                 |            |      |
|---------------------------------|-------------|-------------|--------------------|------|--------|-------|--------------|-----------------------|--------|-----------------------|--------|---------------------------|--------|----------------|------|-----------------|-----------|---------------|-----------------|------------|------|
| Location                        |             |             | Conduit Properties |      |        |       |              | Conduit Profile       |        |                       |        |                           |        |                |      | Conduit Results |           |               |                 |            |      |
| Link Name                       | Node Limits |             | Diameter           |      | Length | Slope | Conduit Type | Ground Elevation (ft) |        | Invert Elevation (ft) |        | Max. Water Elevation (ft) |        | Freeboard (ft) |      | Design Flow     | Max. Flow | Max. Velocity | Design Velocity | Max. Depth | y/d0 |
|                                 | From        | To          | in                 | ft   | ft     | %     |              | US                    | DS     | US                    | DS     | US                        | DS     | US             | DS   | (cfs)           | (cfs)     | (ft/s)        | (ft/s)          | (ft)       |      |
|                                 |             |             |                    |      |        |       |              |                       |        |                       |        |                           |        |                |      |                 |           |               |                 |            |      |
| CuvertB                         | CuvertUP    | Node990     | 30                 | 2.50 | 25.50  | 0.1   | Pipe         | 229.00                | 229.00 | 222.03                | 221.99 | 224.56                    | 224.48 | 4.44           | 4.52 | 15.62           | 22.13     | 4.49          | 3.18            | 2.53       | 1.01 |
| Pipe - (38-2)                   | SDMH-5H     | SDMH-5G     | 12                 | 1.00 | 180.52 | 0.0   | Pipe         | 238.51                | 235.38 | 232.88                | 231.07 | 233.10                    | 232.53 | 5.41           | 2.86 | 3.56            | 0.39      | 1.98          | 4.54            | 1.46       | 1.46 |
| Pipe - 30(3)                    | SDMH-7C     | SDMH-1J     | 12                 | 1.00 | 218.86 | 0.4   | Pipe         | 237.47                | 234.82 | 232.22                | 231.26 | 232.74                    | 231.93 | 4.73           | 2.89 | 2.36            | 1.25      | 2.92          | 3.00            | 0.67       | 0.67 |
| Pipe - (28)                     | SDMH-4G     | SDMH-4F     | 12                 | 1.00 | 302.18 | 0.4   | Pipe         | 237.19                | 233.32 | 231.46                | 230.13 | 231.90                    | 230.77 | 5.30           | 2.55 | 2.36            | 0.93      | 2.79          | 3.01            | 0.64       | 0.64 |
| Pipe - (109)                    | SDMH-14A    | SDMH-5F     | 12                 | 1.00 | 55.31  | 1.0   | Pipe         | 236.71                | 236.04 | 230.57                | 230.02 | 231.77                    | 231.77 | 4.94           | 4.28 | 3.55            | 0.65      | 1.94          | 4.52            | 1.75       | 1.75 |
| Pipe - (35)                     | SDMH-5F     | SDMH-5E     | 24                 | 2.00 | 398.00 | 0.3   | Pipe         | 236.04                | 234.97 | 229.02                | 227.83 | 231.77                    | 229.43 | 4.28           | 5.54 | 12.39           | 17.51     | 5.64          | 3.94            | 2.74       | 1.37 |
| Pipe - (37)                     | SDMH-5G     | SDMH-5F     | 24                 | 2.00 | 148.36 | 0.6   | Pipe         | 235.38                | 236.04 | 230.87                | 230.02 | 232.53                    | 231.77 | 2.86           | 4.28 | 17.15           | 16.88     | 6.32          | 5.46            | 1.75       | 0.87 |
| Pipe - (34) R                   | SDMH-5E     | SDMH-5D     | 24                 | 2.00 | 40.62  | 0.0   | Pipe         | 234.97                | 234.12 | 227.63                | 227.51 | 229.43                    | 229.19 | 5.54           | 4.93 | 12.38           | 17.44     | 5.90          | 3.94            | 1.80       | 0.90 |
| Pipe - (27) R                   | SDMH-4F     | SDMH-4E     | 12                 | 1.00 | 28.21  | 0.4   | Pipe         | 233.32                | 233.40 | 229.93                | 229.81 | 230.77                    | 230.76 | 2.55           | 2.64 | 2.32            | 0.86      | 2.14          | 2.96            | 0.95       | 0.95 |
| Pipe - 66                       | SDMH-1I     | SDMH-4E     | 12                 | 1.00 | 131.88 | 0.4   | Pipe         | 233.75                | 233.40 | 230.39                | 229.81 | 231.08                    | 230.76 | 2.67           | 2.64 | 2.36            | 1.62      | 3.15          | 3.01            | 0.95       | 0.95 |
| Pipe(151)                       | SDMH-1I     | SDMH-1H     | 12                 | 1.00 | 229.81 | 0.3   | Pipe         | 233.75                | 232.95 | 230.48                | 229.81 | 231.08                    | 230.17 | 2.67           | 2.78 | 1.92            | 1.21      | 2.55          | 2.45            | 0.60       | 0.60 |
| Pipe - 26                       | SDMH-4E     | SDMH-4D     | 12                 | 1.00 | 134.69 | 0.4   | Pipe         | 233.40                | 233.01 | 229.61                | 229.02 | 230.76                    | 230.18 | 2.64           | 2.83 | 2.36            | 2.46      | 3.11          | 3.00            | 1.16       | 1.16 |
| Pipe - (42)                     | SDDI-5G-L   | SDMH-5G     | 18                 | 1.50 | 29.82  | 3.0   | Pipe         | 234.61                | 235.38 | 231.97                | 231.07 | 233.21                    | 232.53 | 1.40           | 2.86 | 18.25           | 16.21     | 10.48         | 10.32           | 1.46       | 0.97 |
| Pipe - (25)                     | SDMH-4D     | SDWQ-4C     | 12                 | 1.00 | 69.93  | 0.4   | Pipe         | 233.01                | 233.11 | 228.82                | 228.51 | 230.18                    | 229.69 | 2.83           | 3.42 | 2.37            | 3.01      | 3.80          | 3.02            | 1.36       | 1.36 |
| Pipe - (33) R                   | SDMH-5D     | SDMH-5C     | 24                 | 2.00 | 101.43 | 0.0   | Pipe         | 234.12                | 232.60 | 227.31                | 227.01 | 229.19                    | 228.58 | 4.93           | 4.02 | 12.39           | 17.43     | 5.79          | 3.94            | 1.87       | 0.94 |
| Pipe - (24)                     | SDWQ-4C     | Tract B RG1 | 12                 | 1.00 | 16.10  | 0.4   | Pipe         | 233.11                | 229.60 | 228.31                | 228.24 | 229.69                    | 229.56 | 3.42           | 0.04 | 2.35            | 3.14      | 3.99          | 2.99            | 1.38       | 1.38 |
| Pipe - 61                       | SDMH-11B    | SDMH-11A    | 12                 | 1.00 | 67.24  | 0.4   | Pipe         | 233.09                | 232.42 | 229.60                | 229.30 | 230.18                    | 230.18 | 2.91           | 2.24 | 2.38            | 0.34      | 1.62          | 3.03            | 0.88       | 0.88 |
| Pipe - 32                       | SDMH-5C     | SDMH-5B     | 24                 | 2.00 | 72.69  | 0.0   | Pipe         | 232.60                | 231.54 | 226.81                | 226.59 | 228.58                    | 228.11 | 4.02           | 3.42 | 12.39           | 17.43     | 6.00          | 3.94            | 1.77       | 0.89 |
| Link738                         | Tract B RG1 | SDOF-4A     |                    |      | NA     |       |              | 229.60                | 229.60 | 0.00                  | 0.00   | 229.56                    | 226.75 | 2.85           |      |                 |           |               |                 |            |      |
| Link700                         | Tract B RG1 | OutfallB    |                    |      | NA     |       |              | 229.60                | 230.00 | 0.00                  | 0.00   | 229.56                    | 226.08 | 0.04           | 3.92 |                 |           |               |                 |            |      |
| Link695                         | SDMH-1E     | TractA RG   | 12                 | 1.00 | 38.50  | 0.4   | Pipe         | 231.61                | 232.00 | 227.97                | 227.80 | 229.15                    | 229.01 | 2.46           | 2.99 | 2.37            | 2.22      | 2.71          | 3.01            | 1.21       | 1.21 |
| Link-FS                         | SDMH-1E     | FS2         |                    |      | NA     |       |              | 231.61                | 231.61 | 0.00                  | 0.00   | 229.15                    | 228.99 | 2.46           | 2.62 |                 |           |               |                 |            |      |
| Link-FS                         | SDMH-1E     | FS2         |                    |      | NA     |       |              | 231.61                | 231.61 | 0.00                  | 0.00   | 229.15                    | 228.99 | 2.46           | 2.62 |                 |           |               |                 |            |      |
| Pipe - 41                       | SDMH-5B     | SDMH-5A     | 24                 | 2.00 | 56.99  | 0.0   | Pipe         | 231.54                | 230.71 | 226.39                | 226.22 | 228.11                    | 227.73 | 3.42           | 2.98 | 12.38           | 17.43     | 6.13          | 3.94            | 1.72       | 0.86 |
| Pipe - (21)                     | SDWQ-1C     | Tract B RG2 | 12                 | 1.00 | 38.00  | 0.4   | Pipe         | 230.80                | 230.00 | 227.23                | 227.06 | 228.90                    | 228.84 | 1.90           | 1.16 | 2.38            | 1.36      | 2.20          | 3.03            | 1.78       | 1.78 |
| Pipe - (40)                     | SDMH-5A     | OutfallB    | 24                 | 2.00 | 57.92  | 0.3   | Pipe         | 230.71                | 230.00 | 226.02                | 225.84 | 227.73                    | 226.08 | 2.98           | 3.92 | 12.83           | 17.43     | 6.18          | 4.08            | 1.71       | 0.85 |
| Pipe - (29)                     | SDOF-4A     | OutfallB    | 12                 | 1.00 | 16.43  | 0.4   | Pipe         | 229.60                | 230.00 | 225.91                | 225.84 | 226.75                    | 226.08 | 2.85           | 3.92 | 2.33            | 3.14      | 4.52          | 2.96            | 0.84       | 0.84 |
| Link739                         | Tract B RG2 | SDOF-1A     |                    |      | NA     |       |              | 230.00                | 229.30 | 0.00                  | 0.00   | 228.84                    | 225.73 | 1.16           | 3.57 |                 |           |               |                 |            |      |
| Link739                         | Tract B RG2 | SDOF-1A     |                    |      | NA     |       |              | 230.00                | 229.30 | 0.00                  | 0.00   | 228.84                    | 225.73 | 1.16           | 3.57 |                 |           |               |                 |            |      |
| Pipe - (20)                     | SDOF-1A     | CuvertUP    | 12                 | 1.00 | 49.00  | 0.4   | Pipe         | 229.30                | 229.00 | 225.18                | 224.99 | 225.73                    | 224.56 | 3.57           | 4.44 | 2.25            | 1.34      | 3.10          | 2.87            | 0.55       | 0.55 |
| Pipe - 30                       | SDMH-1J     | SDMH-1I     | 12                 | 1.00 | 107.64 | 0.4   | Pipe         | 234.82                | 233.75 | 231.06                | 230.59 | 231.93                    | 231.08 | 2.89           | 2.67 | 2.35            | 2.61      | 3.68          | 3.00            | 0.87       | 0.87 |
| Link680                         | Str-3       | Node990     | 12                 | 1.00 | 214.73 | 0.4   | Pipe         | 231.45                | 229.00 | 223.91                | 222.99 | 225.43                    | 224.48 | 6.02           | 4.52 | 2.33            | 2.38      | 3.06          | 2.97            | 1.52       | 1.52 |
| Pipe 61-2                       | SDMH-11A    | SDMH-4D     | 12                 | 1.00 | 17.96  | 0.4   | Pipe         | 232.42                | 233.01 | 229.10                | 229.02 | 230.18                    | 230.18 | 2.24           | 2.83 | 2.38            | 0.57      | 0.79          | 3.03            | 1.16       | 1.16 |
| Pipe-154                        | SDMH-1H     | SDMH-1G     | 12                 | 1.00 | 78.30  | 0.4   | Pipe         | 232.95                | 232.61 | 229.61                | 229.27 | 230.17                    | 229.81 | 2.78           | 2.80 | 2.35            | 1.41      | 3.14          | 2.99            | 0.56       | 0.56 |
| Pipe-153                        | SDMH-1G     | SDMH-1F     | 12                 | 1.00 | 97.61  | 0.4   | Pipe         | 232.61                | 231.70 | 229.07                | 228.64 | 229.81                    | 229.42 | 2.80           | 2.28 | 2.36            | 2.04      | 3.32          | 3.01            | 0.78       | 0.78 |
| Pipe-152                        | SDMH-1F     | SDMH-1E     | 12                 | 1.00 | 62.18  | 0.4   | Pipe         | 231.70                | 231.61 | 228.44                | 228.17 | 229.42                    | 229.15 | 2.28           | 2.46 | 2.35            | 2.45      | 3.14          | 2.99            | 0.98       | 0.98 |
| Pipe-238                        | SDMH-14B    | SDMH-14A    | 12                 | 1.00 | 109.35 | 1.0   | Pipe         | 237.75                | 236.71 | 231.86                | 230.77 | 231.97                    | 231.77 | 5.78           | 4.94 | 3.56            | 0.10      | 1.85          | 4.53            | 1.00       | 1.00 |
| Link687                         | Str-20      | Node979     | 12                 | 1.00 | 101.13 | 0.4   | Pipe         | 237.96                | 235.43 | 232.08                | 231.63 | 232.51                    | 231.97 | 5.45           | 3.47 | 2.38            | 0.90      | 2.80          | 3.03            | 0.43       | 0.43 |
| TractB                          | OutfallB    | CuvertUP    | 24                 | 2.00 | 120.00 | 3.2   | Channel      | 230.00                | 229.00 | 225.80                | 222.00 | 226.08                    | 224.56 | 3.92           | 4.44 | 693.57          | 20.55     | 1.83          | 13.87           | 2.56       | 1.00 |
| Link691                         | Node977     | SDMH-7C     | 12                 | 1.00 | 82.60  | 0.4   | Pipe         | 238.92                | 237.47 | 232.78                | 232.42 | 233.02                    | 232.74 | 5.90           | 4.73 | 2.36            | 0.29      | 1.94          | 3.01            | 0.32       | 0.32 |
| Link690                         | Str-10      | Node977     | 12                 | 1.00 | 227.21 | 0.4   | Pipe         | 239.46                | 238.92 | 233.98                | 232.98 | 234.22                    | 233.02 | 5.24           | 5.90 | 2.36            | 0.29      | 1.99          | 3.01            | 0.24       | 0.24 |
| Link692                         | Node979     | SDMH-1J     | 12                 | 1.00 | 35.19  | 0.5   | Pipe         | 235.43                | 234.82 | 231.43                | 231.26 | 231.97                    | 231.93 | 3.47           | 2.89 | 2.48            | 0.90      | 2.28          | 3.15            | 0.67       | 0.67 |
| Link693                         | Str-27      | Node982     | 12                 | 1.00 | 126.51 | 0.4   | Pipe         | 233.70                | 232.91 | 230.23                | 229.67 | 230.60                    | 229.88 | 3.10           | 3.03 | 2.37            | 0.67      | 2.55          | 3.02            | 0.37       | 0.37 |
| Link694                         | Node982     | SDMH-1G     | 12                 | 1.00 | 45.12  | 0.4   | Pipe         | 232.91                | 232.61 | 229.47                | 229.27 | 229.88                    | 229.81 | 3.03           | 2.80 | 2.37            | 0.66      | 2.32          | 3.02            | 0.54       | 0.54 |
| Link696                         | TractA RG   | Node984     |                    |      | NA     |       |              | 232.00                | 231.10 | 0.00                  | 0.00   | 229.01                    | 225.70 | 2.99           | 5.40 |                 |           |               |                 |            |      |
| Link696                         | TractA RG   | Node984     |                    |      | NA     |       |              | 232.00                | 231.10 | 0.00                  | 0.00   | 229.01                    | 225.70 | 2.99           | 5.40 |                 |           |               |                 |            |      |
| Link697                         | Node984     | Str-3       | 12                 | 1.00 | 61.54  | 0.4   | Pipe         | 231.10                | 231.45 | 224.38                | 224.11 | 225.70                    | 225.43 | 5.40           | 6.02 | 2.36            | 2.38      | 3.58          | 3.00            | 1.32       | 1.32 |
| Link698                         | Str-CB      | TractA RG   | 12                 | 1.00 | 25.60  | 0.4   | Pipe         | 231.50                | 232.00 | 227.91                | 227.80 | 229.01                    | 229.01 | 2.49           | 2.99 | 2.37            | 0.33      | 1.44          | 3.01            | 1.21       | 1.21 |
| Pipe - (23)                     | FS2         | SDWQ-1C     | 12                 | 1.00 | 83.30  | 0.6   | Pipe         | 231.61                | 230.80 | 227.97                | 227.43 | 228.99                    | 228.90 | 2.62           | 1.90 | 2.87            | 1.21      | 2.56          | 3.65            | 1.47       | 1.47 |
| Link702                         | Node990     | CuvertDN    | 30                 | 2.50 | 22.68  | 0.1   | pipe         | 229.00                | 229.00 | 221.99                | 221.96 | 224.48                    | 224.40 | 4.52           | 4.60 | 15.65           | 24.45     | 4.99          | 3.19            | 2.49       | 1.00 |

**XP-SWMM HYDRAULICS DATA**

**Frog Pond Estates**

**Proposed Conditions**

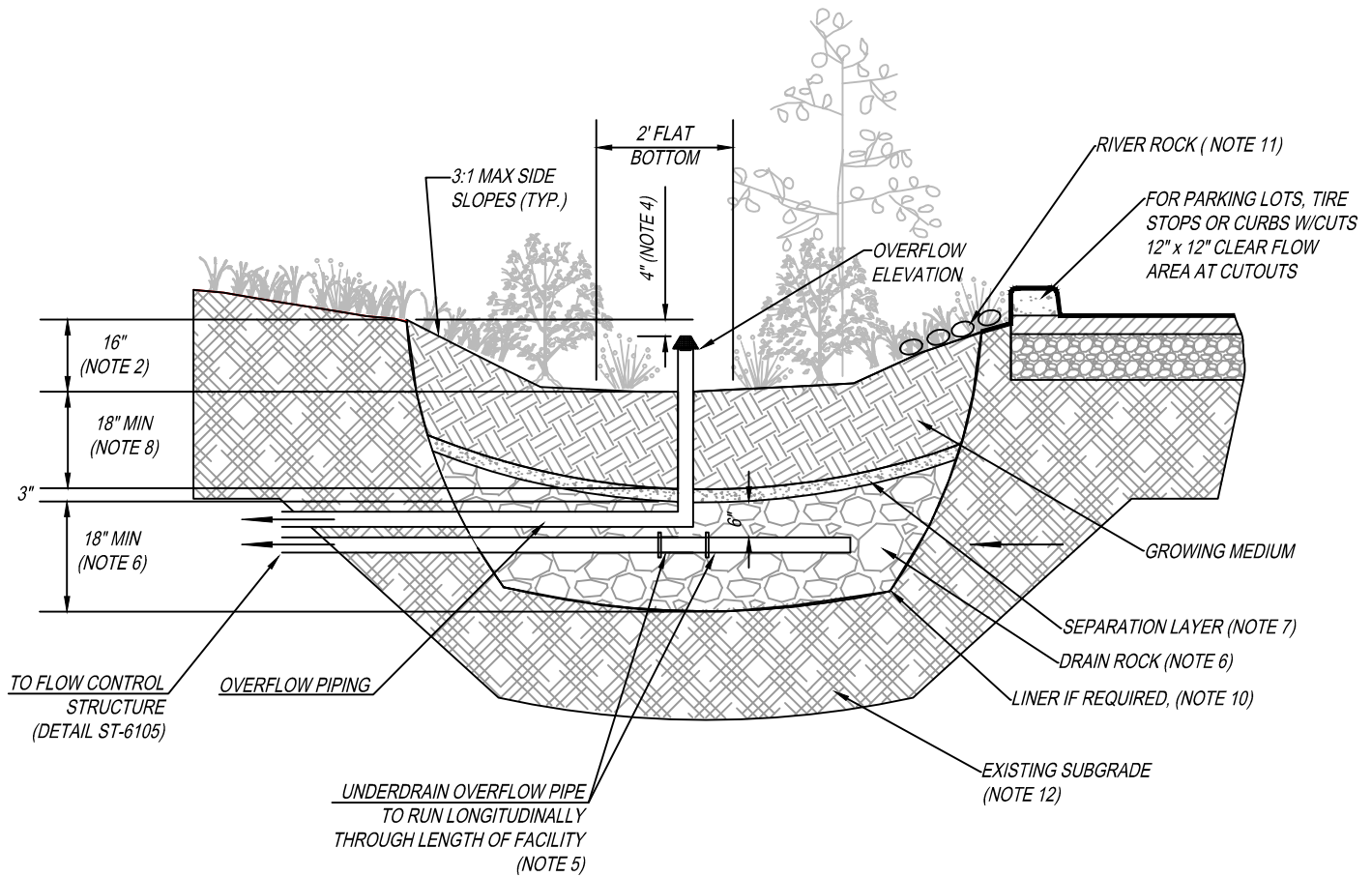
| SCS Type IA 50% 2-Year Storm Event |             |             |                    |      |        |       |              |                       |        |                       |        |                           |        |                |      |                 |           |               |                 |            |      |
|------------------------------------|-------------|-------------|--------------------|------|--------|-------|--------------|-----------------------|--------|-----------------------|--------|---------------------------|--------|----------------|------|-----------------|-----------|---------------|-----------------|------------|------|
| Location                           |             |             | Conduit Properties |      |        |       |              | Conduit Profile       |        |                       |        |                           |        |                |      | Conduit Results |           |               |                 |            |      |
| Link Name                          | Node Limits |             | Diameter           |      | Length | Slope | Conduit Type | Ground Elevation (ft) |        | Invert Elevation (ft) |        | Max. Water Elevation (ft) |        | Freeboard (ft) |      | Design Flow     | Max. Flow | Max. Velocity | Design Velocity | Max. Depth | y/d0 |
|                                    | From        | To          | in                 | ft   | ft     | %     |              | US                    | DS     | US                    | DS     | US                        | DS     | US             | DS   | (cfs)           | (cfs)     | (ft/s)        | (ft/s)          | (ft)       |      |
|                                    |             |             |                    |      |        |       |              |                       |        |                       |        |                           |        |                |      |                 |           |               |                 |            |      |
| CuvertB                            | CuvertUP    | Node990     | 30                 | 2.50 | 25.50  | 0.15  | Pipe         | 229.00                | 229.00 | 222.03                | 221.99 | 222.97                    | 222.93 | 6.03           | 6.07 | 15.62           | 4.69      | 2.80          | 3.18            | 0.94       | 0.37 |
| Pipe - (38-2)                      | SDMH-5H     | SDMH-5G     | 12                 | 1.00 | 180.52 | 0.00  | Pipe         | 238.51                | 235.38 | 232.88                | 231.07 | 232.99                    | 231.50 | 5.52           | 3.88 | 3.56            | 0.09      | 1.39          | 4.54            | 0.43       | 0.43 |
| Pipe - 30(3)                       | SDMH-7C     | SDMH-1J     | 12                 | 1.00 | 218.86 | 0.44  | Pipe         | 237.47                | 234.82 | 232.22                | 231.26 | 232.44                    | 231.37 | 5.03           | 3.45 | 2.36            | 0.24      | 1.87          | 3.00            | 0.22       | 0.22 |
| Pipe - (28)                        | SDMH-4G     | SDMH-4F     | 12                 | 1.00 | 302.18 | 0.44  | Pipe         | 237.19                | 233.32 | 231.46                | 230.13 | 231.66                    | 230.12 | 5.53           | 3.20 | 2.36            | 0.18      | 1.73          | 3.01            | 0.20       | 0.20 |
| Pipe - (109)                       | SDMH-14A    | SDMH-5F     | 12                 | 1.00 | 55.31  | 0.99  | Pipe         | 236.71                | 236.04 | 230.57                | 230.02 | 230.66                    | 229.81 | 6.05           | 6.24 | 3.55            | 0.05      | 1.75          | 4.52            | 0.09       | 0.09 |
| Pipe - (35)                        | SDMH-5F     | SDMH-5E     | 24                 | 2.00 | 398.00 | 0.30  | Pipe         | 236.04                | 234.97 | 229.02                | 227.83 | 229.81                    | 228.36 | 6.24           | 6.61 | 12.39           | 3.80      | 3.39          | 3.94            | 0.79       | 0.39 |
| Pipe - (37)                        | SDMH-5G     | SDMH-5F     | 24                 | 2.00 | 148.36 | 0.57  | Pipe         | 235.38                | 236.04 | 230.87                | 230.02 | 231.50                    | 229.81 | 3.88           | 6.24 | 17.15           | 3.67      | 4.34          | 5.46            | 0.63       | 0.31 |
| Pipe - (34) R                      | SDMH-5E     | SDMH-5D     | 24                 | 2.00 | 40.62  | 0.00  | Pipe         | 234.97                | 234.12 | 227.63                | 227.51 | 228.36                    | 228.07 | 6.61           | 6.05 | 12.38           | 3.80      | 3.68          | 3.94            | 0.73       | 0.37 |
| Pipe - (27) R                      | SDMH-4F     | SDMH-4E     | 12                 | 1.00 | 28.21  | 0.43  | Pipe         | 233.32                | 233.40 | 229.93                | 229.81 | 230.12                    | 229.95 | 3.20           | 3.45 | 2.32            | 0.18      | 1.76          | 2.96            | 0.19       | 0.19 |
| Pipe - 66                          | SDMH-1I     | SDMH-4E     | 12                 | 1.00 | 131.88 | 0.44  | Pipe         | 233.75                | 233.40 | 230.39                | 229.81 | 230.68                    | 229.95 | 3.07           | 3.45 | 2.36            | 0.41      | 2.20          | 3.01            | 0.29       | 0.29 |
| Pipe(151)                          | SDMH-1I     | SDMH-1H     | 12                 | 1.00 | 229.81 | 0.29  | Pipe         | 233.75                | 232.95 | 230.48                | 229.81 | 230.68                    | 229.81 | 3.07           | 3.14 | 1.92            | 0.14      | 1.36          | 2.45            | 0.20       | 0.20 |
| Pipe - 26                          | SDMH-4E     | SDMH-4D     | 12                 | 1.00 | 134.69 | 0.44  | Pipe         | 233.40                | 233.01 | 229.61                | 229.02 | 229.95                    | 229.40 | 3.45           | 3.61 | 2.36            | 0.59      | 2.46          | 3.00            | 0.38       | 0.38 |
| Pipe - (42)                        | SDDI-5G-L   | SDMH-5G     | 18                 | 1.50 | 29.82  | 3.01  | Pipe         | 234.61                | 235.38 | 231.97                | 231.07 | 232.41                    | 231.50 | 2.19           | 3.88 | 18.25           | 3.48      | 7.96          | 10.32           | 0.44       | 0.30 |
| Pipe - (25)                        | SDMH-4D     | SDWQ-4C     | 12                 | 1.00 | 69.93  | 0.44  | Pipe         | 233.01                | 233.11 | 228.82                | 228.51 | 229.40                    | 229.37 | 3.61           | 3.74 | 2.37            | 0.69      | 1.39          | 3.02            | 0.86       | 0.86 |
| Pipe - (33) R                      | SDMH-5D     | SDMH-5C     | 24                 | 2.00 | 101.43 | 0.00  | Pipe         | 234.12                | 232.60 | 227.31                | 227.01 | 228.07                    | 227.56 | 6.05           | 5.04 | 12.39           | 3.80      | 3.54          | 3.94            | 0.76       | 0.38 |
| Pipe - (24)                        | SDWQ-4C     | Tract B RG1 | 12                 | 1.00 | 16.10  | 0.43  | Pipe         | 233.11                | 229.60 | 228.31                | 228.24 | 229.37                    | 229.36 | 3.74           | 0.24 | 2.35            | 0.73      | 1.04          | 2.99            | 1.12       | 1.12 |
| Pipe - 61                          | SDMH-11B    | SDMH-11A    | 12                 | 1.00 | 67.24  | 0.45  | Pipe         | 233.09                | 232.42 | 229.60                | 229.30 | 229.71                    | 229.40 | 3.38           | 3.02 | 2.38            | 0.06      | 1.23          | 3.03            | 0.11       | 0.11 |
| Pipe - 32                          | SDMH-5C     | SDMH-5B     | 24                 | 2.00 | 72.69  | 0.00  | Pipe         | 232.60                | 231.54 | 226.81                | 226.59 | 227.56                    | 227.13 | 5.04           | 4.40 | 12.39           | 3.80      | 3.59          | 3.94            | 0.75       | 0.37 |
| Link738                            | Tract B RG1 | SDOF-4A     |                    |      | NA     |       |              | 229.60                | 229.60 | 0.00                  | 0.00   | 229.36                    | 226.28 | 0.24           | 3.32 |                 |           |               |                 |            | NA   |
| Link700                            | Tract B RG1 | OutfallB    |                    |      | NA     |       |              | 229.60                | 230.00 | 0.00                  | 0.00   | 229.36                    | 225.92 | 0.24           | 4.09 |                 |           |               |                 |            | NA   |
| Link695                            | SDMH-1E     | TractA RG   | 12                 | 1.00 | 38.50  | 0.44  | Pipe         | 231.61                | 232.00 | 227.97                | 227.80 | 228.25                    | 226.50 | 3.36           | 5.50 | 2.37            | 0.40      | 2.24          | 3.01            | 0.28       | 0.28 |
| Link-FS                            | SDMH-1E     | FS2         |                    |      | NA     |       |              | 231.61                | 231.61 | 0.00                  | 0.00   | 228.25                    | 228.14 | 3.36           | 3.47 |                 |           |               |                 |            | NA   |
| Link-FS                            | SDMH-1E     | FS2         |                    |      | NA     |       |              | 231.61                | 231.61 | 0.00                  | 0.00   | 228.25                    | 228.14 | 3.36           | 3.47 |                 |           |               |                 |            | NA   |
| Pipe - 41                          | SDMH-5B     | SDMH-5A     | 24                 | 2.00 | 56.99  | 0.00  | Pipe         | 231.54                | 230.71 | 226.39                | 226.22 | 227.13                    | 226.76 | 4.40           | 3.95 | 12.38           | 3.80      | 3.63          | 3.94            | 0.74       | 0.37 |
| Pipe - (21)                        | SDWQ-1C     | Tract B RG2 | 12                 | 1.00 | 38.00  | 0.40  | Pipe         | 230.80                | 230.00 | 227.23                | 227.06 | 227.44                    | 226.09 | 3.37           | 3.91 | 2.38            | 0.21      | 1.86          | 3.03            | 0.21       | 0.21 |
| Pipe - (40)                        | SDMH-5A     | OutfallB    | 24                 | 2.00 | 57.92  | 0.32  | Pipe         | 230.71                | 230.00 | 226.02                | 225.84 | 226.76                    | 225.92 | 3.95           | 4.09 | 12.83           | 3.80      | 3.68          | 4.08            | 0.73       | 0.37 |
| Pipe - (29)                        | SDOF-4A     | OutfallB    | 12                 | 1.00 | 16.43  | 0.43  | Pipe         | 229.60                | 230.00 | 225.91                | 225.84 | 226.28                    | 225.92 | 3.32           | 4.09 | 2.33            | 0.72      | 2.72          | 2.96            | 0.37       | 0.37 |
| Link739                            | Tract B RG2 | SDOF-1A     |                    |      | NA     |       |              | 230.00                | 229.30 | 0.00                  | 0.00   | 226.09                    | 225.39 | 3.91           | 3.91 |                 |           |               |                 |            | NA   |
| Link739                            | Tract B RG2 | SDOF-1A     |                    |      | NA     |       |              | 230.00                | 229.30 | 0.00                  | 0.00   | 226.09                    | 225.39 | 3.91           | 3.91 |                 |           |               |                 |            | NA   |
| Pipe - (20)                        | SDOF-1A     | CuvertUP    | 12                 | 1.00 | 49.00  | 0.40  | Pipe         | 229.30                | 229.00 | 225.18                | 224.99 | 225.39                    | 222.97 | 3.91           | 6.03 | 2.25            | 0.21      | 1.77          | 2.87            | 0.21       | 0.21 |
| Pipe - 30                          | SDMH-1J     | SDMH-1I     | 12                 | 1.00 | 107.64 | 0.44  | Pipe         | 234.82                | 233.75 | 231.06                | 230.59 | 231.37                    | 230.68 | 3.45           | 3.07 | 2.35            | 0.48      | 2.32          | 3.00            | 0.31       | 0.31 |
| Link680                            | Str-3       | Node990     | 12                 | 1.00 | 214.73 | 0.43  | Pipe         | 231.45                | 229.00 | 223.91                | 222.99 | 224.21                    | 222.93 | 7.24           | 6.07 | 2.33            | 0.44      | 2.22          | 2.97            | 0.30       | 0.30 |
| Pipe 61-2                          | SDMH-11A    | SDMH-4D     | 12                 | 1.00 | 17.96  | 0.45  | Pipe         | 232.42                | 233.01 | 229.10                | 229.02 | 229.40                    | 229.40 | 3.02           | 3.61 | 2.38            | 0.11      | 0.62          | 3.03            | 0.38       | 0.38 |
| Pipe-154                           | SDMH-1H     | SDMH-1G     | 12                 | 1.00 | 78.30  | 0.43  | Pipe         | 232.95                | 232.61 | 229.61                | 229.27 | 229.81                    | 229.32 | 3.14           | 3.29 | 2.35            | 0.19      | 1.76          | 2.99            | 0.20       | 0.20 |
| Pipe-153                           | SDMH-1G     | SDMH-1F     | 12                 | 1.00 | 97.61  | 0.44  | Pipe         | 232.61                | 231.70 | 229.07                | 228.64 | 229.32                    | 228.72 | 3.29           | 2.98 | 2.36            | 0.31      | 2.05          | 3.01            | 0.25       | 0.25 |
| Pipe-152                           | SDMH-1F     | SDMH-1E     | 12                 | 1.00 | 62.18  | 0.43  | Pipe         | 231.70                | 231.61 | 228.44                | 228.17 | 228.72                    | 228.25 | 2.98           | 3.36 | 2.35            | 0.39      | 2.20          | 2.99            | 0.28       | 0.28 |
| Pipe-238                           | SDMH-14B    | SDMH-14A    | 12                 | 1.00 | 109.35 | 1.00  | Pipe         | 237.75                | 236.71 | 231.86                | 230.77 | 231.92                    | 230.66 | 5.83           | 6.05 | 3.56            | 0.02      | 1.78          | 4.53            | 0.06       | 0.06 |
| Link687                            | Str-20      | Node979     | 12                 | 1.00 | 101.13 | 0.44  | Pipe         | 237.96                | 235.43 | 232.08                | 231.63 | 232.26                    | 231.60 | 5.70           | 3.83 | 2.38            | 0.15      | 1.64          | 3.03            | 0.18       | 0.18 |
| TractB                             | OutfallB    | CuvertUP    | 24                 | 2.00 | 120.00 | 3.17  | Channel      | 230.00                | 229.00 | 225.80                | 222.00 | 225.92                    | 222.97 | 4.09           | 6.03 | 693.57          | 4.52      | 1.29          | 13.87           | 0.97       | 0.48 |
| Link691                            | Node977     | SDMH-7C     | 12                 | 1.00 | 82.60  | 0.44  | Pipe         | 238.92                | 237.47 | 232.78                | 232.42 | 232.89                    | 232.44 | 6.03           | 5.03 | 2.36            | 0.05      | 1.18          | 3.01            | 0.11       | 0.11 |
| Link690                            | Str-10      | Node977     | 12                 | 1.00 | 227.21 | 0.44  | Pipe         | 239.46                | 238.92 | 233.98                | 232.98 | 234.09                    | 232.89 | 5.37           | 6.03 | 2.36            | 0.05      | 1.17          | 3.01            | 0.11       | 0.11 |
| Link692                            | Node979     | SDMH-1J     | 12                 | 1.00 | 35.19  | 0.48  | Pipe         | 235.43                | 234.82 | 231.43                | 231.26 | 231.60                    | 231.37 | 3.83           | 3.45 | 2.48            | 0.15      | 1.72          | 3.15            | 0.17       | 0.17 |
| Link693                            | Str-27      | Node982     | 12                 | 1.00 | 126.51 | 0.44  | Pipe         | 233.70                | 232.91 | 230.23                | 229.67 | 230.39                    | 229.63 | 3.31           | 3.28 | 2.37            | 0.13      | 1.55          | 3.02            | 0.16       | 0.16 |
| Link694                            | Node982     | SDMH-1G     | 12                 | 1.00 | 45.12  | 0.44  | Pipe         | 232.91                | 232.61 | 229.47                | 229.27 | 229.63                    | 229.32 | 3.28           | 3.29 | 2.37            | 0.13      | 1.57          | 3.02            | 0.16       | 0.16 |
| Link696                            | TractA RG   | Node984     |                    |      | NA     |       |              | 232.00                | 231.10 | 0.00                  | 0.00   | 226.50                    | 224.68 | 5.50           | 6.42 |                 |           |               |                 |            | NA   |
| Link696                            | TractA RG   | Node984     |                    |      | NA     |       |              | 232.00                | 231.10 | 0.00                  | 0.00   | 226.50                    | 224.68 | 5.50           | 6.42 |                 |           |               |                 |            | NA   |
| Link697                            | Node984     | Str-3       | 12                 | 1.00 | 61.54  | 0.44  | Pipe         | 231.10                | 231.45 | 224.38                | 224.11 | 224.68                    | 224.21 | 6.42           | 7.24 | 2.36            | 0.44      | 2.29          | 3.00            | 0.30       | 0.30 |
| Link698                            | Str-CB      | TractA RG   | 12                 | 1.00 | 25.60  | 0.44  | Pipe         | 231.50                | 232.00 | 227.91                | 227.80 | 228.02                    | 226.50 | 3.48           | 5.50 | 2.37            | 0.05      | 1.21          | 3.01            | 0.11       | 0.11 |
| Pipe - (23)                        | FS2         | SDWQ-1C     | 12                 | 1.00 | 83.30  | 0.65  | Pipe         | 231.61                | 230.80 | 227.97                | 227.43 | 228.14                    | 227.44 | 3.47           | 3.37 | 2.87            | 0.18      | 2.01          | 3.65            | 0.17       | 0.17 |

# **Appendix F**

Operations & Maintenance Plans



This Detail Drawing may not be altered or changed in any manner except by the City Engineer. It is the responsibility of the user to acquire the most current version.



**GENERAL NOTES:**

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED RAIN GARDENS ARE PREFERRED TO MAXIMIZE ONSITE INFILTRATION.
2. **DIMENSIONS:**
  - DEPTH OF BASIN (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION); 12"
  - FLAT BOTTOM WIDTH: 2' MINIMUM
  - SIDE SLOPES OF RAIN GARDEN: 3:1 MAXIMUM
  - CENTERLINE SLOPE OF RAIN GARDEN: 0.5% OR LESS
3. **SETBACKS:**
  - FILTRATION RAIN GARDEN SHALL BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES UNLESS APPROVED BY BUILDING OFFICIAL
4. **OVERFLOW:**
  - OVERFLOW REQUIRED. INLET ELEVATION SHALL ALLOW FOR 4" OF FREEBOARD, MINIMUM.
  - PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
5. **PIPING:**
  - PERFORATED UNDER-DRAIN PIPING: SHALL RUN LONGITUDINALLY THROUGH LENGTH OF FACILITY, SHALL BE ABS SCH. 40, CAST IRON, OR PVC SCH.40. MINIMUM DIAMETER IS 6". PIPING SHALL HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND. WRAP UNDER-DRAIN IN FILTER FABRIC TO REDUCE TRANSPORT OF FINES. OVERFLOW PIPING: SHALL BE ABS SCH. 40, CAST IRON, OR PVC SCH. 40 AND SHALL NOT BE PERFORATED. MINIMUM DIAMETER IS 6". PIPING SHALL HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
6. **DRAIN ROCK:**
  - SIZE: 1 1/2" to 3/4"-0 WASHED
  - DEPTH: 18" MINIMUM
7. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
8. **GROWING MEDIUM:**
  - DEPTH: 18" MINIMUM
  - SEE APPENDIX A FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
  - FACILITY SURFACE AREA MAY BE REDUCED BY 25% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
9. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
10. **WATERPROOF LINER (IF REQUIRED):** SHALL BE 30 MIL PVC OR EQUIVALENT.
11. **INSTALL RIVER ROCK** SPLASH PAD OVER A NON WOVEN GEO TEXTILE FABRIC TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" - 3", 4 SQUARE FEET, 6" DEEP.
12. **SEASONAL HIGH GROUNDWATER SEPARATION:**
  - SEPARATION DISTANCE AS REQUIRED BY CITY.

Rain Garden - Filtration

DRAWING NUMBER: ST-6020

DRAWN BY: SR

SCALE: N.T.S.

FILE NAME: ST-6020.DWG

APPROVED BY: NK

DATE: 6/3/16

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

## Rain Gardens Operations & Maintenance Plan

| What to Look For   | What to Do   |
|--|--|
| <b>Structural Components</b> , including inlets and outlets/overflows, shall freely convey stormwater.                       |  |
| Clogged inlets or outlets  | -Remove sediment and debris from catch basins, trench drains and curb inlets and pipes to maintain at least 50% conveyance capacity at all times.                      |
| Cracked Drain Pipes  | -Repair/seal cracks. Replace when repair is insufficient.  |
| Check Dams   | -Maintain 4 to 10 inch deep rock check dams at design intervals.   |
| <b>Vegetation</b>  |  |
| Dead or strained vegetation  | -Replant per original planting plan, or substitute from Appendix A.<br>-Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides. |
| Tall Grass and Vegetation  | -Cut back grass and prune overgrowth 1-2 times per year. Remove cuttings   |
| Weeds  | -Manually remove weeds. Remove all plant debris.   |
| <b>Growing/Filter Medium</b> , including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours. |  |
| Gullies  | -Fill, lightly compact, and plant vegetation to disperse flow.   |
| Erosion  | -Replace splash blocks or inlet gravel/rock.   |
| Slope Slippage   | -Stabilize 3:1 slopes/banks with plantings from Appendix A   |
| Ponding  | -Rake, till, or amend to restore infiltration rate.  |

### Annual Maintenance Schedule:

*Summer.* Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.

*Fall.* Replant exposed soil and replace dead plants. Remove sediment and plant debris.

*Winter.* Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.

*Spring.* Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.

*All seasons.* Weed as necessary.

*Maintenance Records:* Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.

*Access:* Maintain ingress/egress to design standards.

*Infiltration/Flow Control:* All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.

*Pollution Prevention:* All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact \_\_\_\_\_ for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

*Vectors (Mosquitoes & Rodents):* Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface. Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

### Rain Garden O & M Plan

DRAWING NUMBER: ST-6030

DRAWN BY: SR

SCALE: N.T.S.

FILE NAME: ST-6030.DWG

APPROVED BY: NK

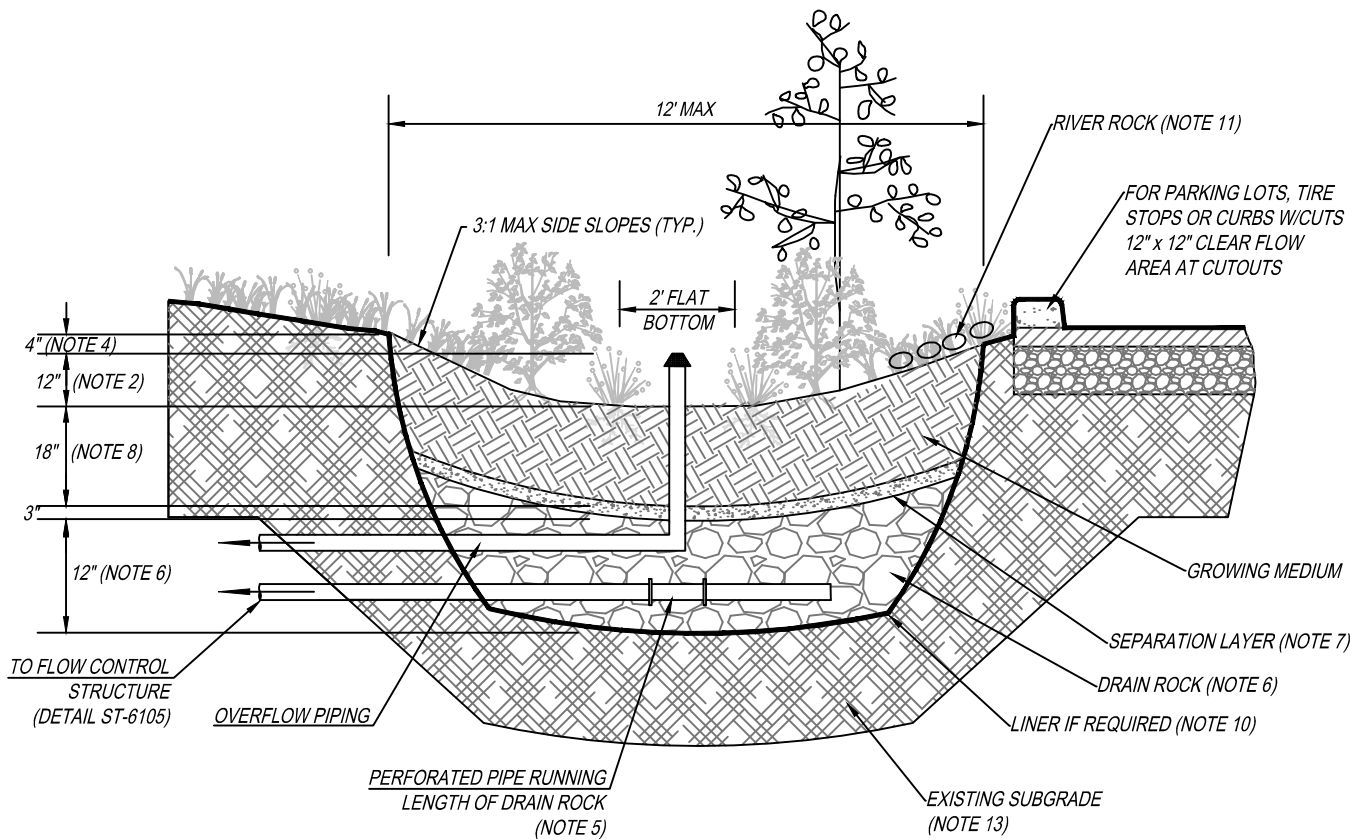
DATE: 10/15/14

CITY OF  
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PUBLIC WORKS STANDARDS

This Detail Drawing may not be altered or changed in any manner except by the City Engineer. It is the responsibility of the user to acquire the most current version.



**GENERAL NOTES:**

1. **PROVIDE PROTECTION** FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC IN PROPOSED INFILTRATION AREAS PRIOR TO, DURING AND AFTER CONSTRUCTION. UNLESS REQUIRED BY SITE CONDITIONS, UNLINED SWALES ARE PREFERRED TO ALLOW MAXIMUM INFILTRATION.
2. **DIMENSIONS:**
  - DEPTH OF SWALE (FROM TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION); 12"
  - LONGITUDINAL SLOPE OF SWALE: 6.0% OR LESS
  - FLAT BOTTOM WIDTH: 2' MINIMUM
  - SIDE SLOPES OF SWALE: 3:1 MAXIMUM
3. **LOCATION/SETBACKS:**
  - FILTRATION SWALES SHALL BE 10' FROM FOUNDATIONS AND 5' FROM PROPERTY LINES UNLESS APPROVED BY BUILDING OFFICIAL
4. **OVERFLOW:**
  - INLET ELEVATION SHALL ALLOW FOR 4" OF FREEBOARD, MINIMUM.
  - PROTECT FROM DEBRIS AND SEDIMENT WITH STRAINER OR GRATE.
5. **PIPING:**
  - PERFORATED UNDER-DRAIN PIPING: SHALL BE ABS SCH. 40, CAST IRON, OR PVC SCH.40. MINIMUM DIAMETER IS 6". PIPING SHALL HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND. WRAP UNDER-DRAIN IN FILTER FABRIC TO REDUCE TRANSPORT OF FINES.
  - OVERFLOW PIPING: SHALL BE ABS SCH. 40, CAST IRON, OR PVC SCH. 40 AND SHALL NOT BE PERFORATED. MINIMUM DIAMETER IS 6". PIPING SHALL HAVE 1% GRADE AND FOLLOW THE UNIFORM PLUMBING CODE. PVC NOT ALLOWED ABOVE GROUND.
6. **DRAIN ROCK:**
  - SIZE: 1 1/2" - 3/4" WASHED
  - DEPTH: 12"
7. **SEPARATION** BETWEEN DRAIN ROCK AND GROWING MEDIUM: SHALL BE A 3" LAYER OF 3/4" - 1/4" OPEN GRADED AGGREGATE.
8. **GROWING MEDIUM:**
  - 18" MINIMUM
  - SEE APPENDIX C FOR SPECIFICATION OR USE SAND/LOAM/COMPOST 3-WAY MIX.
  - FACILITY SURFACE AREA MAY BE REDUCED BY 25% WHEN GROWING MEDIA DEPTH IS INCREASED TO 30" OR MORE.
9. **VEGETATION:** FOLLOW LANDSCAPE PLANS OR REFER TO PLANTING REQUIREMENTS IN APPENDIX A.
10. **WATERPROOF LINER (IF REQUIRED):** SHALL BE 30 MIL PVC OR EQUIVALENT.
11. **INSTALL RIVER ROCK** SPLASH PAD OVER A NON WOVEN GEO TEXTILE FABRIC TO TRANSITION FROM INLETS TO GROWING MEDIUM. SIZE OF ROCK SHALL BE 1" TO 3", 4 SQUARE FEET, 6" DEEP.
12. **CHECK DAMS:** SHALL BE PLACED ACCORDING TO FACILITY DESIGN. REFER TO DETAIL ST-6100 FOR PROFILE AND SPACING.
13. **SEASONAL HIGH GROUNDWATER SEPARATION:**
  - SEPARATION DISTANCE AS REQUIRED BY CITY.

**Vegetated Swale - Filtration**

DRAWING NUMBER: ST-6045

DRAWN BY: SR

SCALE: N.T.S.

FILE NAME: ST-6045.DWG

APPROVED BY: NK

DATE: 6/3/16

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS

## Vegetated Swales Operations & Maintenance Plan

| What to Look For  | What to Do   |
|---|--|
| <b>Structural Components, including inlets and outlets/overflows, shall freely convey stormwater.</b>                       |  |
| Clogged inlets or outlets   | -Remove sediment and debris from catch basins, trench drains, curb inlets and pipes to maintain at least 50% conveyance capacity at all times.                         |
| Cracked Drain Pipes   | -Replace/seal cracks. Replace when repair is insufficient.   |
| Check Dams  | -Maintain 4 - 10 inch deep rock check dams at design intervals.  |
| <b>Vegetation</b>   |  |
| Dead or strained vegetation   | -Replant per original planting plan, or substitute from Appendix A.<br>-Irrigate as needed. Mulch banks annually. DO NOT apply fertilizers, herbicides, or pesticides. |
| Tall Grass and Vegetation   | -Cut back to 4-6 inches, 1-2 times per year. Remove cuttings   |
| Weeds   | -Manually remove weeds. Remove all plant debris.   |
| <b>Growing/Filter Medium, including soil and gravels, shall sustain healthy plant cover and infiltrate within 72 hours.</b> |  |
| Gullies   | -Fill, lightly compact, and plant vegetation to disperse flow.   |
| Erosion   | -Restore or create outfalls, checkdams, or splash blocks where necessary.  |
| Slope Sippage   | -Stabilize Slope.  |
| Ponding   | -Rake, till, or amend to restore infiltration rate.  |

### Annual Maintenance Schedule:

*Summer.* Make any structural repairs. Improve filter medium as needed. Clear drain. Irrigate as needed.

*Fall.* Replant exposed soil and replace dead plants. Remove sediment and plant debris.

*Winter.* Monitor infiltration/flow-through rates. Clear inlets and outlets/overflows to maintain conveyance.

*Spring.* Remove sediment and plant debris. Replant exposed soil and replace dead plants. Mulch.

*All seasons.* Weed as necessary.

*Maintenance Records:* Record date, description, and contractor (if applicable) for all structural repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the inspector.

*Access:* Maintain ingress/egress to design standards.

*Infiltration/Flow Control:* All facilities shall drain within 72 hours. Record time/date, weather, and site conditions when ponding occurs.

*Pollution Prevention:* All sites shall implement best management practices to prevent hazardous or solid wastes or excessive oil and sediment from contaminating stormwater. Contact \_\_\_\_\_ for immediate assistance responding to spills. Record time/date, weather, and site conditions if site activities contaminate stormwater.

*Vectors (Mosquitoes & Rodents):* Stormwater facilities shall not harbor mosquito larvae or rats that pose a threat to public health or that undermine the facility structure. Monitor standing water for small wiggling sticks perpendicular to the water's surface.

Note holes/burrows in and around facilities. Call Clackamas County Vector Control for immediate assistance to eradicate vectors. Record time/date, weather, and site conditions when vector activity observed.

### Vegetated Swale O & M Plan

DRAWING NUMBER: ST-6055

DRAWN BY: SR

SCALE: N.T.S.

FILE NAME: ST-6055.DWG

APPROVED BY: NK

DATE: 10/8/14

CITY OF  
WILSONVILLE



PUBLIC WORKS STANDARDS



## STORMWATER FACILITIES OPERATIONS AND MAINTENANCE CHECKLIST

| <b>Problem</b>                                 | <b>Frequency</b>  | <b>Trigger</b>   | <b>Preferred Condition</b>   |
|--|---|--|--|
| <i>Sediment Accumulation in Treatment Area</i> | <i>Monthly from November through April<br/>Annually Required</i>                          | <i>Sediment depth exceeds 3 inches</i>   | <i>Sediment removed from vegetated treatment area: level side to side and drains freely toward outlet; no standing water within 24 hours of any major storm (1" in 24 hours)</i> |
| <i>Erosion Scouring</i>                        | <i>Monthly from November through April<br/>Annually Required</i>                          | <i>Monthly from November through April<br/>Annually Required</i>   | <i>Repair ruts or bare areas by filling with topsoil during dry season; regrade and replant large bare areas.</i>  |
| <i>Standing Water</i>                          | <i>Monthly from November through April and after any major storm (1 inch in 24 hours)</i> | <i>Standing water in the planter between storms that does not drain freely</i>   | <i>Remove sediment or trash blockages; improve end to end grade so there is no standing water 24 hours after any major storm (1 inch in 24 hours)</i>                            |
| <i>Flow not Distributed Evenly</i>             | <i>Monthly from November through April<br/>Annually Required</i>                          | <i>Flows unevenly distributed through planter width due to uneven or clogged flow spreader</i>                                       | <i>Level the spreader and clean so that flows spread evenly over entire planter width</i>  |
| <i>Settlement/ Misalignment</i>                | <i>Annually Required</i>  | <i>Failure of planters has created safety, function, or design problem</i>   | <i>Planter replaced or repaired to design standards</i>  |
| <i>Constant Baseflow</i>                       | <i>Monthly from November through April<br/>Annually Required</i>                          | <i>Small, continual flow of water through the planter even after weeks without rain; planter bottom has an eroded, muddy channel</i> | <i>Add a low-flow pea gravel drain the length of the planter or bypass the baseflow around the planter</i>   |
| <i>Vegetation</i>                              | <i>Monthly from November through April<br/>Annually Required</i>                          | <i>Vegetation blocking more than 10% of the inlet pipe opening</i>   | <i>No vegetation blocking the inlet pipe opening</i>   |
| <i>Poor Vegetation Coverage</i>                | <i>Monthly<br/>Annually Required</i>  | <i>Grass or other vegetation is sparse, or bare in more than 10% of the planter area</i>   | <i>Determine cause of poor growth and correct the condition; replant with plants (per Appendix A) as needed to meet facility standards</i>                                       |
| <i>Invasive Vegetation</i>                     | <i>Monthly<br/>Annually Required</i>  | <i>No invasive vegetation is planted or permitted to remain</i>  | <i>no invasive vegetation present; remove excessive weeds. Control if complete eradication is not feasible</i>   |
| <i>Rodents</i>                                 | <i>Monthly<br/>Annually Required</i>  | <i>Evidence of rodents or rodent damage</i>  | <i>No rodents; functioning facility</i>  |
| <i>Insects</i>                                 | <i>Annually Required</i>  | <i>Insects such as wasps and hornets that interfere with maintenance activities</i>  | <i>Harmful Insects removed</i>   |
| <i>Trash and Debris</i>                        | <i>Monthly and after any major storm (1 inch in 24 hours)<br/>Annually Required</i>       | <i>Visual evidence of trash, debris or dumping</i>   | <i>Trash and Debris removed from facility</i>  |
| <i>Contamination and Pollution</i>             | <i>Monthly from November through April<br/>Annually Required</i>                          | <i>Any evidence of oil, gasoline, contamination or other pollutants</i>  | <i>No contaminants or pollutants present; coordinate removal/cleanup with local water quality response agency</i>  |
| <i>Obstructed Inlet/Outlet</i>                 | <i>Monthly and after any major storm event (1 inch in 24 hours)<br/>Annually Required</i> | <i>Inlet/outlet areas clogged with sediment, vegetation or debris</i>  | <i>Clear inlet and outlet; obstructions removed</i>  |
| <i>Excessive Shading</i>                       | <i>Monthly from November through April<br/>Annually Required</i>                          | <i>Vegetation growth is poor because unlight does not reach planter</i>  | <i>Trim over-hanging limbs and/or remove brushy vegetation as needed</i>   |
| <i>Vegetation</i>                              | <i>Monthly from November through April<br/>Annually Required</i>                          | <i>Specified or approved grass grows so tall that it competes with shrubs and/or becomes a fire danger</i>                           | <i>String trim non-wetland grasses to 4 inch to 6 inch and remove clippings; protect woody vegetation</i>  |

### Stormwater Facilities Operations & Maintenance Checklist

DRAWING NUMBER: ST-6115

DRAWN BY: SR

SCALE: N.T.S.

FILE NAME: ST-6115.DWG

APPROVED BY: NK

DATE: 10/3/14

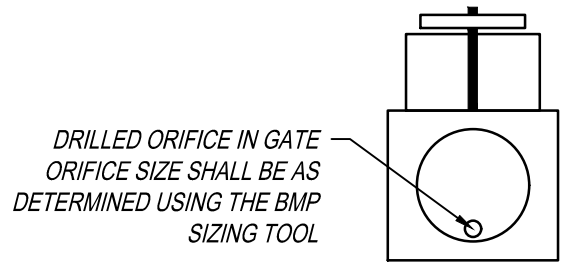
CITY OF  
WILSONVILLE



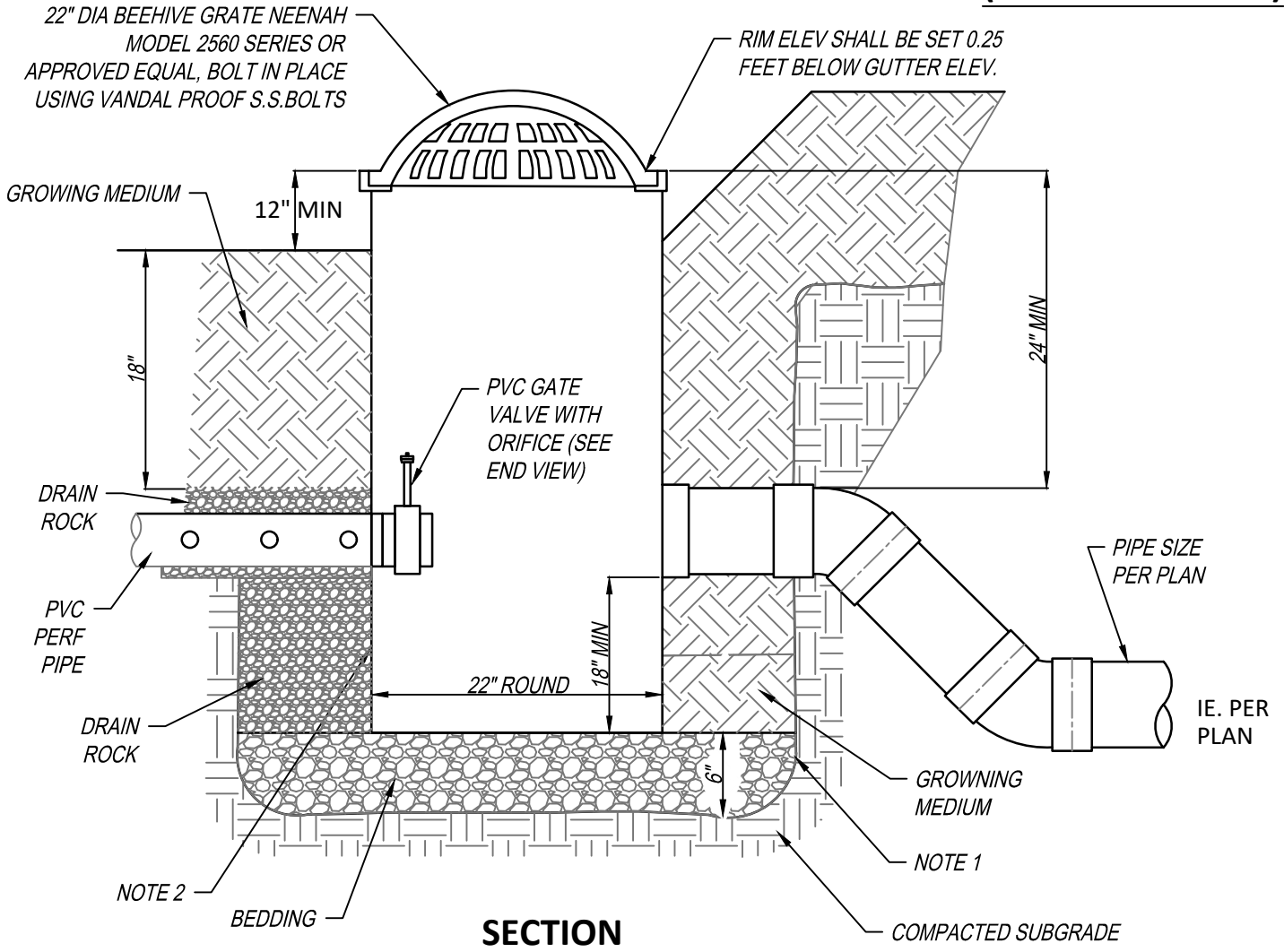
PUBLIC WORKS STANDARDS



This Detail Drawing may not be altered or changed in any manner except by the City Engineer. It is the responsibility of the user to acquire the most current version.




**END VIEW  
(PVC GATE VALVE)**



**SECTION**

**NOTES:**

1. CONTRACTOR TO WIDEN EXCAVATION AS REQUIRED TO OBTAIN COMPACTION WITH CONTRACTORS COMPACTION EQUIPMENT.
2. 10 GA. STEEL PLATE, BITUMINOUS COATED BASIN AS MANUFACTURED BY GIBSON STEEL, GRATEMASTER OR APPROVED EQUAL.
3. BEDDING SHALL BE 6" OF COMPACTIONED 3/4"-0 CRUSHED ROCK BASE MATERIAL.

|                         |                 |               |  |
|-------------------------|-----------------|---------------|--|
| Beehive Overflow Inlet  |                 |               | <b>CITY OF<br/>WILSONVILLE</b><br><br><br><br><b>PUBLIC WORKS STANDARDS</b> |
| DRAWING NUMBER: ST-6120 | DRAWN BY: SR    | SCALE: N.T.S. |  |
| FILE NAME: ST-6120.dwg  | APPROVED BY: NK | DATE: 2/15/18 |  |

## **Appendix C**

Traffic Impact Memorandum dated November 8, 2021, by DKS and Associates



# TECHNICAL MEMORANDUM

DATE: November 8, 2021

TO: Matt Palmer | City of Wilsonville

FROM: Scott Mansur, P.E., PTOE | DKS Associates  
 Jenna Bogert, P.E. | DKS Associates  
 Travis Larson, E.I. |DKS Associates

SUBJECT: Frog Pond West Estates Subdivision Development  
 Transportation Evaluation



P19006-017

## INTRODUCTION

This memorandum evaluates the trip generation associated with the proposed Frog Pond West Estates Subdivision development to be located near Willow Creek Drive in Wilsonville, Oregon. The owner desires to construct 17 single-family homes as part of the Frog Pond West Master Plan.<sup>1</sup> The purpose of this memorandum is to provide the estimated vehicle trip generation for the proposed subdivision, to identify potential operational impacts to the gateway intersections of the Frog Pond West Area, and to evaluate the proposed site plan for potential safety issues and consistency with City planning documents. The study intersections are listed below and shown on Figure 1.

- Stafford Road/ Frog Pond Lane
- Stafford Road/ Brisband Street
- Boeckman Road/ Willow Creek Drive



**FIGURE 1: STUDY AREA**

<sup>1</sup> Frog Pond West Master Plan, City of Wilsonville, July 17, 2017.

## TRIP GENERATION

The Institute of Transportation Engineers (ITE) trip generation rates for Single-Family Detached Housing (210) were used to estimate the site’s trip generation, which is based on the number of lots in the development.<sup>2</sup> As one home will be removed from the site during construction, the trips from that home have been subtracted from the total trips. As shown in Table 1, the proposed development is expected to generate a net total 18 PM peak hour trips (11 in, 7 out).

**TABLE 1: VEHICLE TRIP GENERATION**

| LAND USE                   | ITE DESCRIPTION (CODE)               | UNITS   | PM PEAK TRIP RATE <sup>A</sup> | PM PEAK TRIPS |          |           | WEEKDAY    |
|----------------------------|--------------------------------------|---------|--------------------------------|---------------|----------|-----------|------------|
|                            |                                      |         |                                | IN            | OUT      | TOTAL     |            |
| NEW HOMES                  | SINGLE-FAMILY DETACHED HOUSING (210) | 17 Lots | 1.12 trips per lot             | 12            | 7        | 19        | 198        |
| EXISTING HOME REMOVED      | SINGLE-FAMILY DETACHED HOUSING (210) | 1 Lot   | 1.00 trips per lot             | -1            | -0       | -1        | -15        |
| <b>TOTAL NET NEW TRIPS</b> |                                      |         |                                | <b>11</b>     | <b>7</b> | <b>18</b> | <b>183</b> |

<sup>A</sup> PM peak trip rate is back-calculated from the fitted curve equation

## PROJECT TRIPS THROUGH CITY OF WILSONVILLE INTERCHANGE AREAS

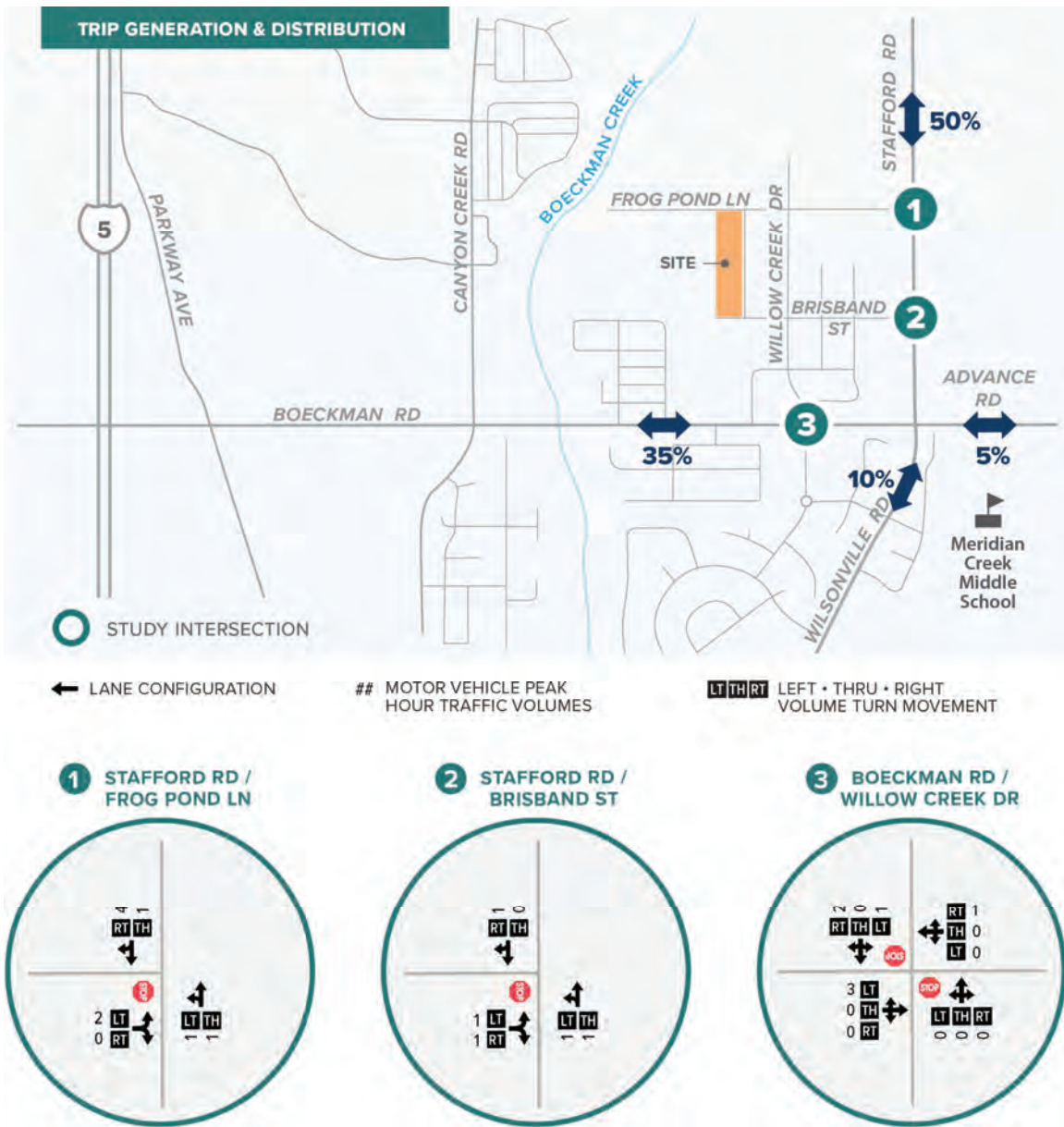
The project trips through the two City of Wilsonville I-5 interchange areas were estimated based on the trip generation and distribution assumptions. Approximately 5% (1 PM trip) of the project trips are expected to travel through the I-5/Wilsonville Road interchange area and 5% (1 PM trip) are expected to travel through the I-5/Elligsen Road interchange area.

## PROJECT TRIP DISTRIBUTION

The project trips, as shown in Table 1, were distributed based on data from the Wilsonville Travel Demand Model and previous Frog Pond traffic analyses.<sup>3</sup> The project trips and distribution are shown in Figure 2.

<sup>2</sup> Trip Generation Manual, 11th Edition, Institute of Transportation Engineers, 2021.

<sup>3</sup> Wilsonville Frog Pond West Vista Subdivision, Transportation Impact Analysis, DKS Associates, August 2021.



**FIGURE 2: PROJECT TRIPS AND DISTRIBUTION**

## INTERSECTION ANALYSIS

This section contains the intersection analysis at the identified study intersections and includes a discussion of the volume development. Intersection operations were determined for the analysis scenario *Existing + Project + Stage II*.

### EXISTING TRAFFIC VOLUMES

New turning movement count data was collected on Thursday, September 30<sup>th</sup>, 2021, during the weekday PM peak period (4:00-6:00 pm) at all study intersections. These new counts were then evaluated for any necessary factoring to represent typical existing PM peak volumes.

In July 2021, ODOT released their final COVID Monitoring Traffic Report, which indicated that statewide traffic levels were approximately back to “pre-COVID” levels (plus or minus 5%). Other local agencies in the area (including City of Wilsonville) have anecdotally noted similar observations on the local street system. Due to this fact, and that the traffic counts were collected when West Linn-Wilsonville schools were back to full-time, in-person attendance, no COVID adjustment factor was applied to the traffic counts.

## STAGE II TRAFFIC VOLUMES

Stage II development trips were included in the intersection analysis. The list of currently approved Stage II developments is provided by City staff.<sup>4</sup> These Stage II trips also included the impacts from the Frog Pond Crossing and Frog Pond Vista subdivisions. A list of all these developments is included in the appendix.

## INTERSECTION OPERATIONS

Intersection operations were analyzed for the PM peak hour during the Existing + Project + Stage II scenario. The traffic volumes are shown in Figure 3. The operations were determined based on the Highway Capacity Manual (HCM) 6th Edition methodology.<sup>5</sup> The volume to capacity (v/c) ratio, delay, and level of service (LOS) of each study intersection are listed in Table 2.

**TABLE 2: INTERSECTION OPERATIONS**

| INTERSECTION                   | OPERATING STANDARD | PM PEAK HOUR |       |     |
|--------------------------------|--------------------|--------------|-------|-----|
|                                |                    | V/C          | DELAY | LOS |
| <b>TWO-WAY STOP CONTROLLED</b> |                    |              |       |     |
| STAFFORD RD/ FROG POND LN      | LOS D              | 0.20         | 25.8  | A/D |
| STAFFORD RD/ BRISBAND ST       | LOS D              | 0.16         | 23.8  | A/C |
| BOECKMAN RD/ WILLOW CREEK DR   | LOS D              | 0.14         | 22.8  | A/C |

**TWO-WAY STOP CONTROLLED INTERSECTION:**

Delay = Critical Movement Delay (secs)  
v/c = Critical Movement Volume-to-Capacity Ratio  
LOS = Critical Levels of Service (Major/Minor Road)

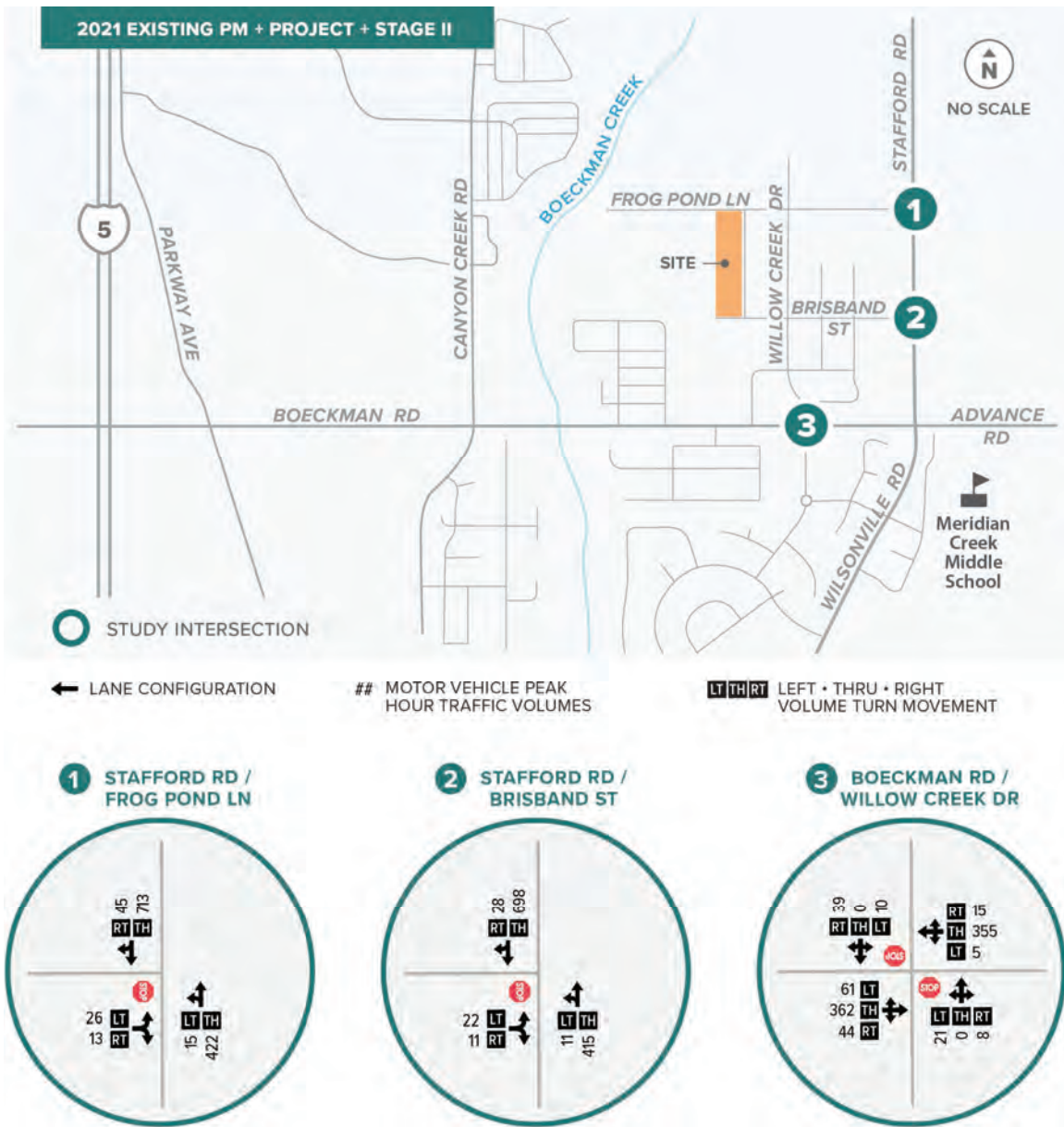
**Bold/Highlighted = Does not meet the operating standard/mobility target**

As shown, all study intersections meet the City of Wilsonville’s operating standard for the existing conditions.

<sup>4</sup> Email from Daniel Pauly, City of Wilsonville, July 8, 2021.

<sup>5</sup> Highway Capacity Manual, 6th Edition, Transportation Research Board, 2017.





**FIGURE 3: EXISTING PM + PROJECT + STAGE II PEAK HOUR TRAFFIC VOLUMES**

## SITE REVIEW

This chapter reviews the provided site plan to determine consistency with the Frog Pond West Master Plan, including street configuration and zoning, and alignment with the Wilsonville Development Code or Construction Standards, including vehicular access, parking, circulation, and street standards.

### FROG POND WEST MASTER PLAN CONSISTENCY

The proposed street layout matches the framework plan as laid out in the Frog Pond West Master Plan.<sup>6</sup> The residential zoning and land use in the site plan also appear to be consistent with the Master Plan.<sup>7</sup>

### ACCESS SPACING

The proposed project is required to comply with access spacing requirements as laid out in the City Transportation System Plan.<sup>8</sup> The access points for the new development are all on local streets, for which there is no spacing requirements prescribed by the City.

### SITE CIRCULATION

The proposed project provides adequate site circulation when considering the entirety of the Frog Pond West Master Plan. The proposed site will have access to Stafford Road via both Frog Pond Lane and Brisband Street and access to Boeckman Road via Willow Creek Drive.

### STREETS

The Frog Pond West Master Plan provides the street type plan and required cross sections for all streets in the Frog Pond West development.<sup>9</sup> The developer will be responsible for building the internal local streets both within and fronting the property with on-street parking and sidewalks. No dedicated bicycle facilities are required. The developer will also be required to build half street improvements along Frog Pond Lane along the property frontage (approximately 210 feet) that meet the Frog Pond West Master Plan cross section standard for Local streets (includes public utility easement, sidewalks, and planter strips).

### SIGHT DISTANCE

Adequate sight distance should be provided at the proposed alleys and internal streets. Objects (e.g., fences, walls, or vegetation) located near the intersections may inhibit sight distance for drivers attempting to turn out of a minor street onto the major street. Prior to occupancy, sight distance at any proposed access point will need to be verified, documented, and stamped by a

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<sup>6</sup> Figure 16, Frog Pond West Master Plan, City of Wilsonville, July 17, 2017.

<sup>7</sup> Figure 6 & Table 1, Frog Pond West Master Plan, City of Wilsonville, July 17, 2017.

<sup>8</sup> Table 3-2, Wilsonville Transportation System Plan, Amended November 2020.

<sup>9</sup> Figure 19, Frog Pond West Master Plan, City of Wilsonville, July 17, 2017.



registered professional Civil or Traffic Engineer licensed in the State of Oregon to assure that buildings, signs, or landscaping does not restrict sight distance.

## SUMMARY OF PROJECT IMPACTS

The key findings of the trip generation memo for the Frog Pond West Estates development are discussed below.

- The project will consist of 17 single-family home lots as part of the Frog Pond West Master Plan. The parcel is currently used for agricultural purposes with one single-family home on it.
- The proposed development is expected to generate a net total of 18 PM peak hour trips (11 in, 7 out).
- Approximately one (5%) trip is expected to travel through the I-5/Wilsonville Road interchange area and one (5%) trip is expected to travel through the I-5/Elligsen Road interchange area.
- All three study intersections will meet the City's peak hour operating standard.
- Based on the provided site plan, the site is consistent with the Frog Pond West Master Plan and meets applicable Wilsonville Development Codes and Construction Standards pertaining to vehicular access and circulation.
- The developer will be responsible for building the internal local streets both within and fronting the property with on-street parking and sidewalks.
- The developer will also be required to build half street improvements along Frog Pond Lane along the property frontage (approximately 210 feet) that meet the Frog Pond West Master Plan cross section standard for Local streets.
- Prior to occupancy, sight distance at any proposed access point will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon to assure that buildings, signs, or landscaping does not restrict sight distance.

### Attachments:

- A. Traffic Count Data
- B. Stage II List
- C. HCM Reports – Existing + Project + Stage II
- D. Site Plan

## A. TRAFFIC COUNT DATA

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

| Interval<br>Start Time | Heavy Vehicles |    |    |    |       | Interval<br>Start Time | Bicycles on Roadway |    |    |    |       | Interval<br>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              | 2  | 0  | 1  | 3     | 4:00 PM                | 0                   | 0  | 0  | 0  | 0     | 4:00 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:05 PM                | 0              | 0  | 0  | 1  | 1     | 4:05 PM                | 0                   | 0  | 0  | 0  | 0     | 4:05 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:10 PM                | 0              | 2  | 0  | 1  | 3     | 4:10 PM                | 0                   | 0  | 0  | 0  | 0     | 4:10 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:15 PM                | 0              | 2  | 0  | 1  | 3     | 4:15 PM                | 0                   | 0  | 0  | 0  | 0     | 4:15 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:20 PM                | 0              | 2  | 0  | 2  | 4     | 4:20 PM                | 0                   | 0  | 0  | 0  | 0     | 4:20 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:25 PM                | 1              | 0  | 0  | 0  | 1     | 4:25 PM                | 0                   | 0  | 0  | 0  | 0     | 4:25 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:30 PM                | 1              | 0  | 0  | 1  | 2     | 4:30 PM                | 0                   | 0  | 0  | 0  | 0     | 4:30 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:35 PM                | 0              | 0  | 0  | 0  | 0     | 4:35 PM                | 0                   | 0  | 0  | 0  | 0     | 4:35 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:40 PM                | 0              | 0  | 0  | 1  | 1     | 4:40 PM                | 0                   | 0  | 0  | 0  | 0     | 4:40 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:45 PM                | 0              | 0  | 0  | 2  | 2     | 4:45 PM                | 0                   | 0  | 0  | 0  | 0     | 4:45 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:50 PM                | 0              | 0  | 0  | 1  | 1     | 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              | 0  | 0  | 0  | 0     | 5:00 PM                | 0                   | 0  | 0  | 0  | 0     | 5:00 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:05 PM                | 0              | 0  | 0  | 2  | 2     | 5:05 PM                | 0                   | 0  | 0  | 0  | 0     | 5:05 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:10 PM                | 0              | 1  | 0  | 2  | 3     | 5:10 PM                | 0                   | 0  | 0  | 0  | 0     | 5:10 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:15 PM                | 0              | 0  | 0  | 1  | 1     | 5:15 PM                | 0                   | 0  | 0  | 0  | 0     | 5:15 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:20 PM                | 0              | 0  | 0  | 1  | 1     | 5:20 PM                | 0                   | 0  | 0  | 0  | 0     | 5:20 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:25 PM                | 0              | 0  | 0  | 0  | 0     | 5:25 PM                | 0                   | 0  | 0  | 0  | 0     | 5:25 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:30 PM                | 0              | 0  | 0  | 2  | 2     | 5:30 PM                | 0                   | 0  | 0  | 0  | 0     | 5:30 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:35 PM                | 0              | 0  | 0  | 1  | 1     | 5:35 PM                | 0                   | 0  | 0  | 0  | 0     | 5:35 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:40 PM                | 0              | 0  | 0  | 1  | 1     | 5:40 PM                | 0                   | 0  | 0  | 0  | 0     | 5:40 PM                | 2                                 | 0  | 0  | 0  | 2     |
| 5:45 PM                | 0              | 0  | 0  | 0  | 0     | 5:45 PM                | 0                   | 0  | 0  | 0  | 0     | 5:45 PM                | 2                                 | 0  | 0  | 0  | 2     |
| 5:50 PM                | 0              | 0  | 0  | 0  | 0     | 5:50 PM                | 0                   | 0  | 0  | 0  | 0     | 5:50 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:55 PM                | 0              | 0  | 0  | 0  | 0     | 5:55 PM                | 0                   | 0  | 0  | 0  | 0     | 5:55 PM                | 0                                 | 0  | 0  | 0  | 0     |
| Count Total            | 2              | 9  | 0  | 22 | 33    | Count Total            | 0                   | 0  | 0  | 0  | 0     | Count Total            | 4                                 | 0  | 0  | 0  | 4     |
| Peak Hour              | 0              | 1  | 0  | 14 | 15    | Peak Hour              | 0                   | 0  | 0  | 0  | 0     | Peak Hour              | 2                                 | 0  | 0  | 0  | 2     |



(303) 216-2439  
www.alltrafficdata.net

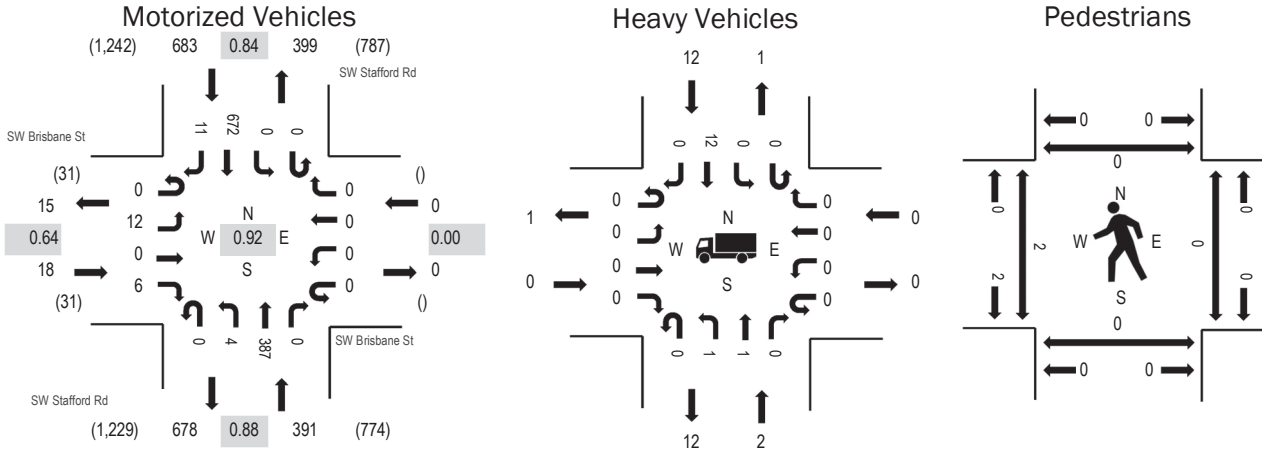
**Location:** 5 SW Stafford Rd & SW Brisbane St PM

**Date:** Thursday, September 30, 2021

**Peak Hour:** 04:45 PM - 05:45 PM

**Peak 15-Minutes:** 05:20 PM - 05:35 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

|     | HV%  | PHF  |
|-----|------|------|
| EB  | 0.0% | 0.64 |
| WB  | 0.0% | 0.00 |
| NB  | 0.5% | 0.88 |
| SB  | 1.8% | 0.84 |
| All | 1.3% | 0.92 |

**Traffic Counts - Motorized Vehicles**

| Interval Start Time | SW Brisbane St Eastbound |      |      |       | SW Brisbane St Westbound |      |      |       | SW Stafford Rd Northbound |      |      |       | SW Stafford Rd Southbound |      |       |       | Total | Rolling Hour |
|---------------------|--------------------------|------|------|-------|--------------------------|------|------|-------|---------------------------|------|------|-------|---------------------------|------|-------|-------|-------|--------------|
|                     | U-Turn                   | Left | Thru | Right | U-Turn                   | Left | Thru | Right | U-Turn                    | Left | Thru | Right | U-Turn                    | Left | Thru  | Right |       |              |
| 4:00 PM             | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 0    | 37   | 0     | 0                         | 0    | 49    | 0     | 86    | 986          |
| 4:05 PM             | 0                        | 1    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 0    | 41   | 0     | 0                         | 0    | 33    | 0     | 75    | 981          |
| 4:10 PM             | 0                        | 1    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 1    | 34   | 0     | 0                         | 0    | 46    | 0     | 82    | 992          |
| 4:15 PM             | 0                        | 0    | 0    | 1     | 0                        | 0    | 0    | 0     | 0                         | 0    | 30   | 0     | 0                         | 0    | 42    | 0     | 73    | 998          |
| 4:20 PM             | 0                        | 2    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 0    | 38   | 0     | 0                         | 0    | 48    | 2     | 90    | 1,010        |
| 4:25 PM             | 0                        | 1    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 0    | 35   | 0     | 0                         | 0    | 44    | 0     | 80    | 1,017        |
| 4:30 PM             | 0                        | 1    | 0    | 2     | 0                        | 0    | 0    | 0     | 0                         | 1    | 21   | 0     | 0                         | 0    | 48    | 2     | 75    | 1,042        |
| 4:35 PM             | 0                        | 1    | 0    | 1     | 0                        | 0    | 0    | 0     | 0                         | 0    | 34   | 0     | 0                         | 0    | 44    | 0     | 80    | 1,062        |
| 4:40 PM             | 0                        | 1    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 1    | 29   | 0     | 0                         | 0    | 43    | 3     | 77    | 1,068        |
| 4:45 PM             | 0                        | 0    | 0    | 1     | 0                        | 0    | 0    | 0     | 0                         | 0    | 30   | 0     | 0                         | 0    | 60    | 0     | 91    | 1,092        |
| 4:50 PM             | 0                        | 1    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 0    | 33   | 0     | 0                         | 0    | 55    | 0     | 89    | 1,089        |
| 4:55 PM             | 0                        | 1    | 0    | 1     | 0                        | 0    | 0    | 0     | 0                         | 0    | 31   | 0     | 0                         | 0    | 53    | 2     | 88    | 1,077        |
| 5:00 PM             | 0                        | 2    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 0    | 35   | 0     | 0                         | 0    | 41    | 3     | 81    | 1,061        |
| 5:05 PM             | 0                        | 3    | 0    | 1     | 0                        | 0    | 0    | 0     | 0                         | 0    | 34   | 0     | 0                         | 0    | 48    | 0     | 86    |              |
| 5:10 PM             | 0                        | 1    | 0    | 2     | 0                        | 0    | 0    | 0     | 0                         | 0    | 43   | 0     | 0                         | 0    | 42    | 0     | 88    |              |
| 5:15 PM             | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 0    | 28   | 0     | 0                         | 0    | 55    | 2     | 85    |              |
| 5:20 PM             | 0                        | 1    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 0    | 27   | 0     | 0                         | 0    | 66    | 3     | 97    |              |
| 5:25 PM             | 0                        | 0    | 0    | 1     | 0                        | 0    | 0    | 0     | 0                         | 1    | 29   | 0     | 0                         | 0    | 74    | 0     | 105   |              |
| 5:30 PM             | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 2    | 32   | 0     | 0                         | 0    | 61    | 0     | 95    |              |
| 5:35 PM             | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 0    | 32   | 0     | 0                         | 0    | 54    | 0     | 86    |              |
| 5:40 PM             | 0                        | 3    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 1    | 33   | 0     | 0                         | 0    | 63    | 1     | 101   |              |
| 5:45 PM             | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 0    | 35   | 0     | 0                         | 0    | 52    | 1     | 88    |              |
| 5:50 PM             | 0                        | 1    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 0    | 23   | 0     | 0                         | 0    | 51    | 2     | 77    |              |
| 5:55 PM             | 0                        | 0    | 0    | 0     | 0                        | 0    | 0    | 0     | 0                         | 1    | 22   | 0     | 0                         | 0    | 47    | 2     | 72    |              |
| Count Total         | 0                        | 21   | 0    | 10    | 0                        | 0    | 0    | 0     | 0                         | 8    | 766  | 0     | 0                         | 0    | 1,219 | 23    | 2,047 |              |
| Peak Hour           | 0                        | 12   | 0    | 6     | 0                        | 0    | 0    | 0     | 0                         | 4    | 387  | 0     | 0                         | 0    | 672   | 11    | 1,092 |              |

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

| Interval<br>Start Time | Heavy Vehicles |    |    |    |       | Interval<br>Start Time | Bicycles on Roadway |    |    |    |       | Interval<br>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              | 2  | 0  | 1  | 3     | 4:00 PM                | 0                   | 0  | 0  | 0  | 0     | 4:00 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:05 PM                | 0              | 0  | 0  | 0  | 0     | 4:05 PM                | 0                   | 0  | 0  | 0  | 0     | 4:05 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:10 PM                | 0              | 2  | 0  | 1  | 3     | 4:10 PM                | 0                   | 0  | 0  | 0  | 0     | 4:10 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:15 PM                | 0              | 2  | 0  | 0  | 2     | 4:15 PM                | 0                   | 0  | 0  | 0  | 0     | 4:15 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:20 PM                | 0              | 2  | 0  | 1  | 3     | 4:20 PM                | 0                   | 0  | 0  | 0  | 0     | 4:20 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:25 PM                | 0              | 0  | 0  | 2  | 2     | 4:25 PM                | 0                   | 0  | 0  | 0  | 0     | 4:25 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:30 PM                | 0              | 0  | 0  | 2  | 2     | 4:30 PM                | 0                   | 0  | 0  | 0  | 0     | 4:30 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:35 PM                | 0              | 0  | 0  | 0  | 0     | 4:35 PM                | 0                   | 0  | 0  | 0  | 0     | 4:35 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:40 PM                | 0              | 0  | 0  | 1  | 1     | 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                | 0                   | 0  | 0  | 0  | 0     | 4:45 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:50 PM                | 0              | 0  | 0  | 1  | 1     | 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              | 0  | 0  | 0  | 0     | 5:00 PM                | 0                   | 0  | 0  | 0  | 0     | 5:00 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:05 PM                | 0              | 0  | 0  | 1  | 1     | 5:05 PM                | 0                   | 0  | 0  | 0  | 0     | 5:05 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:10 PM                | 0              | 1  | 0  | 2  | 3     | 5:10 PM                | 0                   | 0  | 0  | 0  | 0     | 5:10 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:15 PM                | 0              | 0  | 0  | 1  | 1     | 5:15 PM                | 0                   | 0  | 0  | 0  | 0     | 5:15 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:20 PM                | 0              | 0  | 0  | 1  | 1     | 5:20 PM                | 0                   | 0  | 0  | 0  | 0     | 5:20 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:25 PM                | 0              | 0  | 0  | 0  | 0     | 5:25 PM                | 0                   | 0  | 0  | 0  | 0     | 5:25 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:30 PM                | 0              | 1  | 0  | 2  | 3     | 5:30 PM                | 0                   | 0  | 0  | 0  | 0     | 5:30 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:35 PM                | 0              | 0  | 0  | 1  | 1     | 5:35 PM                | 0                   | 0  | 0  | 0  | 0     | 5:35 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:40 PM                | 0              | 0  | 0  | 1  | 1     | 5:40 PM                | 0                   | 0  | 0  | 0  | 0     | 5:40 PM                | 2                                 | 0  | 0  | 0  | 2     |
| 5:45 PM                | 0              | 0  | 0  | 0  | 0     | 5:45 PM                | 0                   | 0  | 0  | 0  | 0     | 5:45 PM                | 2                                 | 0  | 0  | 0  | 2     |
| 5:50 PM                | 0              | 0  | 0  | 0  | 0     | 5:50 PM                | 0                   | 0  | 0  | 0  | 0     | 5:50 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:55 PM                | 0              | 0  | 0  | 0  | 0     | 5:55 PM                | 0                   | 0  | 0  | 0  | 0     | 5:55 PM                | 0                                 | 0  | 0  | 0  | 0     |
| Count Total            | 0              | 10 | 0  | 20 | 30    | Count Total            | 0                   | 0  | 0  | 0  | 0     | Count Total            | 4                                 | 0  | 0  | 0  | 4     |
| Peak Hour              | 0              | 2  | 0  | 12 | 14    | Peak Hour              | 0                   | 0  | 0  | 0  | 0     | Peak Hour              | 2                                 | 0  | 0  | 0  | 2     |



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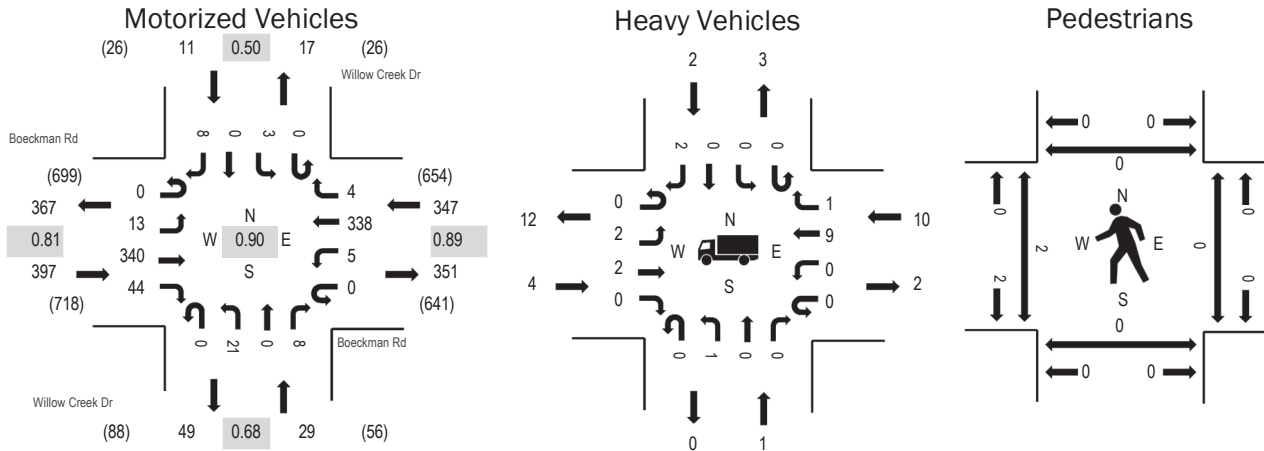
**Location:** 3 Willow Creek Dr & Boeckman Rd PM

**Date:** Thursday, September 30, 2021

**Peak Hour:** 04:45 PM - 05:45 PM

**Peak 15-Minutes:** 05:00 PM - 05:15 PM

**Peak Hour**



Note: Total study counts contained in parentheses.

|     | HV%   | PHF  |
|-----|-------|------|
| EB  | 1.0%  | 0.81 |
| WB  | 2.9%  | 0.89 |
| NB  | 3.4%  | 0.68 |
| SB  | 18.2% | 0.50 |
| All | 2.2%  | 0.90 |

**Traffic Counts - Motorized Vehicles**

| Interval<br>Start Time | Boeckman Rd<br>Eastbound |      |      |       | Boeckman Rd<br>Westbound |      |      |       | Willow Creek Dr<br>Northbound |      |      |       | Willow Creek Dr<br>Southbound |      |      |       | Total | Rolling<br>Hour |
|------------------------|--------------------------|------|------|-------|--------------------------|------|------|-------|-------------------------------|------|------|-------|-------------------------------|------|------|-------|-------|-----------------|
|                        | U-Turn                   | Left | Thru | Right | U-Turn                   | Left | Thru | Right | U-Turn                        | Left | Thru | Right | U-Turn                        | Left | Thru | Right |       |                 |
| 4:00 PM                | 0                        | 2    | 19   | 2     | 0                        | 0    | 45   | 0     | 0                             | 3    | 0    | 0     | 0                             | 1    | 0    | 0     | 72    | 700             |
| 4:05 PM                | 0                        | 0    | 16   | 2     | 0                        | 1    | 23   | 0     | 0                             | 3    | 0    | 1     | 0                             | 0    | 0    | 0     | 46    | 697             |
| 4:10 PM                | 0                        | 0    | 28   | 4     | 0                        | 0    | 23   | 0     | 0                             | 2    | 0    | 1     | 0                             | 0    | 0    | 1     | 59    | 723             |
| 4:15 PM                | 0                        | 1    | 24   | 2     | 0                        | 0    | 18   | 3     | 0                             | 1    | 0    | 0     | 0                             | 0    | 0    | 2     | 51    | 741             |
| 4:20 PM                | 0                        | 1    | 30   | 2     | 0                        | 0    | 18   | 0     | 0                             | 2    | 0    | 1     | 0                             | 1    | 0    | 2     | 57    | 749             |
| 4:25 PM                | 0                        | 1    | 22   | 5     | 0                        | 1    | 33   | 0     | 0                             | 0    | 0    | 0     | 0                             | 1    | 0    | 1     | 64    | 754             |
| 4:30 PM                | 0                        | 0    | 23   | 2     | 0                        | 0    | 30   | 0     | 0                             | 1    | 0    | 0     | 0                             | 1    | 0    | 2     | 59    | 736             |
| 4:35 PM                | 0                        | 0    | 27   | 1     | 0                        | 1    | 18   | 0     | 0                             | 1    | 0    | 0     | 0                             | 0    | 0    | 1     | 49    | 744             |
| 4:40 PM                | 0                        | 0    | 23   | 3     | 0                        | 1    | 16   | 0     | 0                             | 2    | 0    | 0     | 0                             | 0    | 0    | 0     | 45    | 756             |
| 4:45 PM                | 0                        | 0    | 29   | 1     | 0                        | 1    | 27   | 1     | 0                             | 1    | 0    | 1     | 0                             | 0    | 0    | 1     | 62    | 784             |
| 4:50 PM                | 0                        | 1    | 22   | 3     | 0                        | 1    | 33   | 0     | 0                             | 3    | 0    | 2     | 0                             | 0    | 0    | 2     | 67    | 773             |
| 4:55 PM                | 0                        | 1    | 35   | 6     | 0                        | 0    | 25   | 0     | 0                             | 0    | 0    | 2     | 0                             | 0    | 0    | 0     | 69    | 773             |
| 5:00 PM                | 0                        | 2    | 36   | 9     | 0                        | 0    | 20   | 0     | 0                             | 2    | 0    | 0     | 0                             | 0    | 0    | 0     | 69    | 754             |
| 5:05 PM                | 0                        | 1    | 30   | 2     | 0                        | 0    | 36   | 0     | 0                             | 2    | 0    | 0     | 0                             | 1    | 0    | 0     | 72    |                 |
| 5:10 PM                | 0                        | 1    | 33   | 7     | 0                        | 0    | 34   | 0     | 0                             | 2    | 0    | 0     | 0                             | 0    | 0    | 0     | 77    |                 |
| 5:15 PM                | 0                        | 1    | 24   | 3     | 0                        | 0    | 27   | 1     | 0                             | 2    | 0    | 1     | 0                             | 0    | 0    | 0     | 59    |                 |
| 5:20 PM                | 0                        | 2    | 25   | 0     | 0                        | 1    | 31   | 0     | 0                             | 1    | 0    | 0     | 0                             | 0    | 0    | 2     | 62    |                 |
| 5:25 PM                | 0                        | 0    | 22   | 0     | 0                        | 0    | 20   | 1     | 0                             | 1    | 0    | 0     | 0                             | 1    | 0    | 1     | 46    |                 |
| 5:30 PM                | 0                        | 0    | 28   | 8     | 0                        | 0    | 28   | 0     | 0                             | 1    | 0    | 1     | 0                             | 0    | 0    | 1     | 67    |                 |
| 5:35 PM                | 0                        | 3    | 25   | 2     | 0                        | 2    | 25   | 1     | 0                             | 3    | 0    | 0     | 0                             | 0    | 0    | 0     | 61    |                 |
| 5:40 PM                | 0                        | 1    | 31   | 3     | 0                        | 0    | 32   | 0     | 0                             | 3    | 0    | 1     | 0                             | 1    | 0    | 1     | 73    |                 |
| 5:45 PM                | 0                        | 1    | 23   | 2     | 0                        | 1    | 20   | 0     | 0                             | 3    | 0    | 0     | 0                             | 1    | 0    | 0     | 51    |                 |
| 5:50 PM                | 0                        | 0    | 22   | 4     | 0                        | 1    | 35   | 0     | 0                             | 4    | 0    | 0     | 0                             | 0    | 0    | 1     | 67    |                 |
| 5:55 PM                | 0                        | 0    | 25   | 4     | 0                        | 0    | 19   | 0     | 0                             | 2    | 0    | 0     | 0                             | 0    | 0    | 0     | 50    |                 |
| Count Total            | 0                        | 19   | 622  | 77    | 0                        | 11   | 636  | 7     | 0                             | 45   | 0    | 11    | 0                             | 8    | 0    | 18    | 1,454 |                 |
| Peak Hour              | 0                        | 13   | 340  | 44    | 0                        | 5    | 338  | 4     | 0                             | 21   | 0    | 8     | 0                             | 3    | 0    | 8     | 784   |                 |

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

| Interval<br>Start Time | Heavy Vehicles |    |    |    |       | Interval<br>Start Time | Bicycles on Roadway |    |    |    |       | Interval<br>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  | 1  | 0  | 1     | 4:00 PM                | 0                   | 0  | 0  | 0  | 0     | 4:00 PM                | 0                                 | 9  | 0  | 0  | 9     |
| 4:05 PM                | 0              | 0  | 2  | 0  | 2     | 4:05 PM                | 0                   | 0  | 0  | 0  | 0     | 4:05 PM                | 0                                 | 10 | 0  | 0  | 10    |
| 4:10 PM                | 0              | 0  | 1  | 0  | 1     | 4:10 PM                | 0                   | 0  | 0  | 0  | 0     | 4:10 PM                | 0                                 | 1  | 0  | 0  | 1     |
| 4:15 PM                | 1              | 0  | 0  | 0  | 1     | 4:15 PM                | 0                   | 0  | 0  | 0  | 0     | 4:15 PM                | 0                                 | 10 | 0  | 0  | 10    |
| 4:20 PM                | 0              | 0  | 2  | 0  | 2     | 4:20 PM                | 0                   | 0  | 0  | 0  | 0     | 4:20 PM                | 0                                 | 1  | 0  | 0  | 1     |
| 4:25 PM                | 1              | 0  | 2  | 0  | 3     | 4:25 PM                | 0                   | 0  | 0  | 0  | 0     | 4:25 PM                | 0                                 | 5  | 0  | 0  | 5     |
| 4:30 PM                | 0              | 0  | 1  | 0  | 1     | 4:30 PM                | 0                   | 0  | 0  | 0  | 0     | 4:30 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:35 PM                | 0              | 0  | 0  | 0  | 0     | 4:35 PM                | 0                   | 0  | 0  | 0  | 0     | 4:35 PM                | 0                                 | 3  | 0  | 0  | 3     |
| 4:40 PM                | 0              | 0  | 0  | 0  | 0     | 4:40 PM                | 0                   | 0  | 0  | 0  | 0     | 4:40 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:45 PM                | 0              | 0  | 1  | 0  | 1     | 4:45 PM                | 0                   | 0  | 0  | 0  | 0     | 4:45 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:50 PM                | 0              | 0  | 1  | 1  | 2     | 4:50 PM                | 0                   | 0  | 0  | 0  | 0     | 4:50 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 4:55 PM                | 0              | 0  | 0  | 0  | 0     | 4:55 PM                | 0                   | 0  | 0  | 0  | 0     | 4:55 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:00 PM                | 1              | 0  | 0  | 0  | 1     | 5:00 PM                | 0                   | 0  | 0  | 0  | 0     | 5:00 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:05 PM                | 0              | 0  | 1  | 0  | 1     | 5:05 PM                | 0                   | 0  | 0  | 0  | 0     | 5:05 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:10 PM                | 2              | 1  | 1  | 0  | 4     | 5:10 PM                | 0                   | 0  | 0  | 0  | 0     | 5:10 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:15 PM                | 0              | 0  | 1  | 0  | 1     | 5:15 PM                | 0                   | 0  | 0  | 0  | 0     | 5:15 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:20 PM                | 1              | 0  | 1  | 0  | 2     | 5:20 PM                | 0                   | 0  | 0  | 0  | 0     | 5:20 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:25 PM                | 0              | 0  | 0  | 0  | 0     | 5:25 PM                | 0                   | 0  | 0  | 0  | 0     | 5:25 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:30 PM                | 0              | 0  | 1  | 1  | 2     | 5:30 PM                | 0                   | 0  | 0  | 0  | 0     | 5:30 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:35 PM                | 0              | 0  | 3  | 0  | 3     | 5:35 PM                | 0                   | 0  | 0  | 0  | 0     | 5:35 PM                | 0                                 | 0  | 0  | 0  | 0     |
| 5:40 PM                | 0              | 0  | 0  | 0  | 0     | 5:40 PM                | 0                   | 0  | 0  | 0  | 0     | 5:40 PM                | 2                                 | 0  | 0  | 0  | 2     |
| 5:45 PM                | 0              | 0  | 0  | 0  | 0     | 5:45 PM                | 0                   | 0  | 0  | 0  | 0     | 5:45 PM                | 2                                 | 0  | 0  | 0  | 2     |
| 5:50 PM                | 0              | 0  | 0  | 1  | 1     | 5:50 PM                | 0                   | 0  | 0  | 0  | 0     | 5:50 PM                | 0                                 | 1  | 0  | 0  | 1     |
| 5:55 PM                | 0              | 0  | 0  | 0  | 0     | 5:55 PM                | 0                   | 0  | 0  | 0  | 0     | 5:55 PM                | 0                                 | 0  | 0  | 0  | 0     |
| Count Total            | 6              | 1  | 19 | 3  | 29    | Count Total            | 0                   | 0  | 0  | 0  | 0     | Count Total            | 4                                 | 40 | 0  | 0  | 44    |
| Peak Hour              | 4              | 1  | 10 | 2  | 17    | Peak Hour              | 0                   | 0  | 0  | 0  | 0     | Peak Hour              | 2                                 | 0  | 0  | 0  | 2     |



## B. STAGE II LIST

---

| Sort | Import Counts                          | Export                               | imports new ATD format |      |    |    |    |     |     |     |     |     |     |     |     | Total Vehicle Volumes |     |     |           |  |  |           |  |  |
|------|--|--------------------------------------|------------------------|------|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----------------------|-----|-----|-----------|--|--|-----------|--|--|
|      |  |                                      | Northbound             |      |    |    |    |     |     |     |     |     |     |     |     | Southbound            |     |     | Eastbound |  |  | Westbound |  |  |
|      |  |                                      | Count                  | Date | ak | Hr | St | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR                   | WBL | WBT | WBR       |  |  |           |  |  |
| 40   | Stage II Trips (New Trip Distribution) |                                      |                        |      |    |    |    |     |     |     |     |     |     |     |     |                       |     |     |           |  |  |           |  |  |
| 41   | 6                                      | SW Stafford Rd & SW Frog Pond Ln PM  |                        |      |    | 7  | 25 |     |     |     | 33  | 16  | 10  |     | 4   |                       |     |     |           |  |  |           |  |  |
| 42   | 5                                      | SW Stafford Rd & SW Brisbane St PM   |                        |      |    | 6  | 23 |     |     |     | 21  | 16  | 9   |     | 4   |                       |     |     |           |  |  |           |  |  |
| 43   | 4                                      | SW Wilsonville Rd & SW Advance Rd PM |                        |      |    | 4  | 11 | 1   |     | 4   | 7   | 14  | 11  | 8   | 4   |                       |     |     |           |  |  |           |  |  |
| 44   | 3                                      | Willow Creek Dr & Boeckman Rd PM     |                        |      |    |    |    |     |     | 5   |     | 19  | 31  | 18  |     |                       | 9   | 7   |           |  |  |           |  |  |
| 45   | 2                                      | SW Canyon Creek Rd & Boeckman Rd PM  |                        |      |    | 2  | 1  | 5   | 10  | 2   | 4   | 5   | 34  | 3   | 3   | 3                     | 29  | 6   |           |  |  |           |  |  |
| 46   | 1                                      | SW Parkway Ave & Boeckman Rd PM      |                        |      |    | 2  | 1  | 6   | 4   | 1   | 7   | 5   | 32  | 2   | 4   | 4                     | 28  | 3   |           |  |  |           |  |  |
| 50   | Stage II Trips - Crossing Trips        |                                      |                        |      |    |    |    |     |     |     |     |     |     |     |     |                       |     |     |           |  |  |           |  |  |
| 51   | 6                                      | SW Stafford Rd & SW Frog Pond Ln PM  |                        |      |    | 3  |    |     |     |     |     | 10  | 5   |     | 2   |                       |     |     |           |  |  |           |  |  |
| 52   | 5                                      | SW Stafford Rd & SW Brisbane St PM   |                        |      |    |    | 3  |     |     | 2   |     |     |     |     |     |                       |     |     |           |  |  |           |  |  |
| 53   | 4                                      | SW Wilsonville Rd & SW Advance Rd PM |                        |      |    |    | 1  |     | 1   | 1   |     |     | 1   |     |     |                       |     | 1   |           |  |  |           |  |  |
| 54   | 3                                      | Willow Creek Dr & Boeckman Rd PM     |                        |      |    |    |    |     |     |     | 5   | 6   | 1   |     |     |                       |     |     |           |  |  |           |  |  |
| 55   | 2                                      | SW Canyon Creek Rd & Boeckman Rd PM  |                        |      |    |    |    | 1   | 1   | 1   |     |     |     | 5   |     | 1                     | 3   | 1   |           |  |  |           |  |  |
| 56   | 1                                      | SW Parkway Ave & Boeckman Rd PM      |                        |      |    |    |    | 1   | 1   |     |     |     |     | 3   |     | 1                     | 1   | 1   |           |  |  |           |  |  |
| 60   | Stage II Trips - Vista Trips           |                                      |                        |      |    |    |    |     |     |     |     |     |     |     |     |                       |     |     |           |  |  |           |  |  |
| 61   | 6                                      | SW Stafford Rd & SW Frog Pond Ln PM  |                        |      |    | 4  |    |     |     |     |     | 13  | 8   |     | 3   |                       |     |     |           |  |  |           |  |  |
| 62   | 5                                      | SW Stafford Rd & SW Brisbane St PM   |                        |      |    |    | 4  |     |     | 3   |     |     |     |     |     |                       |     |     |           |  |  |           |  |  |
| 63   | 4                                      | SW Wilsonville Rd & SW Advance Rd PM |                        |      |    | 1  | 2  |     | 1   | 1   | 1   | 1   |     | 1   |     |                       | 1   | 1   |           |  |  |           |  |  |
| 64   | 3                                      | Willow Creek Dr & Boeckman Rd PM     |                        |      |    |    |    |     | 1   |     | 5   | 8   | 1   |     |     |                       | 1   | 2   |           |  |  |           |  |  |
| 65   | 2                                      | SW Canyon Creek Rd & Boeckman Rd PM  |                        |      |    |    |    | 1   | 1   |     |     |     |     | 7   |     | 1                     | 4   | 1   |           |  |  |           |  |  |
| 66   | 1                                      | SW Parkway Ave & Boeckman Rd PM      |                        |      |    |    |    | 1   | 1   |     |     |     |     | 5   |     | 1                     | 2   | 1   |           |  |  |           |  |  |

## C. HCM REPORTS – EXISTING + PROJECT + STAGE II

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| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.9  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 26   | 13   | 15   | 422  | 713  | 45   |
| Future Vol, veh/h        | 26   | 13   | 15   | 422  | 713  | 45   |
| Conflicting Peds, #/hr   | 0    | 0    | 2    | 0    | 0    | 2    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 0    | 0    | 0    | 0    | 2    | 50   |
| Mvmt Flow                | 28   | 14   | 16   | 459  | 775  | 49   |

| Major/Minor          | Minor2 | Major1 | Major2 |   |   |   |
|----------------------|--------|--------|--------|---|---|---|
| Conflicting Flow All | 1293   | 802    | 826    | 0 | - | 0 |
| Stage 1              | 802    | -      | -      | - | - | - |
| Stage 2              | 491    | -      | -      | - | - | - |
| Critical Hdwy        | 6.4    | 6.2    | 4.1    | - | - | - |
| Critical Hdwy Stg 1  | 5.4    | -      | -      | - | - | - |
| Critical Hdwy Stg 2  | 5.4    | -      | -      | - | - | - |
| Follow-up Hdwy       | 3.5    | 3.3    | 2.2    | - | - | - |
| Pot Cap-1 Maneuver   | 181    | 387    | 813    | - | - | - |
| Stage 1              | 445    | -      | -      | - | - | - |
| Stage 2              | 619    | -      | -      | - | - | - |
| Platoon blocked, %   |        |        |        | - | - | - |
| Mov Cap-1 Maneuver   | 176    | 386    | 812    | - | - | - |
| Mov Cap-2 Maneuver   | 176    | -      | -      | - | - | - |
| Stage 1              | 433    | -      | -      | - | - | - |
| Stage 2              | 618    | -      | -      | - | - | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 25.8 | 0.3 | 0  |
| HCM LOS              | D    |     |    |

| Minor Lane/Major Mvmt | NBL  | NBT | EBLn1 | SBT | SBR |
|-----------------------|------|-----|-------|-----|-----|
| Capacity (veh/h)      | 812  | -   | 215   | -   | -   |
| HCM Lane V/C Ratio    | 0.02 | -   | 0.197 | -   | -   |
| HCM Control Delay (s) | 9.5  | 0   | 25.8  | -   | -   |
| HCM Lane LOS          | A    | A   | D     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1  | -   | 0.7   | -   | -   |

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.8  |      |      |      |      |      |
| Movement                 | EBL  | EBR  | NBL  | NBT  | SBT  | SBR  |
| Lane Configurations      |      |      |      |      |      |      |
| Traffic Vol, veh/h       | 22   | 11   | 11   | 415  | 698  | 28   |
| Future Vol, veh/h        | 22   | 11   | 11   | 415  | 698  | 28   |
| Conflicting Peds, #/hr   | 0    | 0    | 2    | 0    | 0    | 2    |
| Sign Control             | Stop | Stop | Free | Free | Free | Free |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | 0    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 92   | 92   | 92   | 92   | 92   | 92   |
| Heavy Vehicles, %        | 0    | 0    | 25   | 0    | 2    | 0    |
| Mvmt Flow                | 24   | 12   | 12   | 451  | 759  | 30   |

| Major/Minor          | Minor2 | Major1 |       | Major2 |   |
|----------------------|--------|--------|-------|--------|---|
| Conflicting Flow All | 1251   | 776    | 791   | 0      | 0 |
| Stage 1              | 776    | -      | -     | -      | - |
| Stage 2              | 475    | -      | -     | -      | - |
| Critical Hdwy        | 6.4    | 6.2    | 4.35  | -      | - |
| Critical Hdwy Stg 1  | 5.4    | -      | -     | -      | - |
| Critical Hdwy Stg 2  | 5.4    | -      | -     | -      | - |
| Follow-up Hdwy       | 3.5    | 3.3    | 2.425 | -      | - |
| Pot Cap-1 Maneuver   | 192    | 401    | 736   | -      | - |
| Stage 1              | 457    | -      | -     | -      | - |
| Stage 2              | 630    | -      | -     | -      | - |
| Platoon blocked, %   |        |        |       | -      | - |
| Mov Cap-1 Maneuver   | 187    | 400    | 735   | -      | - |
| Mov Cap-2 Maneuver   | 187    | -      | -     | -      | - |
| Stage 1              | 446    | -      | -     | -      | - |
| Stage 2              | 629    | -      | -     | -      | - |

| Approach             | EB   | NB  | SB |
|----------------------|------|-----|----|
| HCM Control Delay, s | 23.8 | 0.3 | 0  |
| HCM LOS              | C    |     |    |

| Minor Lane/Major Mvmt | NBL   | NBT | EBLn1 | SBT | SBR |
|-----------------------|-------|-----|-------|-----|-----|
| Capacity (veh/h)      | 735   | -   | 227   | -   | -   |
| HCM Lane V/C Ratio    | 0.016 | -   | 0.158 | -   | -   |
| HCM Control Delay (s) | 10    | 0   | 23.8  | -   | -   |
| HCM Lane LOS          | A     | A   | C     | -   | -   |
| HCM 95th %tile Q(veh) | 0.1   | -   | 0.6   | -   | -   |

| Intersection             |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Int Delay, s/veh         | 2.1  |      |      |      |      |      |      |      |      |      |      |      |
| Movement                 | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations      |      | ↕    |      |      | ↕    |      |      | ↕    |      |      | ↕    |      |
| Traffic Vol, veh/h       | 61   | 362  | 44   | 5    | 355  | 15   | 21   | 0    | 8    | 10   | 0    | 39   |
| Future Vol, veh/h        | 61   | 362  | 44   | 5    | 355  | 15   | 21   | 0    | 8    | 10   | 0    | 39   |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    | 2    | 0    | 0    | 0    | 0    | 2    |
| Sign Control             | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized           | -    | -    | None | -    | -    | None | -    | -    | None | -    | -    | None |
| Storage Length           | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
| Veh in Median Storage, # | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Grade, %                 | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    | -    | 0    | -    |
| Peak Hour Factor         | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   | 90   |
| Heavy Vehicles, %        | 15   | 1    | 0    | 0    | 3    | 25   | 5    | 0    | 0    | 0    | 0    | 25   |
| Mvmt Flow                | 68   | 402  | 49   | 6    | 394  | 17   | 23   | 0    | 9    | 11   | 0    | 43   |

| Major/Minor          | Major1 |   |   | Major2 |   |   | Minor1 |     |     | Minor2 |      |       |
|----------------------|--------|---|---|--------|---|---|--------|-----|-----|--------|------|-------|
| Conflicting Flow All | 411    | 0 | 0 | 451    | 0 | 0 | 1001   | 986 | 427 | 982    | 1002 | 405   |
| Stage 1              | -      | - | - | -      | - | - | 563    | 563 | -   | 415    | 415  | -     |
| Stage 2              | -      | - | - | -      | - | - | 438    | 423 | -   | 567    | 587  | -     |
| Critical Hdwy        | 4.25   | - | - | 4.1    | - | - | 7.15   | 6.5 | 6.2 | 7.1    | 6.5  | 6.45  |
| Critical Hdwy Stg 1  | -      | - | - | -      | - | - | 6.15   | 5.5 | -   | 6.1    | 5.5  | -     |
| Critical Hdwy Stg 2  | -      | - | - | -      | - | - | 6.15   | 5.5 | -   | 6.1    | 5.5  | -     |
| Follow-up Hdwy       | 2.335  | - | - | 2.2    | - | - | 3.545  | 4   | 3.3 | 3.5    | 4    | 3.525 |
| Pot Cap-1 Maneuver   | 1081   | - | - | 1120   | - | - | 219    | 250 | 632 | 230    | 244  | 599   |
| Stage 1              | -      | - | - | -      | - | - | 506    | 512 | -   | 619    | 596  | -     |
| Stage 2              | -      | - | - | -      | - | - | 592    | 591 | -   | 512    | 500  | -     |
| Platoon blocked, %   |        | - | - |        | - | - |        |     |     |        |      |       |
| Mov Cap-1 Maneuver   | 1081   | - | - | 1120   | - | - | 189    | 227 | 632 | 211    | 222  | 598   |
| Mov Cap-2 Maneuver   | -      | - | - | -      | - | - | 189    | 227 | -   | 211    | 222  | -     |
| Stage 1              | -      | - | - | -      | - | - | 463    | 468 | -   | 566    | 592  | -     |
| Stage 2              | -      | - | - | -      | - | - | 544    | 587 | -   | 462    | 458  | -     |

| Approach             | EB  |  |  | WB  |  |  | NB   |  |  | SB   |  |  |
|----------------------|-----|--|--|-----|--|--|------|--|--|------|--|--|
| HCM Control Delay, s | 1.1 |  |  | 0.1 |  |  | 22.8 |  |  | 14.5 |  |  |
| HCM LOS              |     |  |  |     |  |  | C    |  |  | B    |  |  |

| Minor Lane/Major Mvmt | NBLn1 | EBL   | EBT | EBR | WBL   | WBT | WBR | SBLn1 |
|-----------------------|-------|-------|-----|-----|-------|-----|-----|-------|
| Capacity (veh/h)      | 234   | 1081  | -   | -   | 1120  | -   | -   | 435   |
| HCM Lane V/C Ratio    | 0.138 | 0.063 | -   | -   | 0.005 | -   | -   | 0.125 |
| HCM Control Delay (s) | 22.8  | 8.6   | 0   | -   | 8.2   | 0   | -   | 14.5  |
| HCM Lane LOS          | C     | A     | A   | -   | A     | A   | -   | B     |
| HCM 95th %tile Q(veh) | 0.5   | 0.2   | -   | -   | 0     | -   | -   | 0.4   |

## D. SITE PLAN

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WEST HILL  
 LAND DEVELOPMENT  
 CONSULTANT

**FROG POND ESTATES (THURMOND PROPERTY)**  
 CITY OF WILSONVILLE, OREGON

**PRELIMINARY SITE PLAN**

| TITLE              |                |             |
|--------------------|----------------|-------------|
| #                  | DATE           | DESCRIPTION |
|                    |                |             |
| REVISIONS          |                |             |
| DATUM              |                |             |
| OTAK CAD           | DRAWN BY       | CHECKED BY  |
| PRELIMINARY STATUS |                |             |
| AUGUST 25, 2021    | DATE           |             |
| 20141              | PROJECT NUMBER |             |
| <b>P1.0</b>        |                |             |

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 If this drawing is not 22" x 34", it has been reduced/enlarged. Scale accordingly.



PRELIMINARY SITE PLAN

P:\Projects\2010020100\20141\CADD\CAD\Draw\20141P1.0.dwg Layout Name: Layout1  
 P:\Projects\2010020100\20141\CADD\CAD\Draw\20141P1.0.dwg Layout Name: Layout1  
 P:\Projects\2010020100\20141\CADD\CAD\Draw\20141P1.0.dwg Layout Name: Layout1



## **Appendix D**

Arborist Report dated December 8, 2021, by Portland Tree Consulting



### **Frog Pond Estates (Thurmond Property) Arborist Report**

This Tree Plan is required by Section 4.610.40. Type C Permit as part of the site development application for the Thurmond Property subdivision in Wilsonville, Oregon. Trees were measured by a licensed surveyor and they were inventoried by an ISA Certified Arborist. The attached Tree Table includes all trees that are 6 inches in diameter and larger on or close to the property. There are forty-six trees on the property, and the Tree Table delineates those to be protected and those to be removed. Three additional trees in the Tree Table are off-site trees in the NW corner. Root protection zones (RPZs) for protected trees are listed in the Tree Table. Protected trees have metal identification tags that will remain until final inspection of the project.

A tree easement will be placed on Lots 1,5, and 6 to preserve the root crowns of protected trees that will be in the backyards of these lots. Landscape plans not covered here must be approved by and an ISA Certified Arborist. Following are the requirements and restrictions for the easement:

1. The top organic layer (turf layer) of soil may be removed to remove invasive blackberries and other vegetation and to facilitate landscape construction.
2. A layer of geo-textile fabric shall be applied to the native soil to provide a barrier between the root zone and landscaping.
3. Mulch and native plantings are encouraged.
4. Impermeable paving within the easement is prohibited.
5. Lawns/turf may be installed on grade on top of the geo-textile fabric. The lawn/turf area must be three feet away from the southern lot line or backyard fence. This three-foot wide area bordering the south lot line must be mulched three inches to four inches deep with woodchips or similar organic material. This area may be used as a planting bed for flowers, woody shrubs, or understory trees. Holes in the landscaping fabric may be cut and the appropriate hole dug for the intended planting. Trees must be installed by a certified landscape professional who will avoid damaging roots.
6. Patios must be constructed on grade and be paved with permeable pavers or permeable concrete to allow water to percolate into the root zones. Patios shall not exceed 400 square feet.
7. Tilling of the native soil is not allowed.
8. Raised bed gardens or planting containers may be installed and shall not exceed 64 square feet.
9. Play structures and sandboxes are allowed.

The purpose of the tree easement is to preserve the native root zones of the adjacent trees being preserved. The geo-textile fabric provides a barrier between landscaping activities and the root zones beneath, reduces soil compaction during regular use of the backyards, and allows stormwater to pass through to the roots of preserved trees. The preserved trees are currently adapted to competition from invasive weeds; therefore, the installation of lawns and other plantings is not a concern. The use of chemical fertilizers and herbicides is discouraged. When necessary, the use of chemical agents should be conservative and targeted.

The eight trees being preserved during development (5 on-site, 3 off-site) will be cordoned off with fencing built at the edge of root protection zones before construction activity begins. Fencing will consist of 6-foot high metal chain link secured with 8-foot metal posts. Without authorization, none of the following is allowed within a root protection zone:

1. New buildings;
2. Grade change or cut and fill, during or after construction;
3. New impervious surfaces;
4. Utility or drainage field placement;
5. Staging or storage of materials and equipment during construction;
6. Vehicle maneuvering during construction.

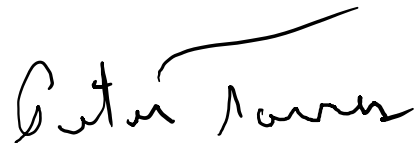
All five of the trees being preserved on the property should be pruned for dead branches before the lots are developed. Tree 50726, a 53-inch DBH Gary oak, will require additional pruning to reduce weight in the crown. I also recommend the installation of an additional support system in the crown which may take the form of steel cables. Steel rods extending through the tree trunk at the main crotch will reduce the likelihood of catastrophic failure at this structural defect.

There will be forty-one trees removed from the property. Twelve of the trees to be removed are black locust, an invasive species. Section 4.620.00. requires that each removed tree be replaced with a 2-inch caliper tree within one year of removal. Replacement trees shall be chosen for the site from an approved tree species list supplied by the City and shall be state Department of Agriculture Nursery Grade No. 1 or better. The trees must be staked, fertilized, and mulched, and shall be guaranteed by the permit grantee for two years after the planting date. The species and locations will be determined by the landscape designer. Alternatively, the owner may invoke Section 4.629.00.(06.) and pay the value of the replacement trees to the City Tree Fund if they cannot be planted at the site due to spatial limitations.

This Tree Plan meets the requirements of the tree preservation code and the owners will observe all laws, rules, and regulations. Trees to be removed should be verified and marked and tree protection measures should be inspected and approved before any clearing or grading work begins. It is the owner's responsibility to implement this tree plan and to monitor the construction process to its conclusion. Deviations can result in tree damage, liability, and violations of the City Code.

**Portland Tree Consulting** PO Box 19042 Portland, OR 97280  
503.421.3883 [peter@torresusa.com](mailto:peter@torresusa.com) CCB 230301

1. Client warrants any legal description provided to the Consultant is correct and titles and ownerships to property are good and marketable. Consultant shall not be responsible for incorrect information provided by Client.
2. Consultant can neither guarantee nor be responsible for the accuracy of information provided by others.
3. The Consultant shall not be required to give testimony or attend court or hearings unless subsequent contractual arrangements are made, including additional fees.
4. The report and any values expressed therein represent the opinion of the Consultant, and the Consultant's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.
5. Sketches, drawings and photographs in the report are intended as visual aids and may not be to scale. The reproduction of information generated by others will be for coordination and ease of reference. Inclusion of such information does not warrant the sufficiency or accuracy of the information by the Consultant.
6. Unless expressed otherwise, information in the report covers only items that were examined and reflects the condition at the time of inspection. The inspection is limited to visual examination of accessible items without laboratory analysis, dissection, excavation, probing, or coring, unless otherwise stated.
7. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the plants or property in question may not arise in the future.
8. The report is the completed work product. Any additional work, including production of a site plan, addenda and revisions, construction of tree protection measures, tree work, or inspection of tree protection measures, for example, must be contracted separately. Loss or alteration of any part of the report invalidates the entire report.
9. Any action or proceeding seeking to enforce any provision of this Agreement shall be brought against any of the parties in Multnomah County Circuit Court of the State of Oregon, or, when applicable, in the United States District Court for the District of Oregon. Each party consents to the jurisdiction of such courts (and of the appropriate appellate courts) and waives any objection to such venue.



Peter Torres

Master of Forestry ASCA RCA 372 ISA Certified Arborist PN-0650B TRAQ

| Tag | Survey | Species        | DBH | Rating | Cr. D | Remarks   | RPZ | Action  |
|-----|--------|----------------|-----|--------|-------|---|-----|---------|
|     | 50102  | giant sequoia  | 30  | 3      | 28    | off property  | 24  | Protect |
|     | 50127  | giant sequoia  | 28  | 3      | 24    | off property  | 24  | Protect |
|     | 50138  | apple          | 12  | 1      | 16    | topped with decay   | 0   | Remove  |
| 29  | 50139  | ponderosa pine | 28  | 1      | 28    | trunk within 10' of high voltage; over-trimmed            | 0   | Remove  |
| 28  | 50140  | ponderosa pine | 16  | 1      | 16    | suppressed, trimmed for high voltage                      | 0   | Remove  |
| 27  | 50141  | ponderosa pine | 28  | 1      | 16    | trimmed for high voltage                                  | 0   | Remove  |
|     | 50142  | ponderosa pine | 30  | 1      | 24    | trimmed for high voltage                                  | 0   | Remove  |
|     | 50143  | black locust   | 16  | 2      | 28    | over-crowding by ponderosa pine stand at high voltage     | 0   | Remove  |
|     | 50144  | black locust   | 18  | 2      | 20    | over-crowding   | 0   | Remove  |
|     | 50145  | black locust   | 12  | 2      | 24    | over-crowding   | 0   | Remove  |
|     | 50146  | black locust   | 10  | 2      | 20    | over-crowding   | 0   | Remove  |
|     | 50147  | black locust   | 6   | 2      | 16    | over-crowding   | 0   | Remove  |
|     | 50148  | black locust   | 9   | 2      | 16    | off Property  | 0   | Protect |
|     | 50149  | black locust   | 10  | 2      | 20    | over-crowding   | 0   | Remove  |
|     | 50150  | black locust   | 9   | 2      | 16    | over-crowding   | 0   | Remove  |
|     | 50151  | black locust   | 16  | 2      | 20    | healthy but spindly due to crowding; tag on tree is 50143 | 0   | Remove  |
|     | 50280  | apple          | 10  | 1      | 25    | topped with decay   | 0   | Remove  |
|     | 50281  | apple          | 14  | 1      | 24    | topped with decay   | 0   | Remove  |
|     | 50282  | apple          | 18  | 1      | 24    | topped with decay   | 0   | Remove  |
|     | 50550  | black locust   | 22  | 2      | 32    | structural weakness at grade; tag on tree is 50151        | 0   | Remove  |
|     | 50551  | black locust   | 6   | 2      | 12    | over-crowding   | 0   | Remove  |
|     | 50552  | black locust   | 11  | 2      | 16    | structurally weak seam in trunk                           | 0   | Remove  |
| 24  | 50553  | giant sequoia  | 50  | 2      | 36    | healthy with vitality                                     | 24  | Protect |
| 23  | 50554  | ponderosa pine | 49  | 2      | 44    | viable; in center of gravel turn around                   | 24  | Protect |
| 25  | 50555  | Gary oak       | 48  | 2      | 64    | viable; minor trunk swoop                                 | 24  | Protect |
|     | 50688  | ponderosa pine | 15  | 2      | 16    | viable  | 0   | Remove  |
|     | 50673  | Gary oak       | 28  | 1      | 12    | Off Property; dead snag                                   | 0   | none    |
|     | 50721  | missing        | 0   | 0      | 0     | 0   | 0   | none    |
|     | 50722  | red pine       | 24  | 2      | 20    | windrow   | 0   | Remove  |
|     | 50723  | red pine       | 22  | 2      | 20    | windrow   | 0   | Remove  |
|     | 50724  | red pine       | 16  | 2      | 16    | windrow   | 0   | Remove  |
|     | 50725  | red pine       | 15  | 2      | 16    | end of a windrow, under oak #50726                        | 12  | Protect |
| 26  | 50726  | Gary oak       | 53  | 2      | 64    | structural defect at main crotch below 8 ft. needs work   | 24  | Protect |

| Tag | Survey | Species    | DBH | Rating | Cr. D | Remarks              | RPZ | Action |
|-----|--------|------------|-----|--------|-------|----------------------|-----|--------|
|     | 50861  | Gary oak   | 8   | 3      | 12    | property line tree   | 0   | Remove |
|     | 50871  | red pine   | 26  | 2      | 28    | windrow              | 0   | Remove |
|     | 50872  | red pine   | 28  | 2      | 28    | windrow              | 0   | Remove |
|     | 50875  | red pine   | 11  | 2      | 20    | windrow              | 0   | Remove |
|     | 50876  | red pine   | 18  | 2      | 24    | windrow              | 0   | Remove |
|     | 50877  | red pine   | 20  | 2      | 24    | windrow              | 0   | Remove |
|     | 50880  | red pine   | 34  | 2      | 32    | windrow              | 0   | Remove |
|     | 50881  | red pine   | 22  | 2      | 24    | windrow              | 0   | Remove |
|     | 50882  | red pine   | 15  | 2      | 20    | windrow              | 0   | Remove |
|     | 50883  | red pine   | 14  | 2      | 16    | windrow              | 0   | Remove |
|     | 50887  | red pine   | 27  | 2      | 24    | windrow              | 0   | Remove |
|     | 50888  | red pine   | 22  | 2      | 24    | windrow              | 0   | Remove |
|     | 50889  | red pine   | 26  | 2      | 24    | windrow              | 0   | Remove |
|     | 50922  | cottonwood | 10  | 2      | 12    | stump sprout thicket | 0   | Remove |
|     | 50923  | cottonwood | 9   | 2      | 12    | stump sprout thicket | 0   | Remove |
|     | 50924  | cottonwood | 6   | 2      | 12    | stump sprout thicket | 0   | Remove |
|     | 50925  | cottonwood | 7   | 2      | 12    | stump sprout thicket | 0   | Remove |
|     | 50928  | apple      | 13  | 1      | 20    | topped with decay    | 0   | Remove |

**RPZ** mean root protection zone. This is a radius to the trunk measured in feet.

**Cr. D** = Crown Diameter or Canopy Spread

Fieldwork done by Ryan Neumann, PN-5539A on 8/17/2020 and by Peter Torres, PN-0650B on 12/8/2021.

Additional fieldwork done by Otak licensed surveyors for tree positions and DBH measurements at various times.

### Species

apple- *Malus sylvestris*

black locust- *Robinia pseudoacacia*

cottonwood- *Populus trichocarpa*

Gary oak- *Quercus garreyana*

giant sequoia- *Sequoiadendron giganteum*

ponderosa pine- *Pinus ponderosae*

red pine- *Pinus rubra*

## **Appendix E**

Geotechnical Report dated October 8, 2021, by Hardman Geotechnical Services, Inc.





October 8, 2021  
HGSI Project No. 21-2830

Dan Grimberg / Kristi Hosea  
**West Hills Land Development**  
3330 NW Yeon Avenue, Suite 200  
Portland, Oregon 97210

Via e-mail (pdf format); hard copies mailed upon request

**Subject: GEOTECHNICAL ENGINEERING AND INFILTRATION TESTING REPORT  
FROG POND ESTATES  
THURMOND PROPERTY  
7070 SW FROG POND LANE  
WILSONVILLE, CLACKAMAS COUNTY, OREGON**

This report presents the results of a geotechnical engineering study conducted by Hardman Geotechnical Services Inc. (HGSI) for Frog Pond Estates (Thurmond Property) at 7070 SW Frog Pond Lane in Wilsonville, Oregon (Figure 1). The purpose of this study was to evaluate subsurface conditions at the site and to provide geotechnical recommendations for site development.

#### **SITE DESCRIPTION AND PROPOSED DEVELOPMENT**

The subject property is currently occupied by a residential house, detached garage and deteriorating barn building; all located within the northern third of the site. The site is listed as 4.05 acres and is rectangular in shape. The areas surrounding the house and other structures are landscaped with lawn and a few trees, although this area is becoming overgrown with blackberries, etc. The southern two-thirds of the site remain undeveloped and are vegetated with tall grasses and shrubbery as well as a few young fruit trees. Along the western edge of the site is a line of older, mature deciduous and coniferous trees.

Preliminary plans indicate the site will be developed into a 17-lot residential subdivision that will include two separate tracts with the intention of having one or both serve as water quality/detention facilities. Site development will also include construction of on-site streets and underground utilities.

#### **REGIONAL GEOLOGY AND SEISMIC SETTING**

The subject site lies within the heart of the Portland Basin, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. The Portland Basin is a northwest-southwest trending structural basin produced by broad regional downwarping of the area. The Portland Basin is approximately 20 miles wide and 45 miles long and is filled with consolidated and unconsolidated sedimentary rocks of late Miocene, Pliocene and Pleistocene age.

Geologic maps indicate the subject site is underlain by Quaternary age (last 1.6 million years) silt, fine flood deposits that mantles basalt bedrock (Madin, 1990). This generally consists of massive fine sand and silt deposited following repeated catastrophic flooding events in the Willamette Valley, the last of which occurred between 15,000 and 10,000 years ago. In localized areas, the tan or white sandy silts include buried paleosols that developed between depositional events. Regionally, the total thickness of fine flood deposits range from 5 feet to greater than 100 feet.



October 8, 2021

HGSI Project No. 21-2830

The loess is underlain by residual soil formed by in place weathering of the underlying Columbia River Basalt Formation (Madin, 1990). The Miocene aged (about 14.5 to 16.5 million years ago) Columbia River Basalts are a thick sequence of lava flows which form the crystalline basement of the Tualatin Valley. The basalts are composed of dense, finely crystalline rock that is commonly fractured along blocky and columnar vertical joints. Individual basalt flow units typically range from 25 to 125 feet thick and interflow zones are typically vesicular, scoriaceous, brecciated, and sometimes include sedimentary rocks.

At least three major fault zones capable of generating damaging earthquakes are known to exist in the region. These include the Portland Hills Fault Zone, Gales Creek-Newberg-Mt. Angel Structural Zone, and the Cascadia Subduction Zone. These potential earthquake source zones are included in the determination of seismic design values for structures, as presented in the *Seismic Design* section. None of the known faults extend beneath the site.

## **FIELD EXPLORATION**

### **Exploratory Hand Auger Borings**

The site-specific exploration for this study was conducted on September 27 and October 7, 2021 and consisted of six hand auger borings (designated HA-1 through HA-6) at the approximate locations shown on the attached Site Plan, Figure 2. These borings were performed using a manually-operated hand auger.

Explorations were conducted under the full-time observation of HGSI personnel. Soil samples obtained from the borings were classified in the field and representative portions were placed in relatively air-tight plastic bags. These soil samples were then returned to the laboratory for further examination. Pertinent information including soil sample depths, stratigraphy, soil engineering characteristics, and groundwater occurrence was recorded. Soils were classified in general accordance with the Unified Soil Classification System.

Summary exploration logs are attached to this report. The stratigraphic contacts shown on the individual exploration logs represent the approximate boundaries between soil types. The actual transitions may be more gradual. The soil and groundwater conditions depicted are only for the specific dates and locations reported, and therefore, are not necessarily representative of other locations and times.

### **Infiltration Testing**

On September 27, 2021, HGSI performed falling head infiltration tests using the open-hole method in hand auger borings HA-1 and HA-2. The infiltration testing was performed by measuring the water level at ten-second intervals using HOBOTM data loggers, which measures water pressure corrected for temperature and barometric pressure. See attached HOBOTM water level data logger plot. The infiltration rate was determined based on the slope of the water depth line near the end of the test. Table 1 presents the results of the falling head infiltration tests.

**Table 1. Summary of Infiltration Test Results**

| <b>Boring</b> | <b>Depth (feet)</b> | <b>Soil Type</b> | <b>Infiltration Rate (in/hr)*</b> | <b>Hydraulic Head Range during Testing (inches)</b> |
|---------------|---------------------|------------------|-----------------------------------|---|
| HA-1          | 6.3                 | Clayey Silt (ML) | 0.7                               | 19.2 – 10.8   |
| HA-2          | 4.2                 | Clayey Silt (ML) | ---                               | ---   |

\*It should be noted that HA-2 experienced heavy caving due to rainy weather and the intrusion of surface water into the boring that rendered collected data unreliable. Data from HA-1 are representative of the similar soil conditions encountered in HA-2.

**SUBSURFACE CONDITIONS**

The following discussion is a summary of subsurface conditions encountered in our explorations. For more detailed information regarding subsurface conditions at specific exploration locations, refer to the attached hand auger logs. Also, please note that subsurface conditions can vary between exploration locations, as discussed in the *Uncertainty and Limitations* section below.

**Soil**

On-site soils are anticipated to consist of undocumented fill, topsoil, and Willamette silt soils as described below.

***Undocumented Fill*** – At the surface and termination points of HA-6 our exploration uncovered a layer of medium dense to dense, poorly graded gravel that was subangular in shape. HA-6 was terminated in the undocumented fill at shallow depth.

***Topsoil*** – Beginning at the surface level, all borings except HA-6 encountered a soft, wet to moist layer of dark brown silt that was inundated with short and tall grass roots. This highly organic unit was found to be between 6 to 12 inches thick.

***Willamette Silt*** – Beneath the topsoil in the hand augers, we encountered stiff to very stiff, moist to dry, brown silt to clayey silt. The upper several feet of this unit exhibited orange and gray mottling. Beyond depths of about 5.5 to 6 feet bgs the borings revealed an increasing amount of clay particles intermixed with the silt.

**Groundwater**

During the field exploration, no seepage or static groundwater table was encountered to the maximum depth of exploration at 10.2 feet bgs. Based on nearby water well data, depth to static groundwater is about 20 feet below the ground surface. Perched groundwater conditions often occur over fine-grained native deposits such as those beneath the site, particularly during the wet season. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors. The groundwater conditions reported above are for the specific date and locations indicated, and therefore may not necessarily be indicative of other times and/or locations.

## **CONCLUSIONS AND RECOMMENDATIONS**

Results of this study indicate that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and construction phases of the project. Recommendations are presented below regarding site preparation and undocumented fill removal, engineered fill, wet weather earthwork, spread footing foundations, below grade structural retaining walls, concrete slabs-on-grade, perimeter footing drains, seismic design, excavating conditions and utility trench backfill, stormwater infiltration systems, and erosion control considerations.

### **Site Preparation and Undocumented Fill Removal**

The areas of the site to be graded should first be cleared of vegetation, undocumented fill, and any loose debris; and debris from clearing should be removed from the site. Organic-rich topsoil should then be removed to competent native soils. We anticipate that the average depth of topsoil stripping will be about 6 to 12 inches over most of the site, however deeper stripping may be needed in localized areas. The final depth of stripping removal may vary depending on local subsurface conditions and the contractor's methods, and should be determined on the basis of site observations after the initial stripping has been performed. Stripped organic soil should be stockpiled only in designated areas or removed from the site and stripping operations should be observed and documented by HGSI. Existing subsurface structures (tile drains, old utility lines, septic leach fields, etc.) beneath areas of proposed structures and pavement should be removed and the excavations backfilled with engineered fill.

Undocumented fill was encountered in HA-6, which was terminated at shallow depth. There is potential for old fills to be present on site in other areas beyond our explorations. Where encountered beneath proposed structures, pavements, or other settlement-sensitive improvements, undocumented fill should be removed down to firm inorganic native soils and the removal area backfilled with engineered fill (see below). HGSI should observe removal excavations (if any) prior to fill placement to verify that overexcavations are adequate and an appropriate bearing stratum is exposed.

In construction areas, once stripping has been verified, the area should be ripped or tilled to a depth of 12 inches, moisture conditioned, and compacted in-place prior to the placement of engineered fill. Exposed subgrade soils should be evaluated by HGSI. For large areas, this evaluation is normally performed by proof-rolling the exposed subgrade with a fully loaded scraper or dump truck. For smaller areas where access is restricted, the subgrade should be evaluated by probing the soil with a steel probe. Soft/loose soils identified during subgrade preparation should be compacted to a firm and unyielding condition or over-excavated and replaced with engineered fill, as described below. The depth of overexcavation, if required, should be evaluated by HGSI at the time of construction.

### **Engineered Fill**

In general, we anticipate that on-site soils will be suitable for use as engineered fill in dry weather conditions, provided they are relatively free of organics and are properly moisture conditioned for compaction. Imported fill material must be approved by the geotechnical engineer prior to being imported to the site. Oversize material greater than 6 inches in size should not be used within 3 feet of foundation footings, and material greater than 12 inches in diameter should not be used in engineered fill.

Engineered fill should be compacted in horizontal lifts not exceeding 8 inches using standard compaction equipment. We recommend that engineered fill be compacted to at least 90 percent of the maximum dry density determined by ASTM D1557 (Modified Proctor) or equivalent. On-site soils may be wet or dry of optimum; therefore, we anticipate that moisture conditioning of native soil will be necessary for compaction operations.

October 8, 2021

HGSI Project No. 21-2830

Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill. Field density testing should conform to ASTM D2922 and D3017, or D1556. Engineered fill should be periodically observed and tested by the project geotechnical engineer or his representative. Typically, one density test is performed for at least every 2 vertical feet of fill placed or every 500 yd<sup>3</sup>, whichever requires more testing.

### **Wet Weather Earthwork**

The on-site soils are moisture sensitive and may be difficult to handle or traverse with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. Earthwork performed during the wet-weather season will probably require expensive measures such as cement treatment or imported granular material to compact fill to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Material used as engineered fill should consist of clean, granular soil containing less than about 7 percent fines. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;
- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and
- Bales of straw and/or geotextile silt fences should be strategically located to control erosion.

If cement or lime treatment is used to facilitate wet weather construction, HGSI should be contacted to provide additional recommendations and field monitoring.

### **Spread Footing Foundations**

Shallow, conventional isolated or continuous spread footings may be used to support the proposed structures, provided they are founded on competent native soils, or compacted engineered fill placed directly upon the competent native soils. We recommend a maximum allowable bearing pressure of 2,000 pounds per square foot (psf) for designing spread footings bearing on undisturbed native soils or engineered fill. The recommended maximum allowable bearing pressure may be increased by a factor of 1.33 for short term transient conditions such as wind and seismic loading. Exterior footings should be founded at least 18 inches below the lowest adjacent finished grade. Minimum footing widths should be determined by the project engineer/architect in accordance with applicable design codes.

Assuming construction is accomplished as recommended herein, and for the foundation loads anticipated, we estimate total settlement of spread foundations of less than about 1 inch and differential settlement between two adjacent load-bearing components supported on competent soil of less than about ½ inch. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied.

October 8, 2021

HGSI Project No. 21-2830

Wind, earthquakes, and unbalanced earth loads will subject the proposed structure to lateral forces. Lateral forces on a structure will be resisted by a combination of sliding resistance of its base or footing on the underlying soil and passive earth pressure against the buried portions of the structure. For use in design, a coefficient of friction of 0.5 may be assumed along the interface between the base of the footing and subgrade soils. Passive earth pressure for buried portions of structures may be calculated using an equivalent fluid weight of 390 pounds per cubic foot (pcf), assuming footings are cast against dense, natural soils or engineered fill. The recommended coefficient of friction and passive earth pressure values do not include a safety factor. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

Footing excavations should be trimmed neat and the bottom of the excavation should be carefully prepared. Loose, wet or otherwise softened soil should be removed from the footing excavation prior to placing reinforcing steel bars. HGSI should observe foundation excavations prior to placing crushed rock, to verify that adequate bearing soils have been reached. Due to the high moisture sensitivity of on-site soils, construction during wet weather may require overexcavation of footings and backfill with compacted, crushed aggregate.

### **Below-Grade Structural Retaining Walls**

Lateral earth pressures against below-grade retaining walls will depend upon the inclination of any adjacent slopes, type of backfill, degree of wall restraint, method of backfill placement, degree of backfill compaction, drainage provisions, and magnitude and location of any adjacent surcharge loads. At-rest soil pressure is exerted on a retaining wall when it is restrained against rotation. In contrast, active soil pressure will be exerted on a wall if its top is allowed to rotate or yield a distance of roughly 0.001 times its height or greater. If the subject retaining walls will be free to rotate at the top, they should be designed for an active earth pressure equivalent to that generated by a fluid weighing 35 pcf for level backfill against the wall. For restrained walls, an at-rest equivalent fluid pressure of 54 pcf should be used in design, again assuming level backfill against the wall. These values assume that the recommended drainage provisions are incorporated, and hydrostatic pressures are not allowed to develop against the wall.

During a seismic event, lateral earth pressures acting on below-grade structural walls will increase by an incremental amount that corresponds to the earthquake loading. Based on the Mononobe-Okabe equation and peak horizontal accelerations appropriate for the site location, seismic loading should be modeled using the active or at-rest earth pressures recommended above, plus an incremental rectangular-shaped seismic load of magnitude  $5H$ , where  $H$  is the total height of the wall.

We assume relatively level ground surface below the base of the walls. As such, we recommend passive earth pressure of 390 pcf for use in design, assuming wall footings are cast against competent native soils or engineered fill. If the ground surface slopes down and away from the base of any of the walls, a lower passive earth pressure should be used and HGSI should be contacted for additional recommendations.

A coefficient of friction of 0.5 may be assumed along the interface between the base of the wall footing and subgrade soils. The recommended coefficient of friction and passive earth pressure values do not include a safety factor, and an appropriate safety factor should be included in design. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

The above recommendations for lateral earth pressures assume that the backfill behind the subsurface walls will consist of properly compacted structural fill, and no adjacent surcharge loading. If the walls will be subjected to the influence of surcharge loading within a horizontal distance equal to or less than the height of the wall, the walls should be designed for the additional horizontal pressure. For uniform surcharge pressures, a uniformly distributed lateral pressure of 0.3 times the surcharge pressure should be added.

October 8, 2021

HGSI Project No. 21-2830

The recommended equivalent fluid densities assume a free-draining condition behind the walls so that hydrostatic pressures do not build up. This can be accomplished by placing a 12-inch wide zone of crushed drain rock containing less than 5 percent fines against the walls. A 3-inch minimum diameter perforated, plastic drain pipe should be installed at the base of the walls and connected to a sump to remove water from the crushed drain rock zone. The drain pipe should be wrapped in filter fabric (Mirafi 140N or other as approved by the geotechnical engineer) to minimize clogging. The above drainage measures are intended to remove water from behind the wall to prevent hydrostatic pressures from building up. Additional drainage measures may be specified by the project architect or structural engineer, for damp-proofing or other reasons.

HGSI should be contacted during construction to verify subgrade strength in wall keyway excavations, to verify that backslope soils are in accordance with our assumptions, and to take density tests on the wall backfill materials.

### **Concrete Slabs-on-Grade**

Preparation of areas beneath concrete slab-on-grade floors should be performed as recommended in the *Site Preparation* section. Care should be taken during excavation for foundations and floor slabs, to avoid disturbing subgrade soils. If subgrade soils have been adversely impacted by wet weather or otherwise disturbed, the surficial soils should be scarified to a minimum depth of 8 inches, moisture conditioned to within about 3 percent of optimum moisture content, and compacted to engineered fill specifications. Alternatively, disturbed soils may be removed and the removal zone backfilled with additional crushed rock. For evaluation of the concrete slab-on-grade floors using the beam on elastic foundation method, a modulus of subgrade reaction of 200 kcf (115 pci) should be assumed for the soils anticipated at subgrade depth. This value assumes the concrete slab system is designed and constructed as recommended herein, with a minimum thickness of crushed rock of 8 inches beneath the slab.

Interior slab-on-grade floors should be provided with an adequate moisture break. The capillary break material should consist of ODOT open graded aggregate per ODOT Standard Specifications 02630-2. The minimum recommended thickness of capillary break materials on re-compacted soil subgrade is 8 inches. The total thickness of crushed aggregate will be dependent on the subgrade conditions at the time of construction, and should be verified visually by proof-rolling. Under-slab aggregate should be compacted to at least 90% of its maximum dry density as determined by ASTM D1557 or equivalent.

In areas where moisture will be detrimental to floor coverings or equipment inside the proposed structure, appropriate vapor barrier and damp-proofing measures should be implemented. A commonly applied vapor barrier system consists of a 10-mil polyethylene vapor barrier placed directly over the capillary break material. With this type of system, an approximately 2-inch thick layer of sand is often placed over the vapor barrier to protect it from damage, to aid in curing of the concrete, and also to help prevent cement from bleeding down into the underlying capillary break materials. Other damp/vapor barrier systems may also be feasible. Appropriate design professionals should be consulted regarding vapor barrier and damp proofing systems, ventilation, building material selection and mold prevention issues, which are outside HGSI's area of expertise.

### **Perimeter Footing Drains**

Due to the potential for perched surface water above fine grained deposits such as those encountered at the site, we recommend the outside edge of perimeter footings be provided with a drainage system consisting of 3-inch minimum diameter perforated PVC pipe embedded in a minimum of 1 ft<sup>3</sup> per lineal foot of clean, free-draining sand and gravel or 1"- 1/4" drain rock. The drain pipe and surrounding drain rock should be wrapped in non-woven geotextile (Mirafi 140N, or approved equivalent) to minimize the potential for clogging and/or ground loss due to piping. Water collected from the footing drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained

throughout the drain and non-perforated pipe outlet. The footing drains should include clean-outs to allow periodic maintenance and inspection.

Down spouts and roof drains should collect roof water in a system separate from the footing drains in order to reduce the potential for clogging. Roof drain water should be directed to an appropriate discharge point well away from structural foundations. Grades should be sloped downward and away from buildings to reduce the potential for ponded water near structures.

**Seismic Design**

Structures should be designed to resist earthquake loading in accordance with the methodology described in the current Oregon Residential Specialty Code (ORSC). We recommend Site Class D (Stiff Soils) be used for design per the ORSC. Design values determined for the site using the ASCE 7-16 Hazard Tool are summarized on Table 2, for Risk Category II.

**Table 2. Recommended Earthquake Ground Motion Parameters (ASCE 7-16)**

| Parameter   | Value              |
|---|--------------------|
| Location (Lat, Long), degrees                               | 45.3211, -122.7494 |
| Mapped Spectral Acceleration Values<br>(MCE, Site Class B): |                    |
| Short Period, $S_s$   | 0.82 g             |
| 1.0 Sec Period, $S_1$                                       | 0.381 g            |
| Design Values for <b>Site Class D</b> (Stiff Soils):        |                    |
| Peak Ground Acceleration $PGA_M$                            | 0.458              |
| $F_a$   | 1.172              |
| $SD_s = 2/3 \times F_a \times S_s$                          | 0.641 g            |
| Seismic Design Category (2021 ORSC)                         | $D_0$              |

Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to earthquake shaking. Soil liquefaction is generally limited to loose, granular soils located below the water table. Following development, on-site soils will consist predominantly of stiff to very stiff silt which are not considered susceptible to liquefaction. Therefore, it is our opinion that special design or construction measures are not required to mitigate the effects of liquefaction.

**Excavating Conditions and Utility Trench Backfill**

We anticipate that on-site soils can be excavated using conventional heavy equipment such as scrapers and trackhoes to a depth of 10 feet and likely greater. Maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the contractor. Actual slope inclinations at the time of construction should be determined based on safety requirements and actual soil and groundwater conditions. All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Health Administration (OSHA) regulations (29 CFR Part 1926), or be shored. The existing native soils classify as Type B Soil and temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. This cut slope inclination is applicable to excavations above the water table only.

Perched groundwater conditions often occur over fine-grained native deposits such as those beneath the site, particularly during the wet season. If encountered, the contractor should be prepared to implement an

October 8, 2021

HGSI Project No. 21-2830

appropriate dewatering system for installation of the utilities. At this time, we anticipate that dewatering systems consisting of ditches, sumps and pumps would be adequate for control of groundwater where encountered during construction conducted during the dry season. Regardless of the dewatering system used, it should be installed and operated such that in-place soils are prevented from being removed along with the groundwater.

Vibrations created by traffic and construction equipment may cause some caving and raveling of excavation walls. In such an event, lateral support for the excavation walls should be provided by the contractor to prevent loss of ground support and possible distress to existing or previously constructed structural improvements.

Utility trench backfill should consist of ¾"-0 crushed rock, compacted to at least 90% of the maximum dry density obtained by Modified Proctor (ASTM D1557) or equivalent. Initial backfill lift thicknesses for a ¾"-0 crushed aggregate base may need to be as great as 4 feet to reduce the risk of flattening underlying flexible pipe. Subsequent lift thickness should not exceed 1 foot. If imported granular fill material is used, then the lifts for large vibrating plate-compaction equipment (e.g. hoe compactor attachments) may be up to 2 feet, provided that proper compaction is being achieved and each lift is tested. Use of large vibrating compaction equipment should be carefully monitored near existing structures and improvements due to the potential for vibration-induced damage.

Adequate density testing should be performed during construction to verify that the recommended relative compaction is achieved. Typically, one density test is taken for every 4 vertical feet of backfill on each 200-lineal-foot section of trench.

### **Stormwater Infiltration Facilities**

On September 27, 2021, HGSI performed falling head infiltration tests using the open hole method in HA-1 and HA-2. Measured infiltration rate in HA-1 was 0.7 inches/hour, at a depth of 6.5 feet bgs. No useable data was obtained in HA-2, which caved during testing. Based on similarity of soil types, an infiltration rate of 0.7 inches/hour is also suitable for use at the location of HA-2. HGSI recommends an ultimate infiltration rate of 0.7 inches per hour for design of the stormwater facility in this area. The ultimate infiltration rate does not incorporate a factor of safety and the stormwater system designer should incorporate a suitable factor of safety in design.

Infiltration test methods and procedures attempt to simulate the as-built conditions of the planned disposal system. However, due to natural variations in soil properties, actual infiltration rates may vary from the measured and/or recommended design rates. All systems should be constructed such that potential overflow is discharged in a controlled manner away from structures, and all systems should include an adequate factor of safety. Infiltration rates presented in this report should not be applied to inappropriate or complex hydrological models such as a closed basin without extensive further studies.

### **Erosion Control Considerations**

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which should include judicious use of straw, bio-bags, silt fences, or other appropriate technology. Where used, erosion control devices should be in place and remain in place throughout site preparation and construction. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets.



## UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and his/her consultants for use in design of this project only. This report should be provided in its entirety to prospective contractors for bidding and estimating purposes; however, the conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, HGSI should be notified for review of the recommendations of this report, and revision of such if necessary.

Sufficient geotechnical monitoring, testing and consultation should be provided during construction to confirm that the conditions encountered are consistent with those indicated by explorations. Recommendations for design changes will be provided should conditions revealed during construction differ from those anticipated, and to verify that the geotechnical aspects of construction comply with the contract plans and specifications.

Within the limitations of scope, schedule and budget, HGSI executed these services in accordance with generally accepted professional principles and practices in the field of geotechnical engineering at the time the report was prepared. No warranty, expressed or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.



We appreciate this opportunity to be of service.

Sincerely,

**HARDMAN GEOTECHNICAL SERVICES INC.**



Scott L. Hardman, P.E., G.E.  
Geotechnical Engineer

Attachments:   References  
                  Figure 1 – Vicinity Map  
                  Figure 2 – Site Plan  
                  Logs of Hand Auger Borings HA-1 through HA-6 (6 Pages)  
                  ASCE Seismic Design Hazards Report (3 Pages)

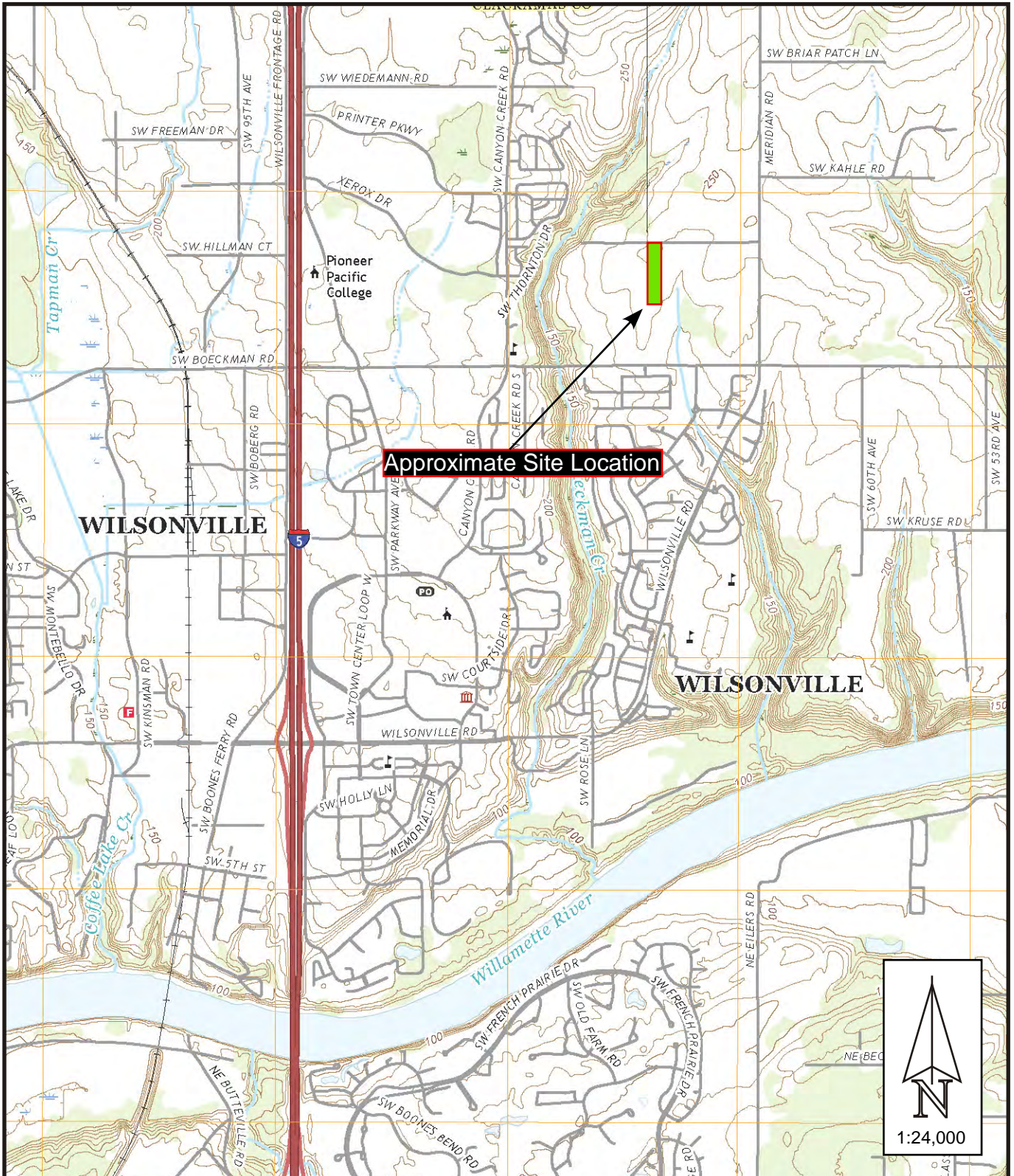


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Yeats, R.S., Graven, E.P., Werner, K.S., Goldfinger, C., and Popowski, T., 1996, Tectonics of the Willamette Valley, Oregon: in Assessing earthquake hazards and reducing risk in the Pacific Northwest, Vol. 1: U.S. Geological Survey Professional Paper 1560, P. 183-222, 5 plates, scale 1:100,000.

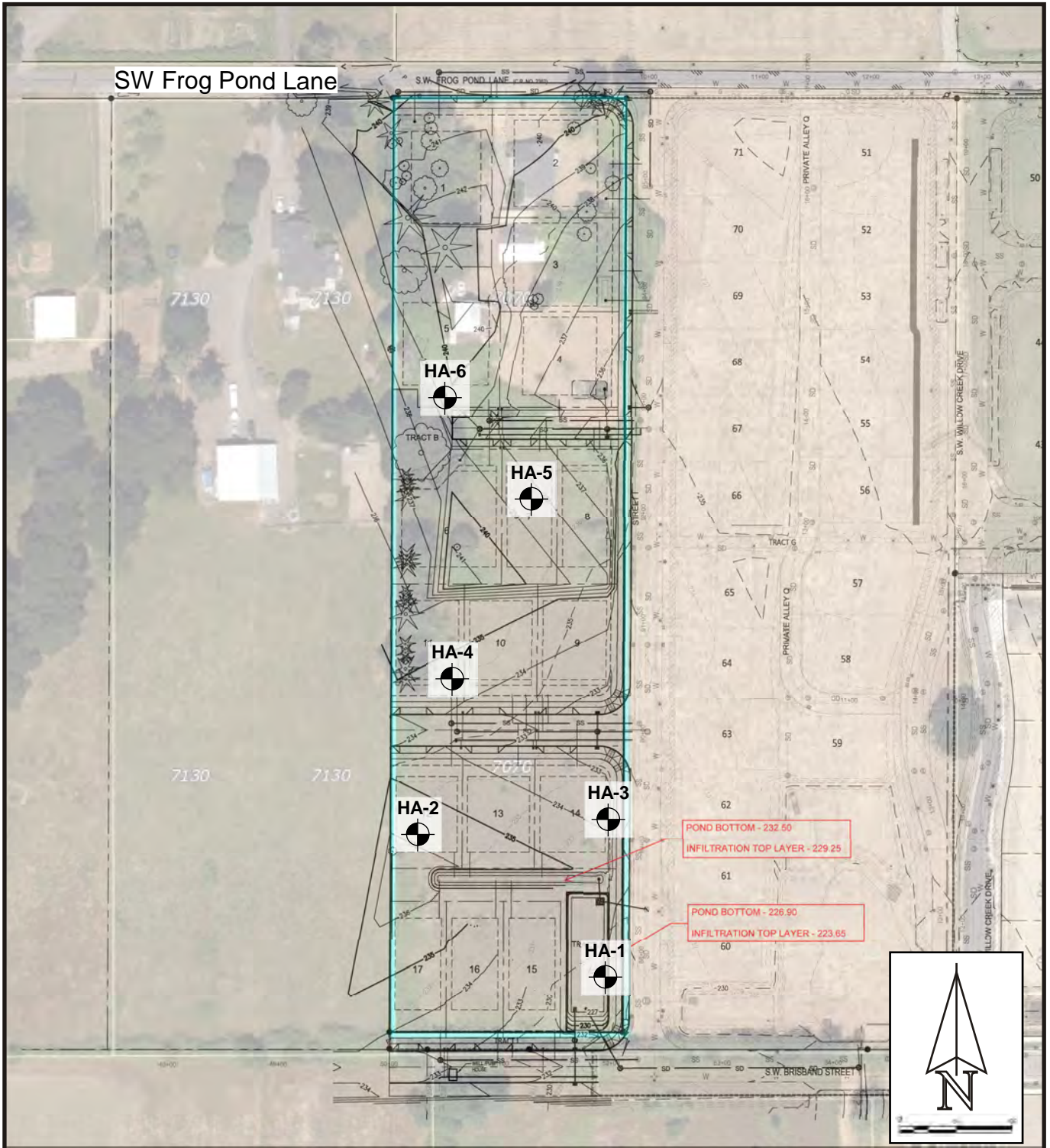


Project: 7070 SW Frog Pond Ln - Thurmond Prop  
Wilsonville, Oregon

Project No. 21-2830

FIGURE 1





— Approximate Site Boundary

HA-X  
Hand Auger Location

# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 1**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description  |
|------------|---|-----------------|--------------------|----------------------|-------------|---|
| 1          |   |                 |                    |                      |             | Wet to Moist, Nonplastic, Noncohesive, Soft, Dark Brown SILT (ML), Slightly Micaceous, Highly Organic with Grass Roots <i>[Native Willamette Silt]</i>  |
| 2          |   |                 |                    |                      |             | Slightly Moist to Dry, Nonplastic, Noncohesive, Stiff, Light Brown to Light Gray SILT (ML), Slightly Micaceous, with Heavy Orange & White Mottling <i>[Native Willamette Silt]</i>  |
| 3          |   |                 |                    |                      |             | Dry, Nonplastic, Noncohesive, Stiff to Very Stiff, Light Brown SILT (ML), Slightly Micaceous, With Some Orange & Gray Mottles <i>[Native Willamette Silt]</i>   |
| 4          |   |                 |                    |                      |             |   |
| 5          |   |                 |                    |                      |             | Slightly Moist, Nonplastic, Noncohesive to Slightly Cohesive, Stiff, Light Brown to Light Orange-Brown SILT to Clayey SILT (ML), Slightly Micaceous, with Moderate Orange to Gray Mottles <i>[Native Willamette Silt]</i> |
| 6          |   |                 |                    |                      |             |   |
| 7          |   |                 |                    |                      |             | <i>Boring terminated at 6.25 feet (75 inches)<br/>No groundwater or seepage encountered<br/>No caving</i>   |
| 8          |   |                 |                    |                      |             |   |
| 9          |   |                 |                    |                      |             |   |
| 10         |   |                 |                    |                      |             |   |

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(503) 530-8076

LEGEND



S-#



Soil Sample Depth  
Interval and Designation

Water Level at  
Time of Excavation

Date Bored: 09/27/2021

Logged By: JAC

Surface Elevation:

# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 2**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description  |
|------------|---|-----------------|--------------------|----------------------|-------------|---|
| 1          |   |                 |                    |                      |             | Wet to Moist, Nonplastic, Noncohesive, Soft, Dark Brown SILT (ML), Slightly Micaceous, Top 6" Highly Organic with Grass Roots <i>[Native Willamette Silt]</i> |
| 2          |   |                 |                    |                      |             | Dry, Nonplastic, Noncohesive, Stiff to Very Stiff, Light Brown SILT (ML), Slightly Micaceous, With Some Orange & Gray Mottles <i>[Native Willamette Silt]</i> |
| 3          |   |                 |                    |                      |             |   |
| 4          |   |                 |                    |                      |             | <i>Boring terminated at 4.0 feet (48 inches)<br/>No groundwater or seepage encountered<br/>No caving</i>  |
| 5          |   |                 |                    |                      |             |   |
| 6          |   |                 |                    |                      |             |   |
| 7          |   |                 |                    |                      |             |   |
| 8          |   |                 |                    |                      |             |   |
| 9          |   |                 |                    |                      |             |   |
| 10         |   |                 |                    |                      |             |   |

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LEGEND



S-#



Soil Sample Depth  
Interval and Designation

Water Level at  
Time of Excavation

Date Bored: 09/27/2021

Logged By: JAC

Surface Elevation:

# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 3**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description  |
|------------|---|-----------------|--------------------|----------------------|-------------|---|
| 1          |   |                 |                    |                      |             | Moist, Nonplastic, Noncohesive, Soft, Dark Brown SILT (ML), Slightly Micaceous, Top 5" Highly Organic with Grass Roots <i>[Native Willamette Silt]</i>                    |
| 2          |   |                 |                    |                      |             | Dry, Nonplastic, Noncohesive, Stiff, Light Brown SILT (ML), Slightly Micaceous, with Heavy Orange Mottels <i>[Native Willamette Silt]</i>                                 |
| 3          |   |                 |                    |                      |             | Slightly Moist, Nonplastic, Noncohesive, Stiff, Light Brown SILT (ML), Slightly Micaceous, with Heavy Orange & Gray Mottling <i>[Native Willamette Silt]</i>              |
| 4          |   |                 |                    |                      |             | Slightly Moist, Nonplastic, Noncohesive, Medium Stiff, Brown SILT (ML), Slightly Micaceous <i>[Native Willamette Silt]</i>  |
| 5          |   |                 |                    |                      |             |   |
| 6          |   |                 |                    |                      |             |   |
| 7          |   |                 |                    |                      |             | Moist, Very Slightly Plastic, Cohesive, Medium Stiff, Brown Clayey SILT (ML), Slightly Micaceous, with Few Orange & Gray Mottels <i>[Native Willamette Silt]</i>          |
| 8          |   |                 |                    |                      |             | Moist, Slightly Plastic, Cohesive, Medium Stiff, Brown Silty CLAY (CL), Slightly Micaceous, with Heavy Orange & Gray Mottels <i>[Native Willamette Silt]</i>              |
| 9          |   |                 |                    |                      |             | Moist, Plastic, Cohesive, Medium Soft, Brown CLAY with Trace Silt (CL), Slightly Micaceous, with Heavy Orange, Dark Brown, & Gray Mottels <i>[Native Willamette Silt]</i> |
| 10         |   |                 |                    |                      |             | <i>Boring terminated at 10.2 feet (122 inches)<br/>No groundwater or seepage encountered<br/>No caving</i>  |

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LEGEND



S-#



Soil Sample Depth  
Interval and Designation

Water Level at  
Time of Excavation

Date Bored: 10/07/2021

Logged By: JAC

Surface Elevation:

# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 4**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description   |
|------------|---|-----------------|--------------------|----------------------|-------------|--|
| 1          |   |                 |                    |                      |             | Moist, Nonplastic, Noncohesive, Soft, Dark Brown SILT (ML), Slightly Micaceous <i>[Native Willamette Silt]</i>   |
| 2          |   |                 |                    |                      |             | Dry to Very Slightly Moist, Nonplastic, Noncohesive, Stiff, Light Brown SILT (ML), Slightly Micaceous, with Heavy Orange Mottels <i>[Native Willamette Silt]</i> |
| 3          |   |                 |                    |                      |             |  |
| 4          |   |                 |                    |                      |             |  |
| 5          |   |                 |                    |                      |             |  |
| 6          |   |                 |                    |                      |             |  |
| 7          |   |                 |                    |                      |             | <i>Boring terminated at 6.25 feet (75 inches)<br/>No groundwater or seepage encountered<br/>No caving</i>  |
| 8          |   |                 |                    |                      |             |  |
| 9          |   |                 |                    |                      |             |  |
| 10         |   |                 |                    |                      |             |  |

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S-#



Soil Sample Depth  
Interval and Designation

Water Level at  
Time of Excavation

Date Bored: 10/07/2021

Logged By: JAC

Surface Elevation:



# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 5**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description   |
|------------|---|-----------------|--------------------|----------------------|-------------|--|
| 1          |   |                 |                    |                      |             | Moist, Nonplastic, Noncohesive, Soft, Dark Brown SILT (ML), Slightly Micaceous, Top 6" Highly Organic with Grass Roots <i>[Native Willamette Silt]</i>       |
| 2          |   |                 |                    |                      |             | Dry, Nonplastic, Noncohesive, Stiff, Light Brown SILT (ML), Slightly Micaceous, with Heavy Orange Mottels <i>[Native Willamette Silt]</i>                    |
| 3          |   |                 |                    |                      |             |  |
| 4          |   |                 |                    |                      |             |  |
| 5          |   |                 |                    |                      |             | Slightly Moist, Nonplastic, Noncohesive, Stiff, Light Brown SILT (ML), Slightly Micaceous, with Heavy Orange & Gray Mottling <i>[Native Willamette Silt]</i> |
| 6          |   |                 |                    |                      |             | Slightly Moist, Nonplastic, Noncohesive, Medium Stiff, Brown SILT (ML), Slightly Micaceous <i>[Native Willamette Silt]</i>                                   |
| 7          |   |                 |                    |                      |             | <i>Boring terminated at 6.7 feet (80 inches)<br/>No groundwater or seepage encountered<br/>No caving</i>   |
| 8          |   |                 |                    |                      |             |  |
| 9          |   |                 |                    |                      |             |  |
| 10         |   |                 |                    |                      |             |  |

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LEGEND



S-#



Soil Sample Depth  
Interval and Designation

Water Level at  
Time of Excavation

Date Bored: 10/07/2021

Logged By: JAC

Surface Elevation:

# LOG OF HAND AUGER BORING

Project: 7070 Frog Pond Ln - Thurmond  
Wilsonville, Oregon

Project No. 21-2830

Boring No. **HA - 6**

| Depth (ft) | Pocket Penetrometer (tons/ft <sup>2</sup> ) | Sample Interval | Sample Designation | Moisture Content (%) | Groundwater | Material Description  |
|------------|---|-----------------|--------------------|----------------------|-------------|---|
| 1          |   |                 |                    |                      |             | Slightly Moist, Medium Dense, Poorly Graded, Subangular, 1"-0" GRAVEL (GP) in Dark Brown Silty Matrix, Top 3" Highly Organic with Grass Roots<br><i>[Undocumented Fill]</i> |
| 2          |   |                 |                    |                      |             | Boring refusal on gravel at 1.1 feet (13 inches)<br>No groundwater or seepage encountered<br>No caving  |
| 3          |   |                 |                    |                      |             |   |
| 4          |   |                 |                    |                      |             |   |
| 5          |   |                 |                    |                      |             |   |
| 6          |   |                 |                    |                      |             |   |
| 7          |   |                 |                    |                      |             |   |
| 8          |   |                 |                    |                      |             |   |
| 9          |   |                 |                    |                      |             |   |
| 10         |   |                 |                    |                      |             |   |

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LEGEND



S-#



Soil Sample Depth Interval and Designation

Water Level at Time of Excavation

Date Bored: 10/07/2021

Logged By: JAC

Surface Elevation:

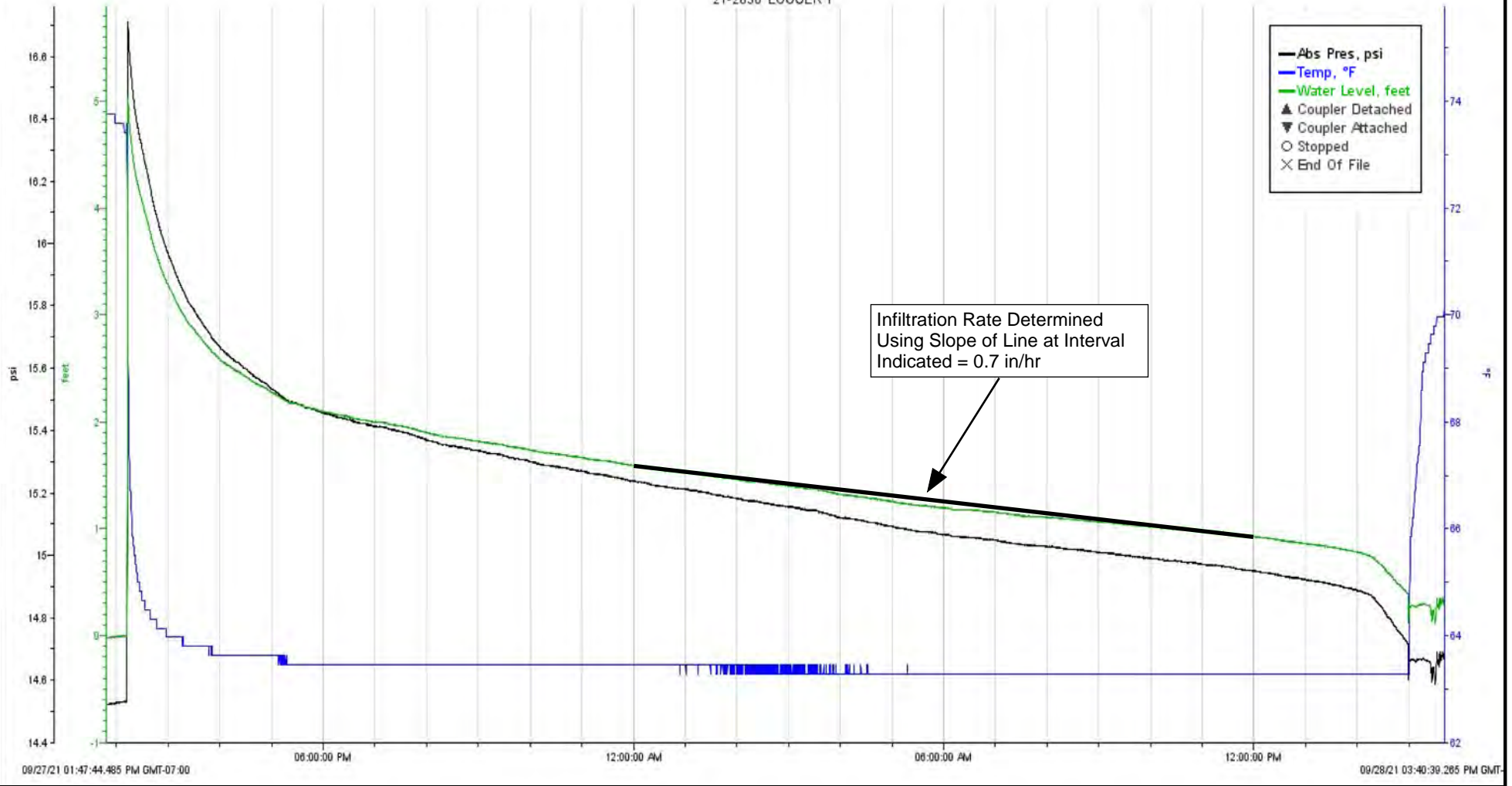


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# INFILTRATION TEST DATA

21-2830 LOGGER 1



Project: Frog Pond - Thurmond Property  
Wilsonville, Oregon

Date Tested: 09/27-28/2021  
Tested By: JAC  
Project No: 21-2830

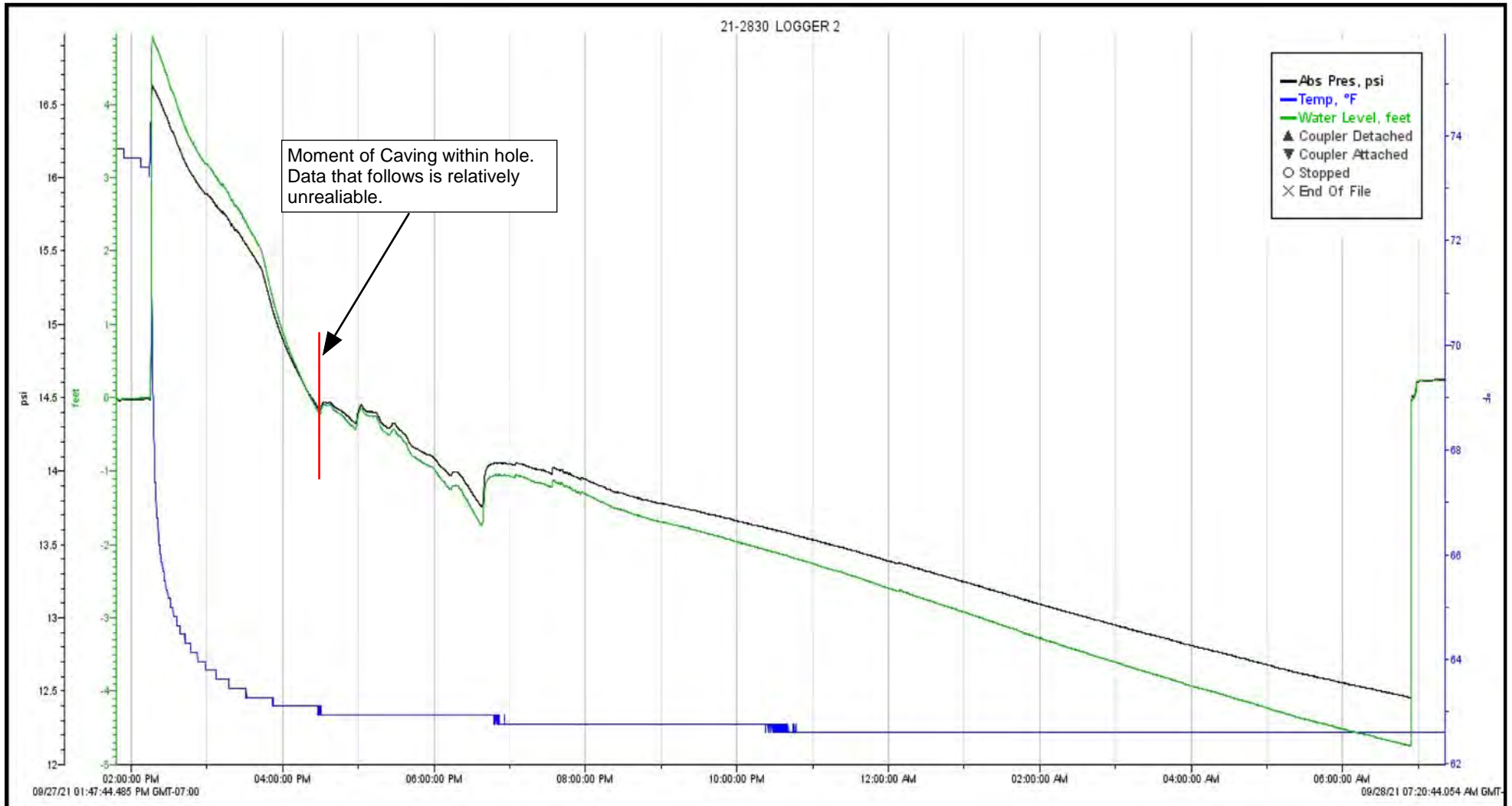
Boring: HA-1  
Depth: 6.25 Feet



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# INFILTRATION TEST DATA



Project: Frog Pond - Thurmond Property  
Wilsonville, Oregon

Date Tested: 09/27-28/2021  
Tested By: JAC  
Project No: 21-2830

Boring: HA-2  
Depth: 4.0 Feet

# ASCE 7 Hazards Report

**Address:**  
No Address at This  
Location

**Standard:** ASCE/SEI 7-16  
**Risk Category:** III  
**Soil Class:** D - Stiff Soil

**Elevation:** 238.19 ft (NAVD 88)  
**Latitude:** 45.321147  
**Longitude:** -122.749391



**Site Soil Class:** D - Stiff Soil

**Results:**

|            |       |                    |       |
|------------|-------|--------------------|-------|
| $S_s$ :    | 0.82  | $S_{D1}$ :         | N/A   |
| $S_1$ :    | 0.381 | $T_L$ :            | 16    |
| $F_a$ :    | 1.172 | PGA :              | 0.373 |
| $F_v$ :    | N/A   | PGA <sub>M</sub> : | 0.458 |
| $S_{MS}$ : | 0.961 | $F_{PGA}$ :        | 1.227 |
| $S_{M1}$ : | N/A   | $I_e$ :            | 1.25  |
| $S_{DS}$ : | 0.641 | $C_v$ :            | 1.21  |

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

**Data Accessed:** Thu Oct 07 2021

**Date Source:** [USGS Seismic Design Maps](#)

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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**Appendix F**  
Stafford Meadows PUD recorded CC&Rs and Bylaws





AFTER RECORDING, RETURN TO:

52p

Michelle D. Da Rosa LLC  
Attorney at Law  
205 SE Spokane Street, Suite 300  
Portland, OR 97202

Clackamas County Official Records  
Sherry Hall, County Clerk

2019-002161



\$358.00

02201725201900021610520524

01/15/2019 09:08:53 AM

PD-COV Cnt=3 Stn=2 COUNTER3  
\$260.00 \$10.00 \$16.00 \$62.00 \$10.00

**DECLARATION OF PROTECTIVE COVENANTS, CONDITIONS,  
RESTRICTIONS AND EASEMENTS  
FOR STAFFORD MEADOWS**

**WEST HILLS LAND DEVELOPMENT LLC**

Declarant

TABLE OF CONTENTS

|   | Page |
|---|------|
| ARTICLE 1 DEFINITIONS .....                                   | 1    |
| 1.1 “Additional Property” .....                               | 1    |
| 1.2 “Architectural Review Committee” or “the Committee” ..... | 1    |
| 1.3 “Assessments” .....                                       | 1    |
| 1.4 “Association” .....                                       | 1    |
| 1.5 “Board of Directors” or “the Board” .....                 | 2    |
| 1.6 “Bylaws” .....  | 2    |
| 1.7 “City of Wilsonville Development Agreements” .....        | 2    |
| 1.8 “Common Areas” .....                                      | 2    |
| 1.9 “Common Easement Areas” .....                             | 2    |
| 1.10 “Common Maintenance Areas” .....                         | 2    |
| 1.11 “Declarant” .....  | 2    |
| 1.12 “Design Guidelines” .....                                | 3    |
| 1.13 “Emergency Assessments” .....                            | 3    |
| 1.14 “Front Yard” .....                                       | 3    |
| 1.15 “General Assessments” .....                              | 3    |
| 1.16 “General Plan of Development” .....                      | 3    |
| 1.17 “Home” .....   | 3    |
| 1.18 “Improvement” .....                                      | 3    |
| 1.19 “Individual Assessments” .....                           | 3    |
| 1.20 “Initial Property” .....                                 | 3    |
| 1.21 “Limited Common Areas” .....                             | 3    |
| 1.22 “Limited Common Area Assessments” .....                  | 3    |
| 1.23 “Limited Common Easement Areas” .....                    | 3    |
| 1.24 “Lot” .....  | 3    |
| 1.25 “Mortgage” .....   | 3    |
| 1.26 “Occupant” .....   | 4    |
| 1.27 “Operations Fund” .....                                  | 4    |

|   |  |   |
|---|--|---|
| 1.28  | “Owner” .....                                      | 4 |
| 1.29  | “Person” .....                                     | 4 |
| 1.30  | “Plat” .....                                       | 4 |
| 1.31  | “Public Areas” .....                               | 4 |
| 1.32  | “Reserve Fund” .....                               | 4 |
| 1.33  | “Rules and Regulations” .....                      | 4 |
| 1.34  | “Sold” .....                                       | 4 |
| 1.35  | “Special Assessments” .....                        | 4 |
| 1.36  | “Stafford Meadows” .....                           | 4 |
| 1.37  | “The Property” .....                               | 4 |
| 1.38  | “This Declaration” .....                           | 4 |
| 1.39  | “Turnover Meeting” .....                           | 5 |
| 1.40  | “Working Fund Assessments” .....                   | 5 |
| ARTICLE 2 PROPERTY SUBJECT TO THIS DECLARATION..... |  | 5 |
| 2.1   | Initial Property. ....                             | 5 |
| 2.2   | Annexation of Additional Property. ....            | 5 |
| 2.3   | Improvements. ....                                 | 6 |
| 2.4   | Withdrawal of Property.....                        | 6 |
| 2.5   | Dedications.....                                   | 6 |
| 2.6   | Conversion of Lots to Common Areas.....            | 6 |
| 2.7   | Subdivisions.....                                  | 7 |
| 2.8   | Consolidations.....                                | 7 |
| ARTICLE 3 LAND CLASSIFICATIONS .....                |  | 7 |
| 3.1   | Land Classifications Within Initial Property. .... | 7 |
| 3.2   | Conversion of Lots to Common Areas.....            | 8 |
| 3.3   | Subdivisions.....                                  | 8 |
| 3.4   | Consolidations.....                                | 8 |
| ARTICLE 4 PROPERTY RIGHTS IN COMMON AREAS .....     |  | 8 |
| 4.1   | Owners’ Easements of Enjoyment. ....               | 8 |
| 4.2   | Title to Common Areas. ....                        | 9 |
| 4.3   | Extent of Owners’ Rights. ....                     | 9 |
| (a)   | Association Easements.....                         | 9 |



|  |  |    |
|--|--|----|
| (b)                                      | Public and Utility Easements.....  | 9  |
| (c)                                      | Use of the Common Areas.....   | 10 |
| (d)                                      | Alienation of the Common Areas.....  | 10 |
| (e)                                      | Leases, Easements, Rights-of-Way, Licenses and Similar<br>Interests and Vacations of Roadways..... | 10 |
| (f)                                      | Limitations on Use.....  | 10 |
| 4.4                                      | Delegation of Use.....   | 11 |
| 4.5                                      | Easements Reserved by Declarant.....   | 11 |
| 4.6                                      | Easement to Serve Other Property.....  | 12 |
| 4.7                                      | Limited Common Areas.....  | 12 |
| ARTICLE 5 PROPERTY RIGHTS IN LOTS .....  |  | 12 |
| 5.1                                      | Use and Occupancy.....   | 12 |
| 5.2                                      | Easements Reserved.....  | 12 |
| (a)                                      | Adjacent Common Maintenance Area.....  | 12 |
| (b)                                      | Utility Easements.....   | 13 |
| (c)                                      | Construction on Adjoining Lot.....   | 13 |
| (d)                                      | Utility Inspection and Repairs.....  | 13 |
| (e)                                      | Easements for Encroachments.....   | 13 |
| (f)                                      | Easements for Maintenance, Emergency and Enforcement.....  | 13 |
| (g)                                      | Future Easements.....  | 14 |
| ARTICLE 6 GENERAL USE RESTRICTIONS ..... |  | 14 |
| 6.1                                      | Structures Permitted.....  | 14 |
| 6.2                                      | Residential Use.....   | 14 |
| 6.3                                      | Offensive or Unlawful Activities.....  | 14 |
| 6.4                                      | Animals.....   | 15 |
| 6.5                                      | Maintenance of Structures.....   | 15 |
| 6.6                                      | Landscape Installation.....  | 15 |
| 6.7                                      | Maintenance of Landscaping.....  | 15 |
| 6.8                                      | Boundary Fences.....   | 16 |
| 6.9                                      | Fences, Hedges and Walls.....  | 16 |
| 6.10                                     | Pest and Weed Control.....   | 16 |
| 6.11                                     | Parking.....   | 16 |

|   |  |    |
|---|--|----|
| 6.12  | Vehicles in Disrepair.....                     | 16 |
| 6.13  | Signs.....                                     | 16 |
| 6.14  | Rubbish, Trash and Outside Storage.....        | 17 |
| 6.15  | Construction.....                              | 17 |
| 6.16  | Temporary Structures.....                      | 17 |
| 6.17  | Recreational Equipment.....                    | 17 |
| 6.18  | Service Facilities.....                        | 18 |
| 6.19  | Antennas and Satellite Dishes.....             | 18 |
| 6.20  | Exterior Lighting or Noisemaking Devices.....  | 18 |
| 6.21  | Subdividing or Partitioning Lots.....          | 18 |
| 6.22  | Grades, Slopes and Drainage.....               | 18 |
| 6.23  | Garages.....                                   | 18 |
| 6.24  | Windows, Decks, Porches and Outside Walls..... | 19 |
| 6.25  | Air Conditioning Units.....                    | 19 |
| 6.26  | Firearms and Fireworks.....                    | 19 |
| 6.27  | Nonbiodegradable Substances.....               | 19 |
| 6.28  | Leasing and Rental of Homes.....               | 19 |
| 6.29  | Rules and Regulations.....                     | 19 |
| ARTICLE 7 ARCHITECTURAL REVIEW COMMITTEE..... |  | 19 |
| 7.1   | Architectural Review.....                      | 19 |
| 7.2   | Committee Decision.....                        | 20 |
| 7.3   | Committee Discretion.....                      | 20 |
| 7.4   | Design Guidelines.....                         | 20 |
|   | (a) Adoption of Design Guidelines.....         | 20 |
|   | (b) Publication of Design Guidelines.....      | 21 |
|   | (c) Amendment of Design Guidelines.....        | 21 |
| 7.5   | Membership: Appointment and Removal.....       | 21 |
| 7.6   | Majority Action.....                           | 22 |
| 7.7   | Liability.....                                 | 22 |
| 7.8   | Nonwaiver.....                                 | 22 |
| 7.9   | Appeal.....                                    | 22 |
| 7.10  | Effective Period of Consent.....               | 22 |



|                            |   |    |
|----------------------------|---|----|
| 7.11                       | Estoppel Certificate.....   | 22 |
| 7.12                       | Enforcement.....  | 22 |
| ARTICLE 8 ASSOCIATION..... |   | 23 |
| 8.1                        | Organization.....   | 23 |
| 8.2                        | Membership.....   | 23 |
| 8.3                        | Voting Rights.....  | 23 |
| 8.4                        | General Powers and Obligations.....                                 | 24 |
| 8.5                        | Specific Powers and Duties.....                                     | 24 |
| (a)                        | Maintenance and Services.....                                       | 24 |
| (b)                        | Insurance.....  | 24 |
| (c)                        | Rulemaking.....   | 24 |
| (d)                        | Assessments.....  | 24 |
| (e)                        | Enforcement.....  | 24 |
| (f)                        | Employment of Agents, Advisers and Contractors.....                 | 25 |
| (g)                        | Borrow Money.....   | 25 |
| (h)                        | Acquire and Hold Title to Property.....                             | 25 |
| (i)                        | Transfers, Dedications, Encumbrances and Easements.....             | 25 |
| (j)                        | Create Classes of Service and Make Appropriate Charges.....         | 25 |
| (k)                        | Restoring Damaged Improvements.....                                 | 25 |
| (l)                        | Security.....   | 26 |
| (m)                        | Services.....   | 26 |
| (n)                        | Implied Rights and Obligations.....                                 | 26 |
| 8.6                        | Liability.....  | 26 |
| 8.7                        | Interim Board; Turnover Meeting.....                                | 26 |
| 8.8                        | Contracts Entered into by Declarant or Before Turnover Meeting..... | 27 |
| 8.9                        | Bylaws.....   | 27 |
| ARTICLE 9 MAINTENANCE..... |   | 27 |
| 9.1                        | Common Maintenance Areas.....                                       | 27 |
| 9.2                        | Maintenance and Lighting of Common Maintenance Areas.....           | 27 |
| 9.3                        | Maintenance of Utilities.....                                       | 28 |
| 9.4                        | Owner's Responsibility.....   | 28 |
| 9.5                        | Damage Liability.....   | 28 |

|                              |   |    |
|------------------------------|---|----|
| 9.6                          | Maintenance Plan .....  | 29 |
| ARTICLE 10 ASSESSMENTS ..... |   | 29 |
| 10.1                         | Purpose of Assessments. ....                                  | 29 |
| 10.2                         | When Lots Become Subject to Assessment. ....                  | 29 |
| 10.3                         | Allocation of Assessments. ....                               | 29 |
| 10.4                         | Type of Assessments.....                                      | 30 |
| (a)                          | General Assessments. ....                                     | 30 |
| (b)                          | Special Assessments.....                                      | 30 |
| (c)                          | Emergency Assessments. ....                                   | 30 |
| (d)                          | Limited Common Area Assessments.....                          | 30 |
| (e)                          | Individual Assessments. ....                                  | 31 |
| (f)                          | Working Fund Assessments.....                                 | 31 |
| 10.5                         | Assessment of Additional Property.....                        | 31 |
| 10.6                         | Operations Fund. ....   | 31 |
| 10.7                         | Reserve Fund.....   | 32 |
| (a)                          | Establishment of Account. ....                                | 32 |
| (b)                          | Funding of Reserve Fund. ....                                 | 32 |
| (c)                          | Reserve Studies. ....   | 32 |
| (d)                          | Use of Reserve Fund. ....                                     | 33 |
| 10.8                         | Declarant's Subsidy.....                                      | 33 |
| 10.9                         | Commencement of Assessment Obligation; Time of Payment. ....  | 33 |
| 10.10                        | Payment of Assessments. ....                                  | 33 |
| 10.11                        | Creation of Lien and Personal Obligation of Assessments. .... | 33 |
| 10.12                        | Voluntary Conveyance. ....                                    | 33 |
| 10.13                        | No Waiver. ....   | 34 |
| 10.14                        | No Option to Exempt.....                                      | 34 |
| 10.15                        | Certificate.....  | 34 |
| ARTICLE 11 ENFORCEMENT ..... |   | 34 |
| 11.1                         | Violation of General Protective Covenants. ....               | 34 |
| 11.2                         | Default in Payment of Assessments; Enforcement of Lien. ....  | 35 |
| 11.3                         | Interest, Late Charges and Expenses.....                      | 35 |
| 11.4                         | Costs and Attorneys' Fees. ....                               | 36 |



|   |  |    |
|---|--|----|
| 11.5                                      | Assignment of Rents.....                           | 36 |
| 11.6                                      | Nonexclusiveness and Accumulation of Remedies..... | 36 |
| 11.7                                      | Enforcement by Clackamas County.....               | 36 |
| ARTICLE 12 DISPUTE RESOLUTION .....       |  | 37 |
| 12.1                                      | Mediation.....                                     | 37 |
| 12.2                                      | Arbitration.....                                   | 37 |
| 12.3                                      | Selection of Arbitrator.....                       | 38 |
| 12.4                                      | Consolidated Arbitration.....                      | 38 |
| 12.5                                      | Discovery.....                                     | 38 |
| 12.6                                      | Evidence.....                                      | 38 |
| 12.7                                      | Excluded Matters.....                              | 38 |
| 12.8                                      | Costs and Attorneys' Fees.....                     | 38 |
| 12.9                                      | Survival.....                                      | 39 |
| ARTICLE 13 MORTGAGEES.....                |  | 39 |
| 13.1                                      | Subordination of Lien to Mortgages.....            | 39 |
| 13.2                                      | Reimbursement of First Mortgagees.....             | 39 |
| 13.3                                      | Notification of First Mortgagee.....               | 39 |
| 13.4                                      | Notice to Association.....                         | 39 |
| ARTICLE 14 AMENDMENT AND REPEAL .....     |  | 40 |
| 14.1                                      | How Proposed.....                                  | 40 |
| 14.2                                      | Approval Required.....                             | 40 |
| 14.3                                      | Recordation.....                                   | 40 |
| 14.4                                      | Regulatory Amendments.....                         | 40 |
| ARTICLE 15 MISCELLANEOUS PROVISIONS ..... |  | 41 |
| 15.1                                      | No Implied Obligations.....                        | 41 |
| 15.2                                      | Right to Approve Additional Covenants.....         | 41 |
| 15.3                                      | Notice of Sale or Transfer of Title.....           | 41 |
| 15.4                                      | Exclusive Rights to Use Name of Development.....   | 41 |
| 15.5                                      | Lessees and Other Invitees.....                    | 41 |
| 15.6                                      | Nonwaiver.....                                     | 41 |
| 15.7                                      | Construction and Severability.....                 | 41 |
| 15.8                                      | Terminology and Captions.....                      | 42 |



|       |                        |    |
|-------|------------------------|----|
| 15.9  | Notices.....           | 42 |
| 15.10 | Private Agreement..... | 42 |

**DECLARATION OF PROTECTIVE COVENANTS,  
CONDITIONS, RESTRICTIONS AND EASEMENTS  
FOR STAFFORD MEADOWS**

THIS DECLARATION is made this 15 day of January, 2019 by WEST HILLS LAND DEVELOPMENT LLC, an Oregon limited liability company ("Declarant").

**RECITALS**

A. Declarant has recorded the plat of "Stafford Meadows" in the plat records of Clackamas County, Oregon as Plat No. 4558. Declarant is the only owner of the land so platted.

B. Declarant desires to subject the Lots and Tracts described in Section 2.1 to the conditions, restrictions and charges set forth in this instrument for the benefit of such property, and its present and subsequent owners, and to establish such property under the Oregon Planned Community Act, ORS 94.550 to 94.783, as the first phase of a Class I planned development to be known as Stafford Meadows.

NOW, THEREFORE, Declarant hereby declares that the property described in Section 2.1 will be held, sold and conveyed subject to the following easements, covenants, restrictions and charges, which run with such property and are binding on all parties having or acquiring any right, title, or interest in such property or any part thereof, unless otherwise provided herein, and inure to the benefit of all such persons.

**Article 1**

**DEFINITIONS**

As used in this Declaration, the terms set forth below have the following meanings:

1.1 "**Additional Property**" means any land, whether or not owned by Declarant, that is made subject to this Declaration as provided in Section 2.2.

1.2 "**Architectural Review Committee**" or "**the Committee**" means the committee appointed pursuant to Article 7.

1.3 "**Assessments**" means all assessments and other charges, fines and fees imposed by the Association on an Owner in accordance with this Declaration, the Bylaws of the Association, or the provisions of the Oregon Planned Community Act, including, without limitation, General Assessments, Special Assessments, Emergency Assessments, Limited Common Area Assessments, Working Fund Assessments and Individual Assessments as described in Article 10.

1.4 "**Association**" means the nonprofit corporation formed to serve as the Owners association as provided in Article 8, and its successors and assigns.



1.5 **“Board of Directors” or “the Board”** means the duly appointed or elected board of directors of the Association, which is invested with the authority to operate the Association and to appoint the officers of the Association. Prior to the Turnover Meeting, Declarant will appoint the Board of Directors. After the Turnover Meeting, the Board will be elected by the Owners.

1.6 **“Bylaws”** means the duly adopted bylaws of the Association as the same may hereafter be amended or replaced.

1.7 **“City of Wilsonville Development Agreements”** mean the following agreements between Declarant and the City of Wilsonville dated effective the same date as this Declaration and recorded in the Records of Clackamas County, Oregon:

-Sanitary Sewer Pipeline Easement Agreement (Tracts “B” and “C”, Plat of “Stafford Meadows”);

-Stormwater Pipeline Easement Agreement (Tracts “B”, “C”, and “D”, Portions of Tracts “F” and “G”, Portion of Lot 11, Plat of “Stafford Meadows”);

-Conservation Easement, which affects a portion of Tract F as legally described in the exhibits in the Conservation Easement);

-Storm Drainage Easement Agreement (Tract “G”, Plat of “Stafford Meadows”);

-Water Pipeline Easement Agreement (Tract “I”, Portion of Tract “H”, Plat of “Stafford Meadows”);

-Public Access Easement Agreement (Tracts “A”, “B”, “C”, “D”, “E”, “H”, “I”, AND “J”, Portions of Lots 1-6, Plat of “Stafford Meadows”).

1.8 **“Common Areas”** means those lots or tracts designated as such on any plat of the Property, or in this Declaration or any declaration annexing Additional Property to Stafford Meadows, including any Improvements thereon, and also includes Limited Common Areas, Common Easement Areas, Limited Common Easement Areas, and any Lots converted to Common Areas as provided in Section 3.2.

1.9 **“Common Easement Areas”** means the easements established for the benefit of all property within Stafford Meadows pursuant to this Declaration or any plat or declaration annexing Additional Property to Stafford Meadows.

1.10 **“Common Maintenance Areas”** means the Common Areas and any other areas designated as such in Section 9.1 of this Declaration or in any declaration annexing Additional Property to Stafford Meadows as being maintained by the Association.

1.11 **“Declarant”** means West Hills Land Development LLC, and its successors and assigns if such successor or assignee should acquire Declarant’s interest in the remainder of the Property, or less than all of such property if a recorded instrument executed by Declarant assigns to the transferee all of Declarant’s rights under this Declaration, and any member or affiliate of West Hills Land Development LLC. Any such successor declarant will succeed to all of the rights and



obligations of the Declarant under this Declaration, including, without limitation, the obligation to complete any Improvements required by City of Wilsonville as part of its subdivision approval.

1.12 "**Design Guidelines**" means the guidelines adopted from time to time by the Architectural Review Committee pursuant to Article 7.

1.13 "**Emergency Assessments**" means the Assessments described in Section 10.4(c).

1.14 "**Front Yard**" means the front yards and side yards of Lots, which are not enclosed by a fence and street frontage planter strips for all Lots, street trees and entry monuments, if any.

1.15 "**General Assessments**" means the Assessments described in Section 10.4(a).

1.16 "**General Plan of Development**" means Declarant's general plan of development of the Property as approved by Clackamas County, as the same may be amended from time to time.

1.17 "**Home**" means a building or a portion of a building located upon a Lot within the Property and designated for separate residential occupancy together with any permitted accessory dwelling unit.

1.18 "**Improvement**" means every structure or improvement of any kind, including, but not limited to, a fence, wall, driveway, swimming pool, storage shelter, mailbox and newspaper receptacle, landscaping and any other product of construction efforts on or in respect to the Property.

1.19 "**Individual Assessments**" means the Assessments described in Section 10.4(d).

1.20 "**Initial Property**" means the real property referred to in Section 2.1.

1.21 "**Limited Common Areas**" means those Common Areas established for the exclusive use or enjoyment of certain Lots as designated in this Declaration or in any declaration annexing property to Stafford Meadows including Limited Common Easement Areas.

1.22 "**Limited Common Area Assessments**" means the Assessments described in Section 10.4(d).

1.23 "**Limited Common Easement Areas**" means those Limited Common Area easements established for the exclusive use or enjoyment of certain Lots as designated in this Declaration or in the Plat or any declaration annexing property to Stafford Meadows.

1.24 "**Lot**" means a platted or partitioned lot within the Property, with the exception of any lot marked on the Plat as being common or open space or so designated in this Declaration or the declaration annexing such property to Stafford Meadows. Lots do not include Common Areas or Public Areas.

1.25 "**Mortgage**" means a mortgage or a trust deed, "**Mortgagee**" means a mortgagee or a beneficiary of a trust deed, and "**Mortgagor**" means a mortgagor or a grantor of a trust deed.



1.26 “**Occupant**” means the occupant of a Home who is the Owner, lessee or any other Person authorized by the Owner to occupy the premises.

1.27 “**Operations Fund**” means the fund described in Section 10.6.

1.28 “**Owner**” means the Person or Persons, including Declarant, owning any Lot in the Property, but does not include a tenant or holder of a leasehold interest or a contract vendor or other Person holding only a security interest in a Lot. If a Lot is Sold under a recorded real estate installment sale contract, the purchaser (rather than the seller) will be considered the Owner unless the contract specifically provides to the contrary. If a Lot is subject to a written lease with a term in excess of one year and the lease specifically so provides, then upon filing a copy of the lease with the Board of Directors, the lessee (rather than the fee owner) will be considered the Owner during the term of the lease for the purpose of exercising any rights related to such Lot under this Declaration. The rights, obligations and other status of being an Owner commence upon acquisition of the ownership of a Lot and terminate upon disposition of such ownership, but termination of ownership does not discharge an Owner from obligations incurred prior to termination.

1.29 “**Person**” means a human being, a corporation, partnership, limited liability company, trustee or other legal entity.

1.30 “**Plat**” means the plat of Stafford Meadows recorded in the plat records of Clackamas County, Oregon as Document No. \_\_\_\_\_ and any annexation plat, as the same may be amended.

1.31 “**Public Areas**” means areas or easement areas dedicated to the public or established for public use in any plat of the Property, or so designated in this Declaration or the declaration annexing such property to Stafford Meadows.

1.32 “**Reserve Fund**” means the fund described in Section 10.7.

1.33 “**Rules and Regulations**” means those policies, procedures, rules and regulations adopted by the Association pursuant to the authority granted in this Declaration, as the same may be amended from time to time.

1.34 “**Sold**” means that legal title has been conveyed or that a contract of sale has been executed and recorded under which the purchaser has obtained the right to possession.

1.35 “**Special Assessments**” means the Assessments described in Section 10.4(b)

1.36 “**Stafford Meadows**” means the Initial Property and any Additional Property annexed to this Declaration.

1.37 “**The Property**” means Stafford Meadows.

1.38 “**This Declaration**” means all of the easements, covenants, restrictions and charges set forth in this instrument, together with any rules or regulations promulgated hereunder, as the same may be amended or supplemented from time to time in accordance with the provisions hereof, including the provisions of any supplemental declaration annexing property to Stafford Meadows.



1.39 “**Turnover Meeting**” means the meeting called by Declarant pursuant to Section 8.7, at which Declarant will turn over administrative responsibility for the Property to the Association.

1.40 “**Working Fund Assessments**” means the Assessments described in Section 10.4(f).

## Article 2

### PROPERTY SUBJECT TO THIS DECLARATION

2.1 **Initial Property.** Declarant hereby declares that all of the real property located in the City of Wilsonville described below is owned and will be owned, conveyed, hypothecated, encumbered, used, occupied and improved subject to this Declaration:

All real property within that certain plat entitled “**Stafford Meadows,**” filed in the plat records of Clackamas County, Oregon, as Document No. 2019-002153, except Lot 24 and Tracts A, K and L.

2.2 **Annexation of Additional Property.** Declarant may from time to time and in its sole discretion annex to Stafford Meadows as “Additional Property” any real property now or hereafter acquired by it and may also from time to time and in its sole discretion permit other holders of real property to annex the real property owned by them to Stafford Meadows. The annexation of such Additional Property is accomplished as follows:

(a) The Owner or Owners of such real property will record a declaration that is executed by or bear the approval of Declarant and will, among other things, describe the real property to be annexed; establish land classifications for the Additional Property; establish any additional limitations, uses, restrictions, covenants and conditions that are intended to be applicable to such Additional Property; and declare that such property is held and will be held, conveyed, hypothecated, encumbered, used, occupied and improved subject to this Declaration.

(b) The Additional Property described in any such annexation thereby becomes a part of Stafford Meadows and subject to this Declaration, and the Declarant and the Association will have and accept and exercise administration of this Declaration with respect to such Additional Property.

(c) Notwithstanding any provision apparently to the contrary, a declaration with respect to any Additional Property may:

(1) modify or exclude any then-existing restrictions and establish such new land classifications and such limitations, uses, restrictions, covenants and conditions with respect to such Additional Property as Declarant may deem to be appropriate for the development of the Additional Property; and

(2) with respect to existing land classifications, modify or exclude any then-existing restrictions and establish additional or different limitations, uses, restrictions, covenants and conditions with respect to such property as Declarant may deem to be appropriate for the development of such Additional Property.



(d) There is no limitation on the number of Lots or Homes that Declarant may create or annex to Stafford Meadows except as may be established by applicable ordinances of Clackamas County. Similarly, there is no limitation on the right of Declarant to annex common property, except as may be established by Clackamas County.

(e) Declarant does not agree to build any specific future Improvement but does not choose to limit Declarant's right to add additional Improvements.

(f) Nothing in this Declaration establishes any duty or obligation on Declarant to annex any property to this Declaration, and no owner of property excluded from this Declaration has any right to have such property annexed to this Declaration or Stafford Meadows.

(g) Upon annexation to Stafford Meadows, additional Lots so annexed will be entitled to voting rights as set forth in Section 8.3.

(h) The formula to be used for reallocating the common expenses if additional Lots are annexed and the manner of reapportioning the common expenses if additional Lots are annexed during a fiscal year are set forth in Section 10.5.

2.3 **Improvements.** Declarant does not agree to build any Improvements on the Property other than as required by City of Wilsonville, but may elect, at Declarant's option, to build additional Improvements.

2.4 **Withdrawal of Property.** Property may be withdrawn from Stafford Meadows only by duly adopted amendment to this Declaration, except that Declarant may withdraw all or a portion of the Initial Property or any Additional Property annexed pursuant to a declaration described in Section 2.2 at any time prior to the sale of the first Lot in the plat of the Initial Property or, in the case of Additional Property, prior to the sale of the first Lot in the property annexed by the supplemental declaration, subject to the prior approval of City of Wilsonville. Such withdrawal will be by a declaration executed by Declarant and recorded in the deed records of Clackamas County, Oregon. If a portion of the Property is withdrawn, all voting rights otherwise allocated to Lots being withdrawn will be eliminated, and the common expenses will be reallocated among the remaining Lots.

2.5 **Dedications.** Declarant reserves the right to dedicate any portions of the Property then owned by Declarant to any governmental authority, quasi-governmental entity or entity qualifying under Section 501(c)(3) of the Internal Revenue Code or similar provisions, from time to time, for such purposes as Declarant may deem to be appropriate, including, without limitation, for utility stations, equipment, fixtures and lines; streets and roads; sidewalks; trails; open space; recreational facilities; schools; fire, police, security, medical and similar services; and such other purposes as Declarant and such governmental authority or quasi-governmental entity determine to be appropriate from time to time. Any consideration received by Declarant as a result of such dedication or by reason of any condemnation or any conveyance in lieu of condemnation will belong solely to Declarant.

2.6 **Conversion of Lots to Common Areas.** Declarant may elect to build common facilities on one or more Lots and designate such Lots, or any portion thereof, as Common Areas by a supplemental declaration recorded in the deed records of Clackamas County, Oregon. The supplemental declaration must be executed by Declarant. Additionally, Declarant reserves the right over the Common Areas (excluding the Common Easement Areas) to make boundary line



adjustments between any Lot (before the Lot has been sold to someone other than the Declarant or a successor declarant) and an adjacent Common Area by a supplemental declaration and plat recorded in the deed records of Clackamas County, Oregon, notwithstanding that such an adjustment may convert a Lot or a portion thereof to Common Area, or a Common Area, or portion thereof, into a Lot or portion of a Lot. This reserved conversion right will expire upon turnover of the Association to the members by the Declarant as provided for in the Bylaws.

2.7 **Subdivisions.** Declarant reserves the right to subdivide any Lots in the Additional Property then owned by it upon receiving all required approvals from the applicable governing authority. If any two or more Lots are so subdivided or subject to condominium ownership, they will be deemed separate Lots for the purposes of allocating assessments under the Declaration. No other Owner of any Lot in the Additional Property may subdivide any Lot without the prior written approval of Declarant prior to the Turnover Meeting and thereafter by the Architectural Review Committee, which consent may be granted or denied at the sole discretion of Declarant or the Committee, as applicable.

2.8 **Consolidations.** Declarant has the right to consolidate any two or more Lots in the Additional Property then owned by it upon receipt of any required approvals from the applicable governing authority. No other Owner may consolidate any Lots without the prior written approval of Declarant before the Turnover Meeting and thereafter by the Architectural Review Committee, which may be granted or denied at the sole discretion of Declarant or the Committee, as applicable. An approved consolidation will be effected by the recording of a supplemental declaration stating that the affected Lots are consolidated, which declaration must be executed by the Owner(s) of the affected Lots and by the chairperson of the Association. Once so consolidated, the consolidated Lot may not thereafter be partitioned, nor may the consolidation be revoked except as provided in Section 2.7 above. Any Lots consolidated pursuant to this section will be considered one Lot thereafter for the purposes of the Declaration, including voting rights and allocation of Assessments.

### Article 3

#### LAND CLASSIFICATIONS

3.1 **Land Classifications Within Initial Property.** All land within the Initial Property is included in one or another of the following classifications:

(a) Lots, which consist of Lots 1 through 23 and Lots 25 through 44, inclusive, of the plat of the Initial Property.

(b) Common Areas, including the areas marked as Tracts D, E, F, G, H, I, and J, on the plat of the Initial Property, plus the Limited Common Areas, Common Easement Areas, and Limited Common Easement Areas, all of which are to be owned and maintained by the Association pursuant to the terms and conditions of this Declaration. Tract D is a pedestrian, bicycle, and emergency vehicular access area; Tract F is a natural resource area; Tract G is a stormwater treatment area subject to an easement in favor of the City of Wilsonville; Tracts E, H, I and J are open space areas that are subject to public pedestrian and bicycle access easements, with E and H being landscape buffers along S.W. Boeckman Road.



(c) Common Easement Areas, inclusive, public pedestrian access easements, public utility easements, storm drainage easements, clean water service and storm facility easement areas, sight distance easements, wall maintenance easements in favor of the Association, and any other easements established on the plat of the Initial Property or in any recorded document for entrance signage, monuments, or landscaping over Lots.

(d) Tract B is a Limited Common Area for ingress and egress over a shared driveway to and from Lots 1 and 6, which is subject to a wall maintenance; Tract C is a Limited Common Area for ingress and egress over a shared driveway to and from Lots 2, 3, 4, and 5.

(e) There are no Limited Common Easement Areas in the Initial Property.

3.2 **Conversion of Lots to Common Areas.** Declarant may elect to build common facilities on one or more Lots and designate such Lots as Common Areas by a declaration recorded in the deed records of Clackamas County, Oregon. Such declaration must be executed by Declarant as Owner of the Lots.

3.3 **Subdivisions.** Declarant reserves the right to subdivide any Lots then owned by it upon receiving all required approvals from City of Wilsonville. If a Lot or Lots are so subdivided, the new lots will be deemed separate Lots for the purposes of allocating Assessments under this Declaration. No other Owner of any Lot in the Property may subdivide any Lot without the prior written approval of the Declarant prior to the Turnover Meeting, and thereafter, by the Architectural Review Committee, which consent may be granted or denied at the sole discretion of the Declarant or the Committee, as applicable.

3.4 **Consolidations.** Declarant has the right to consolidate any two or more Lots then owned by it upon receipt of any required approvals from City of Wilsonville. No other Owner may consolidate any Lots without the prior written approval of the Declarant prior to the Turnover Meeting and thereafter by the Architectural Review Committee, which may be granted or denied at the sole discretion of the Declarant or Committee, as applicable. An approved consolidation will be effected by the recording of a supplemental declaration stating that the affected Lots are consolidated, which declaration must be executed by the Owner(s) of the affected Lots and by the president of the Association. Once so consolidated, the consolidated Lot may not thereafter be partitioned, nor may the consolidation be revoked except as provided in Section 3.3. Any Lots consolidated pursuant to this section will be considered one Lot thereafter for the purposes of this Declaration, including voting rights and allocation of Assessments.

## Article 4

### PROPERTY RIGHTS IN COMMON AREAS

4.1 **Owners' Easements of Enjoyment.** Subject to the provisions of this Article 4, every Owner and his or her invitees have a right and easement of enjoyment in and to the Common Areas, which easement is appurtenant to and passes with the title to every Lot. The use of the Limited Common Easement Areas, however, are limited to the Owners and invitees of the Lots designated in the declaration establishing the Limited Common Easement Area.



4.2 **Title to Common Areas.** Except for portions dedicated to the public or any governmental authority and otherwise provided in this Section 4.2, title to the Common Areas, except the Common Easement Areas and Limited Common Easement Areas, will be conveyed to the Association by Declarant AS IS, but free and clear of monetary liens, on or before the Turnover Meeting. The Association, upon such conveyance, will assume all obligations to maintain, insure, and otherwise assume the obligations of the Declarant in respect of the Common Areas set forth in this Agreement or the Plat or any agreement entered by Declarant with City of Wilsonville in respect of such tracts. Title to Common Easement Areas and Limited Common Easement Areas, if any, subject to the easements set forth in this Declaration or the supplemental declaration creating such areas, rests in the Owners of the respective Lots within which such areas are located, or to the public if part of dedicated street rights-of-way.

4.3 **Extent of Owners' Rights.** The rights and easements of enjoyment in the Common Areas created hereby are subject to the following and to all other provisions of this Declaration:

(a) **Association Easements.** Declarant grants to the Association for the benefit of the Association and all Owners of Lots within the Property the following easements over, under and upon the Common Maintenance Areas:

(1) An easement for underground installation and maintenance of power, gas, electric, water and other utility and communication lines and services installed by Declarant or with the approval of the Board of Directors of the Association and any such easement shown on any plat of the Property.

(2) An easement for construction, maintenance, repair, and use of such areas, including any common facilities on the Common Area tracts.

(3) An easement for access for regular upkeep, maintenance, modification and replacement of the Front Yard landscaping and related irrigation equipment, including drainage systems, if any, and for making emergency repairs to the landscaping and related equipment and settings in the Front Yards of the Lots necessary for the public safety or to prevent damage to the Common Maintenance Areas or to another Lot, or to enforce this Declaration or the Rules and Regulations, or with the approval of the Board of Directors of the Association; and notwithstanding that such areas of Lots are not regular Common Maintenance Areas, an easement for access to unfenced yard landscaping and irrigation controllers on Lots to enforce this Declaration or the Rules and Regulations, including but not limited to standards for Lot maintenance thereunder.

(4) An easement for the purpose of making repairs to any existing structures on Common Areas.

(b) **Public and Utility Easements.**

The Common Areas are subject to the public and utility easements established the Plat. In addition, the public is hereby granted access easements over all sidewalks, pedestrian accesses and trails in the Common Areas within the Property as designated on the Plat. In addition, Declarant or the Association may (and, to the extent required by law will) grant or assign such easements to municipalities or other utilities performing utility services and to communication



companies, and the Association may grant free access thereon to police, fire and other public officials, and to employees of utility companies and communications companies serving the Property.

(c) **Use of the Common Areas.** The Common Areas will be used for the purposes set forth in any plat of the Property; Common Area tracts identified on any plat of the Property may not be partitioned or otherwise divided into parcels for residential use; and, no private structure of any type will be constructed on the Common Areas. Except as otherwise provided in this Declaration, the Common Areas are reserved for the use and enjoyment of all Owners. No private use may be made of the Common Areas except as otherwise provided in this Declaration. No Owner may place or cause to be placed on the Common Areas any trash, structure, equipment, furniture, package, or object of any kind. Nothing in this Declaration prevents the placing of a sign or signs upon the Common Areas by Declarant or the Association identifying the Property or identifying pathways or items of interest, signs restricting certain uses, or warning, traffic or directional signs, provided that such signs are approved by the Architectural Review Committee and comply with any applicable sign ordinances. The Board of Directors has authority to abate any trespass or encroachment upon the Common Areas at any time, by any reasonable means and with or without having to bring legal proceedings. A declaration annexing Additional Property may provide that the Owners of such Additional Property do not have the right to use a particular Common Area or facility located on such Common Area, in which event such Common Area will automatically become a "Limited Common Area" assigned to the Lots that have access thereto.

(d) **Alienation of the Common Areas.** The Association may not by act or omission seek to abandon, partition, subdivide, encumber as security for a debt, sell, transfer or convey the Common Areas owned directly or indirectly by the Association for the benefit of the Lots unless the holders of at least 80 percent of the Class A voting rights and the Class B Member (as defined in Section 8.3), if any, have given their prior written approval and unless approved by City of Wilsonville. Such approvals will not be required for dedications under Section 2.5. The Association, upon approval in writing of at least two-thirds of the Class A voting rights and the Class B Member, if any, and if approved by order or resolution of City of Wilsonville, may dedicate or convey any portion of the Common Areas to a park district or other public body. Any sale, transfer, conveyance or encumbrance permitted by this Declaration may provide that the Common Area may be released from any restrictions imposed by this Declaration if the request for approval of the action also includes approval of the release.

(e) **Leases, Easements, Rights-of-Way, Licenses and Similar Interests and Vacations of Roadways.** Notwithstanding the provisions of Section 4.3(d), the Association may execute, acknowledge and deliver leases, easements, rights-of-way, licenses and other similar interests affecting the Common Areas and consent to vacation of roadways within and adjacent to the Common Areas, subject to such approvals as are required by ORS 94.665(4) and (5).

(f) **Limitations on Use.** Use of the Common Areas is subject to the following:

- (1) The provisions of this Declaration and any applicable supplemental declaration;
- (2) Any restrictions or limitations contained in any deed or other instrument conveying such property to the Association;



(3) Easements reserved or granted in this Declaration or any supplemental declaration;

(4) The Common Areas may not be used for the construction of residential structures at any time.

(5) The Board's right to:

(A) adopt Rules and Regulations regulating use and enjoyment of the Common Areas, including rules limiting the number of guests who may use the Common Areas;

(B) suspend the right of an Owner to use the Common Areas as provided in this Declaration;

(C) dedicate or transfer all or any part of the Common Areas, subject to such approval requirements as may be set forth in this Declaration;

(D) impose reasonable membership requirements and charge reasonable admission or other use fees for the use of any recreational facility situated upon the Common Areas;

(E) permit use of any recreational facilities situated on the Common Areas by Persons other than Owners, their families, lessees and guests with or without payment of use fees established by the Board;

(F) designate areas and facilities of Common Areas as Public Areas; and

(G) provide certain Owners the rights to the exclusive use of those portions of the Common Areas designated as Limited Common Areas.

4.4 **Delegation of Use.** Any Owner may extend the Owner's right of use and enjoyment of the Common Areas to the members of the Owner's family, lessees and social invitees, as applicable, subject to reasonable regulation by the Board of Directors. An Owner who leases the Owner's Home will be deemed to have assigned all such rights to the lessee of such Home for the period of the lease.

4.5 **Easements Reserved by Declarant.** So long as Declarant owns any Lot, Declarant reserves an easement for itself and its successor and assigns (including any builder who purchased more than one Lot from Declarant for purposes of development), over, under and across the Common Areas to carry out sales and rental activities necessary or convenient for the sale or rental of Lots, including, without limitation, advertising and "For Sale" signs. Declarant, for itself and its successors and assigns, hereby retains a right and easement of ingress and egress over, in, upon, under and across the Common Areas and the right to store materials thereon and to make such other use thereof as may be reasonably necessary or incident to the construction of the Improvements on the Property or other real property owned by Declarant; provided, however, that no such rights may be exercised by Declarant in such a way as to unreasonably interfere with the occupancy of, use of, enjoyment of or access to an Owner's Lot by the Owner or the Owner's family, tenants, employees, guests, or invitees.



4.6 **Easement to Serve Other Property.** Declarant reserves for itself and its duly authorized agents, successors, assigns and Mortgagees, and the developers of Improvements in all future phases of Stafford Meadows, a perpetual easement over the Common Areas for the purposes of enjoyment, use, access and development of the property, even if such property is never made subject to this Declaration, including but not limited to, reservations for the benefit of real property in the vicinity of the Property that is owned by or that may be owned in the future by West Hills Land Development LLC, its successors and assigns, for so long as the same reserves annexation rights to the Property. This easement includes, but is not limited to, a right of ingress and egress over the Common Areas for construction, utilities, water and sanitary sewer lines, communication lines, drainage facilities, irrigation systems and signs, and ingress and egress for the benefit of other portions of Stafford Meadows and any Additional Property that becomes subject to this Declaration or any property in the vicinity of the Property or Additional Property that is then owned by Declarant or an affiliate thereof. Declarant agrees that such users are responsible for any damage caused to the Common Areas resulting from their actions in connection with development of such property. If the easement is exercised for permanent use by such property and such property or any portion thereof benefiting from such easement is not made subject to this Declaration, Declarant, its successors or assigns will enter a reasonable agreement with the Association to share the cost of any maintenance of such facilities. The allocation of costs in any such agreement will be based on the relative extent of use of such facilities and the number of dwelling units in such property compared to the number of Homes in the Property.

4.7 **Limited Common Areas.** If any Limited Common Areas are included in an annexation declaration, the respective Limited Common Areas will be subject to a reciprocal access easement for the use by the Owners of the benefited Lots for vehicular access and utilities and communication lines serving such Lots. Such areas will be operated, maintained, replaced, and improved by the Association, but the entire cost thereof, including reserves for future maintenance, repairs, and replacements, will be assessed on an equal basis as Limited Common Area Assessments to the Owners of Lots to which such Limited Common Areas pertain.

## Article 5

### PROPERTY RIGHTS IN LOTS

5.1 **Use and Occupancy.** The Owner of a Lot in the Property is entitled to the exclusive use and benefit of such Lot, except as otherwise expressly provided in this Declaration, but the Lot is bound by, and each Owner and Declarant must comply with, the restrictions contained in Article 6, all other provisions of this Declaration and the provisions of any supplement or amendment to this Declaration.

5.2 **Easements Reserved.** In addition to any utility and drainage easements shown on any recorded plat, Declarant hereby reserves the following easements for the benefit of Declarant and the Association:

(a) **Adjacent Common Maintenance Area.** The Owner of any Lot that includes a Common Maintenance Area or adjoins or blends together visually with any Common Maintenance Area must, as the Association so requires, permit the Association to enter upon the Lot to perform the maintenance of such Common Maintenance Area. The Owner and Occupant of each Lot is



responsible for controlling such Owner's or Occupant's pets so they do not harm or otherwise disturb Persons performing such maintenance on behalf of the Association.

(b) **Utility Easements.** Easements for installation and maintenance of utilities and drainage facilities may be reserved over portions of certain Lots, as shown on any recorded plat. Within the utility easement areas, the Architectural Review Committee will not permit any structure, planting or other material to be placed or permitted to remain on the easement area if such structure, planting or other material may damage or interfere with the installation or maintenance of utilities, change the direction of flow of drainage systems or drainage infiltration facilities in the easements, or obstruct or retard the flow of water through drainage channels in the easements and/or to the extent not permitted in the City of Wilsonville Development Agreements. The easement area of each Lot and all Improvements in it will be maintained continuously by the Owner of the Lot, except for those Improvements for which a public authority or utility company is responsible, and except Common Maintenance Areas, which are maintained by the Association.

(c) **Construction on Adjoining Lot.** Declarant hereby reserves for the benefit of Declarant and its assigns a temporary easement over each Lot for access to the adjoining Lot for construction purposes, including temporary placement of ladders or scaffolding. Declarant will restore the Lot to its condition as it existed prior to such access and will be responsible for any damage to the Lot. Declarant hereby reserves for the benefit of Declarant and its assigns a temporary easement over each Lot Declarant then-currently owns to accommodate uses related to portions of the Property being used for the 2019 "Street of Dreams" event.

(d) **Utility Inspection and Repairs.** Each utility and communication service provider and its agents or employees have authority to access all Lots, but not Improvements constructed thereon, and the Common Areas on which communication, power, gas, drainage, sewage or water facilities may be located for installing, operating, maintaining, improving or constructing such facilities; reading meters; inspecting the condition of pipes, lines and facilities; and completing repairs. The Owner of any such Lot will be given advance notice if possible. In the case of an emergency, as determined solely by the utility or communication service provider, no prior notice will be required.

(e) **Easements for Encroachments.** Declarant grants reciprocal appurtenant easements of encroachment, and for maintenance and use of any permitted encroachment, between each Lot and any adjacent Common Areas and between adjacent Lots due to the unintentional placement or settling or shifting of the Improvements constructed, reconstructed or altered thereon (in accordance with the terms of this Declaration and the Design Guidelines) to a distance of not more than three feet, as measured from any point on the common boundary along a line perpendicular to such boundary. However, in no event will an easement for encroachment exist if such encroachment occurred due to willful and knowing conduct on the part of, or with the knowledge and consent of, the Person claiming the benefit of such easement.

(f) **Easements for Maintenance, Emergency and Enforcement.** Upon request given to the Owner and any Occupant, any Person authorized by the Association may enter a Lot to perform necessary maintenance, repair, or replacement of any property for which the Association has maintenance, repair or replacement responsibility under this Declaration, to make emergency repairs to a Lot that are necessary for the public safety or to prevent damage to Common Areas or to another Lot, or to enforce this Declaration or the Rules and Regulations. Requests for entry must be made in advance and for a reasonable time, except in the case of any emergency, when



the right of entry is immediate. An emergency entry does not constitute a trespass or otherwise create a right of action in the Owner of the Lot.

(g) **Future Easements.** Declarant reserves the nonexclusive right and power to grant and record such specific easements as may be necessary, in the sole discretion of Declarant, in connection with the development of any of the Property. The location of any such easement is subject to the written approval of the Owner of the burdened Lot, which approval will not unreasonably be withheld, delayed or conditioned.

## Article 6

### GENERAL USE RESTRICTIONS

6.1 **Structures Permitted.** No structures may be erected or permitted to remain on any Lot except a single Home and structures normally accessory thereto that have been constructed by Declarant or have first been approved by the Architectural Review Committee pursuant to Article 7. A Home will be deemed a permitted improvement on a Lot under this Section 6.1 notwithstanding that a Home may include within its exterior walls an independent living area with a separate outside entrance. This provision does not exclude construction of a private greenhouse or storage unit, or an accessory dwelling unit as defined by City of Wilsonville ordinances, provided that the location, size and design of such structures are in conformity with the applicable ordinances and permit requirements of City of Wilsonville, are compatible in design and style with the Home constructed on the Lot, and have been approved by the Committee.

6.2 **Residential Use.** Lots must only be used for residential purposes. Except with the consent of the Board of Directors, no trade, craft, business, profession, commercial or similar activity of any kind will be conducted on any Lot, nor may any goods, equipment, vehicles, materials, or supplies used in connection with any trade, service or business be kept or stored on any such Lot. The mere parking on a Lot of a vehicle bearing the name of a business will not, in itself, constitute a violation of this provision. Nothing in this Section 6.2 will be deemed to prohibit (a) activities relating to the sale of Homes; (b) the right of Declarant or any contractor or home builder to construct Improvements on any Lot, to store construction materials and equipment on such Lots in the normal course of construction, and to use one or more Homes as sales offices or model homes for purposes of sales in Stafford Meadows; and (c) the right of the Owner of a Lot to maintain his or her professional personal library, keep his or her personal business or professional records or accounts, handle his or her personal business or professional telephone calls or confer with business or professional associates, clients or customers in his or her Home by appointment only or to operate a registered or certified family child care home pursuant to ORS 329A.250 to 329A.500. The Board will not approve commercial activities otherwise prohibited by this Section 6.2 unless the Board determines that only normal residential activities would be observable outside of the Home and that the activities would not be in violation of applicable law. The Board may specify acceptable activities in the Rules and Regulations.

6.3 **Offensive or Unlawful Activities.** No noxious or offensive activities may be carried out upon the Property, nor will anything be done or placed on the Property that interferes with or jeopardizes the enjoyment of the Property, or that is a source of annoyance to Owners or Occupants. Occupants will use extreme care about creating disturbances, making noises or using musical instruments, radios, televisions, amplifiers and audio equipment that may disturb other Occupants.



No unlawful use may be made of the Property or any part thereof, and all valid laws, zoning ordinances and regulations of all governmental bodies having jurisdiction over the Property must be observed. Owners and other Occupants must not engage in any abusive or harassing behavior, either verbal or physical, or any form of intimidation or aggression directed at other Owners, Occupants, guests or invitees, or directed at the managing agent, its agents or employees, or vendors.

6.4 **Animals.** No animals, livestock, or poultry of any kind may be raised, bred, kept or permitted within any Lot other than seeing eye horses and a reasonable number of ordinary household pets that are not kept, bred, or raised for commercial purposes and that are reasonably controlled so as not to be a nuisance. The Board of Directors has the authority to determine what is an "ordinary household pet." Any unrestrained or barking dog constitutes a nuisance. Any inconvenience, damage or unpleasantness caused by such pets are the responsibility of their respective Owners. No animal is permitted to roam the Property unattended, and each dog must be kept on a leash while outside a Lot. The construction or installation of dog-runs and doghouses are subject to prior review and approval by the Architectural Review Committee pursuant to Article 7. An Owner or Occupant may be required to remove a pet upon receipt of the third written notice from the Board of violations of any rule, regulation or restriction governing pets within the Property.

6.5 **Maintenance of Structures.** Each Owner must maintain the Owner's Lot and Improvements thereon, including sidewalks adjacent to the Owner's Lot, and walkways and the driveway, in a clean and attractive condition, in good repair and in such fashion as not to create a fire or other hazard. Such maintenance includes, without limitation, exterior painting or staining, repair, replacement and care for roofs, gutters, downspouts, exterior building surfaces, walks, lights, perimeter fences and other exterior Improvements and glass surfaces. All repainting or re-staining, any change in type of roof or roof color and any exterior remodeling or changes are subject to prior review and approval by the Architectural Review Committee. Damage caused by fire, flood, storm, earthquake, riot, vandalism or other causes are likewise the responsibility of each Owner and must be restored within a reasonable time. Any change in appearance must first be approved by the Committee.

6.6 **Landscape Installation.** All landscaping on a Lot must be completed within a reasonable time not to exceed 90 days from the date of occupancy of the Home constructed on a Lot. In the event of undue hardship due to weather conditions, this provision may be extended for a reasonable length of time upon approval of the Architectural Review Committee. Landscape plans will be submitted to the Committee for approval. Landscaping in the Front Yards must not be changed by an Owner without the approval of the Committee. Notwithstanding such limitations, an Owner may utilize planting pots or other free standing, movable planters within the Front Yard of his or her Lot; provided that the planters and plants growing in the planters are properly maintained. The Board of Directors may regulate the number and type of such planters.

6.7 **Maintenance of Landscaping.** In any every portion of the Owner's Lot other than the Front Yard, the Owner will keep all shrubs, trees, grass and plantings of every kind on the Owner's Lot, neatly trimmed, properly cultivated, and free of trash, weeds and other unsightly material. Following initial installation by the Declarant or builder the Association will be responsible for maintenance and irrigation of landscaping of the Front Yard of Lots, including the irrigation equipment and controllers. No Owner or Occupant of one of these Lots may alter, change or tamper with the irrigation equipment, controllers or settings in a Front Yard the Association maintains, which settings belong to the Association.



6.8 **Boundary Fences.** The responsibility for and cost of maintenance, repair and replacement of fencing on boundary lines between Lots will be shared by the Owners on either side of the fence in accordance with ORS Chapter 96; provided, however, that the Association is responsible for the maintenance of any fencing or walls adjacent to Tracts E and H the cost of which will be a common expense.

6.9 **Fences, Hedges and Walls.** No fence, hedge, structure, wall, or retaining wall may be constructed or exist anywhere on any Lot without prior approval of the Architectural Review Committee and in accordance with its Design Guidelines. No planting or structure obstructing vision at driveways or intersections is permissible or may be maintained. Installation and maintenance of retaining walls that are required and approved by the Committee due to topographic conditions of a given Lot are the sole and absolute responsibility of the individual Lot Owner, are to be aesthetically incorporated into the landscaping of the Lot, and are not the responsibility of the Association.

6.10 **Pest and Weed Control.** No Owner will permit any thing or condition to exist upon any portion of the Property that will induce, breed or harbor infectious plant or animal diseases or noxious insects or vermin. Each Owner must control noxious weeds on the Owner's Lot.

6.11 **Parking.** Except as may otherwise be provided in the Rules and Regulations, parking in excess of 24 hours of boats, trailers, motorcycles, mobile homes, campers or other recreational vehicles or equipment, regardless of weight, are not be allowed on any part of the Property or on public streets within the Property unless within areas designated for such purposes by the Board of Directors or within the confines of an enclosed garage and approved by the Architectural Review Committee before construction or screened from view in a manner approved by the Committee. No portion of the vehicle may project beyond the screened area. If there is no rear fencing and the vehicle could be seen from outside the Lot other than from the front road, the vehicle must also be screened from view from that direction. Vehicles may not be used for storage of materials for more than 48 hours without approval from the Committee. No motor vehicle of any type may constructed, reconstructed, or repaired in such a manner as will be visible from neighboring property, nor may any vehicle be occupied for residential purposes while located within the Property. The Rules and Regulations may restrict the amount of noise vehicles may generate. The parking of vehicles is prohibited on any public or private street within the Property if posted or marked "No Parking" or if curbs are painted to restrict parking. Blocking a Common Area tract established under any plat of the Property, a roadway, Limited Common Area driveway, or alley is prohibited. No parking is permitted in Common Areas unless so posted.

6.12 **Vehicles in Disrepair.** No Owner will permit any vehicle that is in an extreme state of disrepair or not currently licensed to be abandoned or to remain parked on the Owner's Lot (unless screened from view) or on the Common Area or any street for a period in excess of 48 hours. A vehicle will be deemed in an "extreme state of disrepair" when the Board of Directors determines that its presence reasonably offends the Occupants of the area due to its appearance or continued inoperability. Should any Owner fail to remove such vehicle within five days following the date on which notice is mailed to him or her by the Association, the Association may have the vehicle removed from the Property and charge the expense of such removal to the Owner.

6.13 **Signs.** No signs may be erected or maintained on any Lot except that not more than one "For Sale" sign placed by the Owner, Declarant or a licensed real estate agent, not exceeding 24 inches high and 36 inches long, may be temporarily displayed within the Front Yard of any Lot or



inside of a first floor, front street facing window of a Home located on a Lot, and two such signs may be placed on a Lot during the course of initial construction of a dwelling on such Lot. "For Rent" and "For Lease" signs are prohibited. The restrictions contained in this paragraph do not prohibit the temporary placement of "political" signs on any Lot by the Owner, subject to reasonable regulations adopted by the Architectural Review Committee relating to size and length of display.

6.14 **Rubbish, Trash and Outside Storage.** No part of the Property may be used as a dumping ground for trash or rubbish of any kind, and no rubbish, refuse or garbage is allowed to accumulate. All garbage and other waste must be kept in appropriate sanitary containers for proper disposal and out of public view, except the night before and during garbage pickup days. Yard rakings, dirt, and other material resulting from landscaping work will not be dumped onto Lots, streets, or Common Maintenance Areas. Storage areas, and the storage of machinery and equipment are prohibited on any Lot, unless obscured from view of neighboring property and streets by an appropriate screen or enclosure approved by the Architectural Review Committee. Tarps and covers are prohibited except as otherwise provided in the Rules and Regulations and the Design Guidelines. Should any Owner or Occupant responsible for its generation fail to remove any such materials within 10 days following the date on which notice is mailed to the Owner or Occupant by the Board of Directors, the Association may have the materials removed and charge the expense of such removal to the Owner.

6.15 **Construction.** The construction of any building on any Lot, including painting and all exterior finish, must be completed within eight months from the beginning of construction so as to present a finished appearance when viewed from any angle, and the Home will not be occupied until so completed. In the event of undue hardship due to weather conditions or other causes beyond the reasonable control of the Owner, this time period may be extended for a reasonable length of time upon approval from the Architectural Review Committee. The building area must be kept reasonably clean and in workmanlike order, free of litter, during the construction period with a garbage can or other garbage disposal facility on the site during such period. Debris may not be deposited on any other Lot. All construction debris, stumps, trees, etc. must be periodically removed from each Lot by the builder or Owner, and such debris will not be dumped in any area within the Property unless approved by the Committee. The Rules and Regulations may impose reasonable limitations on the hours during which construction activities may take place. If construction has not commenced upon any Lot within one year after an Owner has acquired it, other than Declarant or an affiliate of Declarant, the Owner must install the sidewalk and landscape the area within 20 feet from the curb. The Owner will irrigate and maintain this area. The Committee may waive this requirement if it determines that construction will commence within a reasonable time. In any case, all unimproved or unoccupied Lots will be kept in a neat and orderly condition, free of brush, vines, weeds and other debris, and grass thereon must be cut or mowed at sufficient intervals to prevent creation of a nuisance or fire hazard.

6.16 **Temporary Structures.** No incomplete building or structure of a temporary character, nor any trailer, basement, tent, shack, garage, barn, or other outbuilding may be used on any Lot at any time as a residence either temporarily or permanently.

6.17 **Recreational Equipment.** Unless approved by the Architectural Review Committee or permitted by the Design Guidelines, no playground, athletic or recreational equipment or structures, including without limitation, permanently installed basketball backboards, hoops and related supporting structures, will be placed, installed or utilized on any Lot in view from any street,



sidewalk or Common Area within the Property. Portable basketball backboards, hoops, soccer goal nets, and related supporting structures may be used during daylight hours, so long as such equipment is stored out of view from any street, sidewalk, or Common Area within the Property.

6.18 **Service Facilities.** Service facilities (garbage containers, fuel tanks, clotheslines, etc.) will be screened so that the elements screened are not visible at any time from the street or a neighboring property. The Architectural Review Committee may develop guidelines for clotheslines that are consistent with the green sustainability objectives of Stafford Meadows. All telephone, power, natural gas, cable television and other communication lines will be placed underground, except as otherwise mandated by local jurisdictions or public utility companies.

6.19 **Antennas and Satellite Dishes.** Exterior antennas, satellite receivers, and transmission dishes are prohibited, except to the extent expressly mandated by rules adopted by the Federal Communication Commission. Specifically, ham radio antennas, cell towers, satellite dishes one meter or larger, television antennas or on masts 12 feet or higher and multi-point distribution antennas are prohibited. To the extent permitted by Federal Communication Commission rules, the Board of Directors may require all other antennas and dishes to be hidden from view from streets and adjoining dwellings. Other communication devices will not be permitted to be placed upon any Lot except in accordance with rules established by the Architectural Review Committee in accordance with Section 7.3.

6.20 **Exterior Lighting or Noisemaking Devices.** Except with the consent of the Architectural Review Committee, no exterior lighting or noisemaking devices may be installed or maintained on any Lot, other than as originally installed by the builder of the home and security alarms and fire alarms. Seasonal holiday lighting and decorations are permissible if consistent with any applicable Rules and Regulations and if installed not more than 30 days before and removed within 30 days after the celebrated holiday. The Committee may regulate the shielding or hours of use of lighting in order to reduce annoyance to neighboring properties. The location of air conditioning compressors must be approved by the Committee prior to installation.

6.21 **Subdividing or Partitioning Lots.** Except as otherwise provided in this Declaration, no Lot may be subdivided or partitioned, nor may its Lot lines be adjusted, without the approval of Clackamas County and the Architectural Review Committee.

6.22 **Grades, Slopes and Drainage.** Each Owner of a Lot accepts the burden of the established drainage pattern and grades, slopes and courses related thereto over any Lot or Common Area, and will not in any manner alter, modify or interfere with such drainage pattern, grades, slopes and courses, any public vegetated swale or rain garden, without the prior approval of the Architectural Review Committee, and then only to the extent and in the manner specifically approved. No structure, plantings or other materials may be placed or permitted to remain on or within any grades, slopes or courses, nor may any other activities be undertaken that may damage or interfere with established slope ratios, create erosion or sliding problems, or obstruct, change the direction of or retard the flow of water through drainage channels.

6.23 **Garages.** All garage doors must remain closed except to permit entrance and exit and in connection with outside activities. Garages will be used primarily for parking of vehicles, and only secondarily for storage, and must not be used as office or living space without the prior approval of the Architectural Review Committee.



6.24 **Windows, Decks, Porches and Outside Walls.** To preserve the attractive appearance of the Property, the Association may regulate the nature of items that may be placed in or on windows, decks, porches, and the outside walls so as to be visible from the street or Common Areas, including, without limitation, window air conditioners and fans. Window coverings, curtains, shutters, drapes or blinds, other than those of commercially produced quality, are not permitted to be visible from any public or private street, pathway, Common Area or adjacent property. No aluminum foil, reflective film, or similar treatment may be placed on windows or glass doors. Garments, rugs, laundry and other similar items may not be hung from windows, facades, porches or decks.

6.25 **Air Conditioning Units.** Window or portable air conditioning units are prohibited.

6.26 **Firearms and Fireworks.** Firearms may not be discharged within Stafford Meadows at any time. Firearms are to be unloaded at all times while in Stafford Meadows. Weapons including "BB" guns, pellet guns, dart guns, paint-ball guns and any other weapon capable of firing a projectile are considered firearms. Oregon statutory law prohibits the use of certain types of fireworks. Only fireworks considered legal are allowed. Owners and their guests must clean up any fireworks discharged in Stafford Meadows.

6.27 **Nonbiodegradable Substances.** No motor oil, paint or other caustic or nonbiodegradable substance may be deposited in any street drain, sewer system or on the grounds within Stafford Meadows. Any fine levied by a governmental agency and/or costs associated with the cleanup of any nonbiodegradable substance for any spill that is caused by any Owner or their guests will be the responsibility of the offending Owner.

6.28 **Leasing and Rental of Homes.** A Home may not be leased or rented for a period of less than 30 days. All leases of a Home must be by written agreement specifying that: (i) the tenant is subject to all provisions of the Declaration, Bylaws and Rules and Regulations; and (ii) failure to comply with any provision of the Declaration, Bylaws or Rules and Regulations constitutes a default under the rental agreement. The Owner must provide each tenant a copy of the Declaration, Bylaws and Rules and Regulations. The Owner is responsible for any violations by tenants and is directly responsible for either correcting or eliminating such violations or causing tenant to do the same.

6.29 **Rules and Regulations.** In addition, the Association from time to time may adopt, modify, or revoke such nondiscriminatory Rules and Regulations governing the conduct of Persons and the operation and use of the Property as it may deem necessary or appropriate to ensure the peaceful and orderly use and enjoyment of the Property. A copy of the Rules and Regulations, upon adoption, and a copy of each amendment, modification or revocation thereof, must be delivered by the Board of Directors promptly to each Owner. The Rules and Regulations may be adopted by the Board, except as may be otherwise provided in the Bylaws of the Association.

## Article 7

### ARCHITECTURAL REVIEW COMMITTEE

7.1 **Architectural Review.** No Improvement may be commenced, erected, placed or altered on any Lot, including without limitation re-landscaping, until the construction or landscaping plans, respectively, and specifications showing the nature, shape, heights, materials, colors and proposed location of the Improvement or landscaping, have been submitted to and approved in



writing by the Architectural Review Committee, except that construction by Declarant or any affiliate of Declarant will be presumed to have been approved and is thereby exempt from this review. Such exception for Declarant and such builders' construction will include without limitation the construction of buildings, hedges, walls, and fences. The building plans to be submitted will consist of one complete set of plans and specifications in the usual form showing insofar as appropriate, (i) size and dimensions of the Improvements; (ii) exterior design; (iii) approximate exterior color scheme; (iv) location of Improvements on the Lot, including setbacks, driveway and parking areas; and (v) location of existing trees to be removed. These plans and specifications must be left with the Committee until 60 days after notice of completion has been received by the Committee. This is for determining whether, after inspection by the Committee, the Improvement complies substantially with the plans and specifications that were submitted and approved. The Committee is not responsible for determining compliance with structural and building codes, zoning codes, or any other governmental regulations, all of which are the responsibility of the applicant. The procedure and specific requirements for review and approval of construction may be set forth in Design Guidelines adopted from time to time by the Committee. The Committee may charge a reasonable fee to cover the cost of processing an application. In all cases in which the Committee's consent is required by this Declaration, the provisions of this Article 7 apply, except that this Article 7 does not apply to construction by Declarant or any affiliate of Declarant.

7.2 **Committee Decision.** The Architectural Review Committee will render its decision with respect to a construction proposal within 30 working days after it has received all material required by it with respect to the application. In the event the Committee fails to render its approval or disapproval within 45 working days after the Committee has received all material required by it with respect to the proposal, or if no suit to enforce this Declaration has been commenced within one year after completion thereof, approval will not be required and the related provisions of this Declaration will be deemed to have been fully complied with.

7.3 **Committee Discretion.** The Architectural Review Committee may withhold consent to any proposed work if the Committee finds the proposed work would be inappropriate for the particular Lot or incompatible with the Design Guidelines or design standards that the Committee intends for Stafford Meadows. It is the intent and purpose of this Declaration to ensure quality of workmanship and materials, to ensure harmony of external design with the existing Improvements and with respect to topography and finished grade elevations, and to ensure compliance with the setback requirements contained in the conditions of approval of Clackamas County. Considerations such as siting, shape, size, color, design, materials, height, screening, impairment of the view from other Lots or other effect on the enjoyment of other Lots or the Common Area, disturbance of existing terrain and vegetation, and any other factors that the Committee reasonably believes to be relevant may be considered by the Committee in determining whether or not to consent to any proposed work. Regulations on siting of television antennas and satellite receiving dishes must be in conformance with any applicable Federal Communications Commission rules.

7.4 **Design Guidelines.**

(a) **Adoption of Design Guidelines.** Declarant or the Architectural Review Committee will prepare Design Guidelines, which may contain general provisions applicable to all of the Property as well as specific provisions that vary from Neighborhood to Neighborhood or any portions of a Neighborhood or Neighborhoods or as to types of use or Improvements. The Design Guidelines will interpret and implement the provisions of this Declaration for architectural review and



establish guidelines for architectural design, placement of buildings, color schemes, exterior finishes and materials and similar features that may be used in Stafford Meadows; provided, however that the Design Guidelines will not be in derogation of the minimum standards established by this Declaration. The Design Guidelines are not the exclusive basis for decisions of the Committee, and compliance with the Design Guidelines does not guarantee approval of any application. Regulations on siting of television antennas and satellite receiving dishes will be in conformance with any applicable Federal Communications Commission rules. The Design Guidelines may not unreasonably restrict solar energy systems in violation of ORS 105.880 or electrical vehicle charging stations in conflict with ORS 94.762.

(b) **Publication of Design Guidelines.** The Architectural Review Committee must make the Design Guidelines available to Owners and builders who seek to engage in development or construction within the Property. In Declarant's discretion, the Design Guidelines may be recorded, in which event the recorded version, as it may be amended from time to time, will control in the event of any dispute as to which version of the Design Guidelines was in effect at any particular time.

(c) **Amendment of Design Guidelines.** Declarant has sole and full authority to amend the Design Guidelines during the Development Period notwithstanding a delegation of reviewing authority to the Architectural Review Committee unless Declarant also delegates the power to amend to the Committee. Upon delegation of Declarant's right to amend, the Committee will have the authority to amend the Design Guidelines with the consent of the Board of Directors. Any amendments to the Design Guidelines will be prospective only and will not apply to require modifications to or removal of structures previously approved once the approved construction or modification has commenced. There is no limitation on the scope of amendments to the Design Guidelines, and such amendments may remove requirements previously imposed or otherwise make the Design Guidelines less restrictive.

7.5 **Membership: Appointment and Removal.** The Architectural Review Committee will consist of as many Persons as Declarant may from time to time appoint. Declarant, at its discretion, may appoint a single Person to serve as the Committee and may remove any member of the Committee from office at any time and may appoint new or additional members at any time. The Association will keep on file at its principal office a list of the names and addresses of the members of the Committee. Declarant may at any time delegate to the Board of Directors of the Association the right to appoint or remove members of the Committee. In such event, or in the event Declarant fails to appoint an Architectural Review Committee, the members of the Committee will be appointed by, and serve on behalf of, the Board, or if the Board fails to appoint such members, then the Board will serve as the Committee. The term of office for each member appointed by the Board will be one year unless lengthened by the Board at the time of appointment or unless the Board serves as the Committee, in which case the terms of the members will be the same as their terms as Board members. The Board may appoint any or all of its members to the Committee and is not required to appoint non-Board members. The Board may appoint one or more members to the Committee who are not Owners, but who have special expertise regarding the matters that come before the Committee. In the sole discretion of the Board, such non-Owner members of the Committee may be paid for such services, the cost of which may be paid by the applicants or treated as a common expense, as determined by the Board.



7.6 **Majority Action.** Except as otherwise provided in this Declaration, a majority of the members of the Architectural Review Committee has the power to act on behalf of the Committee, without the necessity of a meeting and without the necessity of consulting the remaining members of the Committee. The Committee may render its decision only by written instrument setting forth the action taken by the consenting members.

7.7 **Liability.** Neither the Architectural Review Committee nor any member thereof is liable to any Owner, Occupant, builder or developer for any damage, loss or prejudice suffered or claimed on account of any action or failure to act of the Committee or a member of the Committee, and the Association will indemnify the Committee and its members therefrom, provided only that the member has, in accordance with the actual knowledge possessed by him or her, acted in good faith.

7.8 **Nonwaiver.** Consent by the Architectural Review Committee to any matter proposed to it or within its jurisdiction will not be deemed to constitute a precedent or waiver impairing its right to withhold approval as to any similar matter thereafter proposed or submitted to it for consent.

7.9 **Appeal.** At any time after Declarant has delegated appointment of the members of the Architectural Review Committee to the Board of Directors pursuant to Section 7.5, any Owner adversely affected by action of the Committee may appeal such action to the Board. Appeals must be made in writing within 10 days of the Committee's action and must contain specific objections or mitigating circumstances justifying the appeal. If the Board is already acting as the Committee, the appeal will be treated as a request for a rehearing, in which case the Board will meet and receive evidence and argument on the matter. A final, conclusive decision will be made by the Board within 15 working days after receipt of such notification.

7.10 **Effective Period of Consent.** The Architectural Review Committee's consent to any proposed work will automatically be revoked one year after issuance unless construction of the work has been substantially commenced in the judgment of the Committee and thereafter diligently pursued, or unless the Owner has applied for and received an extension of time from the Committee.

7.11 **Estoppel Certificate.** Within 20 business days after written request is delivered to the Architectural Review Committee by any Owner, and upon payment to the Committee of a reasonable fee fixed by the Committee to cover costs, the Committee will provide such Owner with an estoppel certificate executed by a member of the Committee and acknowledged, certifying with respect to any Lot owned by the Owner, that as of the date of the certificate either (a) all Improvements made or done upon or within such Lot by the Owner comply with this Declaration or (b) such Improvements do not so comply, in which event the certificate must also identify the noncomplying Improvements and set forth with particularity the nature of such noncompliance. Any purchaser from the Owner, and any Mortgagee or other encumbrancer, is entitled to rely on such certificate with respect to the matters set forth therein, such matters being conclusive as between Declarant, the Committee, the Association and all Owners, and such purchaser or Mortgagee.

7.12 **Enforcement.** If during or after the construction the Architectural Review Committee finds that the work was not performed in substantial conformance with the approval granted, or that the required approval was not obtained, the Committee will notify the Owner in writing of the noncompliance, specifying the particulars of the noncompliance. The Committee may require conforming changes to be made or that construction be stopped. The cost of any required changes will be borne by the Owner. The Committee has the power and authority to order any manner



of changes or complete removal of any Improvement, alteration, or other activity for which prior written approval from the Committee is required and has not been obtained or waived in writing. If an Owner fails to comply with an order of the Committee, then, subject to the Owner's right of appeal under Section 7.9, either the Committee or the Board of Directors may enforce compliance in accordance with the procedures set forth in Section 11.1.

## Article 8

### ASSOCIATION

Declarant has organized, or before conveyance of the first Lot will organize, an association of all of the Owners within Stafford Meadows. Such Association, and its successors and assigns, will be organized as an Oregon nonprofit corporation under the name "**Stafford Meadows Homeowners Association**," and will have such property, powers and obligations as are set forth in this Declaration for the benefit of the Property and all Owners of Lots located therein.

8.1 **Organization.** Declarant will, before the first Lot is conveyed to an Owner, organize the Association as a nonprofit corporation under the general nonprofit corporation laws of the State of Oregon. The Articles of Incorporation of the Association will provide for its perpetual existence, but in the event the Association is at any time dissolved, whether inadvertently or deliberately, it will automatically be succeeded by an unincorporated association of the same name. In that event, the unincorporated association will have all the property, powers and obligations of the incorporated association existing immediately prior to dissolution. To the greatest extent possible, any successor unincorporated association will be governed by the Articles of Incorporation and Bylaws of the Association as if they had been made to constitute the governing documents of the unincorporated association and will be served by the members of the Board of Directors and the officers who served immediately prior to dissolution.

8.2 **Membership.** Every Owner of one or more Lots within the Property must, immediately upon creation of the Association and thereafter during the entire period of such Owner's ownership of one or more Lots within the Property, be a member of the Association. Such membership commences, exists, and continues simply by virtue of such ownership; expires automatically upon termination of such ownership; and need not be confirmed or evidenced by any certificate or acceptance of membership.

8.3 **Voting Rights.** The Association has two classes of voting membership:

**Class A.** Class A Members are all Owners with the exception of the Class B Member and are entitled to one vote for each Lot owned. When more than one Person holds an interest in any Lot, all such Persons are members. The vote for such Lot is exercised as they among themselves determine, but in no event will more than one vote be cast with respect to any Lot.

**Class B.** The Class B Member is Declarant, who is entitled to three votes for each Lot owned by Declarant. The Class B Membership will cease and be converted to Class A Membership on the happening of any of the following events, whichever occurs earlier:

(1) When all of the Lots in the final phase of development of Stafford Meadows have been Sold and conveyed to Owners other than a successor Declarant; or



(2) At such earlier time as Declarant may elect in writing to terminate Class B Membership.

8.4 **General Powers and Obligations.** The Association has, exercises and performs all of the following powers, duties, and obligations:

(a) The powers, duties and obligations granted to the Association by this Declaration.

(b) The powers and obligations of a nonprofit corporation pursuant to the general nonprofit corporation laws of the State of Oregon.

(c) The powers, duties and obligations of a homeowners association pursuant to the Oregon Planned Community Act.

(d) Any additional or different powers, duties and obligations necessary or desirable for carrying out the functions of the Association pursuant to this Declaration or otherwise promoting the general benefit of the Owners within the Property.

The powers and obligations of the Association may from time to time be amended, repealed, enlarged or restricted by changes in this Declaration made in accordance with the provisions of this Declaration, accompanied by any required changes in the Articles of Incorporation or Bylaws of the Association made in accordance with such instruments and with the nonprofit corporation laws of the State of Oregon.

8.5 **Specific Powers and Duties.** The powers and duties of the Association include, without limitation, all of the following:

(a) **Maintenance and Services.** The Association will provide maintenance and services for the Property as provided in Article 9 and other provisions of this Declaration.

(b) **Insurance.** The Association will obtain and maintain in force policies of insurance as determined by the Board of Directors and in accordance with any requirements in this Declaration or the Bylaws of the Association.

(c) **Rulemaking.** The Association will make, establish, promulgate, amend and repeal Rules and Regulations as provided in Section 0.

(d) **Assessments.** The Association will adopt budgets and impose and collect Assessments as provided in Article 10.

(e) **Enforcement.** The Association will perform such acts, whether or not expressly authorized by this Declaration, as may be reasonably necessary to enforce the provisions of this Declaration and the Rules and Regulations adopted by the Association, including, without limitation, enforcement of the decisions of the Architectural Review Committee. Nothing in this Declaration may be construed as requiring the Association to take any specific action to enforce violations.



(f) **Employment of Agents, Advisers and Contractors.** The Association, through its Board of Directors, may employ the services of any Person as manager; hire employees to manage, conduct and perform the business, obligations and duties of the Association; employ professional counsel and obtain advice from such Persons such as, but not limited to, landscape architects, architects, planners, attorneys and accountants; and contract for or otherwise provide for all services necessary or convenient for the management, maintenance and operation of the Property; provided, however, the Board may not incur or commit the Association to incur legal fees in excess of \$5,000 for any specific litigation or claim matter or enter into any contingent fee contract or any claim in excess of \$100,000 unless the Owners have enacted a resolution authorizing the incurring of such fees by a vote of 75 percent of the total voting rights of the Association. These limitations are not applicable to legal fees incurred in defending the Association or the Board from claims or litigation brought against them. The limitations set forth in this paragraph (f) will increase by 10 percent on each fifth anniversary of the recording of this Declaration.

(g) **Borrow Money.** The Association may borrow and repay money for the purpose of performing its duties under this Declaration; provided, however, that such borrowing in any calendar year may not exceed 20 percent of the estimated budgeted expenses of the Association for that calendar year unless the owners have enacted a resolution authorizing the project by a majority of the voting rights of the members. The Association may pledge Association income to secure such borrowing, and, subject to Section 4.3(d), encumber the Common Areas as security for the repayment of such borrowed money.

(h) **Acquire and Hold Title to Property.** The Association may acquire and hold title to real and personal property and interests therein, and must accept any real or personal property, leasehold or other property interests within Stafford Meadows conveyed to the Association by Declarant.

(i) **Transfers, Dedications, Encumbrances and Easements.** Except as otherwise provided in Sections 4.3(d) and 4.3(e), the Association may sell, transfer or encumber and grant easements upon all or any portion of the Common Area, or other real property to which it then holds title, to a Person, whether public or private, and dedicate or transfer all or any portion of such Common Area or property to any public agency, authority or utility for public purposes.

(j) **Create Classes of Service and Make Appropriate Charges.** The Association may, in its sole discretion, create various classes of service and make appropriate Individual Assessments or charges therefor to the users of such services, including, but not limited to, reasonable admission and other fees for the use of any and all recreational facilities situated on the Common Areas, without being required to render such services to those of its members who do not assent to such charges and to such related Rules and Regulations as the Board deems proper. In addition, the Board has the right to discontinue any service upon nonpayment of Assessments or to eliminate any service for which there is no demand or for which there are inadequate funds to maintain the same.

(k) **Restoring Damaged Improvements.** In the event of damage to or destruction of Common Areas or other property that the Association insures, the Board of Directors or its duly authorized agent must file and adjust all insurance claims and obtain reliable and detailed estimates of the cost of repairing or restoring the property to substantially the condition in which it existed prior to the damage, allowing for changes or Improvements necessitated by changes in



applicable building codes. If a decision is made not to restore the damaged Improvements, and no alternative Improvements are authorized, the affected property will be cleared of all debris and ruins and thereafter will be maintained by the Association in a neat and attractive, landscaped condition. If insurance proceeds are insufficient to cover the costs of reconstruction, the Board may levy Special Assessments to cover the shortfall against those Owners responsible for the premiums for the applicable insurance coverage. Any insurance proceeds remaining after paying the costs of repair or reconstruction, or after such settlement as is necessary and appropriate, will be retained by the Association for the benefit of all or some of the Owners, as appropriate, and placed in a capital Improvements account. This is a covenant for the benefit of Mortgagees and may be enforced by the Mortgagee of any affected Lot.

(l) **Security.** The Association may, but is not obligated to, maintain or support certain activities within Stafford Meadows designed to make the Property more enjoyable or safer than it otherwise might be. **Neither the Association, Declarant nor any managing agent will be considered insurers or guarantors of security or safety within the Property, nor will either be held liable for any loss or damage by reason of failure to provide adequate security or ineffectiveness of security or safety measures undertaken. No representation or warranty is made that any system or measure, including any mechanism or system for limiting access to the Property, cannot be compromised or circumvented, nor that any such system or measure undertaken will in all cases prevent loss or provide the detection or protection for which it is designed or intended. Each Owner acknowledges and agrees that the Association, the Board of Directors and any managing agent are not insurers and that each Person using the Property assumes all risks for personal injury and loss or damage to property resulting from acts of third parties.**

(m) **Services.** The Association may provide or contract for such services as the Board of Directors may reasonably deem to be of benefit to the Property, including, without limitation, landscape services, garbage and trash removal and security services.

(n) **Implied Rights and Obligations.** The Association may exercise any other right or privilege reasonably to be inferred from the existence of any right or privilege expressly given to the Association under this Declaration or reasonably necessary to effectuate any such right or privilege.

8.6 **Liability.** Neither a member of the Board of Directors nor an officer of the Association or member of the Architectural Review Committee or any other committee established by the Board will be liable to the Association, any Owner or any third party for any damage, loss or prejudice suffered or claimed on account of any action or failure to act in the performance of his or her duties, so long as the individual acted in good faith; believed that the conduct was in the best interests of the Association, or at least was not opposed to its best interests; and, in the case of criminal proceedings, had no reason to believe the conduct was unlawful. In the event any member of the Board or any officer or committee member of the Association is threatened with or made a party to any proceeding because the individual was or is a director, officer, or committee member of the Association, the Association will defend the individual against such claims and indemnify the individual against liability and expenses incurred to the maximum extent permitted by law.

8.7 **Interim Board; Turnover Meeting.** Declarant has the right to appoint an interim board of one to three directors, who will serve as the Board of Directors of the Association until



replaced by Declarant or until their successors take office at the Turnover Meeting following termination of Class B Membership. Declarant will call a meeting of the Association for the purpose of turning over administrative responsibility for the Property to the Association not later than 90 days after termination of the Class B Membership in accordance with Section 8.3. At the Turnover Meeting the interim directors will resign and their successors will be elected by the Owners, as provided in this Declaration and in the Bylaws of the Association. If Declarant fails to call the Turnover Meeting required by this Section 8.7, any Owner or Mortgagee of a Lot may call the meeting by giving notice as provided in the Bylaws.

**8.8 Contracts Entered into by Declarant or Before Turnover Meeting.** Notwithstanding any other provision of this Declaration, any management contracts, service contracts or employment contracts entered into by Declarant or the Board of Directors on behalf of the Association before the Turnover Meeting will have a term of not more than three years. In addition, any such contract must provide that it may be terminated without cause or penalty by the Association or Board upon not less than 30 days' notice to the other party given not later than 60 days after the Turnover Meeting. The limitations contained in this Section 8.8 do not apply to those contracts referred to in ORS 94.700(2).

**8.9 Bylaws.** The Bylaws of the Association and any amendment or modification of the Bylaws will be recorded in the Deed Records of Clackamas County, Oregon. On behalf of the Association, the Declarant will adopt and record the initial Bylaws as provided in ORS 94.625.

## Article 9

### MAINTENANCE

**9.1 Common Maintenance Areas.** The Common Maintenance Areas include the Common Areas, Limited Common Areas, Common Easement Areas, and the Front Yards of Lots in Stafford Meadows, and the wall maintenance areas designated on the Plat, until such maintenance is assumed by the local jurisdiction, if ever.

**9.2 Maintenance and Lighting of Common Maintenance Areas.** The Association is responsible for exterior lighting, if any, in the Common Areas and will perform all maintenance upon the Common Maintenance Areas, including, but not limited to, entrance monuments, gates, fences, walls in Common Areas or bordering the Common Areas (including without limitation any fence or wall along S.W. Boeckman Road, and any public vegetated swale along any roadway in the Property), signs, parking areas, pathways, bicycle paths, unless the maintenance thereof is assumed by a public body. Sidewalks, notwithstanding the public easement over them, are the Lot Owner's responsibility to maintain, repair, and replace and to keep free of leaves, ice, and snow. The Association is responsible for maintenance and irrigation of landscaping in the Front Yards and the walls constructed in the wall maintenance easement areas designated on the Plat, and for the design and any modification thereof.

(a) In the Front Yards, irrigation systems, including related controllers, monitors, and equipment, belong to the Lot Owner. Landscaping irrigation settings will be set by the Association and no Owner may tamper with or change such settings. The Association has the right of access to each such controller, monitor, or other equipment wherever located on a Lot. The cost of water for irrigation of the Front Yards is the responsibility of the Association and will be a common



expense. Rain gardens are part of the Property's overall stormwater treatment plan, whether located in the public right of way or on a portion of a Lot; any rain garden located on any Lot will be the responsibility of the Association to maintain as part of the Lot's Front Yard landscaping, which must be performed so that the rain garden area works for its intended stormwater collection and filtering functions. The Association will also maintain and irrigate the area of the street right-of-way between the curb and the sidewalk. Such areas will be maintained in attractive condition and in a good and workmanlike manner to render them fit for the purposes for which they are intended. The maintenance of Front Yards by the Association does not include maintenance of special features, which are the Owner's responsibility, including but not limited to decorative water features (ponds, streams, waterfalls, etc.), bridges, gazebos, foot paths, putting greens, or any other Improvement other than ordinary landscaping, which are the responsibility of the Lot Owner. Front Yard maintenance expenses borne by the Association will be Individual Expenses to be determined by the board of directors according to Section 10.3 below.

(b) The Association is hereby assigned and assumes the City of Wilsonville Development Agreements in respect of all the Property thereunder that subjected to this Declaration. Except to the extent of the Declarant's obligations to install, construct, and for the stated bond period therein, inspect and maintain, certain improvements on the affected Common Areas, this assignment and assumption includes Declarant's on-going maintenance, repair, inspection, and replacement obligations under the City of Wilsonville Development Agreements.

9.3 **Maintenance of Shared Irrigation Systems and Utility Facilities.** The Association will perform or contract to perform maintenance of (i) all irrigation systems and facilities within Common Maintenance Areas, and (ii) any private utilities serving a Common Area (other than Common Easement Areas), except to the extent such maintenance is performed by the utilities furnishing such services. The Association is not liable for any interruption or failure of such services. Each Owner is responsible for maintaining utility lines within his or her Lot other than those serving the Common Maintenance Areas.

9.4 **Owner's Responsibility.** Except as otherwise provided in this Declaration or by written agreement with the Association, all maintenance of the Lots and Improvements, including landscaping for which the Association is not responsible, walkways, and the driveway thereon as provided in Section 6.5 and 6.7 will be the sole responsibility of the Lot Owner, who will maintain the Lot in a neat and attractive condition in accordance with the community-wide standard of Stafford Meadows. Sidewalks, notwithstanding the public easement over them, are the Lot Owner's responsibility to maintain, repair, and replace and to keep free of leaves, ice, and snow. The Association may, in the discretion of the Board of Directors, assume the maintenance responsibilities of such Owner if, in the opinion of the Board, the level and quality of maintenance being provided by such Owner does not satisfy such standard. Before assuming such maintenance responsibilities, the Board will notify the Owner in writing of its intention to do so, and if such Owner has not commenced and diligently pursued remedial action within 15 days after mailing of such written notice, then the Association may proceed. The expenses of such maintenance by the Association will be reimbursed to the Association by the Owner, together with interest as provided in Section 11.3. Such charges will be an Individual Assessment and lien on the Lot as provided in Sections 10.4(d) and 11.1.

9.5 **Damage Liability.** Any damage to any Common Maintenance Area by Owners or their children, agents, visitors, friends, relatives, tenants, Occupants or service personnel, to the extent



not covered by the Association's insurance (including any deductible), will be assessed to such Owners as an Individual Assessment.

9.6 **Maintenance Plan.** Declarant will initially prepare and thereafter the Board of Directors must implement, review, and update a maintenance plan (the "**Maintenance Plan**") for the maintenance, repair and replacement of all property for which the Association has maintenance, repair or replacement responsibility under this Declaration or the Bylaws or the Oregon Planned Community Act. The Maintenance Plan will describe the maintenance, repair or replacement to be conducted; include a schedule for maintenance, repair or replacement; be appropriate for the size and complexity of the maintenance, repair and replacement responsibility of the Association; and address issues that include, but are not limited to, warranties and the useful life of the items of which the Association has maintenance, repair or replacement responsibility. The Board must review and update the Maintenance Plan as necessary. Changes or updates to the Maintenance Plan will be based on advice of competent experts or consultants. For a period of 10 years following recording of the Declaration, any changes to the Maintenance Plan without the approval of the Declarant and the original general contractor may void any applicable warranty and will release them from liability for any damage resulting from such change.

## Article 10

### ASSESSMENTS

10.1 **Purpose of Assessments.** The Association may levy Assessments. The Assessments levied by the Association must be used exclusively to promote the recreation, health, safety and welfare of the Owners and Occupants of the Property and for the improvement, operation and maintenance of the Common Maintenance Areas.

10.2 **When Lots Become Subject to Assessment.** Upon the first sale of each Lot to a purchaser other than (i) Declarant, (ii) another developer or builder in a bulk sale of Lots, (iii) a successor declarant, or (iv) an affiliate of Declarant, the Lot Sold becomes subject to assessment and the Owner will pay General Assessments, Special Assessments, Emergency Assessments, Limited Common Area Assessments, and if any, Individual Assessments.

10.3 **Allocation of Assessments.** Except as may otherwise be provided in an applicable supplemental declaration annexing Additional Property to this Declaration, all Lots subject to assessment will pay an equal share of the General Assessments, Special Assessments, and Emergency Assessments. The cost of Front Yard maintenance, including landscaping upkeep, repair and operation of irrigation systems, and water for irrigation, will be Individual Expenses, which will be reasonably determined by the board of directors based on the size and features of any given Lot's Front Yard and categories of corresponding assessments for the Front Yard maintenance performed by the Association. The board has the authority to create categories of Lots based on their size and Front Yard features, including without limitation that some Lots will have private rain gardens in their Front Yards and others will not, for the purpose of creating categories of Lots in respect of the Front Yard assessments; in other words, notwithstanding that Front Yard maintenance costs will be assessed as Individual Assessments, Front Yards may be lumped together by size and feature for simplification of assessment invoicing. If the irrigation water is not separately metered on a Lot, the board of directors will reasonably estimate irrigation as between Lots sharing a landscaping water meter and allocate the water costs accordingly or according to categories of Lots for Front Yard assessment.



10.4 **Type of Assessments.** The Association is authorized to levy the following types of Assessments:

(a) **General Assessments.** The Association will levy General Assessments for the common expenses incurred by or on behalf of the Association in accordance with this Declaration. The Board of Directors will from time to time and at least annually prepare an operating budget for the Association, taking into account the current costs of maintenance and services and future needs of the Association, any previous over-assessment and any common profits of the Association. The budget must take into account the number of Lots subject to assessment as of the first day of the fiscal year for which the budget is prepared and the number of Lots reasonably anticipated to become subject to assessment during the fiscal year. The budget may be based upon a greater number of Lots than those reasonably anticipated to be subject to assessment during the fiscal year if the Declarant agrees to subsidize the Association for any shortfall in the Operations Fund. The budget will provide for such reserve or contingency funds as the Board deems necessary or as may be required by law, but not less than the reserves required by Section 10.7. General Assessments for such operating expenses and reserves will then be apportioned among the Lots as provided in Section 10.3. The Board may revise the budget and adjust the General Assessment from time to time during the year. Within 30 days after the adoption of a final budget by the Board, the Board will send a copy of the final budget to each Owner. If the Board fails to adopt a budget, the last adopted budget continues in effect. The manner of billing and collection of Assessments is as provided in the Bylaws.

(b) **Special Assessments.** The Board of Directors may levy during any fiscal year a Special Assessment, applicable to that year only, for the purpose of deferring all or any part of the cost of any construction or reconstruction, unexpected repair, or acquisition or replacement of a described capital Improvement, or for any other one-time expenditure not to be paid for out of General Assessments. Special Assessments for acquisition or construction of new capital Improvements or additions that in the aggregate in any fiscal year exceed an amount equal to 15 percent of the budgeted gross expenses of the Association for the fiscal year may be levied only if approved by a majority of the voting rights voting on such matter, together with the written consent of the Class B Member, if any. Prior to the Turnover Meeting, any Special Assessment for acquisition or construction of new capital Improvements or additions must be approved by not less than 50 percent of the Class A voting rights, together with the written consent of the Class B Member. Special Assessments will be apportioned as provided in Section 10.3 and may be payable in lump sum or in installments, with or without interest or discount, as determined by the Board.

(c) **Emergency Assessments.** If the General Assessments levied at any time are or will become inadequate to meet all expenses incurred under this Declaration for any reason, including nonpayment of any Owner's Assessments on a current basis, the Board of Directors will immediately determine the approximate amount of such inadequacy and issue a supplemental budget, noting the reason therefor, and levy an Emergency Assessment for the amount required to meet all such expenses on a current basis. Emergency Assessments will be apportioned as set forth in Section 10.3 and payable as determined by the Board.

(d) **Limited Common Area Assessments.** General Assessments, Special Assessments and Emergency Assessments relating to maintenance, upkeep, repair, replacement or improvements to Limited Common Areas will be assessed exclusively and on an equal basis to the Lots having the right to use such Limited Common Areas.



(e) **Individual Assessments.** Any common expense or any part of a common expense benefiting fewer than all of the Lots may be assessed as Individual Assessments exclusively against the Lots benefited. Individual Assessments include, without limitation, charges for services provided under Sections 8.5(j), 9.2(a), and 10.4(a) and any loss or cost incurred by the Association that the Board of Directors determines is the fault of one or more Owners and not paid by insurance. Individual Assessments also include default Assessments levied against any Lot to reimburse the Association for costs incurred in bringing such Lot or its Owner into compliance with the provisions of this Declaration or the Rules and Regulations of the Association and for fines or other charges imposed pursuant to this Declaration for violation thereof. Unless otherwise provided by the Board, Individual Assessments will be due 30 days after the Board has given written notice thereof to the Owners subject to the Individual Assessments.

(f) **Working Fund Assessments.** Upon the first sale of a Lot to a purchaser other than a successor Declarant and upon any subsequent sale of such Lot, the purchaser will pay to the Association a Working Fund Assessment equal to two times the monthly General Assessment then applicable to the Lot. The Board of Directors may deposit Working Fund Assessments either in the Operations Fund or in the Reserve Fund, at the discretion of the Board.

10.5 **Assessment of Additional Property.** When Additional Properties are annexed to Stafford Meadows, the Lots included therein become subject to Assessments from the date of such annexation to the extent provided in Section 10.2. The Board of Directors, however, at its option may elect to recompute the budget based upon the additional Lots subject to Assessment and additional Common Areas and recompute General Assessments for all Lots, including the new Lots, for the balance of the fiscal year. Notwithstanding any provision of this Declaration apparently to the contrary, a declaration annexing Additional Property may provide that such Additional Property does not have the right to use a particular Common Area or facility located thereon, in which case such Additional Property will not be assessed for the costs of operating, maintaining, repairing, replacing or improving such Common Area or facility.

10.6 **Operations Fund.** The Association will keep all funds received by it as Assessments, other than reserves described in Section 10.7 or Working Fund Assessments deposited in the Reserve Fund, separate and apart from its other funds, in an Operations Fund in a bank account in the name of the Association. The Association will use such fund for the purpose of promoting the recreation, health, safety and welfare of the residents within the Property and in particular for the improvement and maintenance of properties, services and facilities devoted to this purpose and related to the use and enjoyment of the Common Maintenance Areas and the Lots, including but not limited to:

- (a) Payment of the cost of operation, maintenance, utilities, services, repairs, and replacements for the Common Maintenance Areas.
- (b) Payment of the cost of insurance maintained by the Association.
- (c) Payment of taxes assessed against the Common Areas and any Improvements thereon.
- (d) Payment of the cost of other services that the Association deems to be of general benefit to the Owners, including, but not limited to, accounting, legal, and secretarial services.



10.7 **Reserve Fund.**

(a) **Establishment of Account.** Declarant, on behalf of the Association, will conduct an initial reserve study as described in Section 10.7(c) and establish a Reserve Fund in a bank account in the name of the Association to fund major maintenance, repair or replacement of any common properties that will normally require replacement in whole or in part in more than one and less than 30 years; for exterior painting if the Common Maintenance Areas or other property to be maintained by the Association includes exterior painted surfaces; and for other items, whether or not involving Common Maintenance Areas, if the Association has responsibility to maintain the items, including items required by the Maintenance Plan established pursuant to Section 9.6. The Reserve Fund need not include those items that can reasonably be funded from the general budget or other funds of the Association or for those items for which one or more, but less than all, Owners are responsible for maintenance and replacement under the provisions of this Declaration or the Bylaws. Nothing in this Section 10 prohibits prudent investment of the Reserve Fund.

(b) **Funding of Reserve Fund.** The Reserve Fund will be funded by Assessments against the individual Lots assessed for maintenance of the items for which the Reserve Fund is being established, which sums will be included in the regular General Assessment for the Lot and the Limited Common Area Assessments, if applicable. The Board, however, may borrow funds from the Reserve Fund to meet high seasonal demands on the regular operating funds or to meet other temporary expenses that will later be paid from General Assessments, Special Assessments, or Emergency Assessments. The Reserve Fund also includes Working Fund Assessments to the extent so allocated by the Board of Directors pursuant to Section 10.4(f). The Reserve Fund will be established in the name of the Association. The Association is responsible for administering the Reserve Fund and making periodic payments into the account. The Board of Directors or the Owners may not vote to eliminate funding the Reserve Account unless the Board determines that the Reserve Account will be adequately funded for the following year, except that after the Turnover Meeting the Board, with the approval of all Owners, may, on an annual basis, elect not to fund the Reserve Fund for the following year. Assessments paid into the Reserve Fund are the property of the Association and are not refundable to sellers or Owners of Lots. Sellers of the Lots, however, may treat their outstanding share of the Reserve Fund as a separate item in any sales agreement.

(c) **Reserve Studies.** The reserve portion of the initial Assessment determined by Declarant will be based on a reserve study described in this paragraph (c) or other sources of information. The Board of Directors will annually conduct a reserve study, or review and update an existing study, to determine the Reserve Fund requirements, and may adjust the amount of payments as indicated by the study or update and provide other reserve items that the Board, in its discretion, may deem appropriate. The reserve study will:

- (1) Identify all items for which reserves are to be established;
- (2) Include the estimated remaining useful life of each item as of the date of the reserve study; and
- (3) Include for each item, as applicable, an estimated cost of maintenance, repair and replacement at the end of its useful life.



(d) **Use of Reserve Fund.** If a Reserve Fund is required, the Reserve Fund will be used only for the purposes for which the reserves have been established and kept separate from other funds. After the Turnover Meeting, however, the Board of Directors may borrow funds from the Reserve Fund to meet high seasonal demands on the regular operating funds or to meet unexpected increases in expenses if the Board has adopted a resolution, which may be an annual continuing resolution, authorizing the borrowing of funds. Not later than the adoption of the budget for the following year, the Board will adopt by resolution a written payment plan providing for repayment of the borrowed funds within a reasonable period. Assessments paid into the Reserve Fund are the property of the Association and are not refundable to sellers or Owners of Lots. Sellers of the Lots, however, may treat their outstanding share of the Reserve Fund as a separate item in any sales agreement.

10.8 **Declarant's Subsidy.** Declarant may, but is not be obligated to, reduce the General Assessments for any fiscal year by payment of a subsidy (in addition to any other amounts then owed by Declarant), which may be either a contribution, an advance against future Assessments due from Declarant or a loan, in Declarant's discretion. Any such subsidy will be disclosed as a line item in the income portion of the Association's budget. Payment of such subsidy in any year will not obligate Declarant to continue payment of such subsidy in future years unless otherwise provided in a written agreement between the Association and Declarant.

10.9 **Commencement of Assessment Obligation; Time of Payment.** The obligation to pay Assessments under this Declaration commences as to each Lot on the first day of the month after such Lot becomes subject to Assessment. The first annual General Assessment levied on each Lot will be adjusted according to the number of months remaining in the fiscal year at the time Assessments commence for such Lot.

10.10 **Payment of Assessments.** Assessments must be paid in such manner and on such dates as the Board of Directors may establish. Unless the Board otherwise provides, the General Assessment is due and payable in advance on the first day of each fiscal year. If any Owner is delinquent in paying any Assessments or other charges levied on his or her Lot, the Board may require the outstanding balance on all Assessments to be paid in full immediately. Until the Turnover Meeting, any obligation of Declarant to pay Assessments may be satisfied in the form of cash or by "in kind" contributions of services or materials, or by a combination of these.

10.11 **Creation of Lien and Personal Obligation of Assessments.** Declarant, for each Lot owned by it within the Property, hereby covenants, and each Owner of any Lot by acceptance of a conveyance thereof, whether or not so expressed in any such conveyance, will be deemed to covenant to pay to the Association all Assessments or other charges as may be fixed, established and collected from time to time in the manner provided in this Declaration or the Association Bylaws. Such Assessments and charges, together with any interest, late charges, expenses or attorneys' fees imposed pursuant to Article 11, are a charge on the land and a continuing lien upon the Lot against which each such Assessment or charge is made. Such Assessments, charges, and other costs are also the personal obligation of the Person who was the Owner of such Lot at the time when the Assessment or charge fell due. Such liens and personal obligations will be enforced in the manner set forth in Article 11.

10.12 **Voluntary Conveyance.** In a voluntary conveyance of a Lot the grantee will be jointly and severally liable with the grantor for all unpaid Assessments against the grantor of the Lot up to



the time of the grant or conveyance, without prejudice to the grantee's right to recover from the grantor the amounts paid by the grantee therefor. However, upon request of an Owner or Owner's agent for the benefit of a prospective purchaser, the Board of Directors will make and deliver a written statement of the unpaid Assessments against the prospective grantor of the Lot effective through a date specified in the statement, and the grantee in that case will not be liable for any unpaid Assessments against the grantor not included in the written statement.

10.13 **No Waiver.** Failure of the Board of Directors to fix Assessment amounts or rates or to deliver or mail each Owner an Assessment notice will not be deemed a waiver, modification or release of any Owner from the obligation to pay Assessments. In such event, each Owner will continue to pay Assessments on the same basis as during the last year for which an Assessment was made, if any, until a new Assessment is levied, at which time the Association may retroactively assess any shortfalls in collections.

10.14 **No Option to Exempt.** No Owner may exempt himself or herself from liability for Assessments by nonuse of Common Areas, abandonment of his or her Lot, or any other means. The obligation to pay Assessments is a separate and independent covenant on the part of each Owner. No diminution or abatement of Assessments or set-off may be claimed or allowed for any alleged failure of the Association or Board of Directors to take some action or perform some function required of it, or for inconvenience or discomfort arising from the making of repairs or Improvements, or from any other action it takes.

10.15 **Certificate.** Upon written request, the Association must furnish to any Owner liable for any type of Assessment a certificate in writing signed by an Association officer setting forth whether such Assessment has been paid. Such certificate is conclusive evidence of payment. The Association may require the advance payment of a reasonable processing fee for the issuance of such certificate.

## Article 11

### ENFORCEMENT

11.1 **Violation of General Protective Covenants.** If an Owner constructs or permits to be constructed on his or her Lot an Improvement contrary to the provisions of this Declaration, or violates any provisions of this Declaration, the Bylaws, or the Rules and Regulations, then the Association acting through the Board of Directors will notify the Owner in writing of any such specific violations. If the Owner is unable, is unwilling, or refuses to comply with the Association's specific directives for remedy or abatement, or the Owner and the Association cannot agree to a mutually acceptable solution within the framework and intent of this Declaration, after notice and opportunity to be heard and within 14 days after issuing written notice to the Owner, then the Association acting through the Board has the right to do any or all of the following:

(a) Assess reasonable fines against such Owner, based upon a resolution adopted by the Board of Directors that is delivered to each Lot, mailed to the mailing address of each Lot or mailed to the mailing address designated by the Owner of each Lot in writing, which fines constitute Individual Assessments for purposes of this Declaration;



(b) Enter the offending Lot and remove the cause of such violation, or alter, repair or change the item that is in violation of this Declaration in such a manner as to make it conform thereto, in which case the Association may assess such Owner for the entire cost of the work done, which amount will be payable to the Operations Fund as an Individual Assessment, provided that no items of construction will be altered or demolished in the absence of judicial proceedings;

(c) Cause any vehicle parked in violation of this Declaration or of the Rules and Regulations to be towed and impounded at the Owner's expense;

(d) Suspend the voting rights, any utility services paid for out of Assessments and the right to use the Common Areas for the period that the violations remain unabated, provided that the Association does not deprive any Owner of access to and from the Owner's Lot in the absence of a lien foreclosure or court order to such effect; and

(e) Bring suit or action against the Owner on behalf of the Association and other Owners to enforce this Declaration.

**11.2 Default in Payment of Assessments; Enforcement of Lien.** If an Assessment or other charge levied under this Declaration is not paid within 30 days after its due date, such Assessment or charge becomes delinquent and bears interest from the due date at the rate set forth below. In such event the Association may exercise any or all of the following remedies:

(a) The Association may suspend such Owner's voting rights, any utility or communication service paid for out of Assessments and right to use the Common Areas until such amounts, plus other charges under this Declaration, are paid in full, and may declare all remaining periodic installments of any General Assessment immediately due and payable. In no event, however, will the Association deprive any Owner of access to and from the Owner's Lot in the absence of a lien foreclosure or court order to such effect.

(b) The Association has a lien in accordance with ORS 94.709 against each Lot for any Assessment levied against the Lot, including any fines or other charges imposed under this Declaration or the Bylaws against the Owner of the Lot, and may foreclose such lien in the manner provided in ORS 94.709.

(c) The Association may bring an action to recover a money judgment for unpaid Assessments under this Declaration without foreclosing or waiving the lien described in Section 11.2(b). Recovery on any such action, however, operates to satisfy the lien, or the portion thereof, for which recovery is made.

(d) The Association has any other remedy available to it by law or in equity.

**11.3 Interest, Late Charges and Expenses.** Any amount not paid to the Association when due in accordance with this Declaration bears interest from the due date until paid at a rate that is the greater of 12 percent per annum or such other rate as may be established by the Board of Directors, but not to exceed the lawful rate of interest under the laws of the state of Oregon. A late charge may be charged for each delinquent Assessment in an amount established from time to time by resolution of the Board, which resolution is delivered to each Lot, mailed to the mailing address of each Lot or mailed to the mailing address designated by the Owner in writing, together with all



expenses incurred by the Association in collecting such unpaid Assessments, including attorneys' fees (even if suit is not instituted). In the event the Association files a notice of lien, the lien amount also includes the recording fees associated with filing the notice, and a fee for preparing the notice of lien, established from time to time by resolution of the Board.

11.4 **Costs and Attorneys' Fees.** In the event of any suit or action to enforce this Declaration, the Bylaws, the Rules and Regulations, or the Oregon Planned Community Act, or to collect any money due hereunder or to foreclose a lien, the prevailing party in such suit or act will be entitled to recover all costs and expenses incurred by it in connection with such suit or action, including a foreclosure title report, and will recover such amount as the court may determine to be reasonable as attorneys' fees at trial and upon any appeal or petition for review thereof or in connection with any bankruptcy proceedings or special bankruptcy remedies.

11.5 **Assignment of Rents.** As security for the payment of all obligations owing to the Association pursuant to this Section 11.5, each Owner hereby grants to the Association the right to collect the rents, issues and profits of the Owner's Lot; provided, however, that the Owner will retain the right, prior to any default by such Owner in performance of the Owner's obligations under this Declaration, to collect and retain such rents, issues and profits as they become due and payable. Upon any such default, the Association may, at any time after 10 days written notice to the Owner, either in person, by agent or by a receiver to be appointed by a court of competent jurisdiction, and without regard to the adequacy of any security for such indebtedness, in its own name sue for or otherwise collect such rents, issues and profits, including those past due and unpaid, and apply them, less costs and expenses of operation and collection, including reasonable attorneys' fees, in payment of such indebtedness to the Association, and in such order as the Association may determine. Such action will not cure nor waive any default under this Declaration or invalidate any act done pursuant to this Declaration. The assignment of rents and powers described in this Section 11.5 does not affect, and will in all respects be subordinated to, the rights and powers of the holder of any first or second Mortgage on any Lot to do the same or similar acts

11.6 **Nonexclusiveness and Accumulation of Remedies.** An election by the Association to pursue any remedy provided for violation of this Declaration will not prevent concurrent or subsequent exercise of another remedy permitted under this Declaration. The remedies provided in this Declaration are not exclusive but are in addition to all other remedies, including actions for damages and suits for injunctions and specific performance, available under applicable law to the Association. In addition, any aggrieved Owner may bring an action against another Owner or the Association to recover damages or to enjoin, abate, or remedy any violation of this Declaration by appropriate legal proceedings.

11.7 **Enforcement by Clackamas County.** The provisions of this Declaration relating to preservation and maintenance of Common Areas will be deemed to be for the benefit of Clackamas County as well as the Association and Owners of Lots, and Clackamas County may enforce such provisions by appropriate proceedings at law or in equity, or may cause such maintenance to be performed, the costs of which will become a lien upon the Property.



## Article 12

### DISPUTE RESOLUTION

#### 12.1 Mediation.

(a) Except as otherwise provided in this Section 12.1, before initiating litigation, arbitration, or an administrative proceeding in which the Association and an Owner have an adversarial relationship, the party that intends to initiate litigation, arbitration or an administrative proceeding will offer to use any dispute resolution program available within Clackamas County, Oregon that is in substantial compliance with the standards and guidelines adopted under ORS 36.175. The written offer must be hand-delivered or mailed by certified mail, return receipt requested, to the address, contained in the records of the Association, for the other party.

(b) If the party receiving the offer does not accept the offer within 10 days after receipt of the offer, such acceptance to be made by written notice, hand-delivered or mailed by certified mail, return receipt requested, to the address, contained in the records of the Association, for the other party, the initiating party may commence the litigation, arbitration or administrative proceeding. The notice of acceptance of the offer to participate in the program must contain the name, address, and telephone number of the body administering the dispute resolution program.

(c) If a qualified dispute resolution program exists within Clackamas County, Oregon and an offer to use the program is not made as required under Section 12.1(a), then litigation, arbitration or an administrative proceeding may be stayed for 30 days upon a motion of the noninitiating party. If the litigation, arbitration or administrative action is stayed under this Section 12.1(c), both parties must participate in the dispute resolution process.

(d) Unless a stay has been granted under Section 12.1(c), if the dispute resolution process is not completed within 30 days after receipt of the initial offer, the initiating party may commence litigation, arbitration or an administrative proceeding without regard to whether the dispute resolution is completed.

(e) Once made, the decision of the court, arbitrator or administrative body arising from litigation, arbitration or an administrative proceeding may not be set aside on the grounds that an offer to use a dispute resolution program was not made.

(f) The requirements of this Section 12.1 do not apply to circumstances in which irreparable harm to a party will occur due to delay or to litigation, arbitration, or an administrative proceeding initiated to collect Assessments, other than Assessments attributable to fines.

12.2 Arbitration. Any claim, controversy or dispute by or among Declarant (including members, officers, directors, shareholders and affiliates of Declarant), Association, the Architectural Review Committee, or one or more Owners, or any of them, arising out of or related to this Declaration, the Bylaws, the Rules and Regulations, or the Property will be first subject to mediation as described in Section 12.1 or otherwise, and if not timely settled by mediation will be resolved by arbitration in accordance with this Article 12. The decisions and award of the arbitrator are final, binding and nonappealable. The arbitration will be conducted in the Portland, Oregon, metropolitan area or at such other location as may be agreed upon by the parties, pursuant to the arbitration statutes



of the state of Oregon, and any arbitration award may be enforced by any court with jurisdiction. Filing for arbitration will be treated the same as filing in court for purposes of meeting any applicable statute of limitations or for purposes of filing a notice of pending action ("lis pendens").

**12.3 Selection of Arbitrator.** The arbitration will be conducted by a single arbitrator selected by mutual agreement of the parties. The arbitrator selected must be neutral and unbiased, except to the extent the arbitrator's prior relationship with any party is fully disclosed and consented to by the other party or parties. If the parties are unable to agree upon the arbitrator within 10 days after a party's demand for arbitration, upon application of any party, the presiding judge of the Circuit Court of Clackamas County, Oregon will designate the arbitrator.

**12.4 Consolidated Arbitration.** Upon demand by any party, claims between or among the parties and third parties will be submitted in a single, consolidated arbitration. Notwithstanding the provisions of this Article 12, in the event any claim, controversy or dispute involves a claim by either party against a third party who is not required to and does not voluntarily agree to submit such claim to arbitration, then either party may elect to have the matter determined by a court of law in a consolidated proceeding, rather than by arbitration. In such case, the parties hereby waive trial by jury and agree that the matter will be determined by a judge sitting without a jury.

**12.5 Discovery.** The parties to the arbitration are entitled to such discovery as would be available to them in an action in Clackamas County Circuit Court. The arbitrator has all of the authority of the court incidental to such discovery, including, without limitation, authority to issue orders to produce documents or other materials, to issue orders to appear and submit to deposition, and to impose appropriate sanctions, including, without limitation, award against a party for failure to comply with any order.

**12.6 Evidence.** The parties to the arbitration may offer such evidence as they desire and will produce such additional evidence as the arbitrator may deem necessary for an understanding and determination of the dispute. The arbitrator will determine the admissibility of the evidence offered. All evidence will be taken in the presence of the arbitrator and all of the parties, except when any of the parties is absent in default or has waived its right to be present.

**12.7 Excluded Matters.** Notwithstanding the foregoing, the following matters are not subject to mediation or arbitration under this Article 12 (but are subject to the applicable provisions of Section 12.8): (a) actions relating to the collection of fees, Assessments, fines and other charges imposed or levied by the Association (other than disputes as to the validity or amount of such fees, Assessments, fines or charges, which disputes will be subject to mediation/arbitration as provided above); and (b) actions to enforce any order, decision or award rendered by arbitration pursuant to this Article 12. The filing of a lis pendens or the application to any court for the issuance of any provisional process or similar remedy described in the Oregon or Federal Rules of Civil Procedure will not constitute a waiver of the right or duty to utilize the procedures specified in this Article 12.

**12.8 Costs and Attorneys' Fees.** The fees of any mediator and the costs of mediation will be divided and paid equally by the parties. Each party will pay its own attorneys' fees and costs in connection with any mediation. The fees of any arbitrator and the costs of arbitration will be paid by the nonprevailing party or parties; if none, such fees and costs will be divided and paid equally by the parties. Should any suit, action or arbitration be commenced in connection with any dispute related to or arising out of this Declaration, the Bylaws, the Rules and Regulations, or the Oregon Planned



Community Act to obtain a judicial construction of any provision of this Declaration, the Bylaws or the Rules and Regulations; to rescind this Declaration; or to enforce or collect any judgment or decree of any court or any award obtained during arbitration, the prevailing party will be entitled to recover its costs and disbursements, together with such investigation, expert witness and attorneys' fees incurred in connection with such dispute as the court or arbitrator may adjudge reasonable, at trial, in the arbitration, upon any motion for reconsideration, upon petition for review, and on any appeal of such suit, action or arbitration proceeding. The determination of who is the prevailing party and the amount of reasonable attorneys' fees to be paid to the prevailing party will be decided by the arbitrator (with respect to attorneys' fees incurred before and during the arbitration proceeding) and by the court or courts, including any appellate or review court, in which such matter is tried, heard or decided, including a court that hears a request to compel or enjoin arbitration or that hears exceptions made to an arbitration award submitted to it for confirmation as a judgment (with respect to attorneys' fees incurred in such proceedings).

12.9 **Survival.** The mediation and arbitration agreement set forth in this Article 12 will survive the transfer by any party of its interest or involvement in the Property and any Lot therein and will survive the termination of this Declaration.

### Article 13

#### MORTGAGEES

The following provisions are for the benefit of holders, insurers and guarantors of first Mortgage on Lots. The provisions of this Article 13 apply to both this Declaration and to the Bylaws, notwithstanding any other provisions contained therein.

13.1 **Subordination of Lien to Mortgages.** The lien of the Assessments or charges provided for in this Declaration are subordinate to the lien of any Mortgage on such Lot which was made in good faith and for value and which was recorded prior to the recordation of the notice of lien. Sale or transfer of any Lot does not affect the Assessment lien, but the sale or transfer of any Lot that is subject to any Mortgage or deed of trust pursuant to a decree of foreclosure or nonjudicial sale thereunder extinguishes any lien of an Assessment, notice of which was recorded after the recording of the Mortgage. Such sale or transfer, however, does not release the Lot from liability for any Assessments or charges thereafter becoming due or from the lien of such Assessments or charges.

13.2 **Reimbursement of First Mortgagees.** First Mortgagees of Lots may, jointly or singly, pay taxes or other charges which are in default and which may or have become a charge against any Common Areas and may pay overdue premiums on hazard insurance policies or secure new hazard insurance coverage on the lapse of a policy, for such Common Area. First Mortgagees making such payments are owed immediate reimbursement therefor from the Association.

13.3 **Notification of First Mortgagee.** If a first Mortgagee has requested such notice in writing from the Association, the Board will notify such Mortgagee of any individual Lot of any default in performance of this Declaration by the Owner which is not cured within 60 days after notice of default to the Owner.

13.4 **Notice to Association.** Upon request, each Owner is obligated to furnish to the Association the name and address of the holder of any Mortgage encumbering such Owner's Lot.



## Article 14

### AMENDMENT AND REPEAL

14.1 **How Proposed.** Amendments to or repeal of this Declaration will be proposed by either a majority of the Board of Directors or by Owners holding 30 percent or more of the Association's voting rights. The proposed amendment or repeal must be reduced to writing and will be included in the notice of any meeting at which action is to be taken thereon or attached to any request for consent to the amendment or repeal.

14.2 **Approval Required.** This Declaration, or any provision thereof, as from time to time in effect with respect to all or any part of the Property, may be amended or repealed by the vote or written consent of Owners representing not less than 75 percent of the voting rights, without regard to any weighted vote for the Class B Member, together with the written consent of the Class B Member, if such Class B Membership has not been terminated as provided in this Declaration. In no event will an amendment under this section create, limit or diminish special Declarant rights without Declarant's written consent, or change the boundaries of any Lot or any uses to which any Lot is restricted under this Declaration or change the method of determining liability for common expenses, the method of determining the right to common profits or the method of determining voting rights of any Lot unless the Owners of the affected Lots unanimously consent to the amendment. Declarant may not amend this Declaration to increase the scope of special Declarant rights reserved in this Declaration after the sale of the first Lot unless Owners representing 75 percent of the total vote, other than Declarant, agree to the amendment. To the extent any amendment relates to the preservation or maintenance of the Common Areas or private utility lines, a City of Wilsonville Development Agreement, or the existence of an entity responsible for accomplishing the same, such amendment must be approved by the planning department of City of Wilsonville.

14.3 **Recordation.** Any such amendment or repeal becomes effective only upon recordation in the Deed Records of Clackamas County, Oregon of a certificate of the president and secretary of the Association setting forth in full the amendment, amendments or repeal so approved and certifying that such amendment, amendments or repeal have been approved in the manner required by this Declaration and ORS 94.590, and acknowledged in the manner provided for acknowledgment of deeds.

14.4 **Regulatory Amendments.** Notwithstanding the provisions of Section 14.2, until the Turnover Meeting has occurred, Declarant has the right to amend this Declaration or the Bylaws of the Association to comply with the requirements of the Federal Housing Administration; the United States Department of Veterans Affairs; the Farmers Home Administration of the United States; the Federal National Mortgage Association; the Government National Mortgage Association; the Federal Home Mortgage Loan Corporation; any department, bureau, board, commission or agency of the United States or the state of Oregon; or any corporation wholly owned, directly or indirectly, by the United States or the state of Oregon that insures, guarantees or provides financing for a planned community or lots in a planned community. After the Turnover Meeting, any such amendment must be approved by the Association in accordance with the approval provisions of this Declaration or the Bylaws, as applicable.



## Article 15

### MISCELLANEOUS PROVISIONS

15.1 **No Implied Obligations.** Nothing in this Declaration may be construed to require Declarant or any successor Declarant to subject Additional Property to this Declaration or to improve or develop any of the Property or to do so for any particular uses.

15.2 **Right to Approve Additional Covenants.** No Person may record any declaration of covenants, conditions and restrictions, declaration of condominium or similar instrument affecting any portion of the Property without Declarant's prior written consent. Any attempted recordation without such consent will result in such instrument being void and of no force or effect unless subsequently approved in writing by Declarant.

15.3 **Notice of Sale or Transfer of Title.** Any Owner selling or otherwise transferring title to his or her Lot must give the Association written notice within seven days after the transfer of the name and address of the purchaser or transferee, the date of such transfer of title and such other information as the Association may reasonably require. The transferor continues to be jointly and severally responsible with the transferee for all obligations of the Owner of the Lot, including Assessment obligations, until the date upon which such notice is received by the Board, notwithstanding the transfer of title.

15.4 **Exclusive Rights to Use Name of Development.** No Person may use the name "Stafford Meadows" or any derivative of such name in any printed, digital (i.e., internet) or other promotional or commercial material without Declarant's prior written consent. However, an Owner may use the name "Stafford Meadows" where such term is used solely to specify that the Owner's property is located within the Property. In no event will any Owner enter into an agreement with any third party for the sale, rental, or management of the Owner's Lot if such agreement purports to grant any right to such third party to use the name "Stafford Meadows" or any derivative of such name in violation of this provision.

15.5 **Lessees and Other Invitees.** Lessees, employees, invitees, licensees, contractors, family members, guests, and other Persons entering the Property under rights derived from an Owner must comply with all of the provisions of this Declaration restricting or regulating the Owner's use, improvement or enjoyment of his or her Lot and other areas within the Property. The Owner is responsible for obtaining such compliance and will be liable for any failure of compliance by such Persons in the same manner and to the same extent as if the failure had been committed by the Owner.

15.6 **Nonwaiver.** Failure by the Association or by any Owner to enforce any covenant or restriction contained in this Declaration will in no event be deemed a waiver of the right to do so thereafter.

15.7 **Construction and Severability.** This Declaration will be liberally construed as an entire document to accomplish the purposes hereof as stated in the introductory paragraphs hereof. Nevertheless, each provision of this Declaration will be deemed independent and severable, and the invalidity or partial invalidity of any provision will not affect the validity or enforceability of the remaining part of that or any other provision.

15.8 **Terminology and Captions.** As used in this Declaration, the singular includes the plural and the plural the singular, and the masculine and neuter each include the masculine, feminine and neuter, as the context requires. All captions used in this Declaration are intended solely for convenience of reference and in no way limit any of the provisions of this Declaration.

15.9 **Notices.** All notices to the Association or to the Board of Directors will be sent care of the manager or, if there is no manager, to the principal office of the Association or to such other address as the Board may designate from time to time. All notices to any Owner will be sent to such address as may have been designated by such Owner from time to time, in writing, to the Board or, if no address has been designated, to the Owner's Lot. In the discretion of the Board, any notice, information or other written material required to be given to an Owner or director under this Declaration or the Bylaws or pursuant to the Oregon Planned Community Act, may be given by electronic mail, facsimile or other form of electronic communication acceptable to the Board, except for the following notices: failure to pay an Assessment, foreclosure of an Association lien under ORS 94.709, or an action the Association may take against an Owner. An Owner or director may decline to receive notice by electronic mail, facsimile or other form of electronic communication and may direct the Board to provide notice in any other manner permitted under this Declaration or the Bylaws or the Oregon Planned Community Act.

15.10 **Private Agreement.** This Declaration and the covenants and agreements contained herein constitute a private agreement among the Owners of Lots in Stafford Meadows. This Declaration does not restrict City of Wilsonville's authority to adopt or amend its development regulations. It is the duty of every Person engaged in development or remodeling of a Lot and/or Improvement in Stafford Meadows to know the requirements of this Declaration and the covenants



and agreements contained herein. There may be conflicting requirements between this Declaration and regulations of City of Wilsonville. In the event there is a conflict between a regulation of City of Wilsonville and this Declaration, any question regarding which provision controls will be directed to the Architectural Review Committee. In each case, Clackamas County will limit its review of a development application to the requirements of its regulations and will not be liable for any approvals or permits that are granted in compliance with the regulations of City of Wilsonville, Clackamas County, the state of Oregon or any other jurisdiction, but that are not in compliance with this Declaration. Declarant, the Committee and the Association, or any one of them, will not be liable for any approvals that are granted in compliance with this Declaration, but that are not in compliance with the regulations of City of Wilsonville, Clackamas County, the State of Oregon or any other jurisdiction.

IN WITNESS WHEREOF, Declarant has executed this Declaration on the date set forth above.

WEST HILLS LAND DEVELOPMENT LLC,  
an Oregon limited liability company

*[Handwritten Signature]*  
Walter E. Remmers, Member

STATE OF OREGON )  
 )ss.  
COUNTY OF Multnomah )

The foregoing instrument was acknowledged before me this 12th day of December, 2018, by Walter E. Remmers, member of West Hills Land Development LLC, an Oregon limited liability company, on its behalf.

*[Handwritten Signature]*  
Notary Public for Oregon  
My commission expires: March 01, 2022



23P  
AFTER RECORDING RETURN TO:

Michelle D. Da Rosa LLC  
Attorney at Law  
205 SE Spokane Street, Suite 300  
Portland, OR 97202  
Zachary Taylor

Clackamas County Official Records  
Sherry Hall, County Clerk

2019-002824



\$203.00

01/17/2019 12:56:31 PM

PD-BYL Cnt=1 Stn=54 COUNTER2  
\$115.00 \$16.00 \$62.00 \$10.00

**BYLAWS OF STAFFORD MEADOWS HOMEOWNERS ASSOCIATION**

Attached hereto are the initial Bylaws of Stafford Meadows Homeowners Association adopted January 18, 2019 by the Declarant pursuant to the Declaration of Protective Covenants, Conditions, Restrictions and Easements for Stafford Meadows recorded 1/15, 2019 in the Records of ~~Washington~~ Clackamas County, Oregon, as Document No. 2019-002161.

**WEST HILLS LAND DEVELOPMENT LLC,**  
an Oregon limited liability company

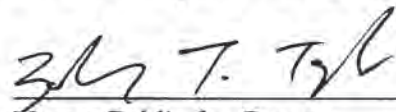
By:   
Walter E. Remmers, member

Address: 3330 NW Yeon, Suite 200  
Portland, OR 97210

STATE OF OREGON )  
 )ss.  
COUNTY of Multnomah )

This instrument was acknowledged before me this 12th day of December, 2018, by Walter E. Remmers, member of West Hills Land Development LLC, an Oregon limited liability company, on its behalf.



  
Notary Public for Oregon  
My commission expires March 1, 2022

**BYLAWS OF  
STAFFORD MEADOWS HOMEOWNERS ASSOCIATION**



## TABLE OF CONTENTS

|  | Page |
|--|------|
| Article 1 DEFINITIONS .....                          | 1    |
| 1.1 Association .....                                | 1    |
| 1.2 Articles of Incorporation .....                  | 1    |
| 1.3 Declaration .....                                | 1    |
| 1.4 Incorporation by Reference .....                 | 1    |
| Article 2 MEMBERSHIP .....                           | 1    |
| 2.1 Membership .....                                 | 1    |
| 2.2 Membership List .....                            | 1    |
| Article 3 MEETINGS AND VOTING .....                  | 1    |
| 3.1 Place of Meetings .....                          | 1    |
| 3.2 Turnover Meeting .....                           | 1    |
| 3.3 Annual Meeting .....                             | 2    |
| 3.4 Special Meetings .....                           | 2    |
| 3.5 Notice of Meeting .....                          | 2    |
| 3.6 Quorum .....                                     | 2    |
| 3.7 Voting Rights .....                              | 3    |
| 3.8 Fiduciaries and Joint Owners .....               | 3    |
| 3.9 Tenants and Contract Vendors .....               | 3    |
| 3.10 Casting of Votes and Consents .....             | 4    |
| 3.11 Majority Vote .....                             | 4    |
| 3.12 Rules of Order .....                            | 4    |
| Article 4 DIRECTORS: MANAGEMENT .....                | 5    |
| 4.1 Number and Qualification .....                   | 5    |
| 4.2 Interim Directors .....                          | 5    |
| 4.3 Transitional Advisory Committee .....            | 5    |
| 4.4 Election and Tenure of Office .....              | 5    |
| 4.5 Vacancies .....                                  | 6    |
| 4.6 Removal of Directors .....                       | 6    |
| 4.7 Powers .....                                     | 6    |
| 4.8 Meetings .....                                   | 8    |
| 4.9 Open Meetings .....                              | 8    |
| 4.10 Notice of Meetings .....                        | 9    |
| 4.11 Quorum and Vote .....                           | 9    |
| 4.12 Right Of Declarant To Disapprove Actions .....  | 9    |
| 4.13 Liability .....                                 | 10   |
| 4.14 Compensation .....                              | 10   |
| 4.15 Executive, Covenants and Other Committees ..... | 10   |
| 4.16 Enforcement Procedures .....                    | 11   |
| Article 5 OFFICERS .....                             | 12   |
| 5.1 Designation and Qualification .....              | 12   |
| 5.2 Election and Vacancies .....                     | 12   |
| 5.3 Removal and Resignation .....                    | 12   |
| 5.4 President .....                                  | 12   |
| 5.5 Vice Presidents .....                            | 12   |

|           |  |    |
|-----------|--|----|
| 5.6       | Secretary.....                           | 12 |
| 5.7       | Treasurer.....                           | 13 |
| 5.8       | Compensation of Officers. ....           | 13 |
| Article 6 | ASSESSMENTS, RECORDS AND REPORTS.....    | 13 |
| 6.1       | Assessments. ....                        | 13 |
| 6.2       | Records. ....                            | 14 |
| 6.3       | Statement of Assessments Due.....        | 14 |
| 6.4       | Inspection of Books and Records. ....    | 15 |
| 6.5       | Payment of Vouchers. ....                | 15 |
| 6.6       | Execution of Documents.....              | 15 |
| 6.7       | Reports and Audits. ....                 | 15 |
| Article 7 | INSURANCE.....                           | 16 |
| 7.1       | Types of Insurance.....                  | 16 |
| 7.2       | Insurance by Lot Owners. ....            | 17 |
| 7.3       | Planned Community Act Requirements. .... | 17 |
| Article 8 | GENERAL PROVISIONS.....                  | 17 |
| 8.1       | Seal.....                                | 17 |
| 8.2       | Notice.....                              | 17 |
| 8.3       | Waiver of Notice.....                    | 18 |
| 8.4       | Action Without Meeting. ....             | 18 |
| 8.5       | Conflicts.....                           | 18 |
| Article 9 | AMENDMENTS TO BYLAWS.....                | 18 |
| 9.1       | How Proposed.....                        | 18 |
| 9.2       | Adoption.....                            | 18 |
| 9.3       | Execution and Recording.....             | 19 |



BYLAWS OF  
STAFFORD MEADOWS HOMEOWNERS ASSOCIATION

**Article 1**

**DEFINITIONS**

1.1 **Association.** "Association" means Stafford Meadows Homeowners Association, a nonprofit corporation organized and existing under the laws of the State of Oregon.

1.2 **Articles of Incorporation.** "Articles of Incorporation" means the Articles of Incorporation of the Association.

1.3 **Declaration.** The "Declaration" means the recorded Declaration of Protective Covenants, Conditions, Restrictions and Easements for Stafford Meadows, as the same may be subsequently amended or supplemented pursuant to the terms thereof.

1.4 **Incorporation by Reference.** Except as otherwise provided herein, the terms that are defined in Article 1 of the Declaration are used in these Bylaws as therein defined.

**Article 2**

**MEMBERSHIP**

2.1 **Membership.** Every Owner of one or more Lots within the Property will, immediately upon creation of the Association and thereafter during the entire period of such ownership, be a member of the Association. Such membership commences, exists and continues simply by virtue of such ownership, expires automatically upon termination of such ownership, and need not be confirmed or evidenced by any certificate or acceptance of membership. The Association has two classes of membership, Class A and Class B, as set forth in the Declaration.

2.2 **Membership List.** The Secretary will maintain at the principal office of the Association a membership list showing the name and address of the Owner of each Lot. The Secretary may accept as satisfactory proof of such ownership a duly executed and acknowledged conveyance, a title insurance policy, or other evidence reasonably acceptable to the Board of Directors.

**Article 3**

**MEETINGS AND VOTING**

3.1 **Place of Meetings.** Meetings of the members of the Association will be held at such reasonable place convenient to the members as may be designated in the notice of the meeting

3.2 **Turnover Meeting.** Declarant will call the first meeting of the Owners to organize the Association within 90 days after termination of the Class B Membership as provided in Section



3.7 below. Notice of such meeting will be given to all Owners as provided in Section 3.5. If a quorum of the Owners is present, the Owners will elect not fewer than the number of directors sufficient to constitute a quorum of the Board of Directors. If the Declarant fails to call the meeting, the meeting may be called and notice given by any Owner or Mortgagee of a Lot. The expense of giving notice will be paid or reimbursed by the Association. In the event of a lack of quorum at such Turnover Meeting, it may be adjourned as provided in Section 3.6. Nothing in this section may be construed as preventing Declarant from calling the Turnover Meeting before such date or from calling informal, informational meetings of the Owners.

3.3 **Annual Meeting.** The annual meeting of the members for the election of directors and for the transaction of such other business as may properly come before the meeting will be held at a reasonable hour and on a reasonable day as may be established by the Board of Directors or, if the Board fail to designate a date by the first day of September, then at 7:30 p.m. on the second Thursday in October. The first annual meeting will be held within one year after the date of the Turnover Meeting.

3.4 **Special Meetings.** A special meeting of the Association may be called at any time by the President or by a majority of the Board of Directors. A special meeting will be called by the president or secretary upon receipt of a written request stating the purpose of the meeting from members having at least 30 percent of the voting rights entitled to be cast at such meeting. Business transacted at a special meeting will be confined to the purposes stated in the notice of meeting.

3.5 **Notice of Meeting.**

(a) Written or printed notice stating the place, day and hour of the meeting, the items on the agenda, including the general nature of any proposed amendment to the Declaration or these Bylaws, any budget changes, any proposal to remove a director or officer and, in case of a special meeting, the purpose or purposes for which the meeting is called, will be delivered not less than 10 or more than 50 days before the date of the meeting. Such notice will be given either personally, by mail or, to the extent permitted by law, by electronic mail, facsimile or other form of electronic communication acceptable to the Board of Directors, by or at the direction of the President, the Secretary, or the persons calling the meeting, to each member entitled to vote at such meeting and to all Mortgagees who have requested such notice. For a period of 10 years following recording of the Declaration, notices of meetings (including agendas) must also be given to Declarant (or any designee of Declarant specified in any written notice to the Association) in the same manner as given to Owners, and Declarant or a representative of Declarant will be entitled to attend such meetings. If mailed, such notice will be deemed to be delivered when deposited in the United States mail, with postage fully prepaid thereon, addressed to the member at his or her most recent address as it appears on the records of the Association or to the mailing address of his or her Lot.

(b) When a meeting is adjourned for 30 days or more, or when a redetermination of the Persons entitled to receive notice of the adjourned meeting is required by law, notice of the adjourned meeting will be given as for an original meeting. In all other cases, no notice of the adjournment or of the business to be transacted at the adjourned meeting need be given other than by announcement at the meeting at which such adjournment is taken.

3.6 **Quorum.** At any meeting of the Association, members having at least 25 percent of the voting rights entitled to be cast at such meeting, present in person, by proxy or by absentee ballot,



if permitted by the Board of Directors, constitutes a quorum, except when a larger quorum is required by the Declaration. When a quorum is once present to organize a meeting, it cannot be broken by the subsequent withdrawal of a member or members. If any meeting of members cannot be organized because of a lack of quorum, the members who are present, either in person or by proxy, may adjourn the meeting from time to time not less than 48 hours or more than 30 days from the time the original meeting was called until a quorum is present, in which case, at the re-scheduled meeting at least 10 percent of the voting rights entitled to be cast at such meeting, present in person, or by proxy, or by absentee ballot (if permitted by the Board of Directors) will constitute a quorum, or half the number of a larger quorum required by the Declaration. If the notice of a meeting of the Association provided that if the meeting fails to meet the 25%-quorum requirement then the quorum will be reduced to 10 percent, then a meeting may continue with a quorum of 10 percent of the voting rights entitled to be cast at such meeting are present in person, or by proxy, or by absentee ballot (if permitted by the Board of Directors).

3.7 **Voting Rights.** The Association has two classes of voting membership:

**Class A.** Class A Members are all Owners with the exception of the Class B Member and is entitled to one vote for each Lot owned. When more than one Person holds an interest in any Lot, all such Persons will be members. The vote for such Lot is exercised as they among themselves determine, but in no event will more than one vote be cast with respect to any Lot.

**Class B.** The Class B Member is the Declarant, who is entitled to three votes for each Lot owned by Declarant. The Class B Membership ceases and is converted to Class A Membership on the happening of either of the following events, whichever occurs earlier:

(1) When all of the Lots in the final phase of development of Stafford Meadows have been Sold and conveyed to Owners other than a successor Declarant; or

(2) At such earlier time as Declarant may elect in writing to terminate Class B Membership.

3.8 **Fiduciaries and Joint Owners.** An attorney-in-fact, executor, administrator, guardian, conservator or trustee may vote or grant consent with respect to any Lot owned or held in a fiduciary capacity, whether or not the specific right has been transferred to his or her name; provided that such Person satisfies the Secretary that he or she is the attorney-in-fact, executor, administrator, guardian, conservator or trustee, holding such Lot in a fiduciary capacity. Whenever any Lot is owned by two or more Persons jointly, according to the records of the Association, the vote of such Lot may be exercised by any one of the Owners, in the absence of protest by a co-Owner. In the event of disagreement among the co-Owners, the vote of such Lot will be disregarded completely in determining the proportion of votes given with respect to such matter, unless a valid court order establishes the authority of a co-Owner to vote.

3.9 **Tenants and Contract Vendors.** Unless otherwise expressly stated in the rental agreement or lease, all voting rights allocated to a Lot are exercised by the Owner. Unless otherwise stated in the contract, all voting rights allocated to a Lot are exercised by the vendee of any recorded land sale contract on the Lot.



3.10 **Casting of Votes and Consents.** The voting rights or consent of an Owner may be cast in person at a meeting of the Association or, at the discretion of the Board of Directors, by proxy in accordance with paragraph (a) of this Section, by absentee ballot in accordance with paragraph (b) of this Section, by written ballot in accordance with paragraph (c) of this Section, or by any other method specified in the Declaration, these Bylaws or the Oregon Planned Community Act.

(a) **Proxies.** A proxy must be dated and signed by the Owner and it is not valid if it is undated or purports to be revocable without notice; such proxy terminates one year after its date unless the proxy specifies a shorter term. The Board of Directors may not require that a proxy be on a form prescribed by the Board. An Owner may not revoke a proxy given pursuant to this paragraph except by actual notice of revocation to the person presiding over a meeting of the Association or to the Board if a vote is being conducted by written ballot in lieu of a meeting. A copy of a proxy in compliance with this paragraph provided to the Association by facsimile, electronic mail or other means of electronic communication utilized by the Board is valid.

(b) **Absentee Ballots.** An absentee ballot, if authorized by the Board of Directors, will set forth each proposed action and provide an opportunity to vote for or against each proposed action. All solicitations for votes by absentee ballot must include instructions for delivery of the completed absentee ballot, including the delivery location and instructions about whether the ballot may be canceled if the ballot has been delivered according to the instructions. An absentee ballot will be counted as an Owner present for the purpose of establishing a quorum. Even if an absentee ballot has been delivered to an Owner, the Owner may vote in person at a meeting if the Owner has returned the absentee ballot and canceled the absentee ballot, if cancellation is permitted in the instructions given under this paragraph.

(c) **Ballot Meetings.** At the discretion of the Board of Directors, any action that may be taken at any annual, regular or special meeting of the Association may be taken without a meeting by written ballot to the extent and in the manner provided in ORS 94.647

(d) **Electronic Ballots.** To the extent authorized by the Board of Directors and permitted by the Oregon Planned Community Act, any vote, approval or consent of an owner may be given by electronic ballot.

(e) **Mortgages.** An Owner may pledge or assign such Owner's voting rights to a Mortgagee. In such a case, the Mortgagee or its designated representative will be entitled to receive all notices to which the Owner is entitled under these Bylaws and to exercise the Owner's voting rights from and after the time that the Mortgagee will give written notice of such pledge or assignment to the Board of Directors. Any first Mortgagee may designate a representative to attend all or any meetings of the Association.

3.11 **Majority Vote.** The vote of a majority of the voting rights entitled to be cast by the members present or represented by absentee ballot or proxy, at a meeting at which a quorum is present, is necessary for the adoption of any matter voted upon by the members, unless a greater proportion is required by law, by the Declaration, by the Articles of Incorporation, or by these Bylaws.

3.12 **Rules of Order.** Unless other rules of order are adopted by resolution of the Association or the Board of Directors, all meetings of the Association are to be conducted according to the latest edition of *Robert's Rules of Order*, published by Robert's Rules Association.



## Article 4

### DIRECTORS: MANAGEMENT

4.1 **Number and Qualification.** The affairs of the Association will be governed by a Board of Directors of three or five individuals. All directors, other than interim directors appointed by Declarant, must be Owners or co-Owners of Lots. For purposes of this section, an officer, employee or agent of a corporation, a member, manager, employee or agent of a limited liability company, or a partner, employee or agent of a partnership may serve on the Board if such corporation, limited liability company or partnership is an Owner or co-Owner of a Lot. In addition, a trustee may serve on the Board if the trustee holds legal title to a Lot for the benefit of the owner of the beneficial interest in the Lot; and an executor, administrator, guardian, conservator or other individual appointed by a court to serve in a fiduciary capacity for an Owner of a Lot, or an officer or employee of an entity if an entity is appointed, may serve on the Board.

4.2 **Interim Directors.** Upon the recording of the Declaration, Declarant will appoint an interim board of one to three directors, who serve until replaced by Declarant or until their successors have been replaced by the Owners as provided below.

4.3 **Transitional Advisory Committee.** Unless the Turnover Meeting has already been held, Declarant will call a meeting of the Owners for the purpose of forming a Transitional Advisory Committee. The meeting must be called within 60 days after the date Declarant conveys 50 percent or more of the Lots then existing in Stafford Meadows to Owners other than a successor Declarant. The committee will consist of two or more Owners elected by the Owners other than Declarant and not more than one representative of Declarant. The members serve until the Turnover Meeting. The Transitional Advisory Committee is advisory only, and its purpose is to enable ease of transition from administrative control of the Association by Declarant to control by the Owners. The committee will have access to any information, documents and records that Declarant must turn over to the Owners at the time of the Turnover Meeting. If Declarant fails to call the meeting to elect a Transitional Advisory Committee within the time specified, the meeting may be called and notice given by any Owner. If the Owners fail to elect a Transitional Advisory Committee at the meeting called for such purpose, Declarant will have no further obligation to form the committee.

#### 4.4 **Election and Tenure of Office.**

(a) At the Turnover Meeting, the interim directors will resign and the members will elect three directors, two to serve for two years and one to serve for one year. The nominees receiving the greatest number of votes serve for two years. In the event of a tie, term selection will be by random means. Thereafter, the successors to each director serve for terms of two years each.

(b) Upon a majority vote of the voting rights entitled to be cast by the members present or represented by absentee ballot or proxy at a meeting or ballot meeting at which a quorum is present, the Board of Directors may be increased from three directors to five directors. At the next annual meeting or a special meeting called for such purpose, two additional directors will be elected, one to serve for a two-year term and one to serve for a one-year term. Term selection will be in the same manner as provided in paragraph (a) above.



(c) All directors hold office until their respective successors have been elected by the members. Election is by plurality.

#### 4.5 **Vacancies.**

(a) A vacancy in the Board of Directors will exist upon the death, resignation or removal of any director, or if the authorized number of directors is increased, or if the members fail at any annual or special meeting of members at which any director or directors are to be elected to elect the full authorized number of directors to be voted for at that meeting.

(b) Vacancies in the Board of Directors caused by any reason other than the removal of a director by a vote of the Association will be filled by vote of the majority of the remaining directors, even though they may constitute less than a quorum, or by a sole remaining director. Each person so elected will serve as a director until a successor is elected to fill the unexpired term at the next annual meeting of the Association or the next special meeting of the Association called for that purpose. Vacancies in interim directors are filled by Declarant.

4.6 **Removal of Directors.** At any regular or special meeting of the Association duly called, any one or more of the directors, other than interim directors, may be removed with or without cause by a majority vote of the members present in person or by proxy, and a successor may be elected at that meeting to fill the vacancy thus created. The members must vote on the removal of each director separately. The notice and agenda of any such meeting will state that such removal is to be considered, and any director whose removal has been proposed must be given an opportunity to be heard at that meeting and prior to the vote. A removed director remains a director until the vacancy has been filled.

4.7 **Powers.** The Board of Directors has all the powers and duties necessary for the administration of the affairs of the Association, except such powers and duties as by law or by the Declaration or by these Bylaws may not be delegated to the Board by the Owners. The Board may delegate responsibilities to committees or a managing agent but must retain ultimate control and supervision. The powers and duties to be exercised by the Board include, but not be limited to, those set forth in Section 8.5 of the Declaration and the following:

(a) Carry out the program for maintenance, upkeep, repair and replacement of any property required to be maintained by the Association as described in the Declaration and these Bylaws.

(b) Determine the amounts required for operation, maintenance and other affairs of the Association, and the making of such expenditures.

(c) Prepare a budget for the Association, and assessment and collection of the Assessments.

(d) Employ and dismiss such personnel as may be necessary for such maintenance, upkeep and repair.

(e) Employ legal, accounting or other personnel for reasonable compensation to perform such services as may be required for the proper administration of the Association; provided,



however, the Board of Directors may not incur or commit the Association to incur legal fees in excess of \$5,000 for any specific litigation or claim matter or enter into any contingent fee contract on any claim in excess of \$100,000 unless the Owners have enacted a resolution authorizing the incurring of such fees by a vote of 75 percent of the total voting rights. These limitations are not applicable to legal fees incurred in defending the Association or the Board from claims or litigation brought against them. The limitations set forth in this paragraph will increase by ten percent on each fifth anniversary of the recording of the Declaration. To the extent required by the Oregon Planned Community Act, the Board will notify the Owners before instituting litigation or administrative proceedings. With regard to any pending litigation involving the Association, the Board will periodically report to the Owners the status (including settlement offers), progress and method of funding such litigation. Nothing in this paragraph may be construed as requiring the Board to disclose any privileged communication between the Association and its counsel.

(f) Open bank accounts on behalf of the Association and designating the signatories required therefor.

(g) Prepare and file, or cause to be prepared and filed, any required income tax returns or forms for the Association.

(h) Purchase Lots at foreclosure or other judicial sales in the name of the Association or its designee.

(i) Sell, lease, mortgage, vote the votes appurtenant to (other than for the election of directors), or otherwise deal with Lots acquired by the Association or its designee.

(j) Obtain insurance or bonds pursuant to the provisions of these Bylaws and review such insurance coverage at least annually.

(k) Make additions and improvements to, or alterations of, the Common Areas, or modify, close, remove, eliminate or discontinue use of any common facility, including any improvement or landscaping, except that any such modification, closure, removal, elimination or discontinuance (other than on a temporary basis) of any swimming pool, spa or recreational or community building must be approved by a majority vote of the members at a meeting or by written ballot held or conducted in accordance with these Bylaws.

(l) From time to time adopt, modify, or revoke such rules and regulations governing the details for the operation of the Association, the conduct of Persons and the operation and use of the Property as the Board of Directors may deem necessary or appropriate to ensure the peaceful and orderly use and enjoyment of the Property. Such action may be overruled or modified by vote of not less than 75 percent of the voting rights of each class of members present, in person or by proxy, at any meeting, the notice of which will have stated that such modification or revocation of rules and regulations will be under consideration.

(m) Enforce by legal means the provisions of the Declaration, these Bylaws and any rules and regulations adopted hereunder.



(n) In the name of the Association, maintain a current mailing address of the Association, file annual reports with the Oregon Secretary of State, and maintain and keep current the information required to enable the Association to comply with ORS 94.670(7).

(o) Subject to Section 8.8 of the Declaration, enter into management agreements with professional management firms.

#### 4.8 Meetings.

(a) Meetings of the Board of Directors will be held at such place as may be designated from time to time by the Board or other Persons, calling the meeting.

(b) Annual meetings of the Board of Directors will be held within 30 days following the adjournment of the annual meetings of the members.

(c) Special meetings of the Board of Directors for any purpose or purposes may be called at any time by the President or by any two directors.

Unless other rules of order are adopted by resolution of the Association or the Board of Directors, all meetings of the Board will be conducted according to the latest edition of *Robert's Rules of Order*, published by Robert's Rules Association.

#### 4.9 Open Meetings.

(a) All meetings of the Board of Directors must be open to Owners except that, in the discretion of the Board, the Board may close the meeting to Owners other than Board members and meet in executive session to consult with legal counsel or to consider personnel matters, including salary negotiations and employee discipline, negotiation of contracts with third parties or collection of unpaid assessments. Except in the case of an emergency, the Board will vote in an open meeting on whether to meet in executive session. If the Board votes to meet in executive session, the presiding officer will state the general nature of the action to be considered and; as precisely as possible, when and under what circumstances the deliberations can be disclosed to Owners. The statement, motion or decision to meet in the executive session must be included in the minutes of the meeting, and any contract or action considered in executive session does not become effective unless the Board, following the executive session, reconvenes in open meeting and votes on the contract or action, which is reasonably identified in the open meeting and included in the minutes.

(b) Meetings of the Board of Directors may be conducted by telephonic communication or by other means of communication that allows all members of the Board participating to hear each other simultaneously or otherwise to be able to communicate during the meeting, except that if a majority of the Lots are principal residences of the occupants, then: (i) for other than emergency meetings, notice of each Board's meeting must be posted at a place or places on the property at least three days before the meeting, or notice will be provided by a method otherwise reasonably calculated to inform the Owners of such meeting; and (ii) only emergency meetings of the Board may be conducted by telephonic communication. The meeting and notice requirements of this section may not be circumvented by chance, social meetings, or any other means.



#### 4.10 Notice of Meetings.

(a) Notice of the time and place of meetings will be given to each director orally, or delivered in writing personally, by mail or to the extent permitted by the Oregon Planned Community Act, by electronic mail, facsimile or other form of electronic communication acceptable to the Board of Directors, at least 24 hours before the meeting. Notice is sufficient if received at the required time or if mailed or sent electronically not less than 72 hours before the meeting. If mailed, the notice will be directed to the address shown on the Association's records or to the director's actual address ascertained by the person giving the notice. Such notice need not be given for an adjourned meeting if such time and place is fixed at the meeting adjourned. For a period of 10 years following recording of the Declaration, notices of meetings (including agendas) must also be given to Declarant in the same manner as given to the directors.

(b) Attendance of a director at a meeting constitutes a waiver of notice of such meeting except when a director attends a meeting for the express purpose of objecting to the transaction of any business because the meeting is not lawfully called or convened.

#### 4.11 Quorum and Vote.

(a) A majority of the directors constitutes a quorum for the transaction of business. A minority of the directors, in the absence of a quorum, may adjourn from time to time but may not transact any business.

(b) The action of a majority of the directors present at any meeting at which there is a quorum is the act of the Board of Directors unless a greater number is required by law, the Declaration, the Articles of incorporation or these Bylaws.

(c) A director who is present at a meeting of the Board of Directors at which action is taken on any Association matter is presumed to have assented to the action unless the director votes against the action or abstains from voting on the action because the director claims a conflict of interest. When action is taken on any matter at a meeting of the Board, the vote or abstention of each director present must be recorded in the minutes of the meeting. Directors may not vote by proxy or by secret ballot at meetings of the Board, except that officers may be elected by secret ballot.

4.12 Right Of Declarant To Disapprove Actions. So long as Declarant or any affiliate of Declarant owns any property within Stafford Meadows, directly or indirectly, in whole or in part, Declarant has a right to disapprove any action, policy or program of the Association, the Board of Directors and any committee which, in the sole judgment of the Declarant, would tend to impair the rights of Declarant or builders under the Declaration or these Bylaws, or interfere with development, construction or marketing of any portion of the Property, or diminish the level of services being provided by the Association. This right to disapprove is in addition to, and not in lieu of, any right to approve or disapprove specific actions of the Association, the Board or any committee as may be granted to the Class B Member or Declarant in the Declaration or these Bylaws.

(a) The Declarant must be given written notice of all meetings of the Association, the Board of Directors or any committee thereof and of all proposed actions of the Association, the Board or any committee thereof to be approved at such meetings or by written request in lieu of a meeting. Such notice will be given by certified mail, return receipt requested, or by personal delivery



at the address it has registered with the Secretary of the Association, which notice complies with the requirements for Board meetings set forth in these Bylaws and which notice will, except in the case of the regular meetings held pursuant to the Bylaws, set forth with reasonable particularity the agenda to be followed at such meeting.

(b) The Declarant must be given the opportunity at any such meeting to join in or to have its representatives or agents join in discussion from the floor of any prospective action, policy, or program which would be subject to the right of disapproval set forth herein. The Declarant, its representatives or agents may make its concerns, thoughts, and suggestions known to the Board of Directors and/or the members of the subject committee.

(c) No action, policy or program subject to the right of disapproval set forth herein become effective or be implemented until and unless the requirements of subsections (a) and (b) above have been met and the time period set forth in subsection (d) below has expired.

(d) The Declarant, acting through any officer or director, agent or authorized representative, may exercise its right to disapprove at any time within 10 days following the meeting at which such action was proposed or, in the case of any action taken by written consent in lieu of a meeting, at any time within 10 days following receipt of written notice of the proposed action. This right to disapprove may be used to block proposed actions but does not include a right to require any action or counteraction on behalf of any committee, the Board of Directors, or the Association unless such action or counteraction countermands an action, policy or program that was not properly noticed and implemented. The Declarant will not use its right to disapprove to reduce the level of services which the Association is obligated to provide or to prevent capital repairs or any expenditure required to comply with applicable laws and regulations.

4.13 **Liability.** Neither a member of the Board of Directors nor an officer of the Association or a member of the Architectural Review Committee or any other committee established by the Board will be liable to the Association, any Owner or any third party for any damages, loss or prejudice suffered or claimed on account of any action or failure to act in the performance of his or her duties, so long as the individual acted in good faith, believed that the conduct was in the best interests of the Association, or at least was not opposed to its best interests; and in the case of criminal proceedings, had no reason to believe the conduct was unlawful. In the event any member of the Board or any officer or committee member of the Association is made a party to any proceeding because the individual is or was a director, officer or committee member of the Association, the Association will defend such individual against such claims and indemnify such individual against liability and expenses incurred to the maximum extent permitted by law.

4.14 **Compensation.** No director will receive any compensation from the Association for acting as such.

4.15 **Executive, Covenants and Other Committees.** Subject to law, the provisions of the Declaration and these Bylaws, the Board of Directors, may appoint an Executive Committee, a Covenants Committee to be responsible for covenant enforcement as provided in Section 4.16 and such other standing or temporary committees as may be necessary from time to time consisting of Owners and at least one member of the Board and having such powers as the Board may designate. Such committees hold office at the pleasure of the Board.



4.16 **Enforcement Procedures.** The Association has the power, as provided in the Declaration, to impose sanctions for any violation of the Declaration, these Bylaws or the Rules and Regulations. To the extent specifically required by the Declaration, the Board of Directors must comply with the following procedures prior to the imposition of sanctions:

(a) **Notice.** The Board of Directors or its delegate must serve the alleged violator with written notice describing (i) the nature of the alleged violation, (ii) the proposed sanction to be imposed, (iii) a statement that the alleged violator will have 14 days to present a written request for a hearing before the Board or a Covenants Committee appointed by the Board, if any; and (iv) a statement that the proposed sanction may be imposed as contained in the notice unless a hearing is requested within 14 days of the notice.

(b) **Response.** The alleged violator must respond to the notice of the alleged violation in writing within such 14 day period, regardless of whether the alleged violator is challenging the imposition of the proposed sanction. If the alleged violator cures the alleged violation and notifies the Board of Directors in writing within such 14 day period the Board may, but is not obligated to, waive the sanction. Such waiver does not constitute a waiver of the right to sanction future violations of the same or other provisions by any Person. If a timely request for a hearing is not made, the sanction stated in the notice will be imposed; provided, however, that the Board or Covenants Committee may, but is not obligated to, suspend any proposed sanction if the violation is cured within the 14 day period. Any response or request for a hearing must be delivered to the Association's manager, President or Secretary, or as otherwise specified in the notice of violation.

(c) **Proof of Notice.** Prior to the effectiveness of sanctions imposed pursuant to this section, proof of proper notice must be placed in the minutes of the Board of Directors or Covenants Committee, as applicable. Such proof will be deemed adequate if a copy of the notice, together with a statement of the date and manner of delivery, is entered by the officer, director, or agent who delivered such notice. The notice requirement will be deemed satisfied if the alleged violator or its representative requests and appears at the hearing.

(d) **Hearing.** If a hearing is requested within the allotted 14 day period, the hearing will be held before the Board of Directors or the Covenants Committee, as applicable. The alleged violator will be afforded a reasonable opportunity to be heard. The minutes of the meeting must contain a written statement of the results of the hearing (i.e., the decision) and the sanction, if any, to be imposed.

(e) **Appeal.** Following a hearing before the Covenants Committee, if applicable, the violator must have the right to appeal the decision to the Board of Directors. To exercise this right, the violator must deliver a written notice of appeal to the Association's manager, President or Secretary within 10 days after the hearing date.

(f) **Enforcement Policies.** The Board of Directors, by Resolution, may adopt additional policies and procedures governing enforcement of the Declaration, these Bylaws or the Rules and Regulations.



## Article 5

### OFFICERS

5.1 **Designation and Qualification.** The officers of the Association are the President, the Secretary, the Treasurer, and such Vice Presidents and subordinate officers as the Board of Directors will from time to time appoint. The President must be a member of the Board, but the other officers need not be directors. Any two offices, except the offices of President and Secretary, may be held by the same person.

5.2 **Election and Vacancies.** The officers of the Association are appointed annually by the Board of Directors at the organization meeting of each new Board to serve for one year and until their respective successors are elected. If any office becomes vacant by reason of death, resignation, removal, disqualification or any other cause, the Board will appoint a successor to fill the unexpired term at any meeting of the Board.

5.3 **Removal and Resignation.**

(a) Any officer may be removed upon the affirmative vote of a majority of the directors whenever, in their judgment, the best interests of the Association will be served thereby. The removal of an officer will be without prejudice to the contract rights, if any, of the officer so removed.

(b) Any officer may resign at any time by giving written notice to the Board of Directors, the President or the Secretary of the Association. Any such resignation takes effect upon receipt of such notice or at any later time specified therein. Unless otherwise specified therein, the acceptance of such resignation is not necessary to make it effective, provided, however, that the Board may reject any postdated resignation by notice in writing to the resigning officer. The effectiveness of such resignation will not prejudice the contract rights, if any, of the Association against the officer so resigning.

5.4 **President.** The President is the chief executive officer of the Association and, subject to the control of the Board of Directors, has powers of general supervision, direction and control of the business and affairs of the Association. He or she presides at all meetings of the members and of the Board. He or she is an ex officio member of all the standing committees, including the executive committee, if any, has the general powers and duties of management usually vested in the office of president of a nonprofit corporation, and has such other powers and duties as may be prescribed by the Board or these Bylaws.

5.5 **Vice Presidents.** The Vice Presidents, if any, performs such duties as the Board of Directors prescribe. In the absence or disability of the President, the President's duties and powers are performed and exercised by the Senior Vice President as designated by the Board.

5.6 **Secretary.**

(a) The Secretary keeps or causes to be kept a book of minutes of all meetings of directors and members showing the time and place of the meeting, whether it was regular or special,



and if special, how authorized, the notice given, the names of those present at directors' meetings, the number of memberships present or represented at members' meetings and the proceedings thereof.

(b) The Secretary gives or causes to be given such notice of the meetings of the members and of the Board of Directors as is required by these Bylaws or by law. The Secretary keeps the seal of the Association, if any, and affixes it to all documents requiring a seal, and has such other powers and perform such other duties as may be prescribed by the Board or these Bylaws.

(c) If there are no Vice Presidents, then in the absence or disability of the President, the President's duties and powers are performed and exercised by the Secretary.

5.7 **Treasurer.** The Treasurer keeps and maintains, or causes to be kept and maintained, adequate and correct accounts of the properties and business transactions of the Association, including accounts of its assets, liabilities, receipts and disbursements. The books of accounts must at all reasonable times be open to inspection by any director. The Treasurer deposits or causes to be deposited all moneys and other valuables in the name and to the credit of the Association with such depositories as may be designated by the Board of Directors. The Treasurer disburses or causes to be disbursed the funds of the Association as may be ordered by the Board, renders to the President and directors, whenever they request it, an account of all of the Treasurer's transactions as Treasurer and of the financial condition of the Association, and has such other powers and perform such other duties as may be prescribed by the Board or these Bylaws.

5.8 **Compensation of Officers.** No officer who is a member of the Board of Directors will receive any compensation from the Association for acting as an officer, unless such compensation is authorized by a resolution duly adopted by the members. The Board may fix any compensation to be paid to other officers.

## Article 6

### ASSESSMENTS, RECORDS AND REPORTS

6.1 **Assessments.** As provided in the Declaration, the Association, through its Board of Directors, will do the following:

(a) Assess and collect from every Owner Assessments in the manner described in the Declaration.

(b) Keep all funds received by the Association as Assessments, other than reserves described in the Declaration, in the Operations Fund and keep all reserves collected pursuant to the Declaration in the Reserve Fund and use such funds only for the purposes described in the Declaration. All assessments will be deposited and maintained in the name of the Association in one or more separate federally insured accounts, including certificates of deposit, at a financial institution as defined in ORS 706.008, other than an extranational institution. Such funds may be used to purchase obligations of the United States government. All expenses of the Association are paid from the Association's bank account.

(c) From time to time, and at least annually, prepare a budget for the Association, estimating the common expenses expected to be incurred with adequate allowance for reserves based



upon the reserve study required by the Declaration and determine whether the General Assessment should be increased or decreased. Within 30 days after adopting a proposed annual budget, the Board of Directors will provide a summary of the budget to all Owners. If the Board fails to adopt a budget, the last adopted annual budget continues in effect.

(d) Fix the amount of the General Assessment against each Lot at least 30 days in advance of each General Assessment period. Written notice of any Assessment will be sent to every Owner subject thereto and to any first Mortgagee requesting such notice. The due dates will be established by the Board of Directors, which may fix a regular flat Assessment payable on a monthly, quarterly, semiannual or annual basis. The Board will cause to be prepared a roster of the Lots showing Assessments applicable to each Lot. The roster will be kept in the Association office and subject to inspection by any Owner or Mortgagee during regular business hours. Within 10 business days after receiving a written request, and for a reasonable charge, the Association will furnish to any Owner or Mortgagee a recordable certificate setting forth the unpaid Assessments against such Owner's Lot. Such certificate is binding upon the Association, the Board, and every Owner as to the amounts of unpaid Assessments.

(e) When Additional Properties are annexed, the Board of Directors will assess any Lots included therein in accordance with Section 10.5 of the Declaration.

(f) Enforce the Assessments in the manner provided in the Declaration.

(g) Keep records of the receipts and expenditures affecting the Operations Fund and Reserve Fund and make the same available for examination by members and their Mortgagees at convenient hours, maintain an Assessment roll showing the amount of each Assessment against each Owner, the amounts paid upon the account and the balance due on the Assessments, give each member written notice of each Assessment at least 30 days before the time when such Assessments will become due and payable; and for a reasonable charge, promptly provide any Owner or Mortgagee who makes a request in writing with a written certificate of such Owner's unpaid Assessments.

6.2 **Records.** The Association will keep within the State of Oregon correct and complete financial records sufficiently detailed for proper accounting purposes, keep minutes of the proceedings of its members, Board of Directors and committees having any of the authority of the Board, and retain all documents, information and records turned over to the Association by Declarant. All documents, information and records delivered to the Association by Declarant pursuant to ORS 94.616 will be kept within the State of Oregon.

6.3 **Statement of Assessments Due.** The Association will provide, within 10 business days after receipt of a written request from an Owner, a written statement that provides: (a) the amount of assessments due from the Owner and unpaid at the time the request was received, including regular and special assessments, fines and other charges, accrued interest, and late-payment charges; (b) the percentage rate at which interest accrues on assessments that are not paid when due; and (c) the percentage rate used to calculate the charges for late payment or the amount of a fixed-rate charge for late payment. The Association is not required to comply with this section if the Association has commenced litigation by filing a complaint against the Owner and the litigation is pending when the statement would otherwise be due.



6.4 **Inspection of Books and Records.** Except as otherwise provided in ORS 94.670(5), during normal business hours or under other reasonable circumstances, the Association must make reasonably available for examination and, upon written request, available for duplication, by Owners, lenders, and holders of any Mortgage of a Lot that make the request in good faith for a proper purpose, current copies of the Declaration, Articles, Bylaws, Rules and Regulations, amendments or supplements to such documents and the books, records, financial statements and current operating budget of the Association. The Association will maintain a copy, suitable for purposes of duplication, of each of the following: (a) the Declaration, these Bylaws, the Rules and Regulations and any amendments or supplements to them, (b) the most recent financial statement of the Association, and (c) the current operating budget of the Association. The Association, within 10 business days after receipt of a written request by an Owner, will furnish copies of such documents to the requesting Owner. Upon written request, the Association will make such documents, information and records available to such Persons for duplication during reasonable hours. The Board of Directors, by resolution, may adopt reasonable rules governing the frequency, time, location, notice and manner of examination and duplication of Association records and the imposition of a reasonable fee for furnishing copies of such documents, information or records. The fee may include reasonable personnel costs for furnishing the documents, information or records.

6.5 **Payment of Vouchers.** The Treasurer or managing agent will pay all vouchers for all budgeted items and for any nonbudgeted items, up to \$1,000 signed by the President, managing agent, manager or other person authorized by the Board of Directors. Any voucher for nonbudgeted items in excess of \$1,000 requires the authorization of the President or a resolution of the Board.

6.6 **Execution of Documents.** The Board of Directors may, except as otherwise provided in the Declaration, Articles of Incorporation; or these Bylaws, authorize any officer or agent to enter into any contract or execute any instrument in the name of and on behalf of the Association. Such authority may be general or confined to specific instances. Unless so authorized by the Board, no officer, agent, or employee has any power or authority to bind the Association by any contract or engagement, to pledge its credit, or to render it liable for any purpose or for any amount.

6.7 **Reports and Audits.** An annual financial statement consisting of a balance sheet and an income and expense statement for the preceding year will be rendered by the Board of Directors to all Owners and to all Mortgagees who have requested the same within 90 days after the end of each fiscal year. Commencing with the fiscal year following the Turnover Meeting, if the General Assessments exceed \$75,000 for the year, then the Board will cause such financial statements to be reviewed within 300 days after the end of the fiscal year by an independent certified public accountant licensed in Oregon in accordance with the Statements on Standards for Accounting and Review Services issued by the American Institute of Certified Public Accountants, or if the General Assessments are \$75,000 or less, will cause such review within 300 days after receipt of a petition requesting such review signed by at least a majority of owners. The Board need not cause such a review to be performed if so directed by an affirmative vote of at least 60 percent of the Owners, not including votes of Declarant with respect to Lots owned by Declarant. From time to time, the Board, at the expense of the Association, may obtain an audit of the books and records pertaining to the Association and furnish copies thereof to the members. At any time an Owner or holder of a Mortgage may, at their own expense, cause an audit or inspection to be made of the books and records of the Association.



## Article 7

### INSURANCE

7.1 **Types of Insurance.** For the benefit of the Association and the Owners, the Board of Directors will obtain and maintain at all times, and pay for out of the Operations Fund, the following insurance:

(a) **Property Damage Insurance.**

(1) The Association will maintain a policy or policies of insurance covering loss or damage from fire, with standard extended coverage and "all risk" endorsements, and such other coverages as the Association may deem desirable.

(2) The amount of the coverage will be for not less than 100 percent of the current replacement cost of the improvements on the Common Areas (exclusive of land, foundation, excavation and other items normally excluded from coverage), subject to a reasonable deductible not to exceed \$10,000.

(3) The policy or policies will include all fixtures and building service equipment to the extent that they are part of the Common Areas and all personal property and supplies belonging to the Association.

(b) **Liability Insurance.**

(1) The Association will maintain comprehensive general liability insurance coverage insuring the Declarant, the Association, the Board of Directors, and the managing agent, against liability to the public or to Owners and their invitees or tenants, incident to the operation, maintenance, ownership or use of the Common Areas, including legal liability arising out of lawsuits related to employment contracts of the Association. There may be excluded from such policy or policies coverage of an Owner (other than as a member of the Association or Board) for liability arising out of acts or omissions of such Owner and liability incident to the ownership and/or use of the part of the Property as to which such Owner has the exclusive use or occupancy.

(2) Limits of liability under such insurance will not be less than \$1,000,000 on a combined single-limit basis.

(3) Such policy or policies will be issued on a comprehensive liability basis and provide a cross-liability endorsement wherein the rights of named insureds under the policy or policies are not prejudiced as respects his, her or their action against another named insured.

(c) **Workers' Compensation Insurance.** The Association will maintain workers' compensation insurance to the extent necessary to comply with any applicable laws.

(d) **Fidelity Insurance.**

(1) The Board of Directors will cause the Association to maintain blanket fidelity insurance for all officers, directors, trustees and employees of the Association and all other



Persons handling or responsible for funds of, or administered by, the Association. In the event that the Association has retained a management agent, the Board may require such agent to maintain fidelity insurance for its officers, employees and agents handling or responsible for funds of, or administered on behalf of, the Association. The cost of such insurance, if any, is borne by the Association.

(2) The total amount of fidelity insurance coverage required will be based upon the best business judgment of the Board of Directors.

(3) Such fidelity insurance will name the Association as obligee and contain waivers by the insurers of all defenses based upon the exclusion of Persons serving without compensation from the definition of "employees" or similar terms or expressions. The insurance will provide that it may not be canceled or substantially modified (including cancellation for nonpayment of premium) without at least 10 days' prior written notice to the Association.

(e) **Director's and officers' liability insurance.** The Association will maintain a policy of directors' and officers' liability insurance with coverage in the amount of not less than \$1,000,000 subject to a reasonable deductible, which deductible is the responsibility of the Association. Such insurance will cover both interim and regular directors and will include coverage for claims brought by the Association, Owners and/or third parties, including, without limitation, claims arising out of construction defects or failure to maintain adequate reserves. Directors and officers will be accepting such positions in reliance upon such insurance protection being maintained by the Association. Therefore, in the event the Association fails to carry such insurance or amends these Bylaws to delete or reduce these insurance requirements, the Association and Owners will be deemed to have released such claims and deemed to have covenanted not to sue or prosecute any claims against its current or former directors or officers that would have been insured under such a policy.

7.2 **Insurance by Lot Owners.** Each Owner are responsible for obtaining, at his or her own expense, homeowner's insurance covering the improvements on the Owner's Lot and liability resulting from use or ownership of the Lot, unless the Association agrees otherwise. The insurance coverage maintained by the Association may not be brought into contribution with the insurance obtained under this section by the Owners.

7.3 **Planned Community Act Requirements.** The insurance maintained by the Association must comply with the requirements of the Oregon Planned Community Act, ORS 94.550 to 94.780.

## Article 8

### GENERAL PROVISIONS

8.1 **Seal.** The Board of Directors may, by resolution, adopt a corporate seal.

8.2 **Notice.** All notices to the Association or to the Board of Directors will be sent care of the managing agent, or if there is no managing agent, to the principal office of the Association or to such other address as the Board of Directors may hereafter designate from time to time. All notices to members will be sent to the member's unit or to such other address as may have been designated by the member from time to time in writing to the Board of Directors.



8.3 **Waiver of Notice.** Whenever any notice to any member or director is required by law, the Declaration, the Articles of Incorporation, or these Bylaws, a waiver of notice in writing signed at any time by the Person entitled to notice is equivalent to the giving of the notice.

8.4 **Action Without Meeting.** Any action that the law, the Declaration, the Articles of Incorporation or the Bylaws require or permit the members or directors to take at any meeting may be taken without a meeting or ballot meeting if a consent in writing setting forth the action so taken is signed by all of the members or directors entitled to vote on the matter. The consent, which will have the same effect as a unanimous vote of the members or directors, will be filed in the records of minutes of the Association.

8.5 **Conflicts.** These Bylaws are intended to comply with the Oregon Planned Community Act, the Oregon Nonprofit Corporation Law, the Declaration and the Articles of Incorporation. In case of any irreconcilable conflict, such statutes and documents control over these Bylaws.

## Article 9

### AMENDMENTS TO BYLAWS

9.1 **How Proposed.** Amendments to these Bylaws must be proposed by either a majority of the Board of Directors or by members holding at least 30 percent of the voting rights entitled to be cast for such amendment. The proposed amendment must be reduced to writing and must be included in the notice of any meeting at which action is to be taken thereon or be attached to any request for consent to the amendment.

9.2 **Adoption.**

(a) A resolution adopting a proposed amendment may be proposed by either the Board of Directors or by the members and may be approved by the membership at a meeting called for such purpose, or by written consent of the members. Members not present at the meeting considering such amendment may express their approval in writing or by proxy. Any resolution must be approved by members holding a majority of the voting rights, together with the written consent of the Class B Member, if any. Amendment or repeal of any provision of these Bylaws that is also contained in the Declaration must be approved by the same voting requirement for amendment of such provision of the Declaration.

(b) Notwithstanding the provisions of the preceding paragraph, until the Turnover Meeting has occurred, Declarant has the right to amend these Bylaws in order to comply with the requirements of the Federal Housing Administration, the United States Department of Veterans Affairs, the Farmers Home Administration of the United States, the Federal National Mortgage Association, the Government National Mortgage Association, the Federal Home Mortgage Loan Corporation, any department, bureau, board, commission or agency of the United States or the State of Oregon, or any corporation wholly owned, directly or indirectly, by the United States or the State of Oregon that insures, guarantees or provides financing for a planned community or lots in a planned community. After the Turnover Meeting, any such amendment must be approved as provided in Section 9.2(a).



9.3 **Execution and Recording.** An amendment will not be effective until certified by the President and Secretary of the Association as being adopted in accordance with these Bylaws and ORS 94.625 and recorded in the Deed Records of Clackamas County, Oregon.

# Appendix G

Example Building Elevations



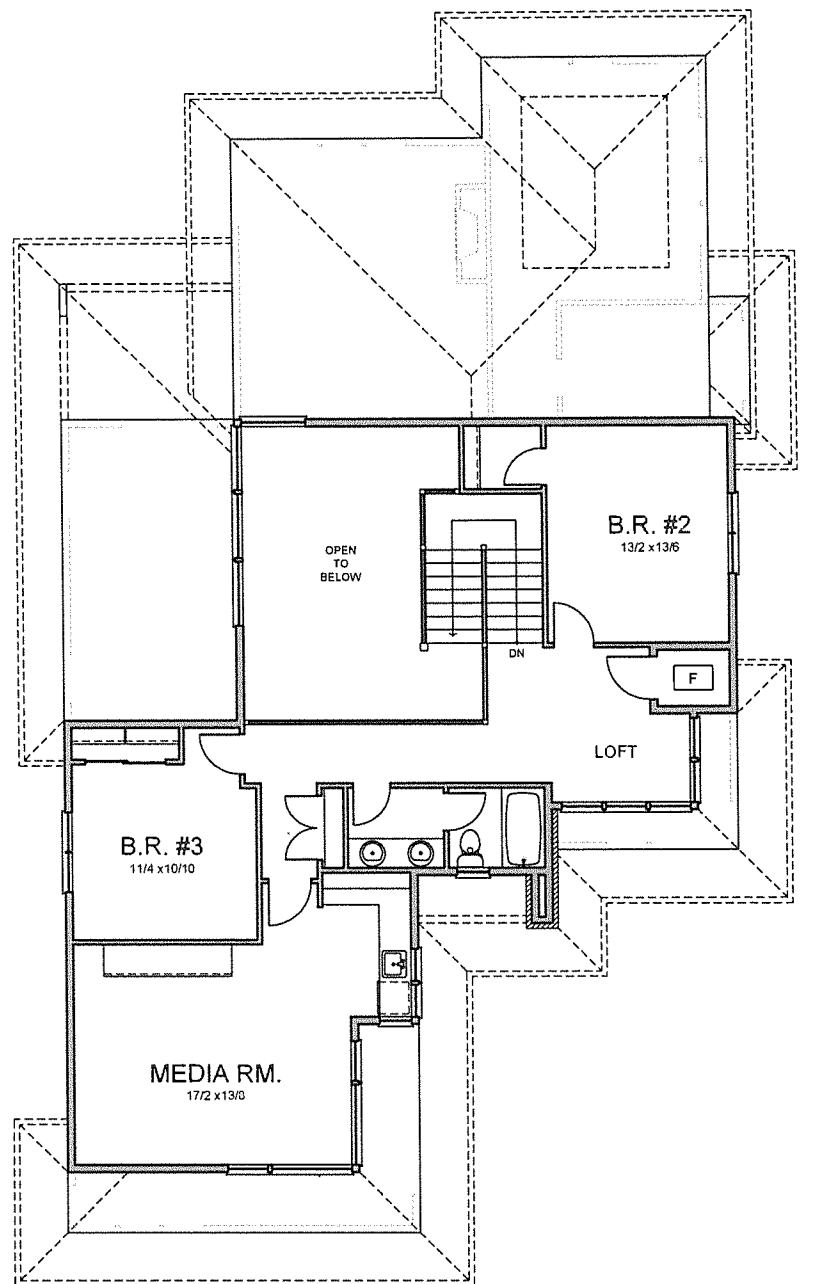
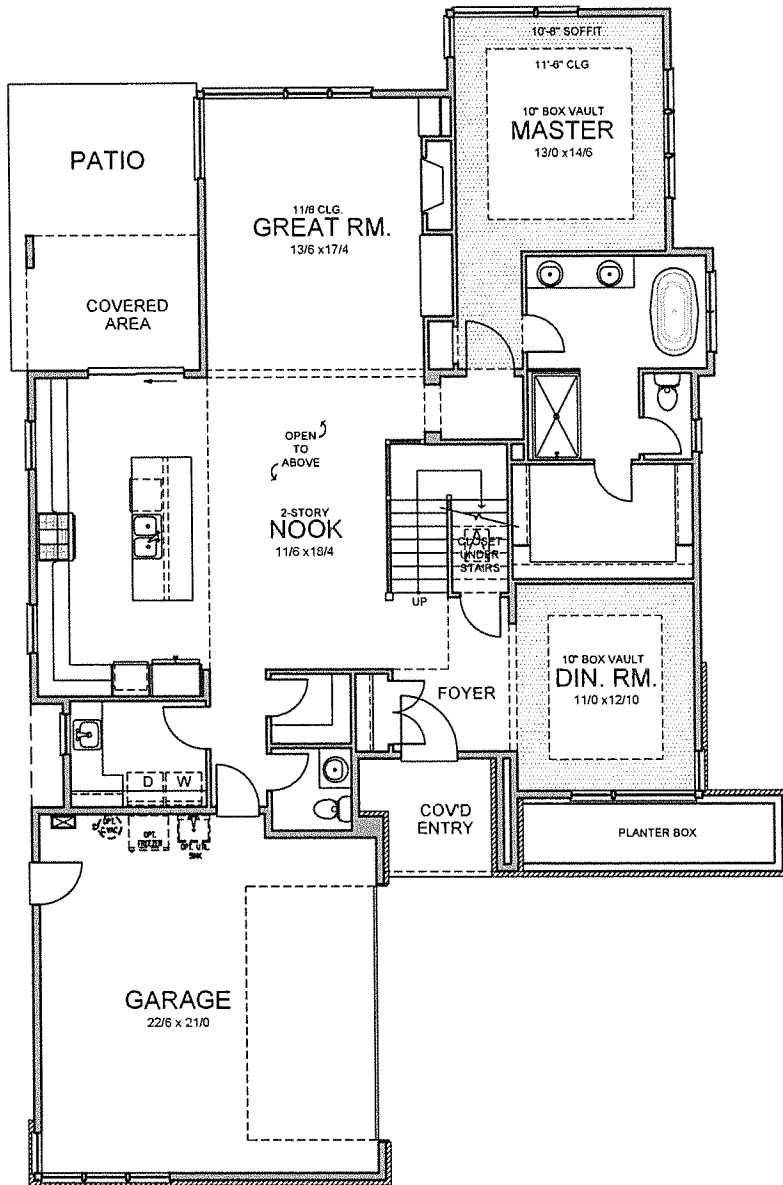
**WEST HILLS**  
HOMES NORTHWEST

|                                      |              |
|--------------------------------------|--------------|
| <b>2746 BAYBERRY PRAIRIE (2-CAR)</b> |              |
| M. FLR.                              | = 1,685 S.F. |
| U. FLR.                              | = 1,061 S.F. |
| TOTAL                                | = 2,746 S.F. |
| GARAGE                               | = 499 S.F.   |



**EVERETT**  
CUSTOM HOMES

3-BEDROOMS  
2.5-BATHS  
MEDIA  
2-CAR GARAGE



MAIN LEVEL FLOOR PLAN (9' & 11/6 CLG.)

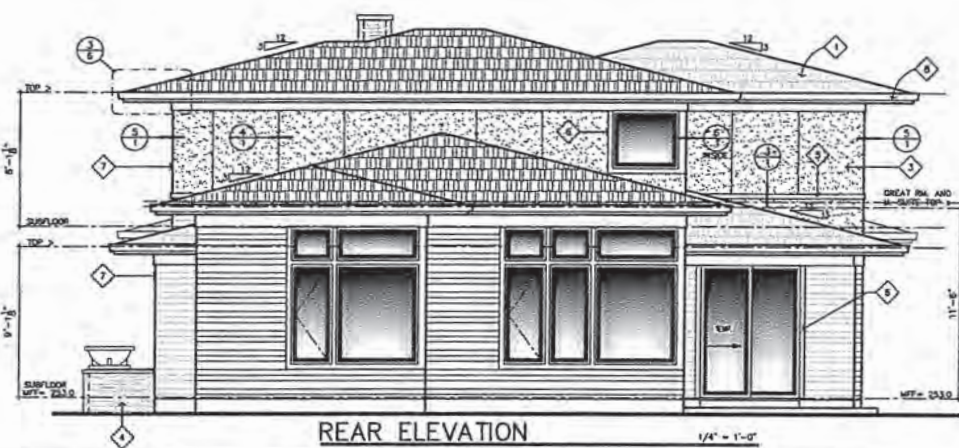
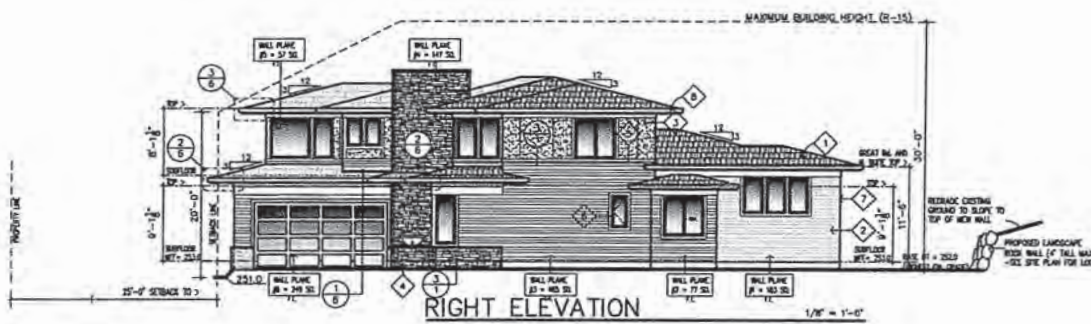
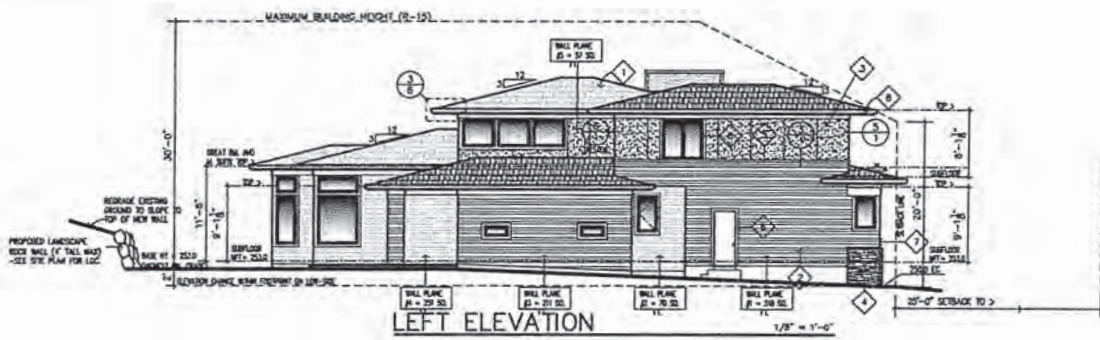
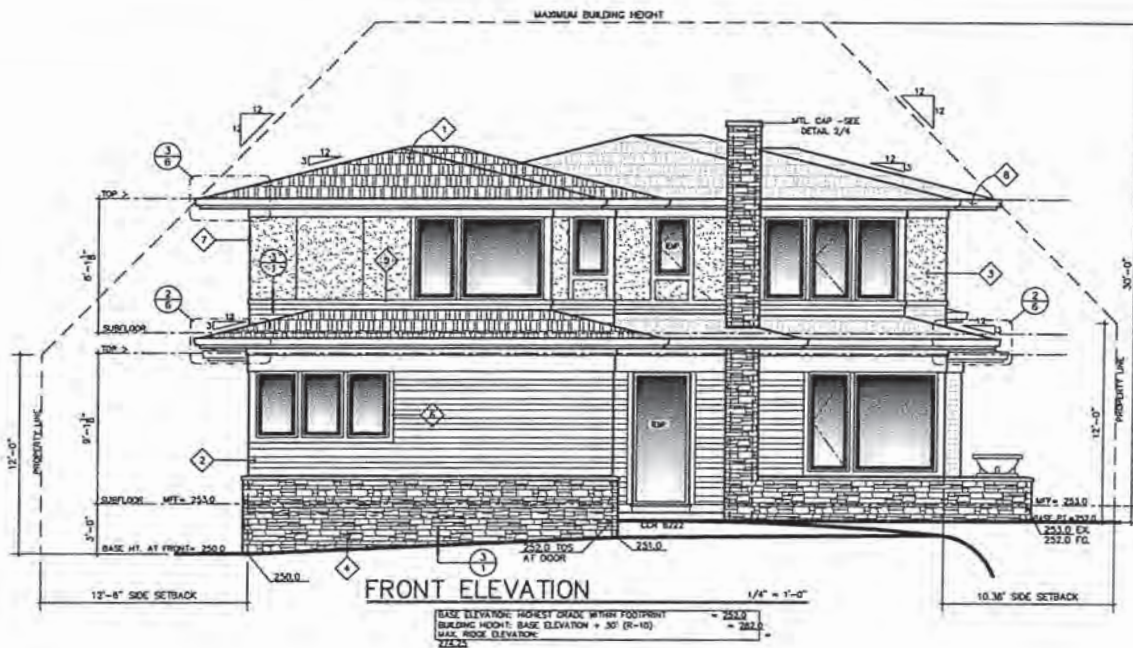
UPPER LEVEL FLOOR PLAN (8' CLG.)

REV. 5/2/17 DDR

3330 NW YEON AVE STE 100  
 PORTLAND, OREGON 97210  
 PHONE 503 726-7060

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5/15/17, PRELIM. LAYOUT DOR  
 4/3/17, PRELIM. ENG. CHK. DOR  
 5/2/17, FINAL ENG. CHK. DOR  
 5/2/17, PUBLISH PLAN DOR



**NOTE:**  
 FOR ALL STRUCTURAL  
 INFORMATION REFER  
 TO THE (S) SHEETS

**PLAN 2746  
 BAYBERRY  
 PRAIRIE  
 2-CAR  
 GARAGE LEFT**

MAIN LEVEL: 1,683 SQ FT  
 UPPER LEVEL: 1,061 SQ FT  
 GRAND TOTAL: 2,744 SQ FT  
 GARAGE: 499 SQ FT

SHEET #

JOB #





**WEST HILLS**  
HOMES NORTHWEST

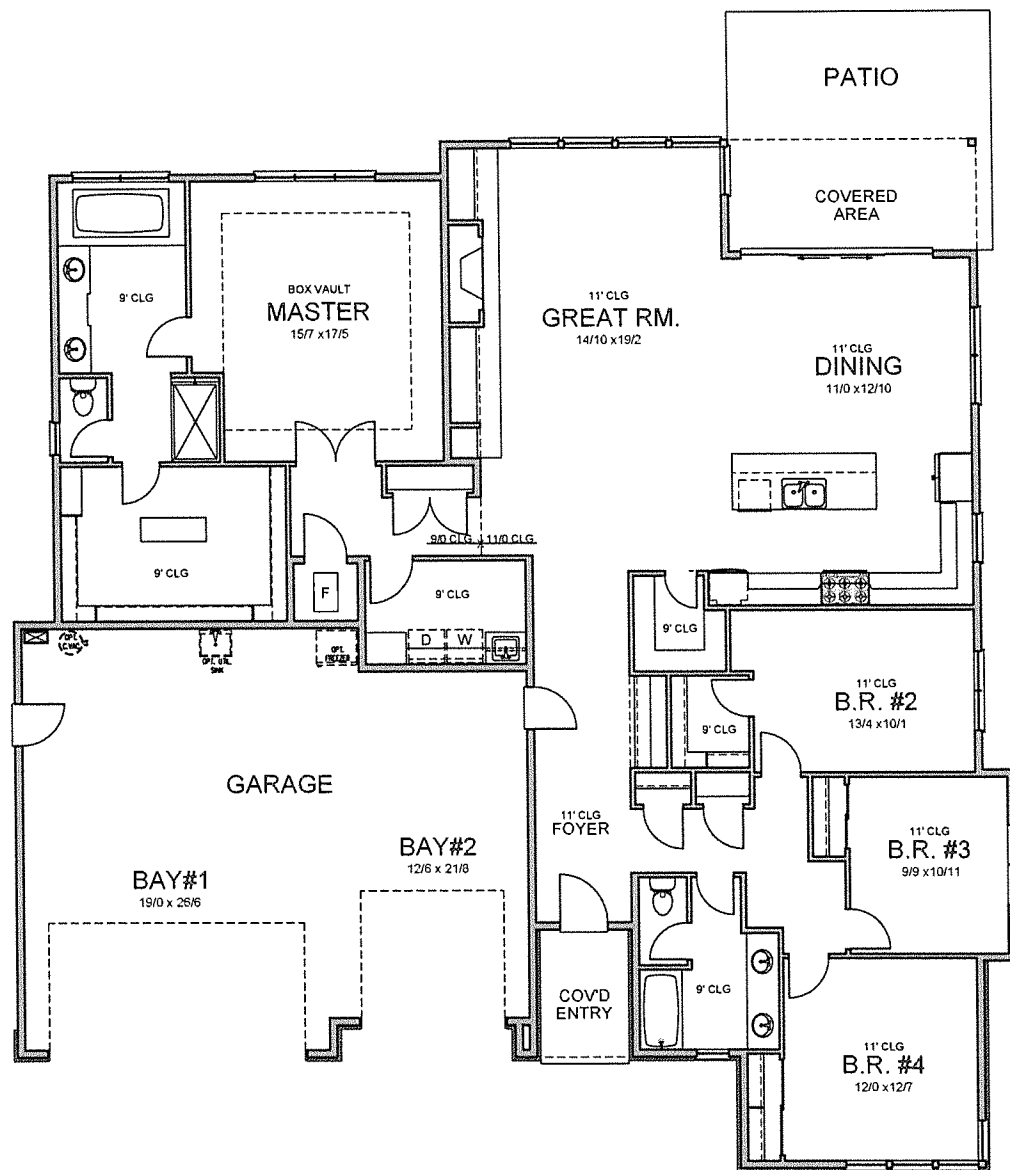
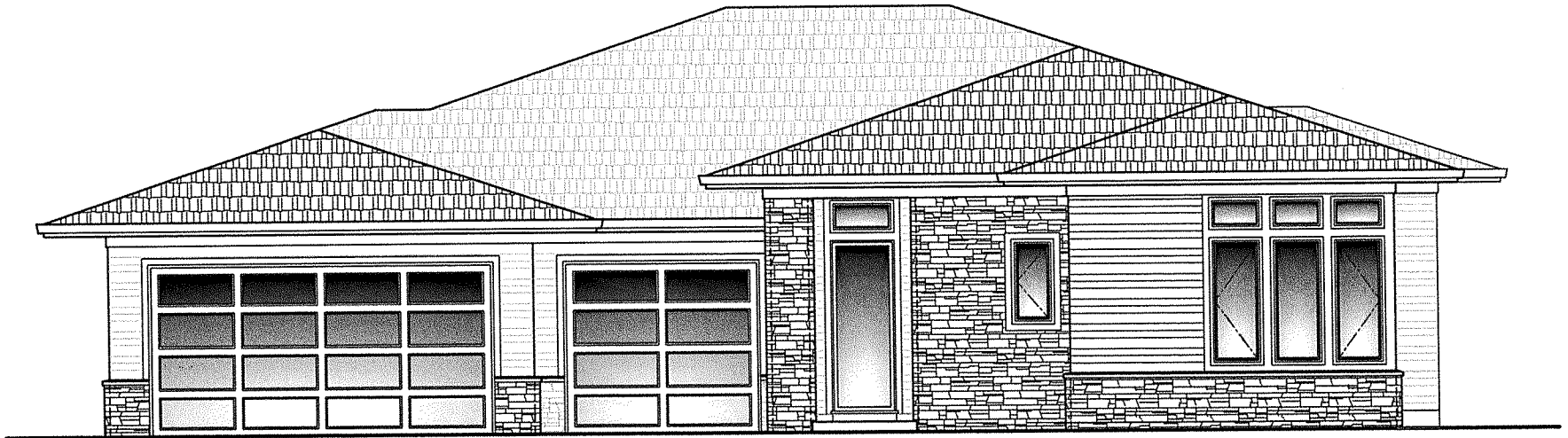
**2480 ESLINGER  
PRAIRIE**

|         |   |            |
|---------|---|------------|
| M. FLR. | = | 2,480 S.F. |
| TOTAL   | = | 2,480 S.F. |
| GARAGE  | = | 826 S.F.   |



**EVERETT**  
CUSTOM HOMES

4-BEDROOMS  
2-BATHS  
3-CAR GARAGE



MAIN LEVEL FLOOR PLAN (9' & 11' CLG'S.)

**WEST HILLS**  
HOMES NORTHWEST



**EVERETT**  
CUSTOM HOMES

3330 NW YEON AVE STE 100  
PORTLAND, OREGON 97210  
PHONE (503) 726-7060

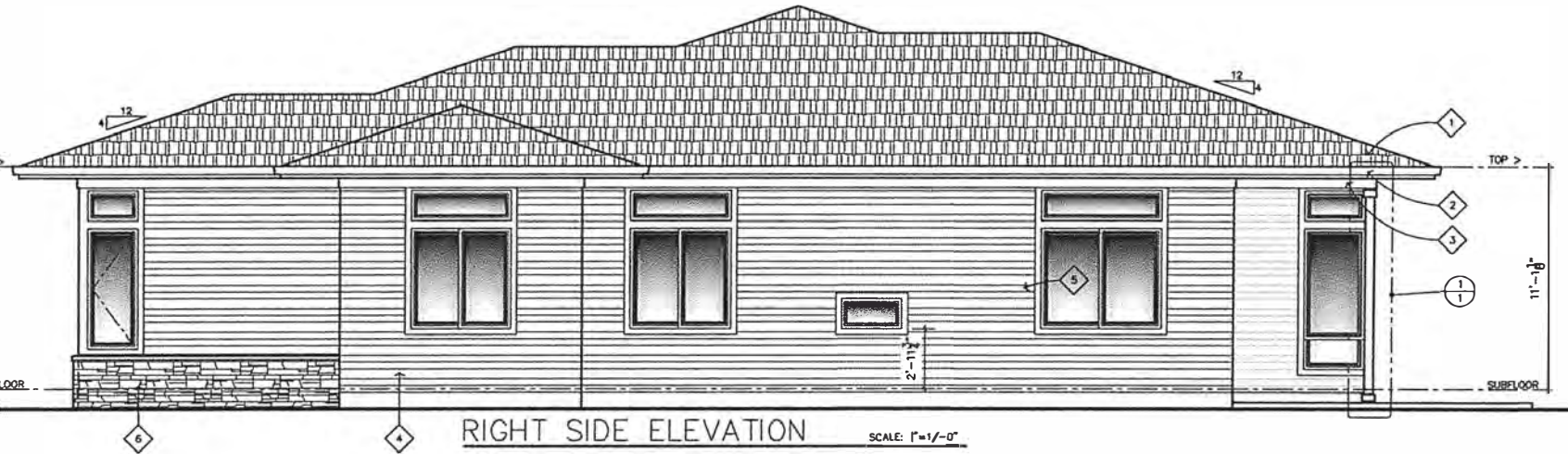
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8/18/17, PRELIM. LAYOUT DDR  
9/27/17, PRELIM. ENG. CHK. DDR  
10/30/17, FIN. ENG. CHK. DDR  
10/20/17, PUBLISH. PLAN DDR



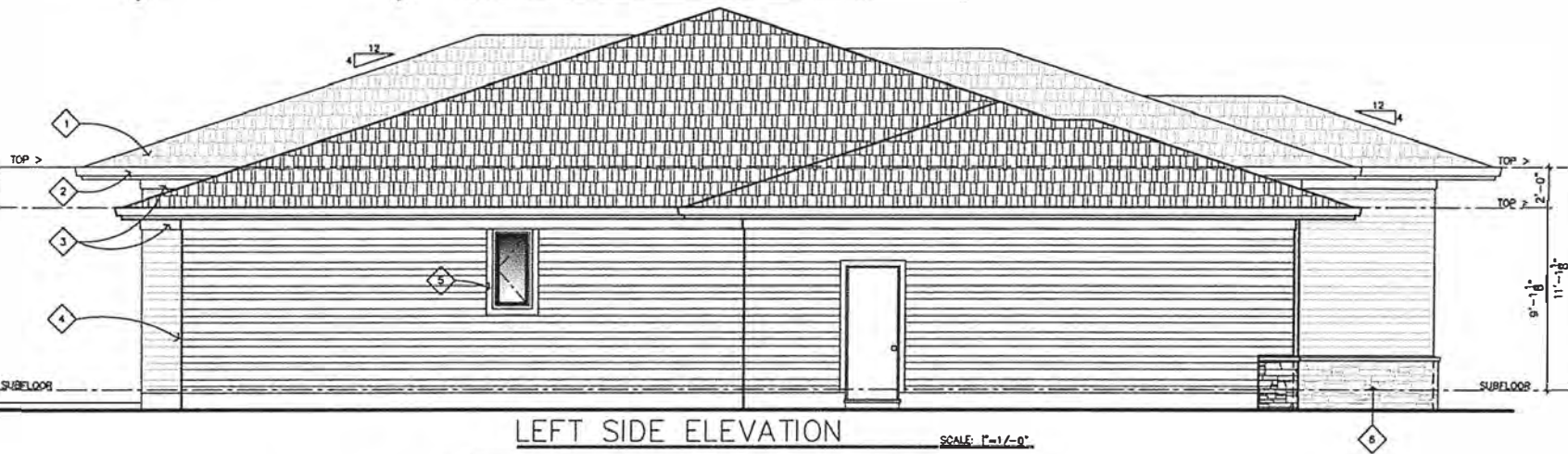
FRONT ELEVATION

SCALE: 1/4"=1'-0"



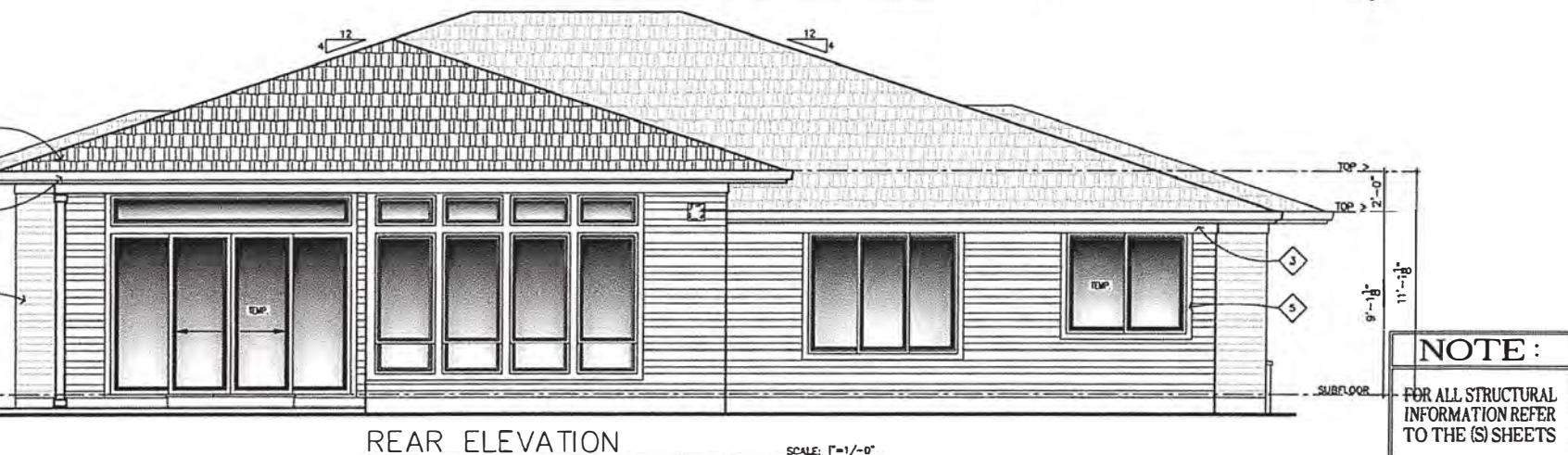
RIGHT SIDE ELEVATION

SCALE: 1/4"=1'-0"



LEFT SIDE ELEVATION

SCALE: 1/4"=1'-0"



REAR ELEVATION

SCALE: 1/4"=1'-0"

**PLAN 2480  
ESLINGER  
PRAIRIE  
GARAGE LEFT**

MAIN LEVEL: 2,480 SQ FT  
GRAND TOTAL: 2,480 SQ FT  
GARAGE: 826 SQ FT

SHEET#

JOB#

**NOTE:**  
FOR ALL STRUCTURAL  
INFORMATION REFER  
TO THE (S) SHEETS





**WEST HILLS**  
HOMES NORTHWEST

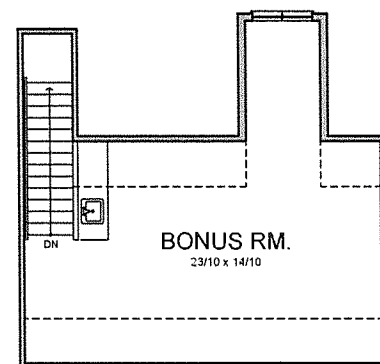
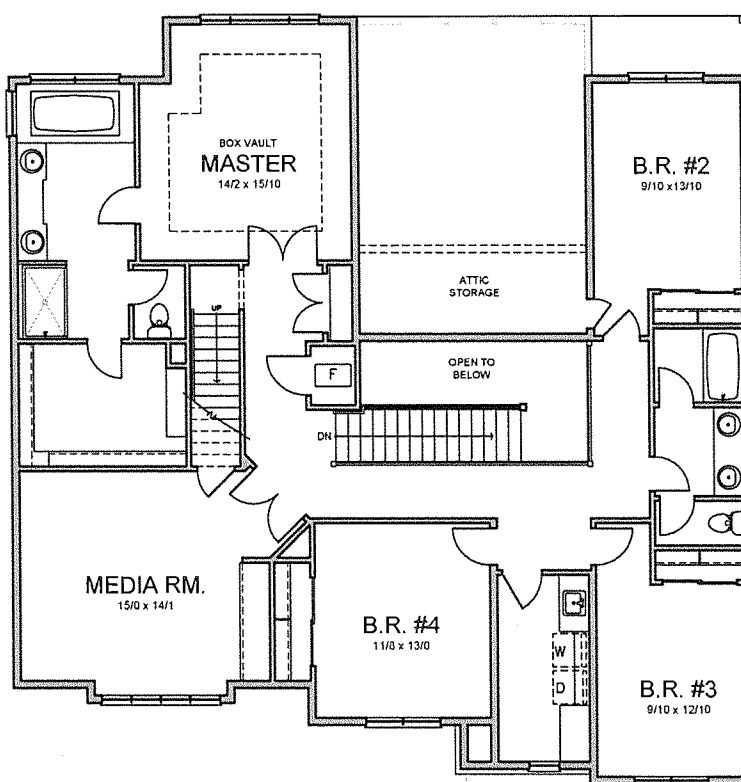
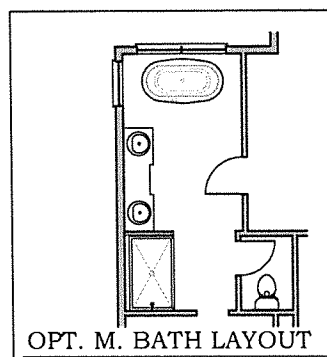
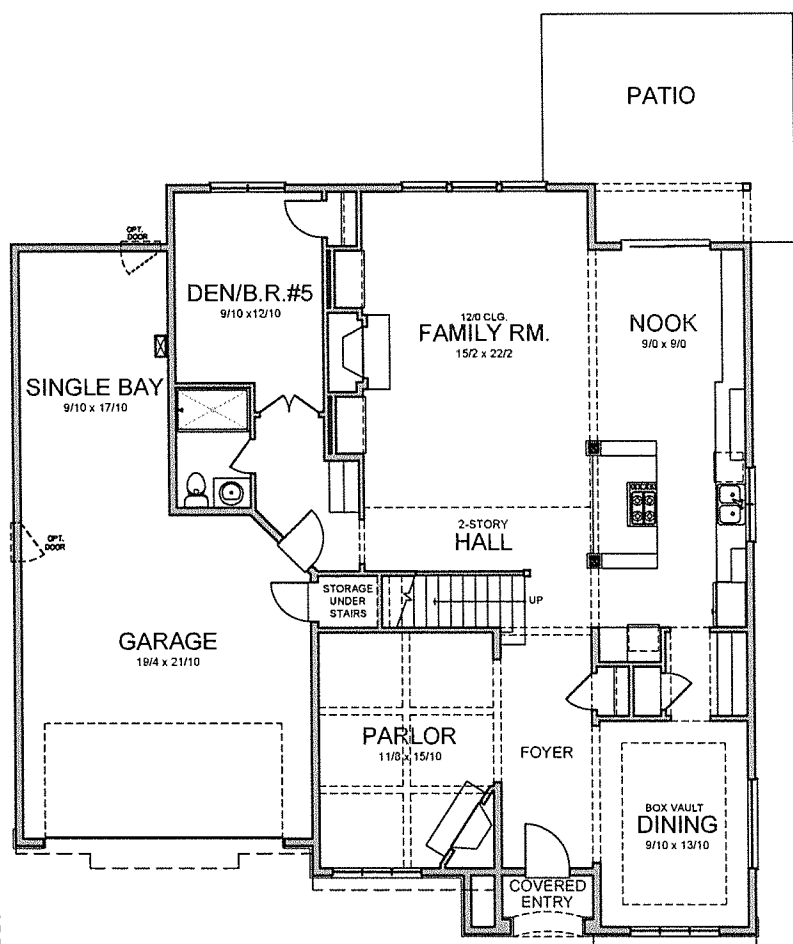
**3557 DUNTHORPE  
FRENCH**

|         |   |            |
|---------|---|------------|
| M. FLR. | = | 1,605 S.F. |
| U. FLR. | = | 1,917 S.F. |
| BONUS   | = | 451 S.F.   |
| TOTAL   | = | 3,973 S.F. |
| GARAGE  | = | 636 S.F.   |



**EVERETT**  
CUSTOM HOMES

5-BEDROOMS  
3-BATHS  
MEDIA, BONUS  
TANDEM 3-CAR GARAGE

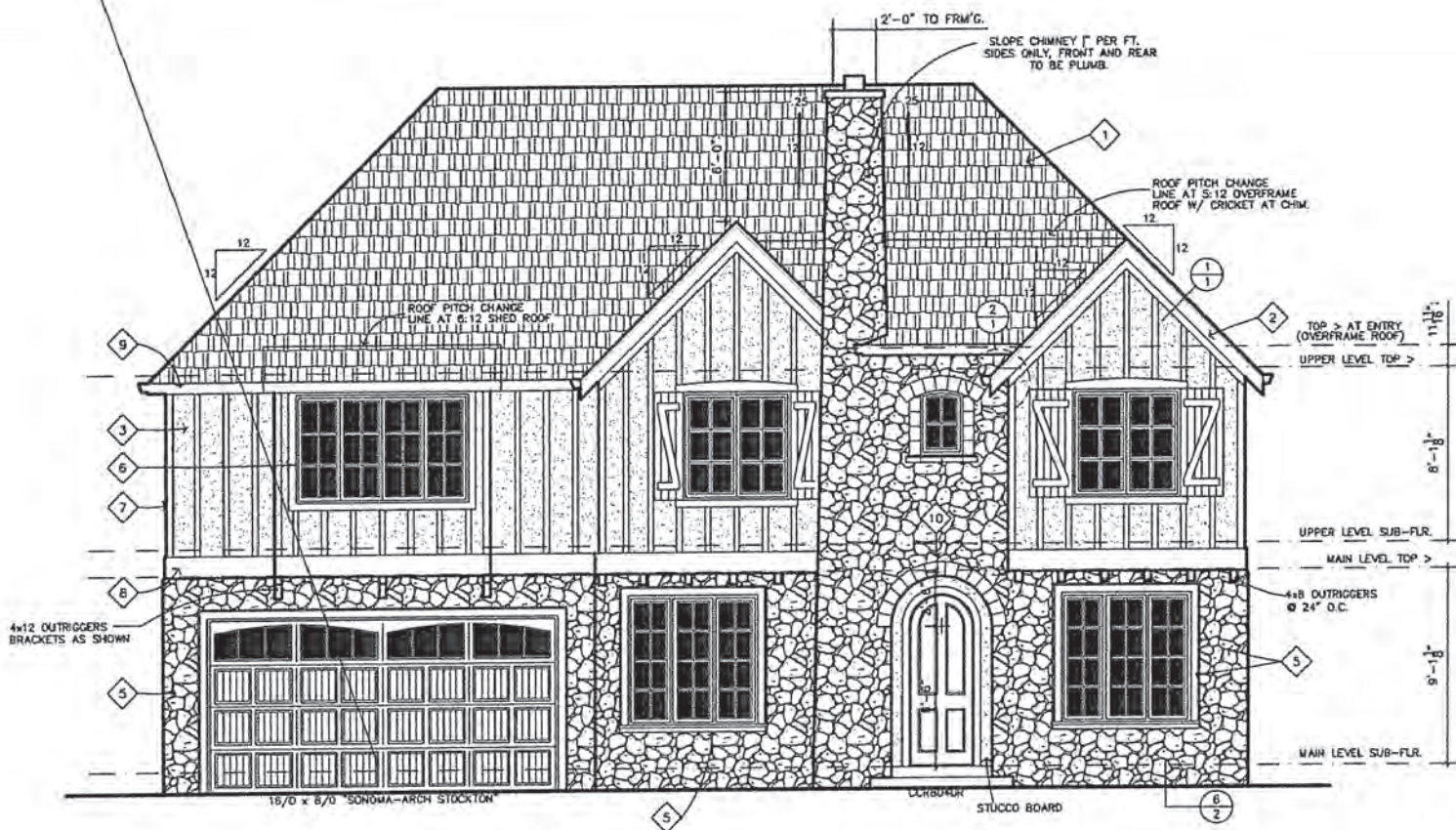


REV: 3/9/17 DDR



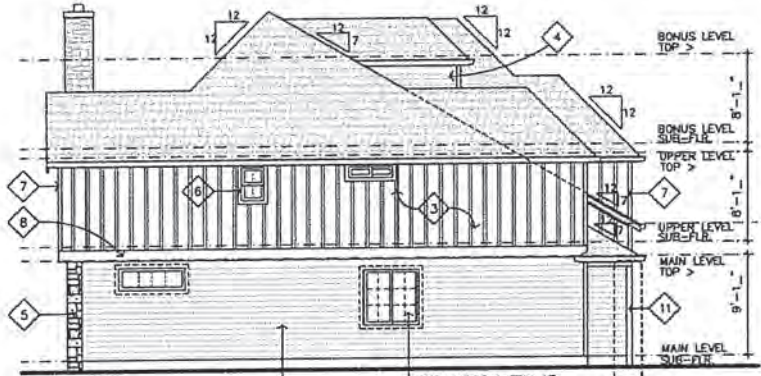
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10/27/16 ECH-WALK-THROUGH SPOT FOR FUTURE SHEL DOB  
3/9/17 ECH UPDATE FH-29, FH-33 DOB  
3/2/17 ECH UPDATE FH-29, FH-33 DOB  
3/9/17 ECH FOLDER TRANSFER DOB



FRONT ELEVATION

1/4"=1'-0"



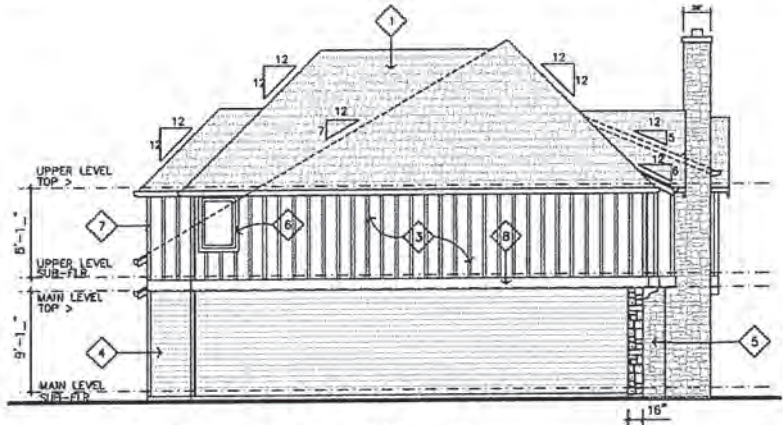
RIGHT SIDE ELEVATION

1/8"=1'-0"



REAR ELEVATION

1/8"=1'-0"



LEFT SIDE ELEVATION

1/8"=1'-0"

- ELEVATION KEYNOTES**
1. ROOFING (TYPICAL): 30 YEAR HEAVY WEIGHT FIBERGLASS COMPOSITION ROOFING.
  2. VERGE BOARD TYPICAL: RS 1x3 TRIM OR 2x8 VERGE BOARD. PROVIDE 5/4x8 (8 SHINGLES AND LAP SIDING) OR 1x8 (8 PANEL SIDING) TRIM BOARD FLAT ON WALL AND BUTT TO UNDERSIDE OF ROOF SHEATHING FOLLOWING GABLE END VERGE BOARD.
  3. SIDING (TYPICAL): HARDIE STUCCO BRD. SIDING W/ 1 x 3 BATTENS SPACED AT 16" O.C.
  4. SIDING (TYPICAL WHERE SHOWN): HARDIE-BOARD LAP SIDING.
  5. CULTURED STONE (TYPICAL): INSTALL STONE, SILL & TRIM STONE WHERE SHOWN ON ELEV. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. SEE VENEER DETAILS 3/1, 4/1, 5/3 FOR INFO.
  6. WINDOW TRIM: 5/4 x 4 AROUND ALL WINDOWS AND DOORS AT FRONT AND ALL WINDOWS AT PANEL AND BATTEN SIDING. NO WINDOW TRIM AT LAP SIDING UNLESS AT ENHANCED ELEVATIONS. FLASH ABOVE ALL HORIZONTAL TRIM.
  7. 5/4 x 4 CORNER TRIM AT LAP SIDING, 1 x 4 CORNER TRIM AT PANEL SIDING.
  8. HORIZONTAL TRIM: 5/4 x 12 W/ 26 GA. 2" FLASHING OVER TOP AND INTEGRATED W/ WRB.
  9. GUTTERS (TYP.-U.N.O.): 6" FASCIA STYLE, 26 GA. STEEL GUTTER WITH 2"x3" STEEL DOWNSPOUTS. ALL GUTTERS TO BE SPIKED A MIN. OF 24" O.C. ALL JOINTS TO BE SCREWED AND SEALED WITH 'ALCOID' GUTTER SEAL OR EQUIV. CONNECT ALL DOWNSPOUTS TO RAIN DRAINS WHERE PROVIDED.
  10. 6x8 TRIMSTONE PER MFR.
  11. P.T. 6x6 POST -RATED FOR BURIAL. SEE DETAIL 5/3

**NOTE:**  
FOR ALL STRUCTURAL INFORMATION REFER TO THE (S) SHEETS

**PLAN 3557  
DUNTHORPE  
FRENCH  
GARAGE LEFT**

|              |             |
|--------------|-------------|
| MAIN LEVEL:  | 1605 SQ FT  |
| UPPER LEVEL: | 1917 SQ FT  |
| TOTAL:       | 3522 SQ FT  |
| BONUS:       | 493 SQ FT   |
| GRAND TOTAL: | 3973 SQ FT. |

GARAGE: 836 SQ FT





**WEST HILLS**  
HOMES NORTHWEST

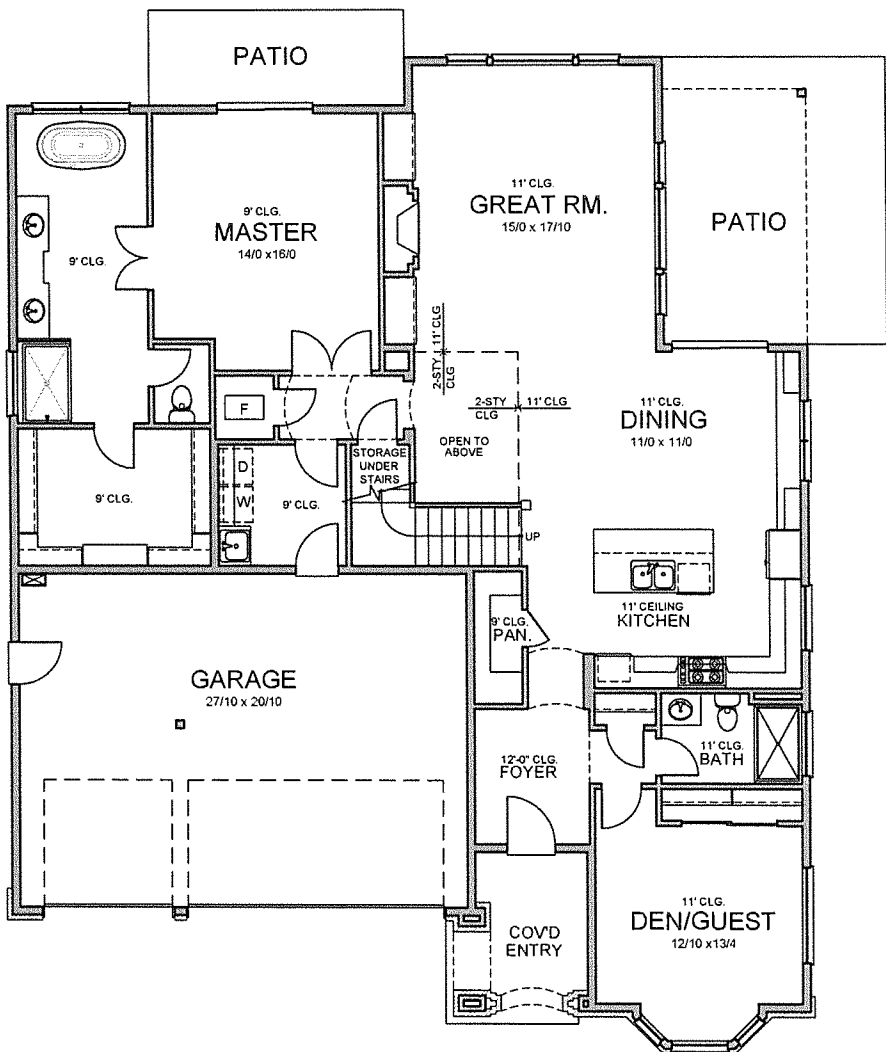
**2957 WESTLAKE  
ENGLISH (PH-23)**

|         |   |            |
|---------|---|------------|
| M. FLR. | = | 1,877 S.F. |
| U. FLR. | = | 1,080 S.F. |
| TOTAL   | = | 2,957 S.F. |
| GARAGE  | = | 615 S.F.   |

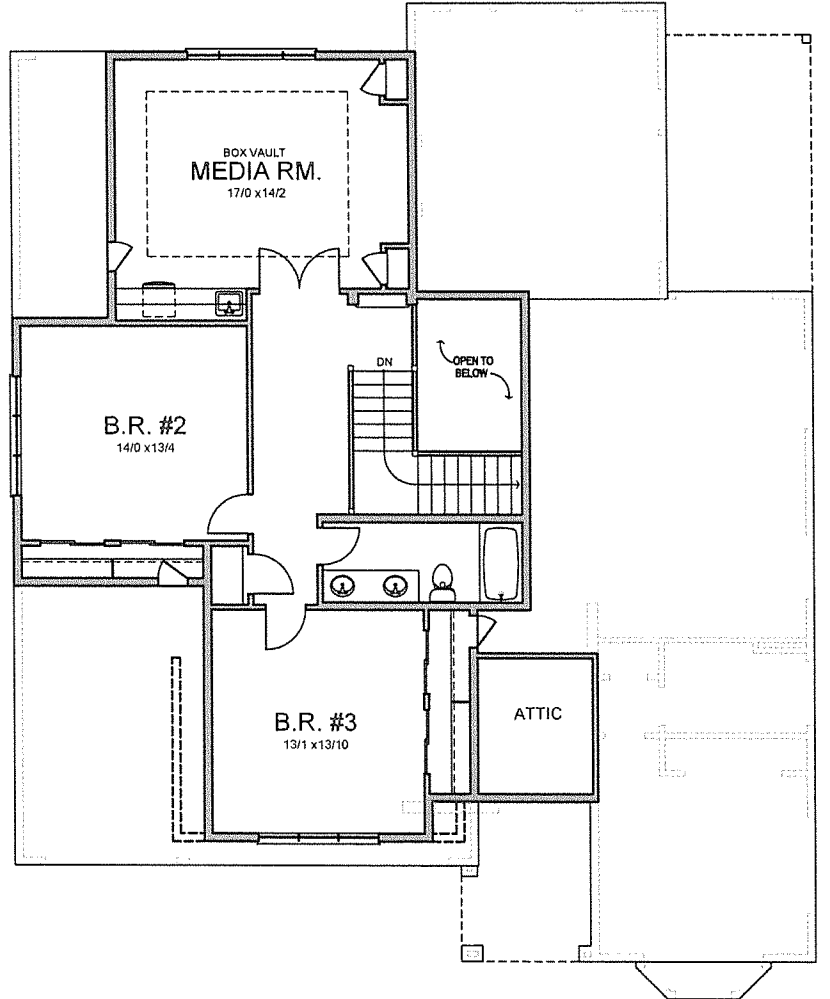


**EVERETT**  
CUSTOM HOMES

4-BEDROOMS  
3-BATHS  
MEDIA  
3-CAR GARAGE



MAIN LEVEL FLOOR PLAN (9'/11'/12' CLG'S.)



UPPER LEVEL FLOOR PLAN (8' CLG.)

REV: 9/21/17 DDR







**WEST HILLS**  
HOMES NORTHWEST

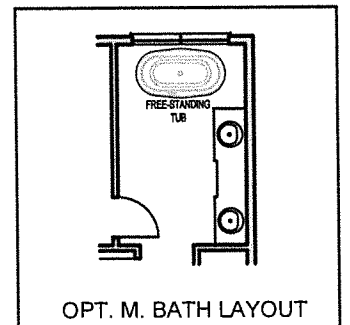
**3017 BROOKLYN  
FRENCH**

|         |   |            |
|---------|---|------------|
| M. FLR. | = | 1,268 S.F. |
| U. FLR. | = | 1,772 S.F. |
| TOTAL   | = | 3,040 S.F. |
| GARAGE  | = | 466 S.F.   |

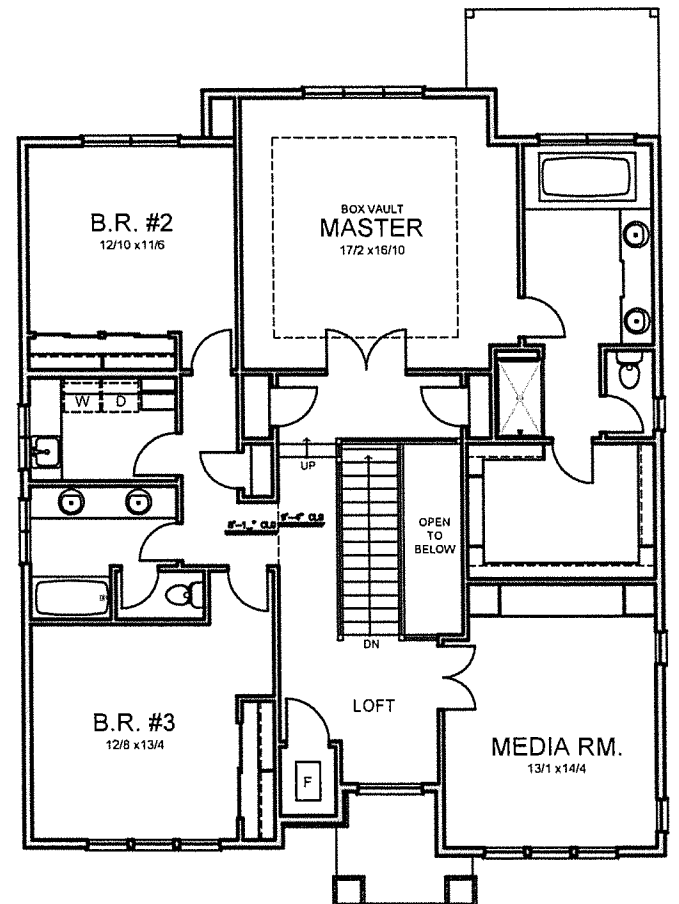
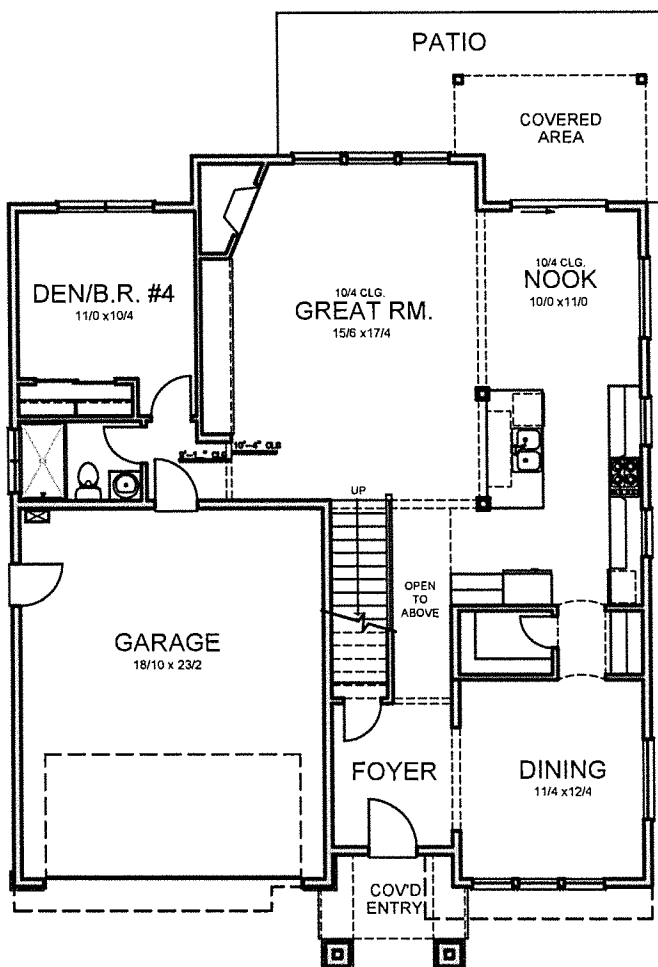


**EVERETT**  
CUSTOM HOMES

4-BEDROOMS  
3-BATHS  
MEDIA  
2-CAR GARAGE



OPT. M. BATH LAYOUT

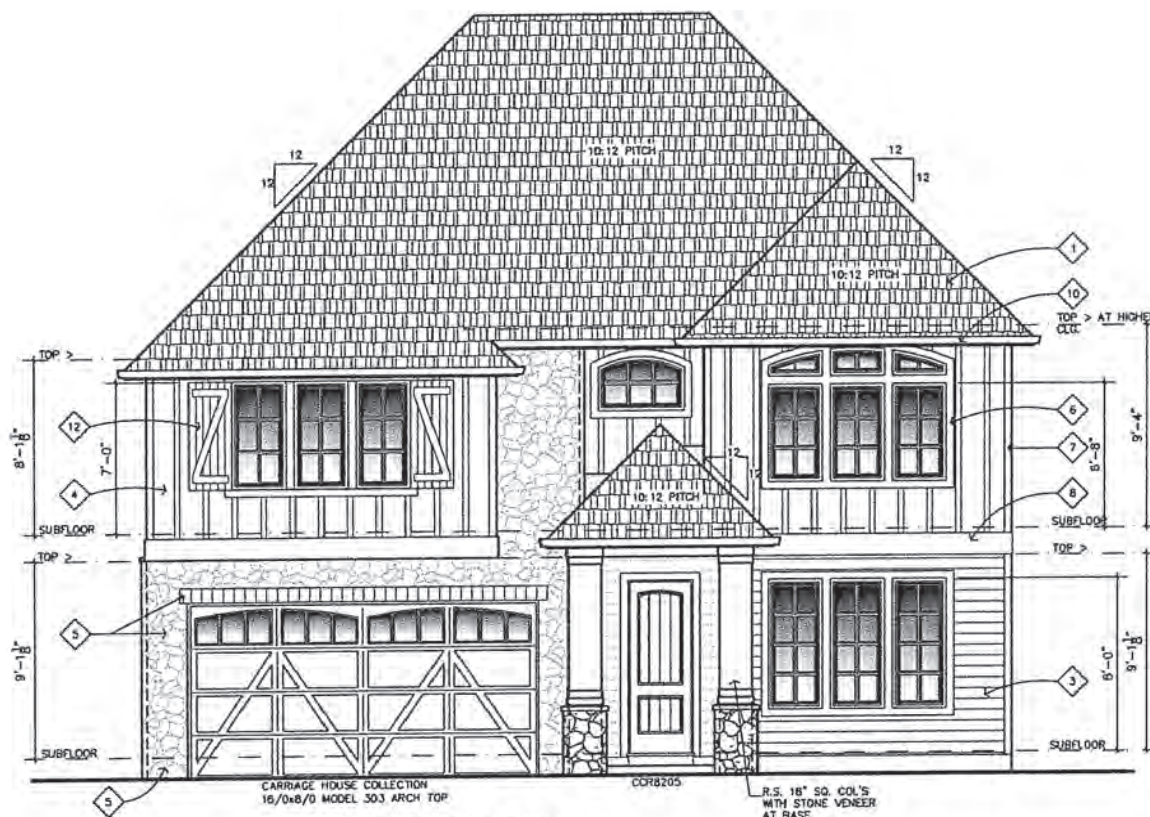


REV. 11/2/17 DDR



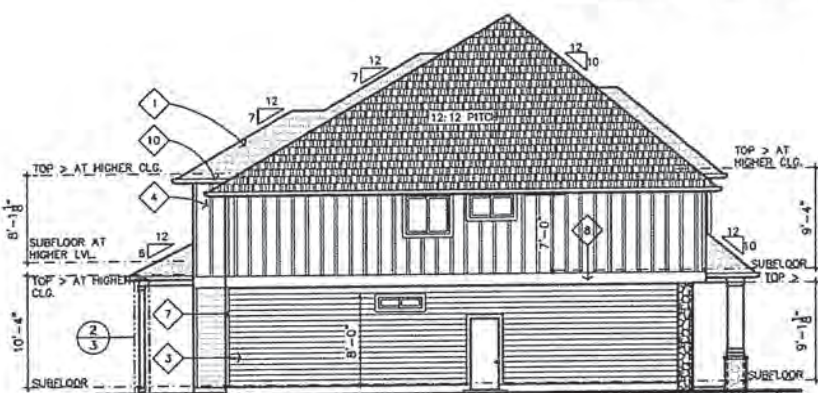
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4/7/15, PRELIM. LAYOUT DOR  
4/15/15, PRELIM. ENG. CHK. DOR  
6/1/15, FINAL ENG. CHK. DOR  
6/1/15, PUBLISH PLAN DOR  
6/30/15, PC#1 IMPLEMENTED DOR  
12/9/15, PC#2 IMPLEMENTED DOR  
11/2/17, PC#3 IMPLEMENTED DOR



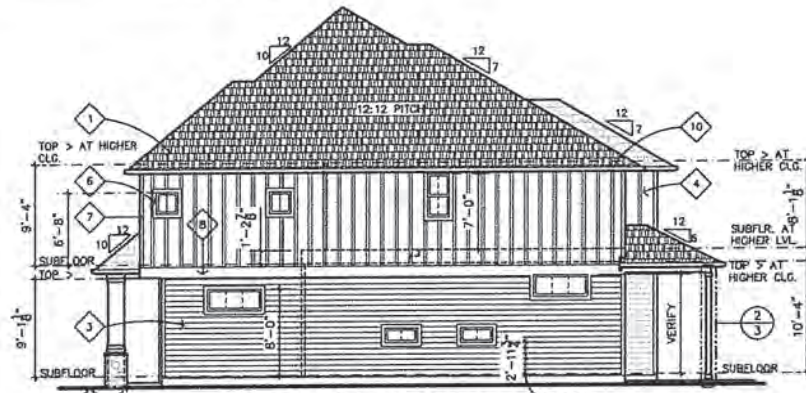
**FRONT ELEVATION**

1/4" = 1'-0"



**LEFT ELEVATION**

1/8" = 1'-0"



**RIGHT ELEVATION**

1/8" = 1'-0"

CRDS @ WINDOWS THIS SIDE AT ENHANCED ELEVATION ONLY



**REAR ELEVATION**

1/8" = 1'-0"

**PLAN 3017  
BROOKLYN  
FRENCH  
GARAGE LEFT**

MAIN LEVEL: 1,368 SQ FT  
UPPER LEVEL: 1,772 SQ FT  
GRAND TOTAL: 3,040 SQ FT

GARAGE: 466 SQ FT

SHEET#

**NOTE :**  
FOR ALL STRUCTURAL  
INFORMATION REFER  
TO THE (S) SHEETS

JOB#





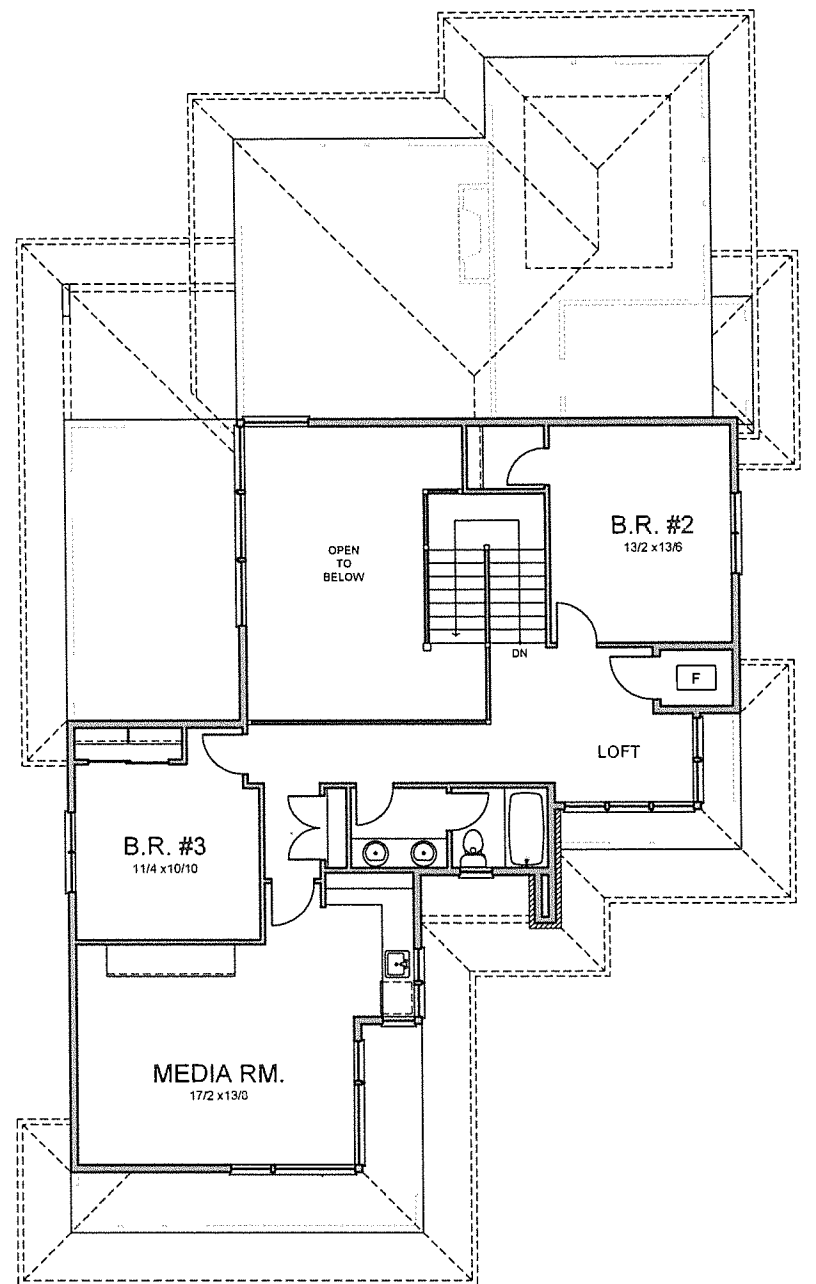
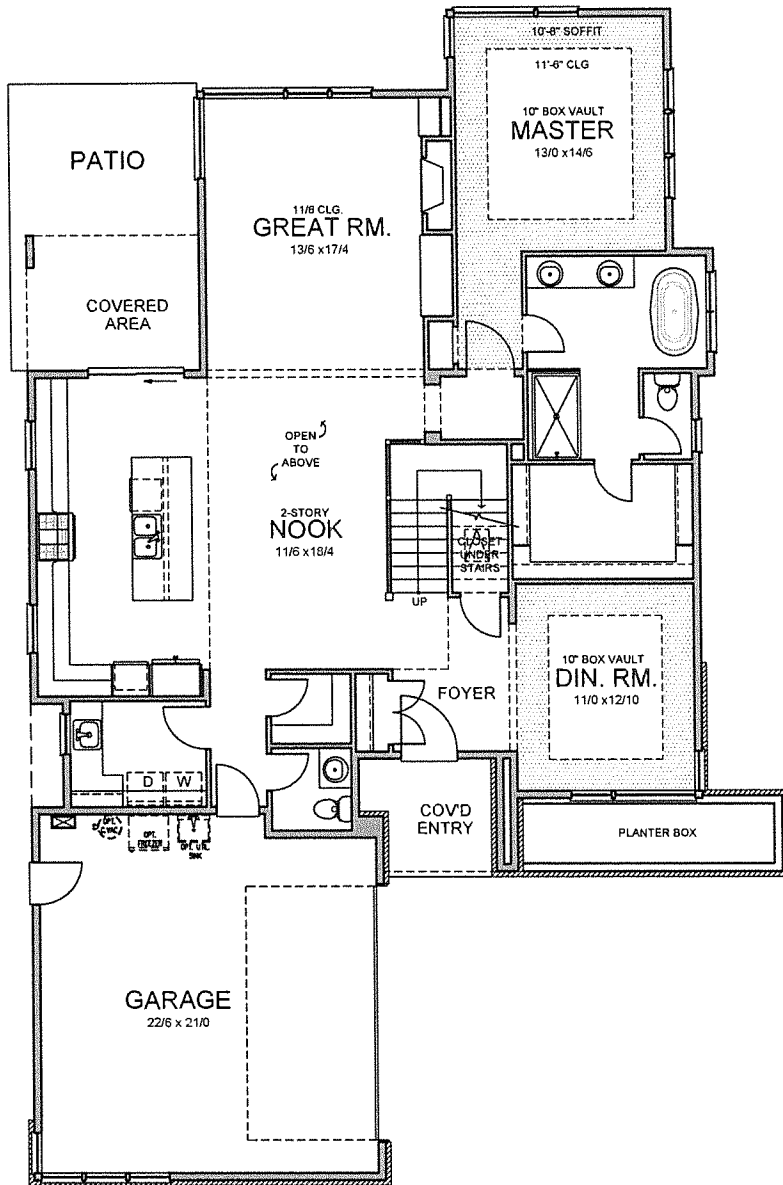
**WEST HILLS**  
HOMES NORTHWEST

|                                      |              |
|--------------------------------------|--------------|
| <b>2746 BAYBERRY PRAIRIE (2-CAR)</b> |              |
| M. FLR.                              | = 1,685 S.F. |
| U. FLR.                              | = 1,061 S.F. |
| TOTAL                                | = 2,746 S.F. |
| GARAGE                               | = 499 S.F.   |



**EVERETT**  
CUSTOM HOMES

3-BEDROOMS  
2.5-BATHS  
MEDIA  
2-CAR GARAGE



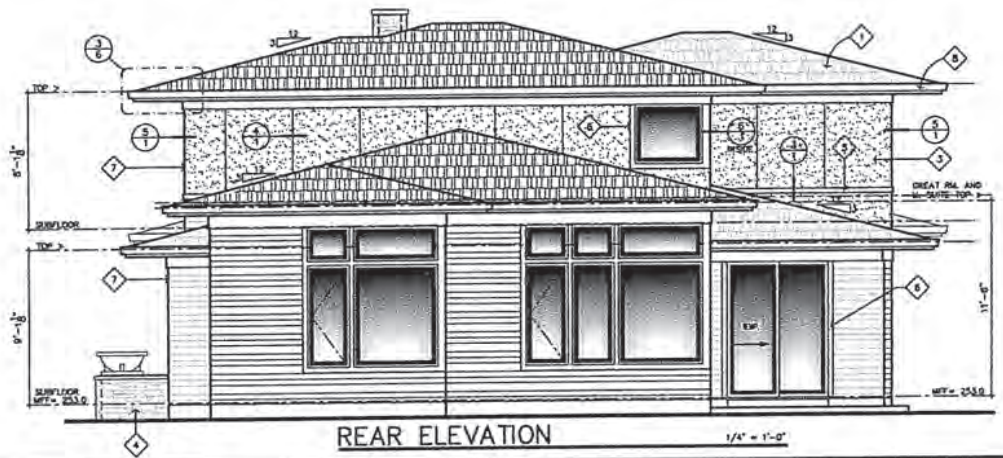
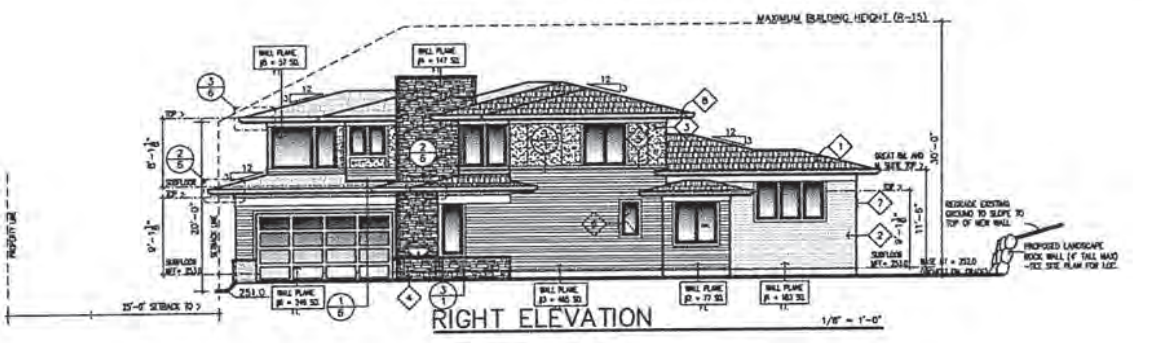
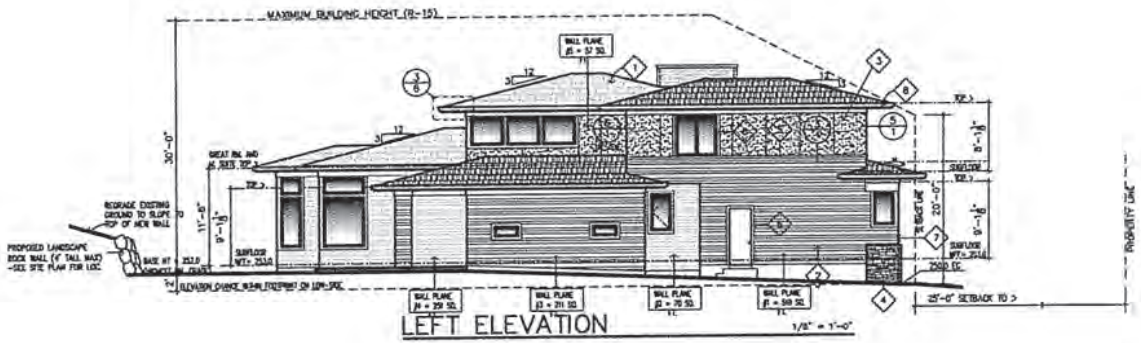
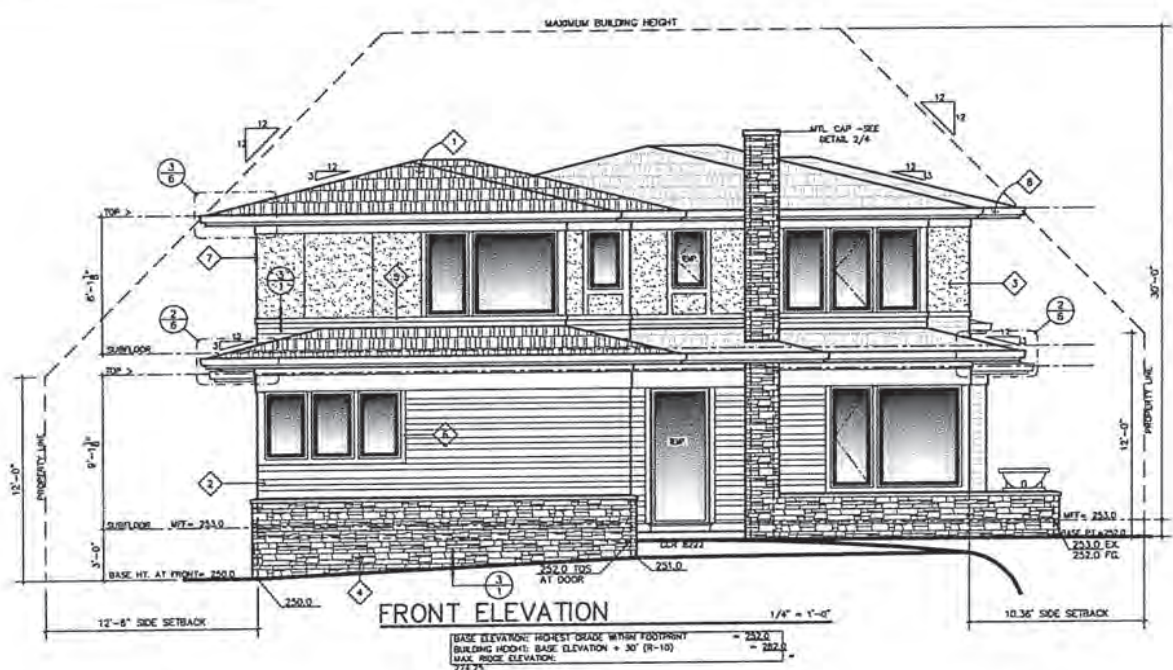
MAIN LEVEL FLOOR PLAN (9' & 11/6 CLG.)

UPPER LEVEL FLOOR PLAN (8' CLG.)

REV. 5/2/17 DDR

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5/13/17 PRELIM LAYOUT DOR  
4/23/17 PRELIM ENG. CHK. DOR  
5/2/17 FINAL ENG. CHK. DOR  
5/2/17 PUBLISH PLAN DOR



**NOTE :**  
FOR ALL STRUCTURAL INFORMATION REFER TO THE (S) SHEETS

**PLAN 2746  
BAYBERRY PRAIRIE  
2-CAR GARAGE LEFT**

|              |             |
|--------------|-------------|
| MAIN LEVEL:  | 1,625 SQ FT |
| UPPER LEVEL: | 1,061 SQ FT |
| GRAND TOTAL: | 2,746 SQ FT |
| GARAGE:      | 499 SQ FT   |

SHEET#



**WEST HILLS**  
HOMES NORTHWEST

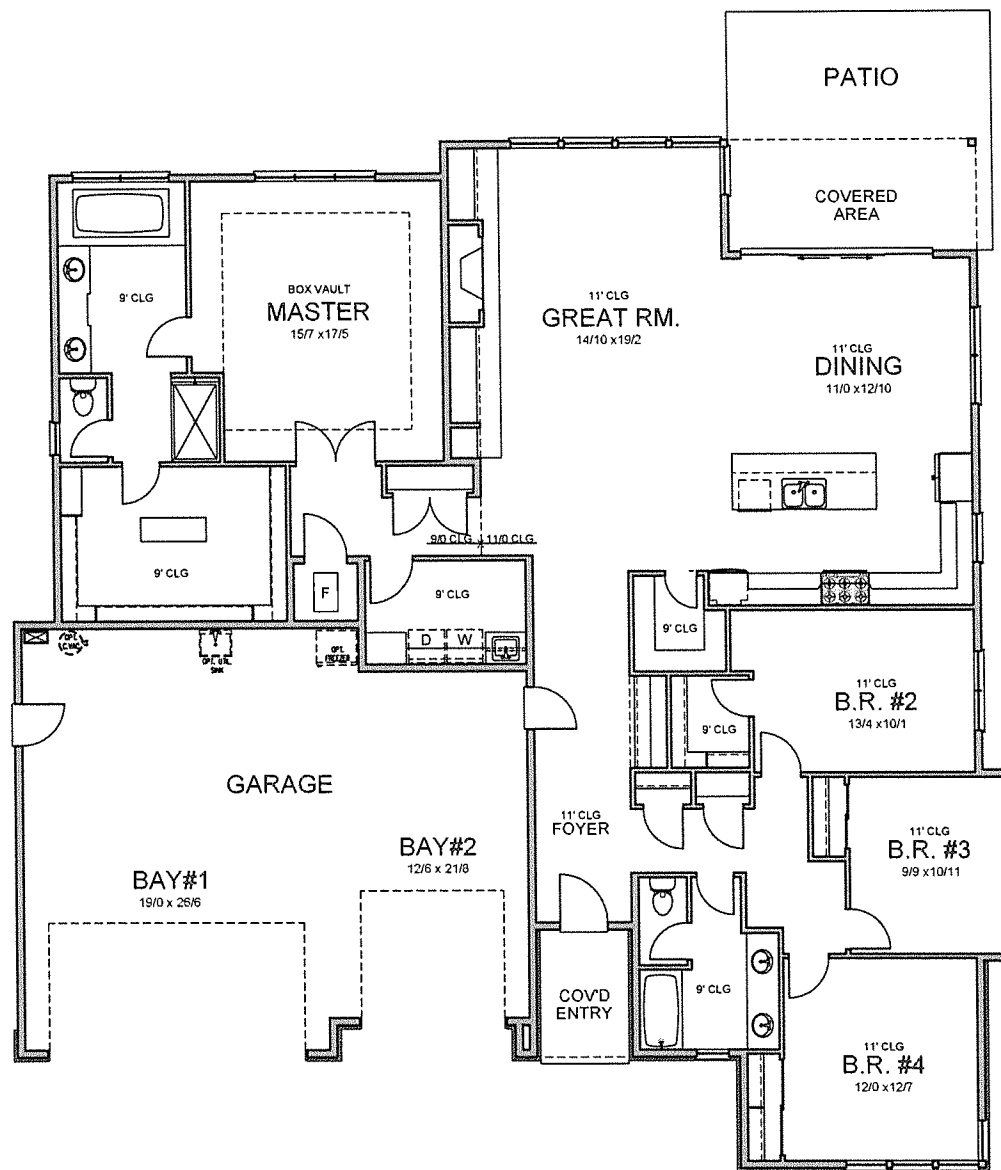
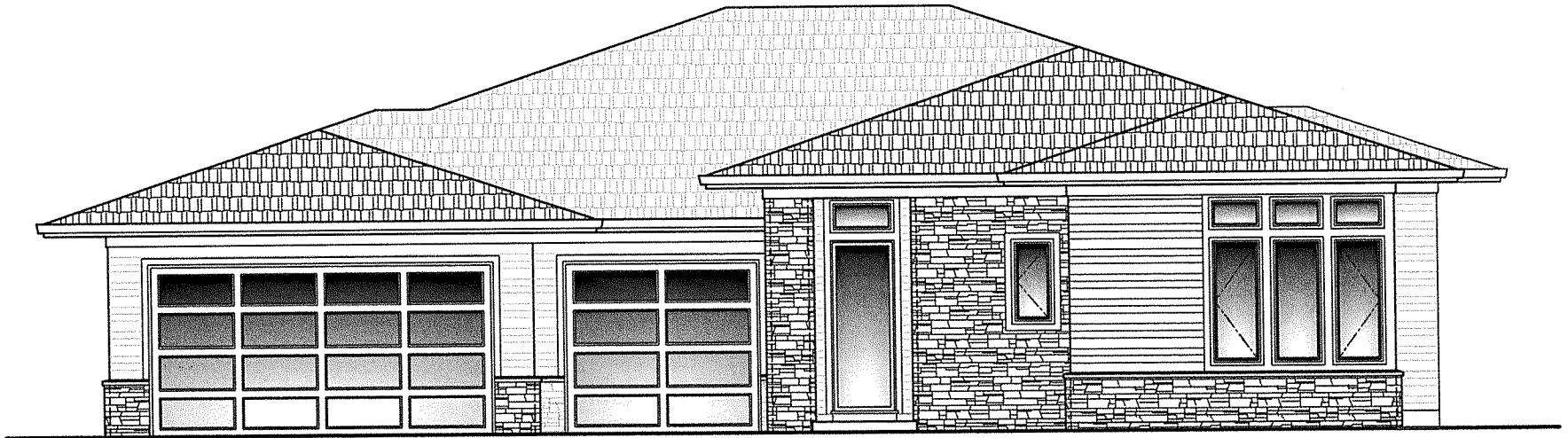
**2480 ESLINGER  
PRAIRIE**

|         |   |            |
|---------|---|------------|
| M. FLR. | = | 2,480 S.F. |
| TOTAL   | = | 2,480 S.F. |
| GARAGE  | = | 826 S.F.   |



**EVERETT**  
CUSTOM HOMES

4-BEDROOMS  
2-BATHS  
3-CAR GARAGE



REV: 10/20/17 DDR

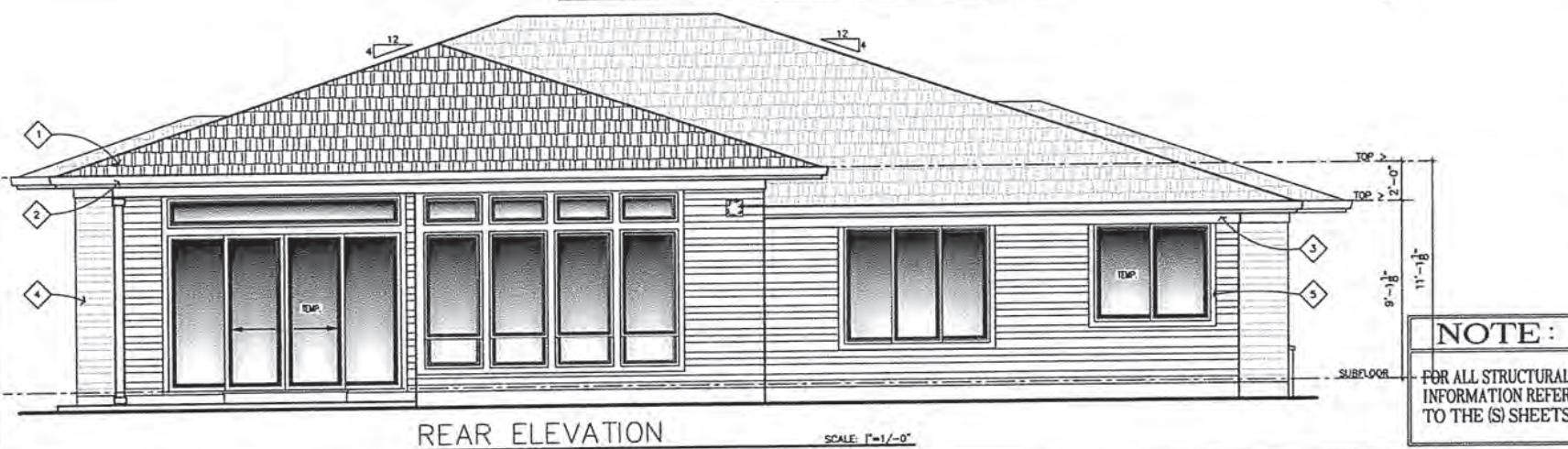
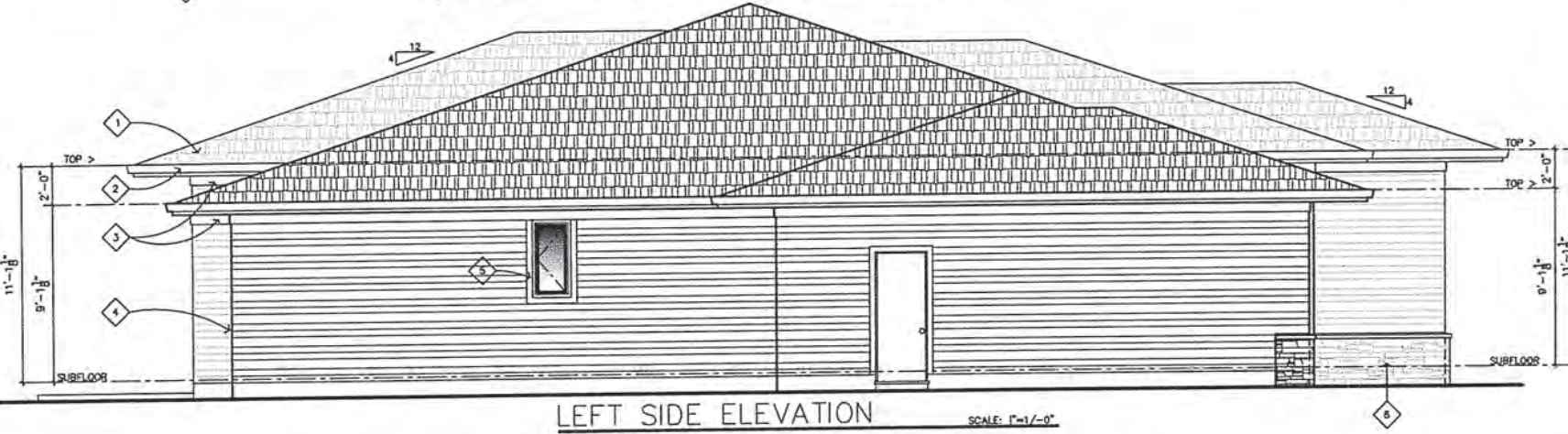
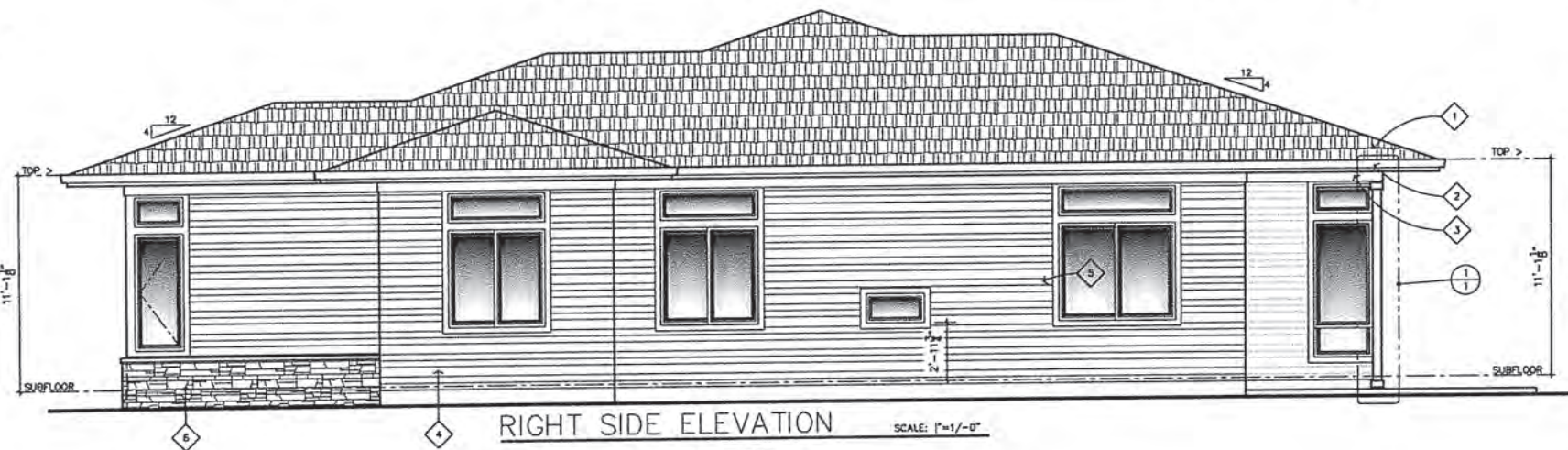
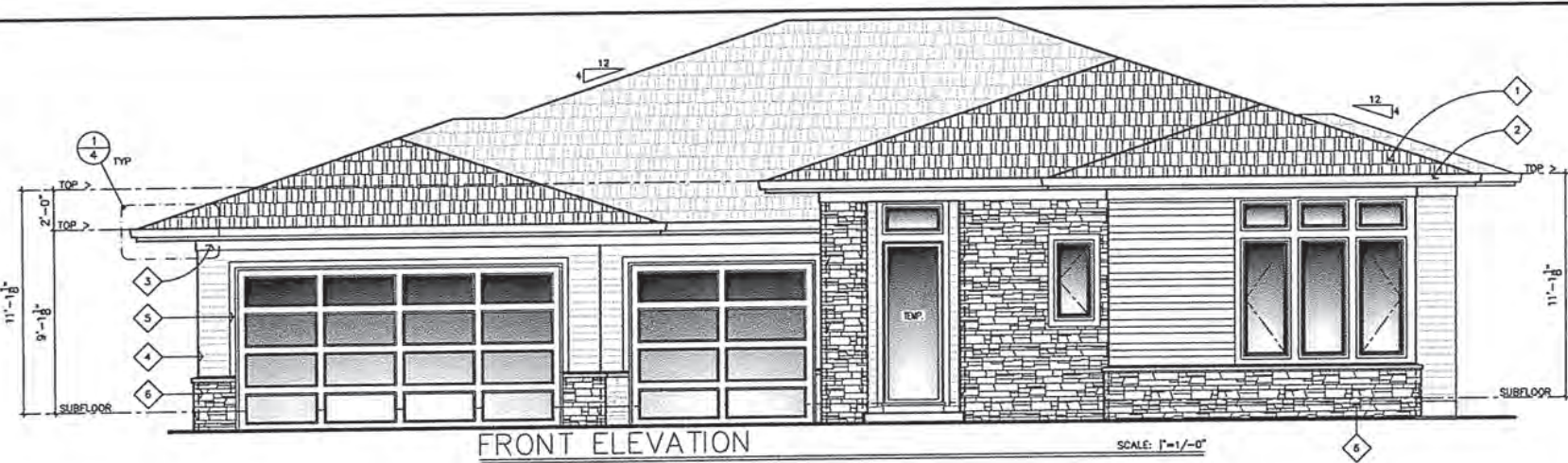
MAIN LEVEL FLOOR PLAN (9' & 11' CLG'S.)



3330 NW YEON AVE STE 100  
PORTLAND, OREGON 97210  
PHONE (503) 726-7060

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8/18/17, PRELIM. LAYOUT DDR  
9/27/17, PRELIM. ENG. CHK. DDR  
10/20/17, FIN. ENG. CHK. DDR  
10/20/17, PUBLISH PLAN DDR



**PLAN 2480  
ESLINGER  
PRAIRIE  
GARAGE LEFT**

MAIN LEVEL: 2,480 SQ FT  
GRAND TOTAL: 2,480 SQ FT  
GARAGE: 826 SQ FT

SHEET#

**NOTE:**  
FOR ALL STRUCTURAL  
INFORMATION REFER  
TO THE (S) SHEETS





**WEST HILLS**  
HOMES NORTHWEST

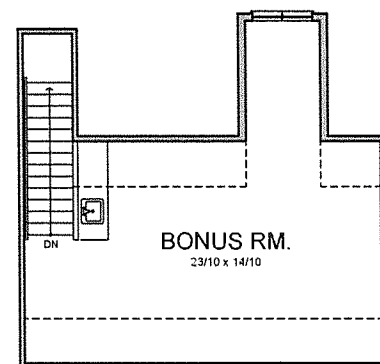
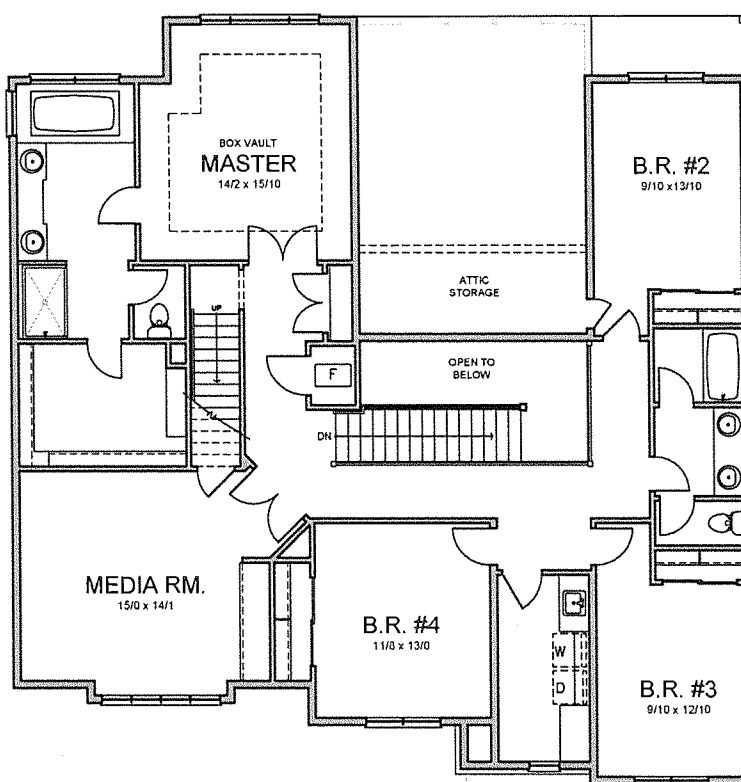
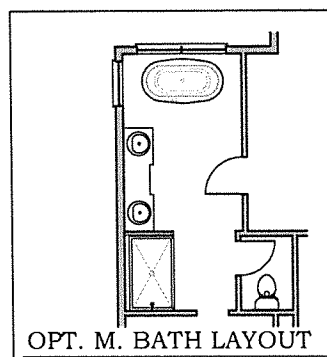
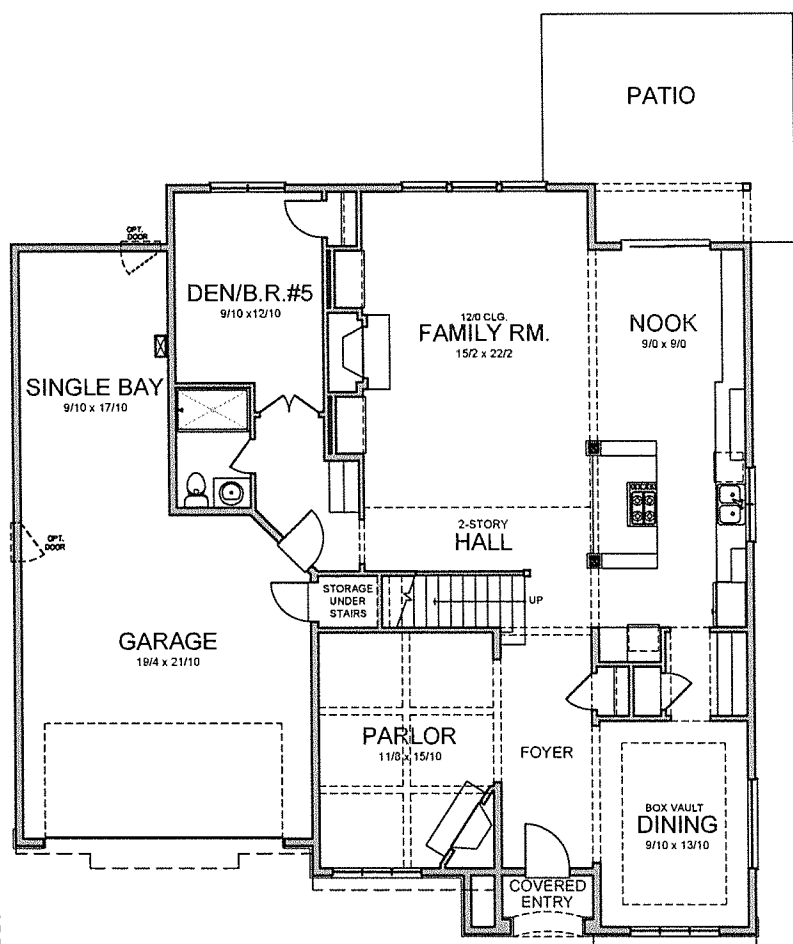
**3557 DUNTHORPE  
FRENCH**

|         |   |            |
|---------|---|------------|
| M. FLR. | = | 1,605 S.F. |
| U. FLR. | = | 1,917 S.F. |
| BONUS   | = | 451 S.F.   |
| TOTAL   | = | 3,973 S.F. |
| GARAGE  | = | 636 S.F.   |



**EVERETT**  
CUSTOM HOMES

5-BEDROOMS  
3-BATHS  
MEDIA, BONUS  
TANDEM 3-CAR GARAGE

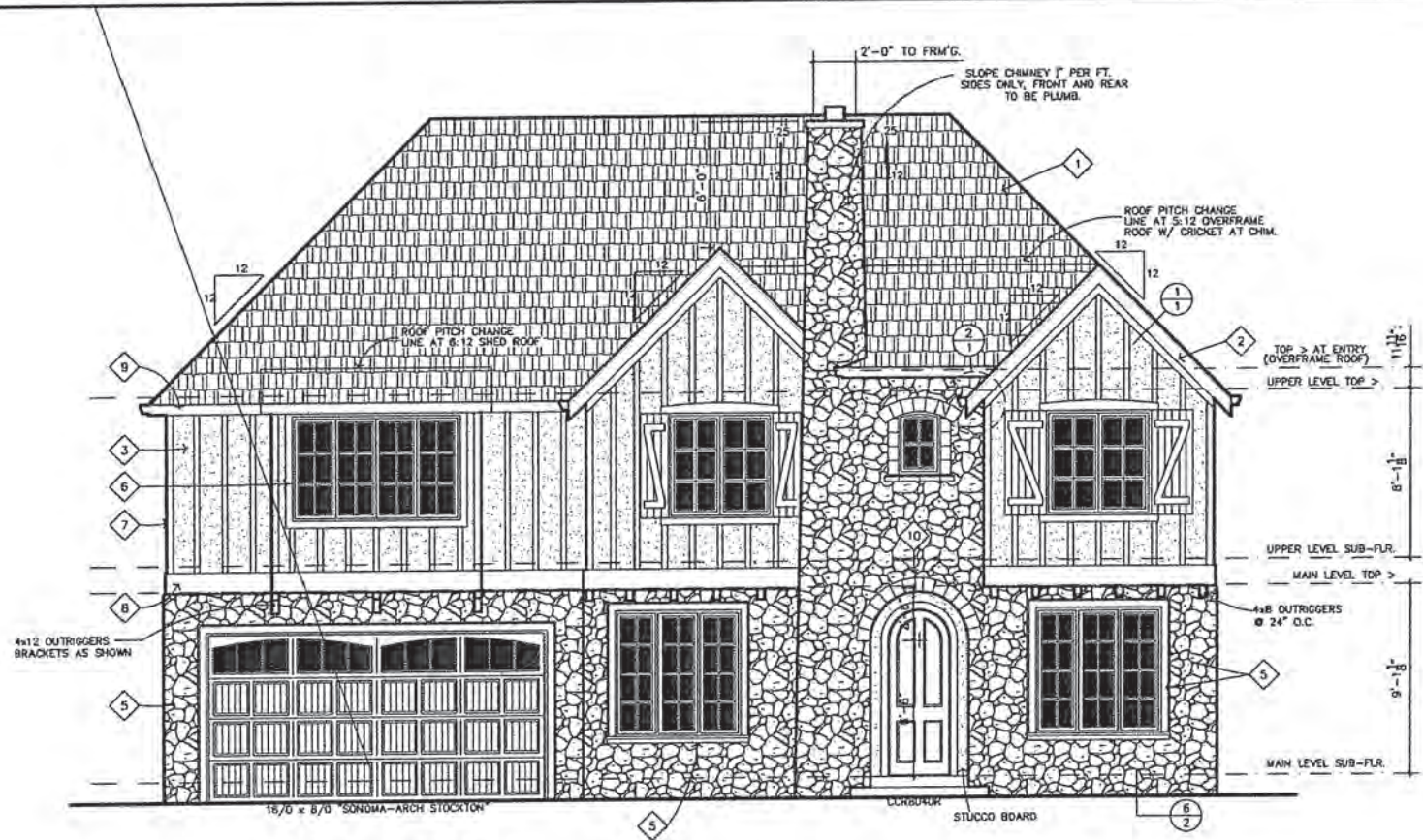


REV: 3/9/17 DDR



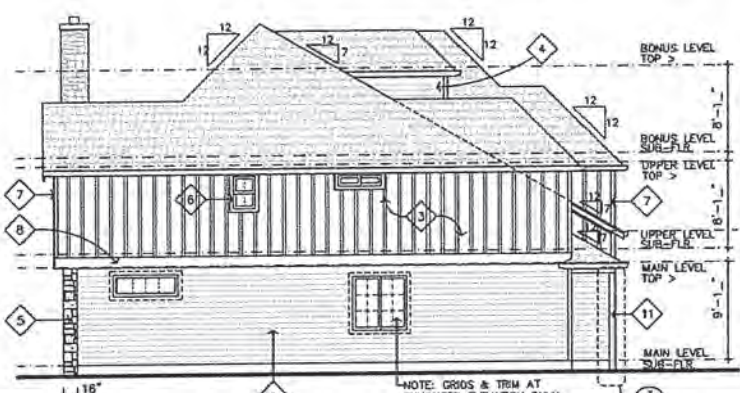
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10/27/16 ECH-MARK-THROUGH LOT FOR FUTURE SUB. 008  
3/9/17 ECH UPDATE FH-29, FH-33 008  
3/7/17 ECH UPDATE FH-29, FH-33 008  
3/9/17 ECH FOLDER TRANSFER 008



FRONT ELEVATION

1/4"=1'-0"



RIGHT SIDE ELEVATION

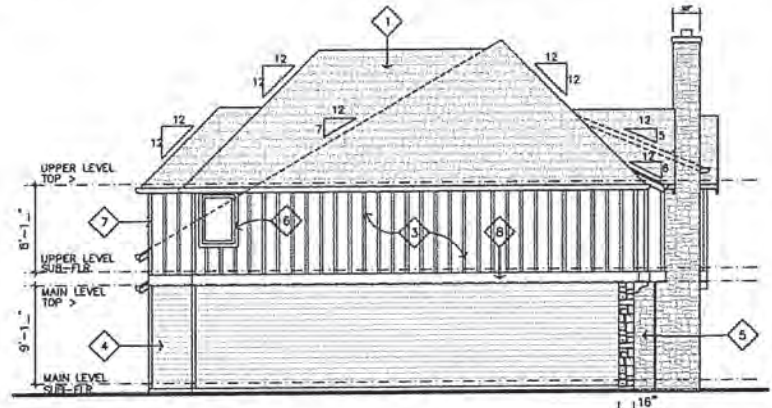
1/8"=1'-0"



REAR ELEVATION

1/8"=1'-0"

- ELEVATION KEYNOTES**
1. ROOFING (TYPICAL): 30 YEAR HEAVY WEIGHT FIBERGLASS COMPOSITION ROOFING.
  2. VERGE BOARD TYPICAL: 1x3 TRIM ON 2x8 VERGE BOARD. PROVIDE 5/4x8 (Ø SHINGLES AND LAP SIDING) OR 1x8 (Ø PANEL SIDING) TRIM BOARD FLAT ON WALL AND BUTT TO UNDERSIDE OF ROOF SHEATHING FOLLOWING GABLE END VERGE BOARD.
  3. SIDING (TYPICAL): HARDIE STUCCO BRO. SIDING W/ 1 x 3 BATTENS SPACED AT 16" O.C.
  4. SIDING (TYPICAL WHERE SHOWN): HARDIE-BOARD LAP SIDING.
  5. CULTURED STONE (TYPICAL): INSTALL STONE, SILL & TRIM STONE WHERE SHOWN ON ELEV'S. INSTALL PER MANUFACTURER'S RECOMMENDATIONS. SEE VENEER DETAILS 3/1, 4/1, 5/3 FOR INFO.
  6. WINDOW TRIM: 5/4 x 4 AROUND ALL WINDOWS AND DOORS AT FRONT AND ALL WINDOWS AT PANEL AND BATTEN SIDING. NO WINDOW TRIM AT LAP SIDING UNLESS AT ENHANCED ELEVATIONS. FLASH ABOVE ALL HORIZONTAL TRIM.
  7. 5/4 x 4 CORNER TRIM AT LAP SIDING, 1 x 4 CORNER TRIM AT PANEL SIDING.
  8. HORIZONTAL TRIM: 5/4 x 12 W/ 26 GA. 'Z' FLASHING OVER TOP AND INTEGRATED W/ WRB.
  9. GUTTERS (TYP-ULI.O.): 6" FASCIA STYLE, 26 GA. STEEL GUTTER WITH 2"x3" STEEL DOWNSPOUTS. ALL GUTTERS TO BE SPIKED A MIN. OF 24" O.C. ALL JOINTS TO BE SCREWED AND SEALED WITH 'ALOCO' GUTTER SEAL OR EQUIV. CONNECT ALL DOWNSPOUTS TO RAIN DRAINS WHERE PROVIDED.
  10. 6x8 TRIMSTONE PER MFR.
  11. P.T. 6x6 POST -RATED FOR BURIAL. SEE DETAIL 5/3



LEFT SIDE ELEVATION

1/8"=1'-0"

**NOTE:**  
FOR ALL STRUCTURAL INFORMATION REFER TO THE (S) SHEETS

**PLAN 3557  
DUNTHORPE  
FRENCH  
GARAGE LEFT**

|              |             |
|--------------|-------------|
| MAIN LEVEL:  | 1505 SQ FT  |
| UPPER LEVEL: | 1917 SQ FT  |
| TOTAL:       | 3422 SQ FT  |
| BONUS:       | 451 SQ FT   |
| GRAND TOTAL: | 3873 SQ FT. |
| GARAGE:      | 636 SQ FT   |

JOB NO:





**WEST HILLS**  
HOMES NORTHWEST

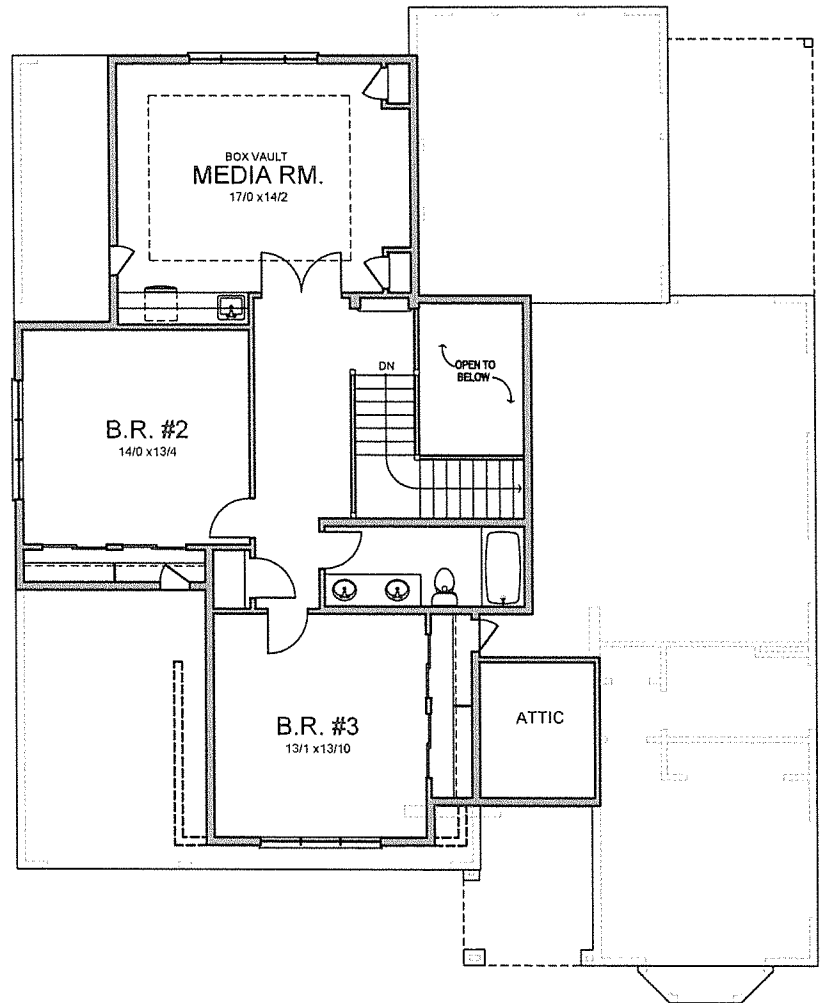
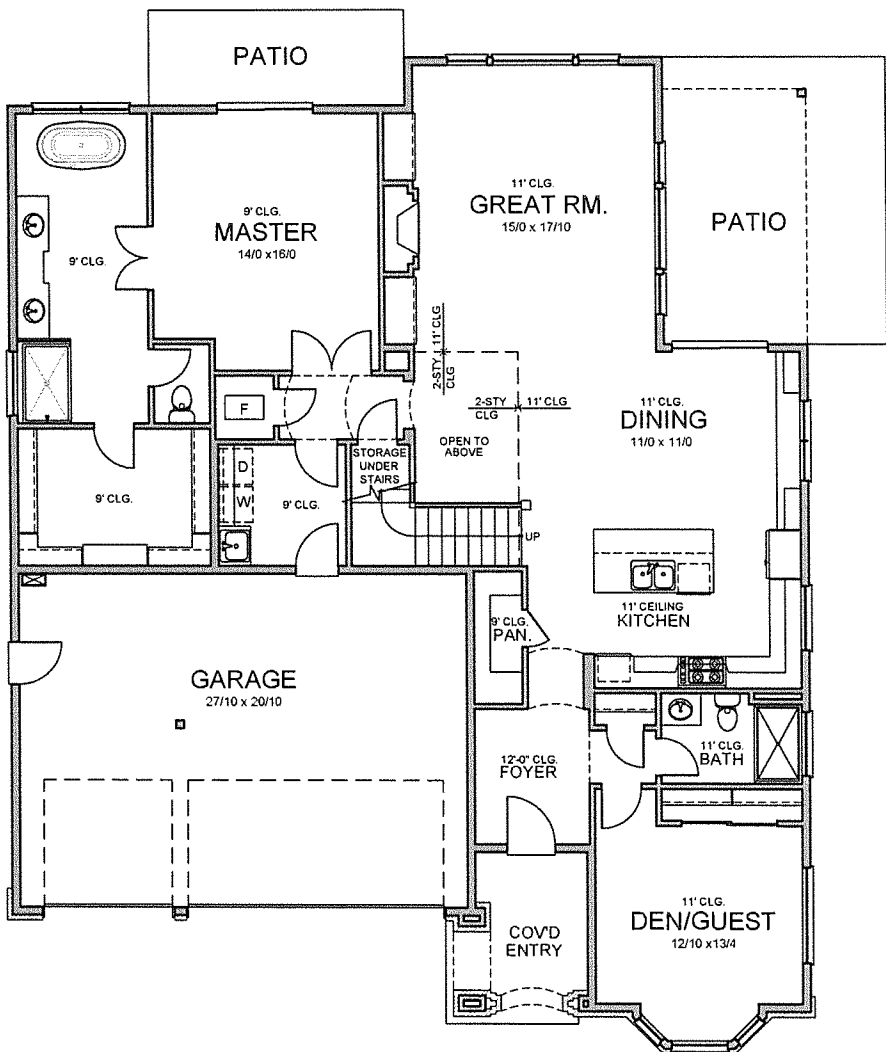
**2957 WESTLAKE  
ENGLISH (PH-23)**

|         |   |            |
|---------|---|------------|
| M. FLR. | = | 1,877 S.F. |
| U. FLR. | = | 1,080 S.F. |
| TOTAL   | = | 2,957 S.F. |
| GARAGE  | = | 615 S.F.   |



**EVERETT**  
CUSTOM HOMES

4-BEDROOMS  
3-BATHS  
MEDIA  
3-CAR GARAGE



MAIN LEVEL FLOOR PLAN (9'/11'/12' CLG'S.)

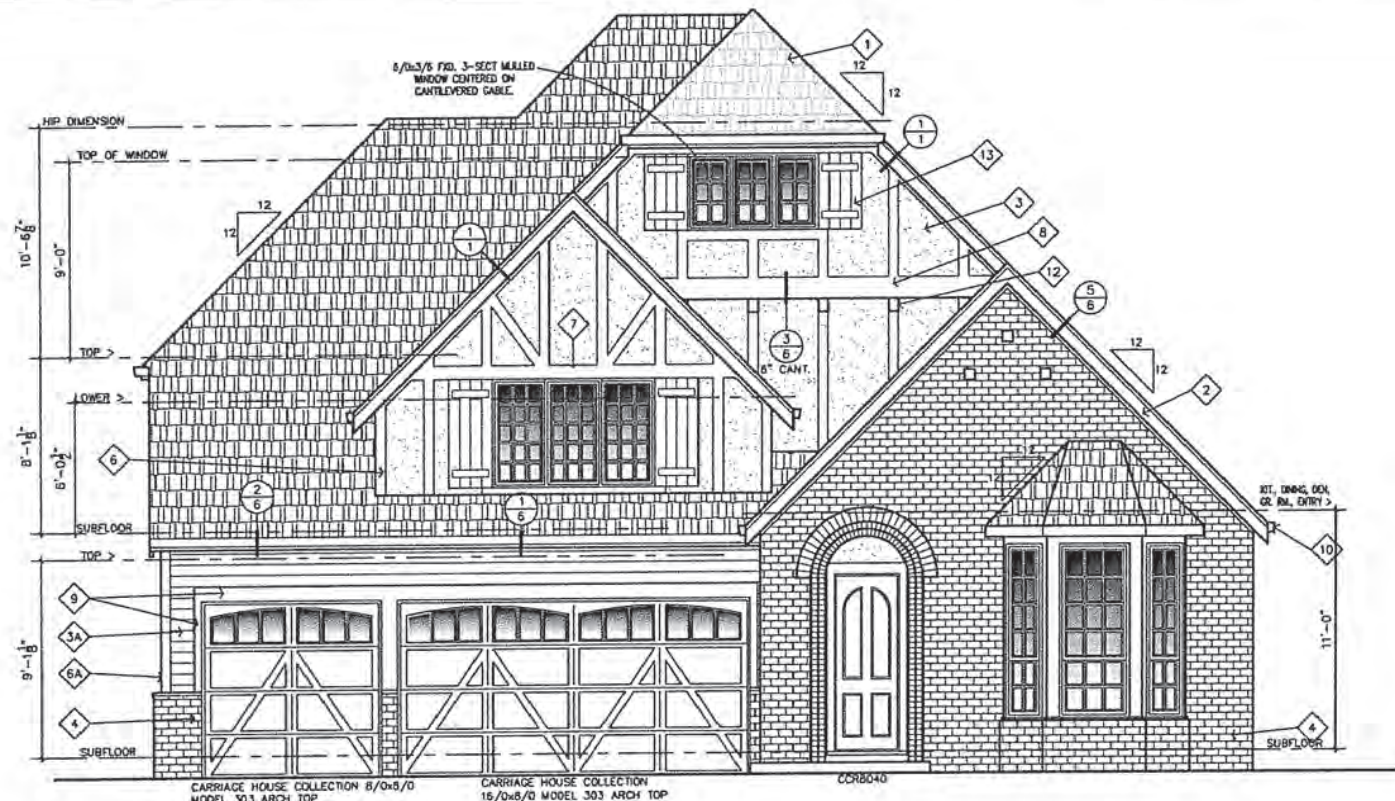
UPPER LEVEL FLOOR PLAN (8' CLG.)

REV: 9/21/17 DDR



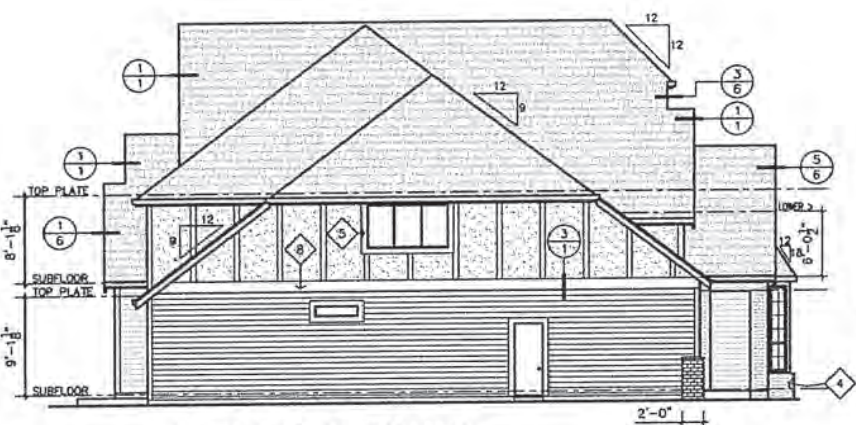
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4/11/17, ECH CONVERSION DOR  
5/5/17, PRELIM ENG. CHK. DOR  
8/8/17, FIN. ENG. CHK. DOR  
9/5/17, PUBLISH PLAN DOR  
8/22/17, PH-23 FRAME-WALK CHG. P.C. #1 IMPLEMENTED DOR



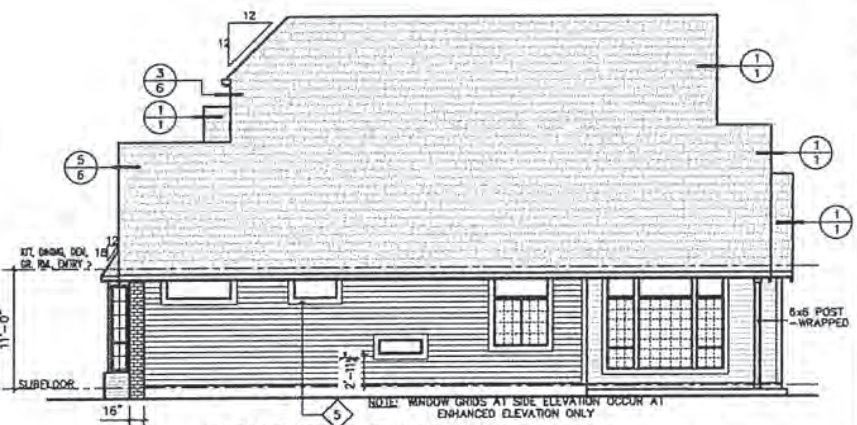
FRONT ELEVATION

1/4" = 1'-0"



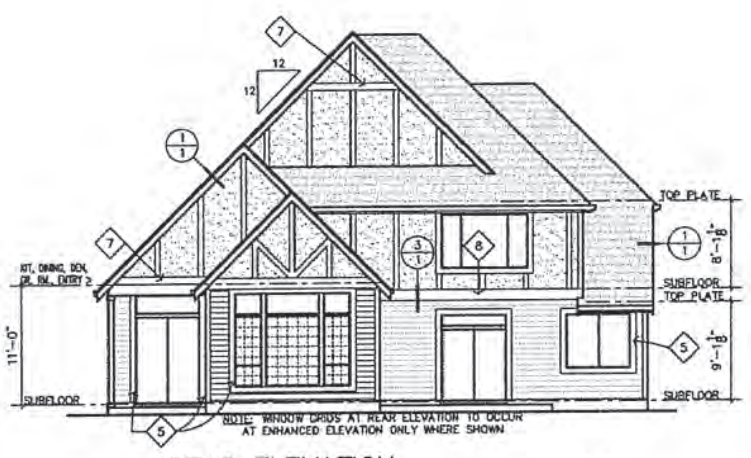
LEFT SIDE ELEVATION

1/8" = 1'-0"



RIGHT SIDE ELEVATION

1/8" = 1'-0"



REAR ELEVATION

1/8" = 1'-0"

**PLAN 2957**  
**WESTLAKE**  
**ENGLISH**  
**GARAGE LEFT**

|              |             |
|--------------|-------------|
| MAIN LEVEL:  | 1,877 SQ FT |
| UPPER LEVEL: | 1,080 SQ FT |
| GRAND TOTAL: | 2,957 SQ FT |

GARAGE: 815 SQ FT  
SHEET#

**NOTE :**  
FOR ALL STRUCTURAL  
INFORMATION REFER  
TO THE (S) SHEETS

JOB#





**WEST HILLS**  
HOMES NORTHWEST

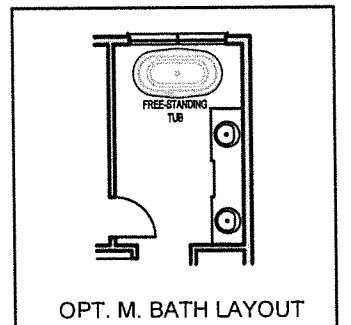
**3017 BROOKLYN  
FRENCH**

|         |   |            |
|---------|---|------------|
| M. FLR. | = | 1,268 S.F. |
| U. FLR. | = | 1,772 S.F. |
| TOTAL   | = | 3,040 S.F. |
| GARAGE  | = | 466 S.F.   |

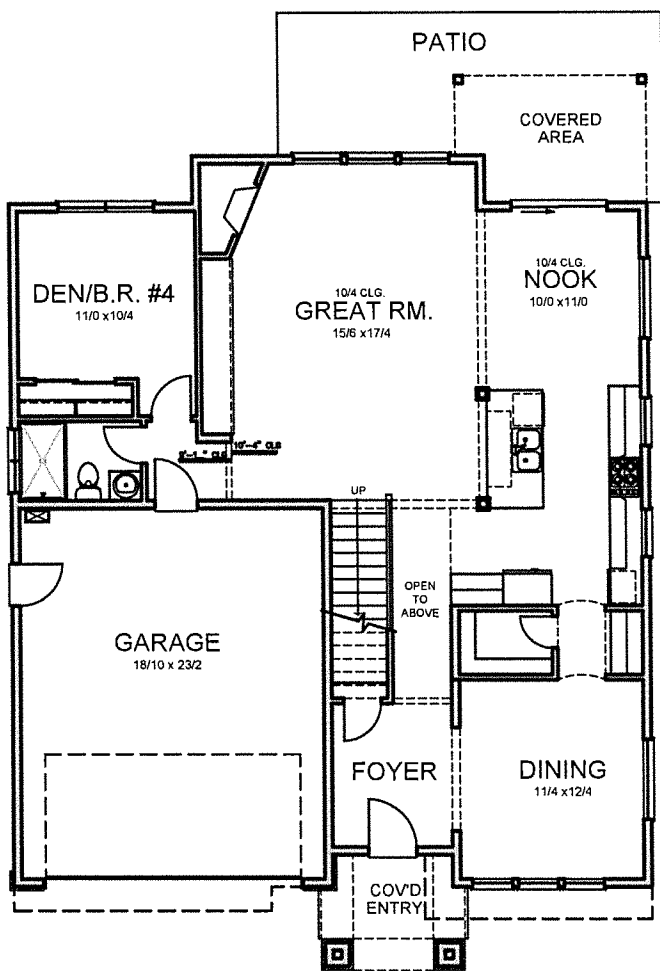


**EVERETT**  
CUSTOM HOMES

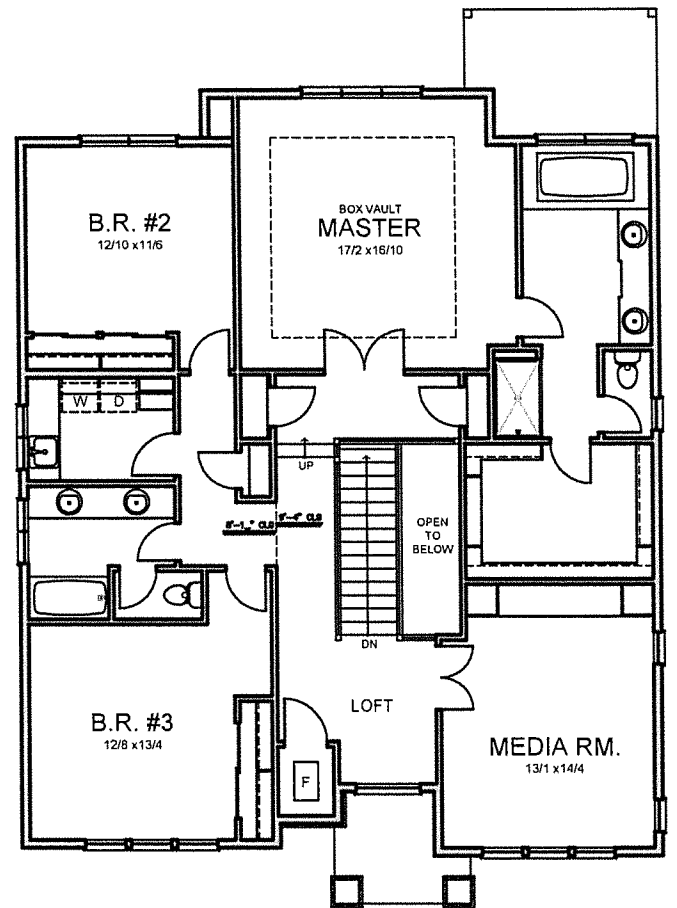
4-BEDROOMS  
3-BATHS  
MEDIA  
2-CAR GARAGE



OPT. M. BATH LAYOUT



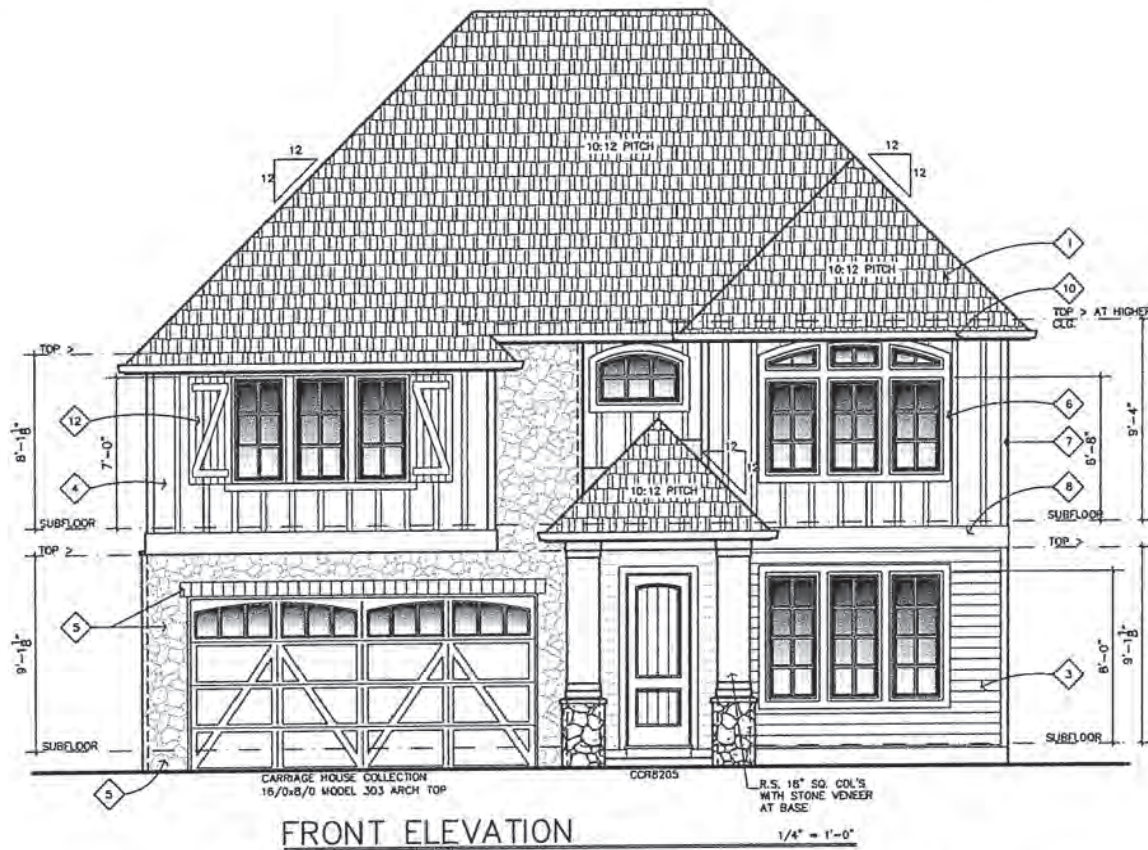
MAIN LEVEL FLOOR PLAN



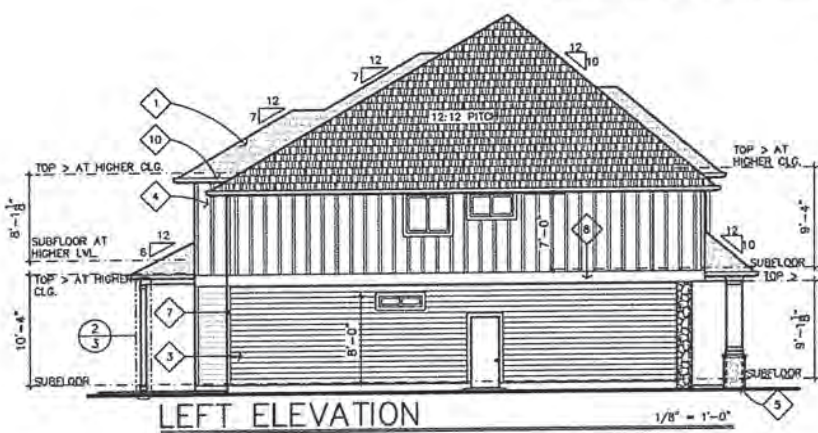
UPPER LEVEL FLOOR PLAN

These building plans are protected by United States federal and state copyright law. The copyright in these building plans is owned by EVERETT CUSTOM HOMES Company. Pursuant to the United States copyright law and state copyright law, these plans, in any printed or electronic form, contain the copyright notice protecting all rights of EVERETT CUSTOM HOMES Company. Except in accordance with the copyright law, no part of the building plans may be reproduced in any way without prior written consent of EVERETT CUSTOM HOMES Company and may only be used for the construction of one residence and may not be used thereafter. Any infringement of the copyright of the building plans may lead to civil action or constitute a criminal offense.

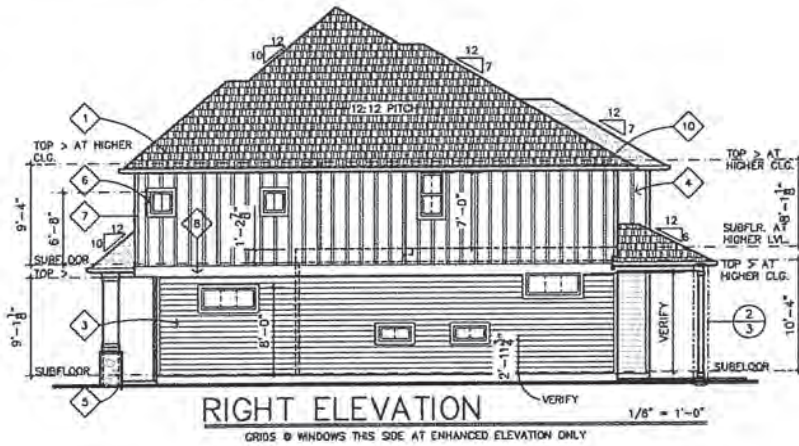
4/7/16, PRELIM. LAYOUT DOR  
4/15/16, PRELIM. ENG. CHK. DOR  
6/1/16, FINAL ENG. CHK. DOR  
6/1/16, PUBLISH PLAN DOR  
8/30/16, PC#1 IMPLEMENTED DOR  
12/9/16, PC#2 IMPLEMENTED DOR  
11/22/17, PC#3 IMPLEMENTED DOR



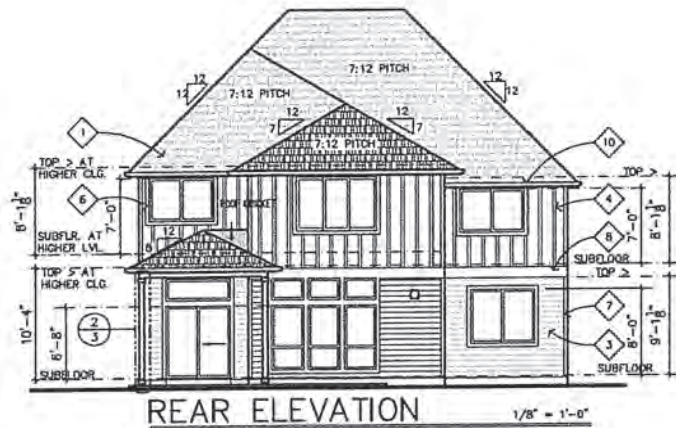
FRONT ELEVATION



LEFT ELEVATION



RIGHT ELEVATION



REAR ELEVATION

PLAN 3017  
BROOKLYN  
FRENCH  
GARAGE LEFT

MAIN LEVEL: 1,358 SQ FT  
UPPER LEVEL: 1,772 SQ FT  
GRAND TOTAL: 3,040 SQ FT

GARAGE: 466 SQ FT

SHEET#

NOTE:

FOR ALL STRUCTURAL  
INFORMATION REFER  
TO THE (S) SHEETS

JOB#

**Appendix H**  
Service Provider Letter from Republic Services  
dated November 4, 2021







November 4, 2021

Keith Buisman

Re: Frog Pond Estates  
Wilsonville, OR 97070

Dear Keith,

Thank you, for sending us the preliminary site plans for this proposed development in Wilsonville.

My Company: Republic Services of Clackamas and Washington Counties has the franchise agreement to service this area with the City of Wilsonville, OR.

We have reviewed your plans for extending development at Frog Pond Estates. Republic Services approves your trash and recycle service provider plan as outlined in your email 10/28/2021:

- Lots 9 through 14 (Street A) and 15 through 17 (Brisband) will have interim waste pickup along Columbine Street until the future extension for each street has been completed. The interim requirement will be addressed with specific recorded CC&Rs against the lots with compliance and enforcement by the HOA. Future changes to service to be approved by Republic Services.
- Lots 4 through 8 on the private street would have permanent waste pickup along Columbine Street. Similar to the public street, this would be addressed in the CC&Rs and enforced by the HOA. No future changes are anticipated to this arrangement as this will be a permanent dead end.
- The map shows where pickup of these bins would occur.

To ensure cart placement space is available for residence, Republic Services will require parking restriction signage be provided where bins would be placed for these lots. Minimum spacing for each residential trash and recycle cart package must be a minimum 2' x 8' spacing to accommodate each lot's bins.

Thanks Keith, for your help and concerns for our services prior to this project being developed.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kelly Herrod", written over a horizontal line.

Kelly Herrod  
Operations Supervisor  
Republic Services Inc.





STAMP  
WEST HILLS  
LAND DEVELOPMENT  
CONSULTANT

FROG POND ESTATES  
17 DETACHED SINGLE FAMILY LOTS  
CITY OF WILSONVILLE, OREGON

PRELIMINARY SITE PLAN

| # | DATE | DESCRIPTION |
|---|------|-------------|
|   |      |             |

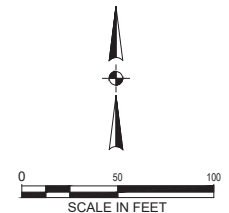
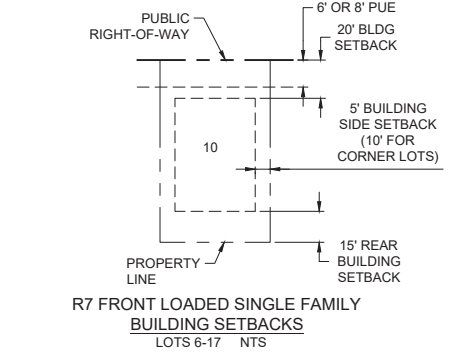
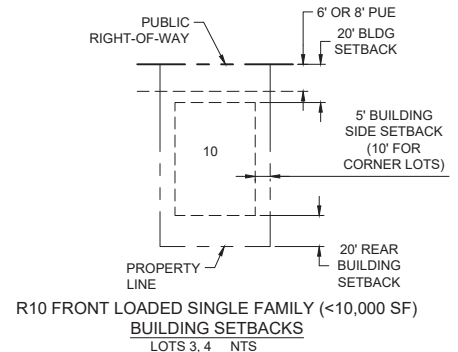
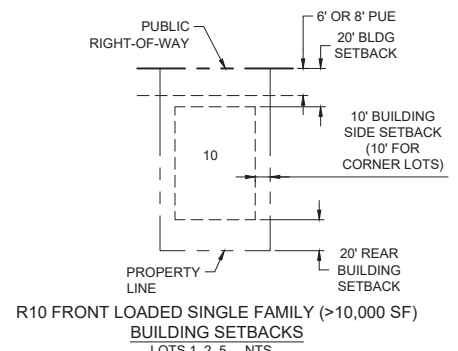
| REVISIONS                 | DATE       | DESCRIPTION |
|---------------------------|------------|-------------|
| NAVD88 DATUM              |            |             |
| OTAK CAD                  | KJB        |             |
| DRAWN BY                  | CHECKED BY |             |
| LAND USE SUBMITTAL STATUS |            |             |
| OCTOBER 8, 2021           |            |             |
| DATE                      |            |             |
| 20141                     |            |             |
| PROJECT NUMBER            |            |             |

P2.00  
© 2021 OTAK, INC.

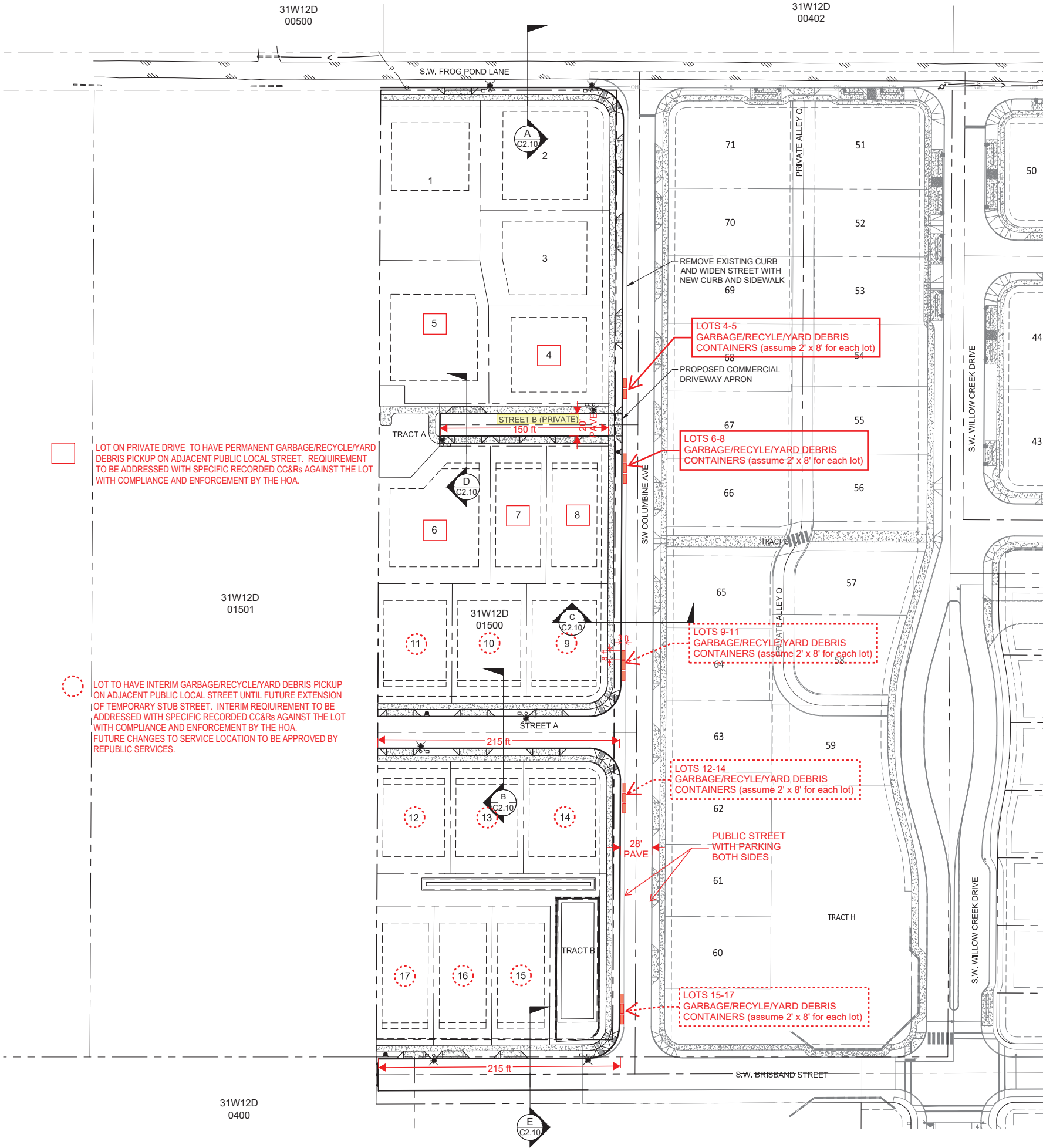
If this drawing is not 22" x 34", it has been reduced/enlarged. Scale accordingly.

LEGEND

- PROPERTY LINE
- CENTER LINE
- LOT LINE
- LOT SETBACK
- LOT NUMBER / NAME
- EASEMENT LINE
- STANDARD CURB
- SIDEWALK
- RETAINING WALL
- INTERSECTION SIGHT DISTANCE
- TYPICAL STREET CROSS SECTION (SEE SHEET C2.10)
- PUBLIC RAIN GARDEN
- DRIVEWAY
- CURB RAMP



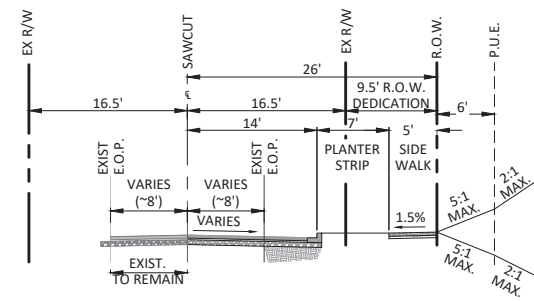
PROPOSED REPUBLIC SERVICES PLAN  
10/27/2021



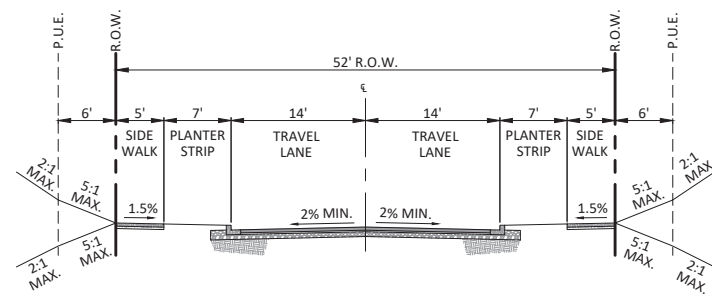
LOT ON PRIVATE DRIVE TO HAVE PERMANENT GARBAGE/RECYCLE/YARD DEBRIS PICKUP ON ADJACENT PUBLIC LOCAL STREET. REQUIREMENT TO BE ADDRESSED WITH SPECIFIC RECORDED CC&Rs AGAINST THE LOT WITH COMPLIANCE AND ENFORCEMENT BY THE HOA.

LOT TO HAVE INTERIM GARBAGE/RECYCLE/YARD DEBRIS PICKUP ON ADJACENT PUBLIC LOCAL STREET UNTIL FUTURE EXTENSION OF TEMPORARY STUB STREET. INTERIM REQUIREMENT TO BE ADDRESSED WITH SPECIFIC RECORDED CC&Rs AGAINST THE LOT WITH COMPLIANCE AND ENFORCEMENT BY THE HOA. FUTURE CHANGES TO SERVICE LOCATION TO BE APPROVED BY REPUBLIC SERVICES.

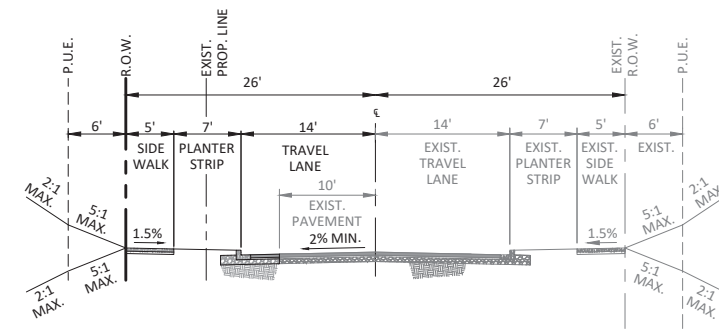
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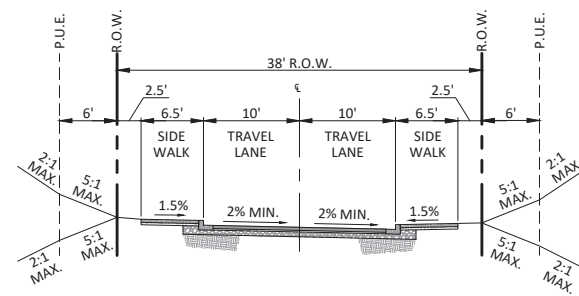
**A** SW FRONG POND LN  
(LOCAL STREET - NO PARKING)  
SCALE: 1" = 10'-0"



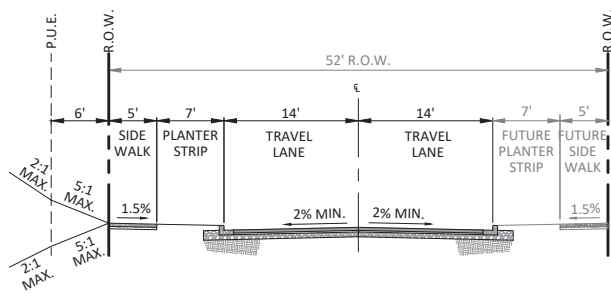
**B** STREET A  
(LOCAL STREET - PARKING ON BOTH SIDES)  
SCALE: 1" = 10'-0"



**C** SW COLUMBINE AVE  
(LOCAL STREET - PARKING ON BOTH SIDES)  
SCALE: 1" = 10'-0"



**D** STREET B (PRIVATE)  
(LOCAL STREET - NO PARKING)  
SCALE: 1" = 10'-0"



**E** SW BRISBAND ST  
(LOCAL STREET - PARKING ON BOTH SIDES)  
SCALE: 1" = 10'-0"

**STREET CROSS SECTIONS**  
SEE SHEET P2.00 FOR SECTION LOCATIONS

**FROG POND ESTATES**  
 17 DETACHED SINGLE FAMILY LOTS  
 CITY OF WILSONVILLE, OREGON  
**PRELIMINARY STREET CROSS SECTIONS**

| # | DATE | DESCRIPTION |
|---|------|-------------|
|   |      |             |
|   |      |             |

REVISIONS  
 NAVD88  
 DATUM  
 OTAK CAD KJB  
 DRAWN BY CHECKED BY  
 LAND USE SUBMITTAL  
 STATUS  
 OCTOBER 8, 2021  
 DATE  
 20141  
 PROJECT NUMBER  
**P2.10**  
 © 2021 OTAK, INC.  
If this drawing is not 22" x 34", it has been reduced/enlarged. Scale accordingly.

Plotted: Oct 08, 2021 - 10:15am. Keith Bufaman. L:\Project\201410\201410\CADD\CADD\Drawl\Frog Pond - Estates\201410\201410.dwg. Layout Name: P2.10

## **Appendix I**

Service Provider Letter from Tualatin Valley Fire and Rescue October 13, 2021



**FIRE CODE / LAND USE / BUILDING REVIEW  
APPLICATION**



**North Operating Center**  
11945 SW 70<sup>th</sup> Avenue  
Tigard, OR 97223  
Phone: 503-649-8577

**South Operating Center**  
8445 SW Elligsen Rd  
Wilsonville, OR 97070  
Phone: 503-649-8577

REV 6-30-20

**Project Information**

Applicant Name: West Hills Land Development  
Address: 3330 NW Yeon Ave Suite 200 Portland, OR 97210  
Phone: (503) 641-7342  
Email: dan@westhillsdevelopment.com  
Site Address: 7070 SW Frog Pond Ln  
City: Wilsonville, OR 97070  
Map & Tax Lot #: (3S 1W 12D TL 1501)  
Business Name: N/A  
Land Use/Building Jurisdiction: Wilsonville  
Land Use/ Building Permit # N/A

Choose from: Beaverton, Tigard, Newberg, Tualatin, North Plains, West Linn, Wilsonville, Sherwood, Rivergrove, Durham, King City, Washington County, Clackamas County, Multnomah County, Yamhill County

**Project Description**  
**17-lot single family detached subdivision**

**Permit/Review Type (check one):**

- Land Use / Building Review - Service Provider Permit
- Emergency Radio Responder Coverage Install/Test
- LPG Tank (Greater than 2,000 gallons)
- Flammable or Combustible Liquid Tank Installation (Greater than 1,000 gallons)
  - \* Exception: Underground Storage Tanks (UST) are deferred to DEQ for regulation.
- Explosives Blasting (Blasting plan is required)
- Exterior Toxic, Pyrophoric or Corrosive Gas Installation (in excess of 810 cu.ft.)
- Tents or Temporary Membrane Structures (in excess of 10,000 square feet)
- Temporary Haunted House or similar
- OLCC Cannabis Extraction License Review
- Ceremonial Fire or Bonfire (For gathering, ceremony or other assembly)

**For Fire Marshal's Office Use Only**

TVFR Permit # 2021-0108  
Permit Type: SPP-COW  
Submittal Date: 10-13-2021  
Assigned To: DFM Arn  
Due Date: \_\_\_\_\_  
Fees Due:  \_\_\_\_\_  
Fees Paid:  \_\_\_\_\_

**Approval/Inspection Conditions**  
(For Fire Marshal's Office Use Only)

**This section is for application approval only**

[Signature] 10-13-2021  
Fire Marshal or Designee Date

Conditions:

See Attached Conditions:  Yes  No

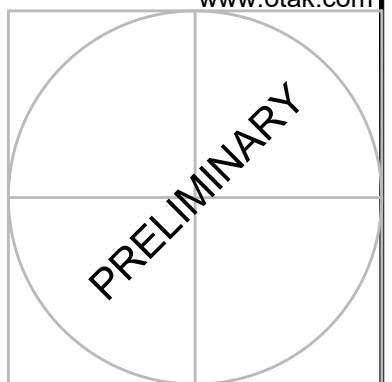
Site Inspection Required:  Yes  No

**This section used when site inspection is required**

Inspection Comments:

Final TVFR Approval Signature & Emp ID \_\_\_\_\_ Date \_\_\_\_\_





STAMP  
**WEST HILLS**  
LAND DEVELOPMENT  
CONSULTANT

**FROG POND ESTATES**  
17 DETACHED SINGLE FAMILY LOTS  
CITY OF WILSONVILLE, OREGON

**PRELIMINARY SITE PLAN**

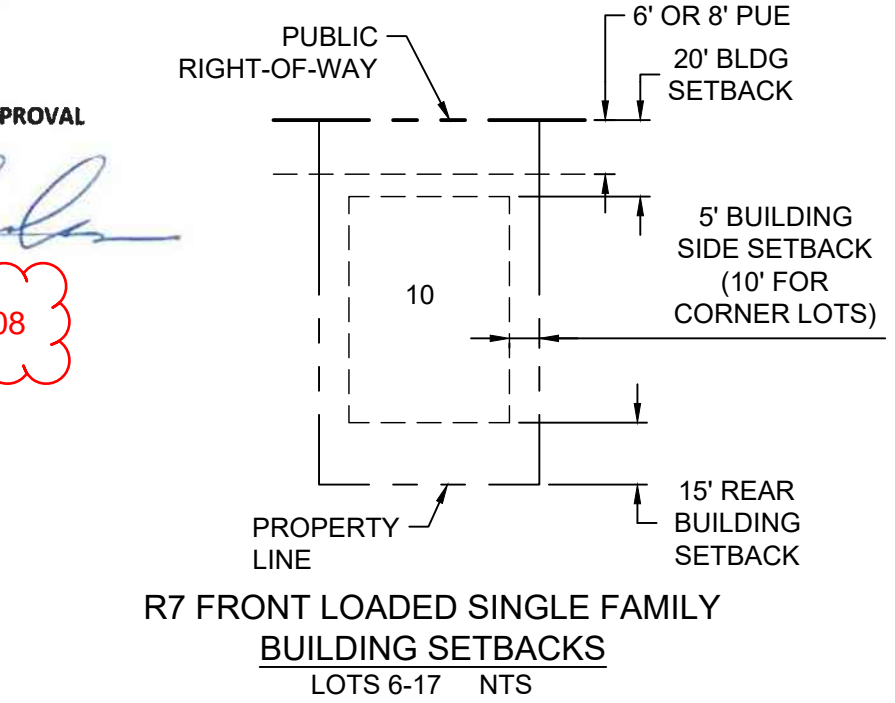
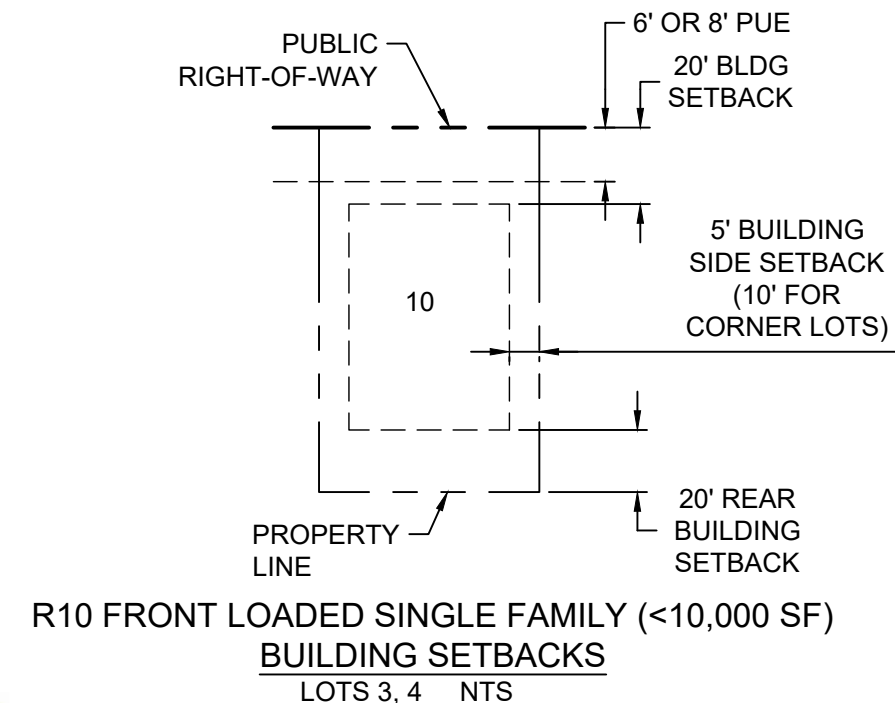
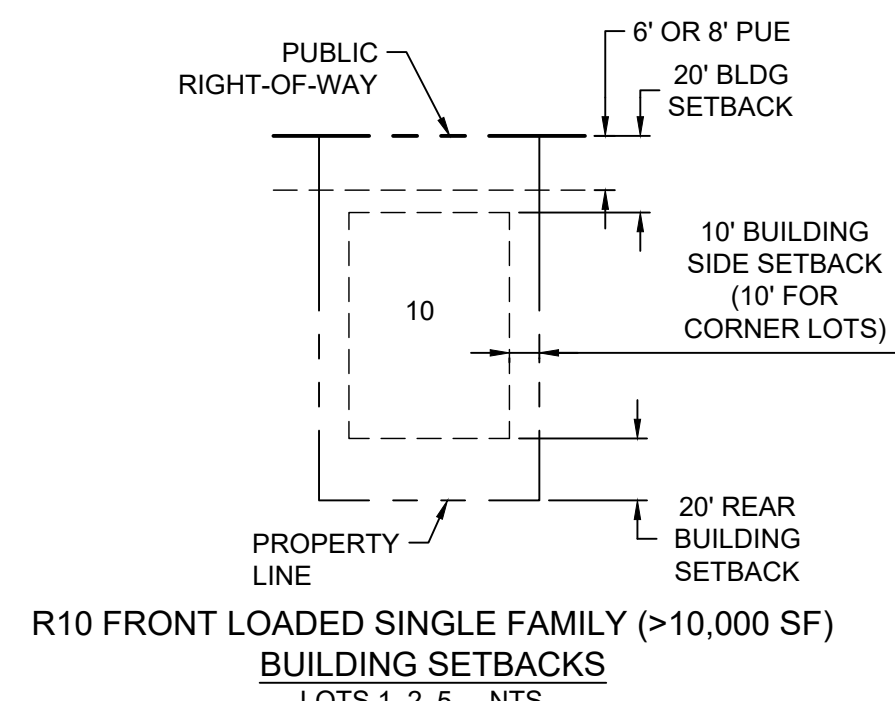
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|------------------------------|
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| OTAK CAD<br>DRAWN BY         |
| KJB<br>CHECKED BY            |
| LAND USE SUBMITTAL<br>STATUS |
| OCTOBER 8, 2021<br>DATE      |
| 20141<br>PROJECT NUMBER      |

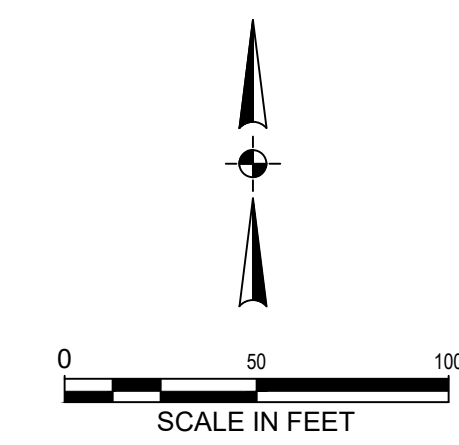
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© 2021 OTAK, INC.  
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**LEGEND**

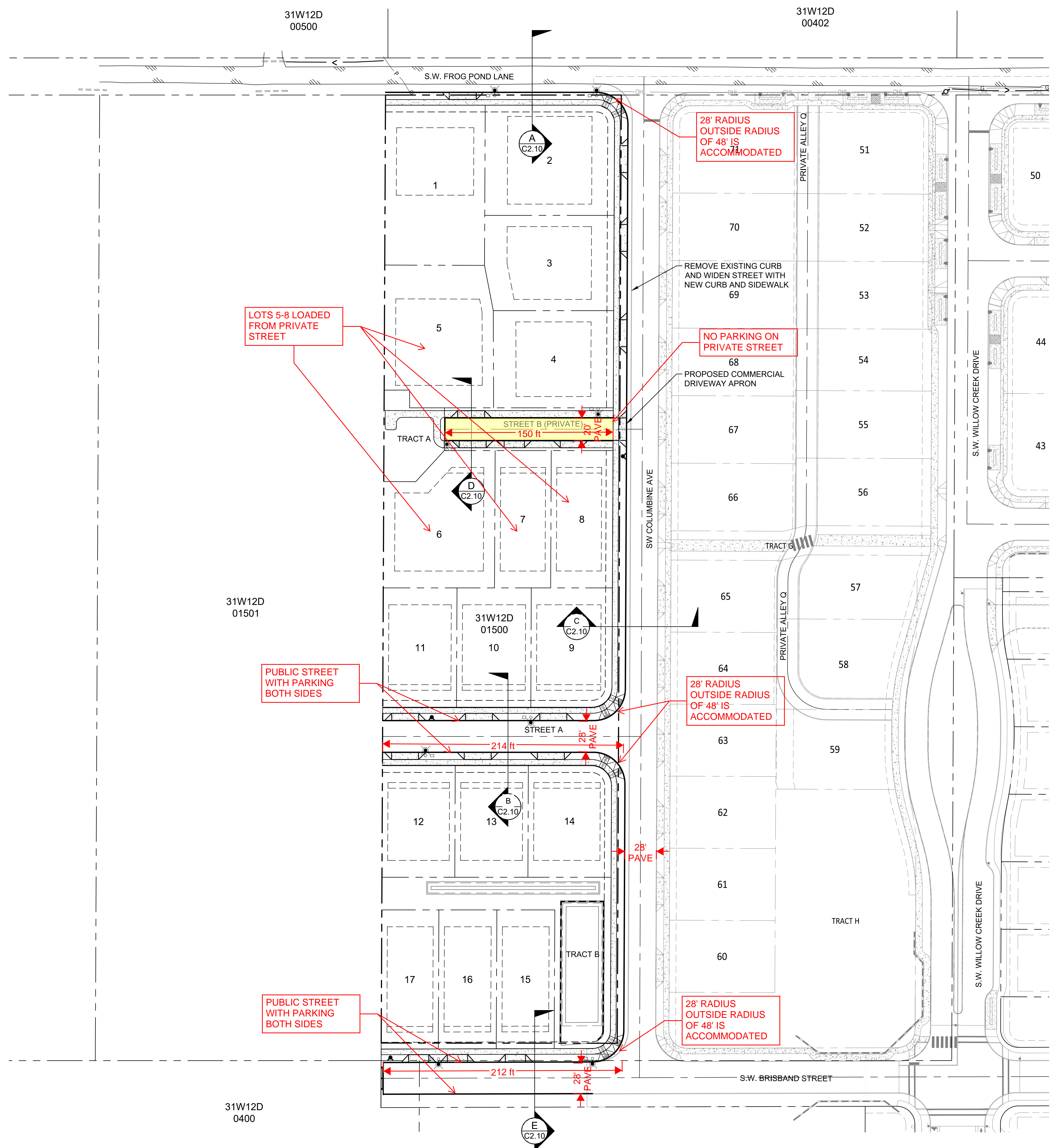
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- CENTER LINE
- LOT LINE
- LOT SETBACK
- LOT NUMBER / NAME 16
- EASEMENT LINE
- STANDARD CURB
- SIDEWALK
- RETAINING WALL
- INTERSECTION SIGHT DISTANCE
- TYPICAL STREET CROSS SECTION (SEE SHEET C2.10)
- PUBLIC RAIN GARDEN
- DRIVEWAY
- CURB RAMP



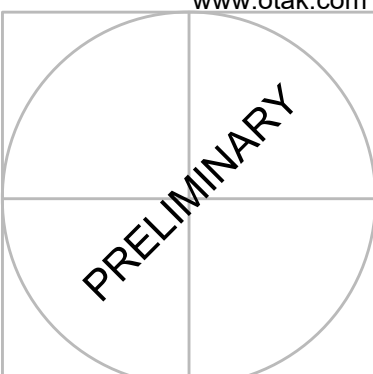
**TVALFR**  
Tualatin Valley  
Fire & Rescue  
APPROVED PLANS  
APPROVAL OF PLANS IS NOT AN APPROVAL  
OF OMISSIONS OR OVERSIGHTS.  
*Jason Am...*  
Deputy Fire Marshal II  
TVF&R Permit # 2021-0108



**EXHIBIT FP-1**



Plotted: Oct.08. 2021 - 10:14am Keith Huisman L:\Projects\201\001\20141\CADD\DWG\Frog Pond - Estates\20141\F200.dwg Layout Name: P2.00



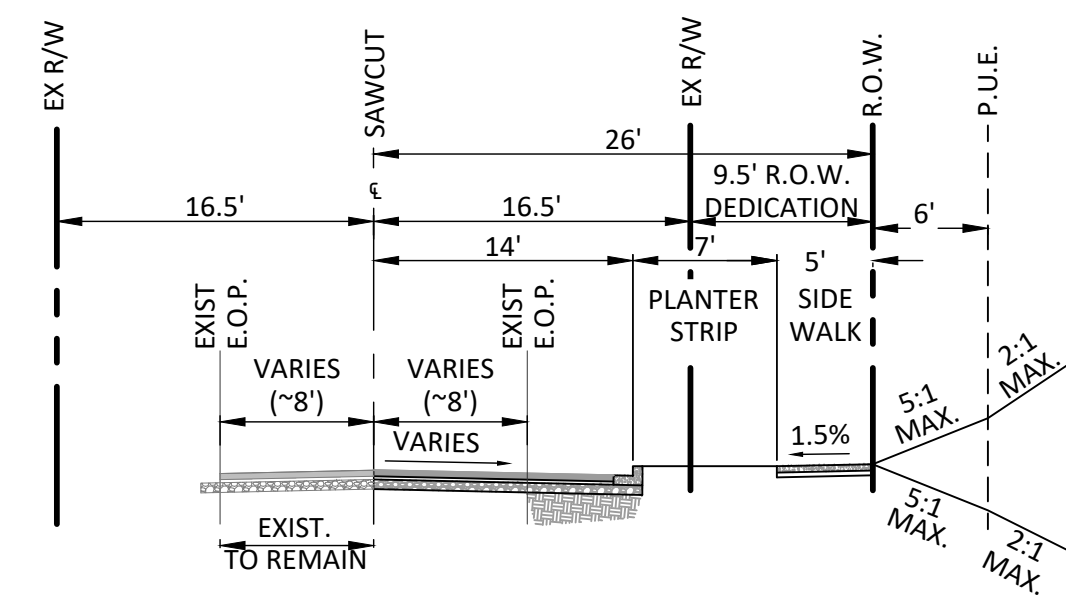
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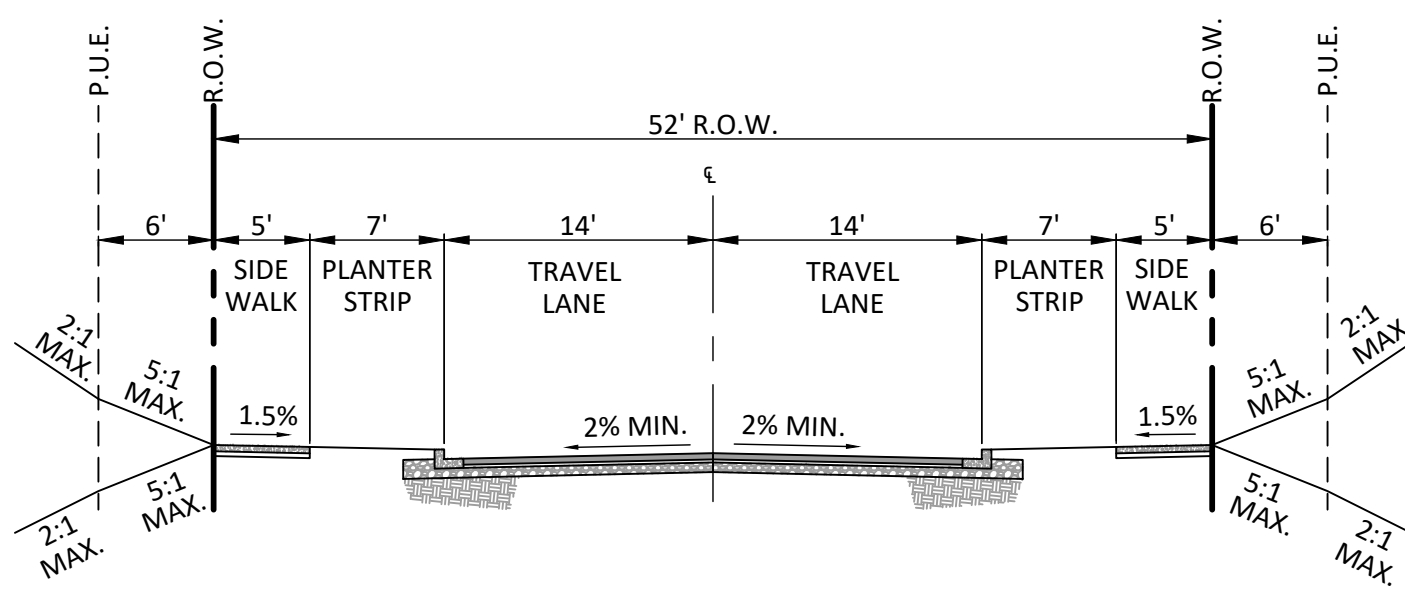
**WEST HILLS**  
LAND DEVELOPMENT  
CONSULTANT

**FROG POND ESTATES**  
17 DETACHED SINGLE FAMILY LOTS  
CITY OF WILSONVILLE, OREGON

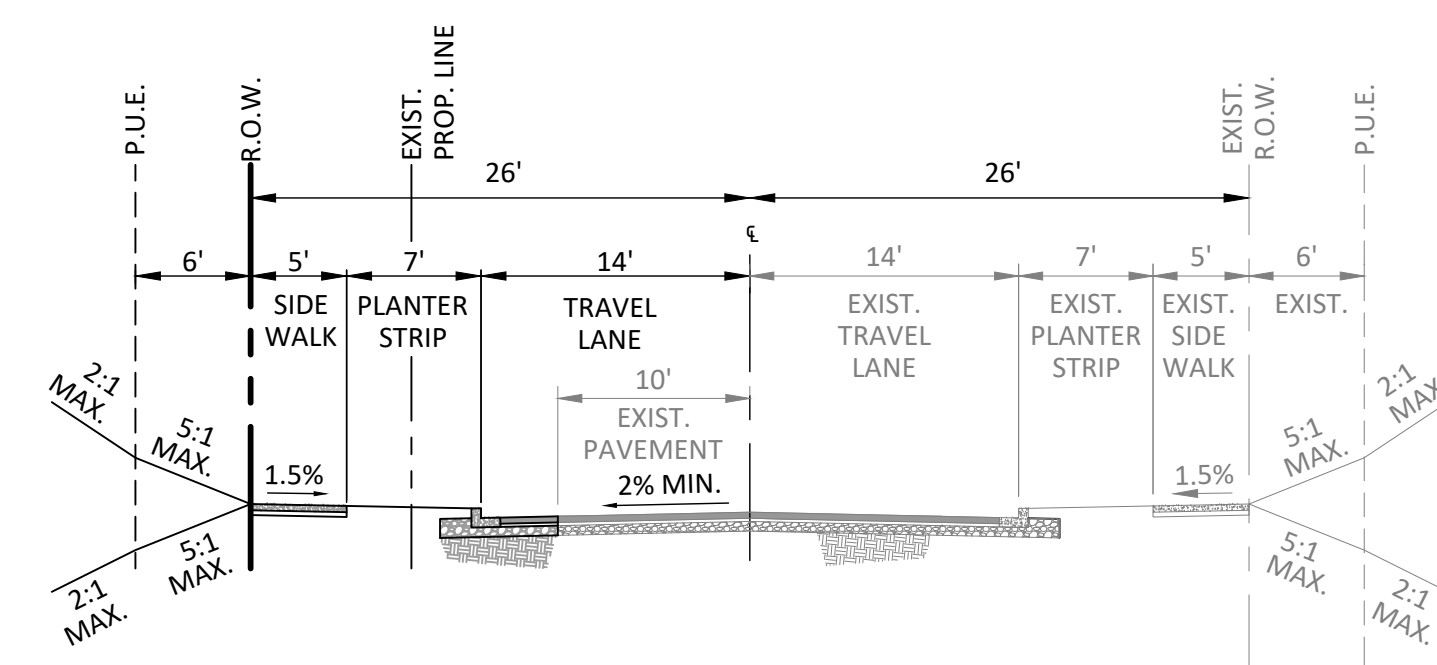
PRELIMINARY STREET CROSS SECTIONS



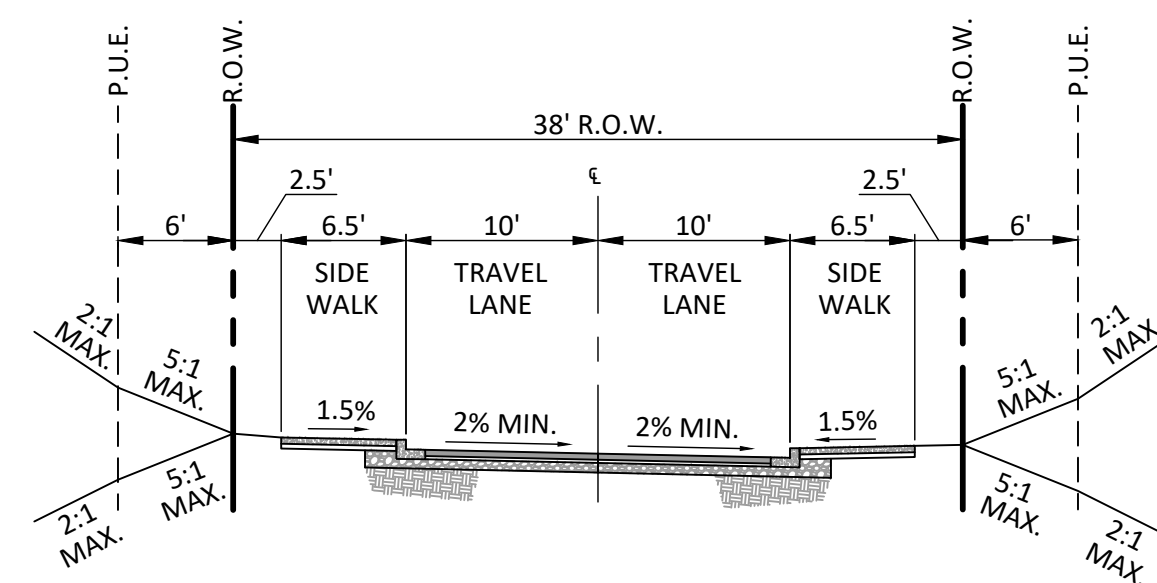
**A** SW FRONG POND LN  
(LOCAL STREET - NO PARKING)  
SCALE: 1" = 10'-0"



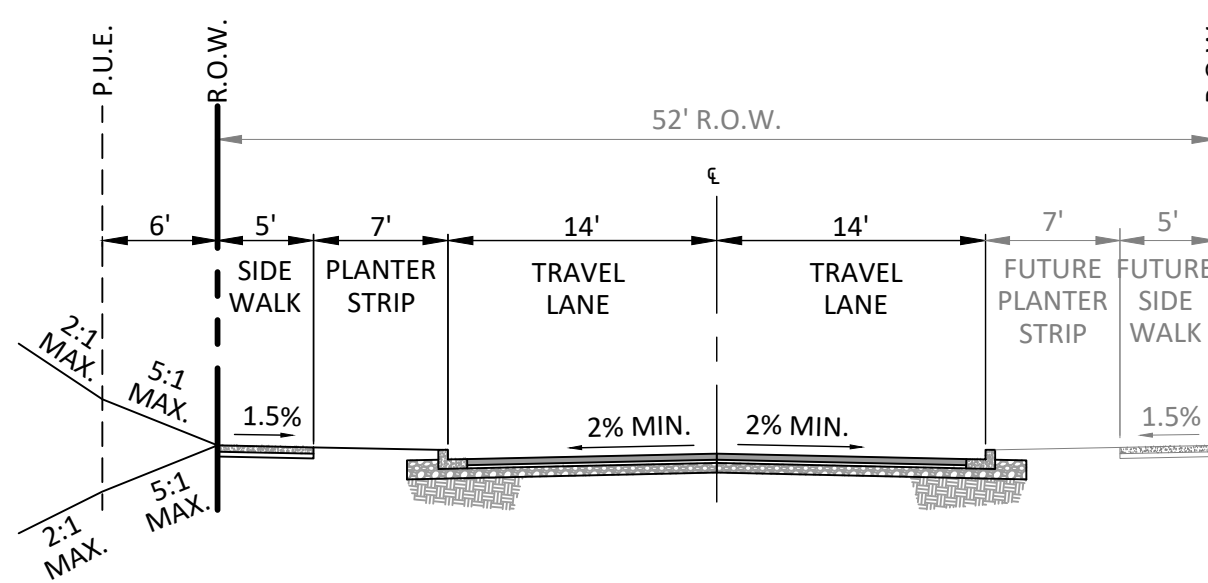
**B** STREET A  
(LOCAL STREET - PARKING ON BOTH SIDES)  
SCALE: 1" = 10'-0"



**C** SW COLUMBINE AVE  
(LOCAL STREET - PARKING ON BOTH SIDES)  
SCALE: 1" = 10'-0"



**D** STREET B (PRIVATE)  
(LOCAL STREET - NO PARKING)  
SCALE: 1" = 10'-0"



**E** SW BRISBAND ST  
(LOCAL STREET - PARKING ON BOTH SIDES)  
SCALE: 1" = 10'-0"

**STREET CROSS SECTIONS**  
SEE SHEET P2.00 FOR SECTION LOCATIONS



APPROVED PLANS

APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.

*Jason Am...*  
Deputy Fire Marshal II

TVFR Permit # 2021-0108

| # | DATE | DESCRIPTION |
|---|------|-------------|
|   |      |             |
|   |      |             |
|   |      |             |

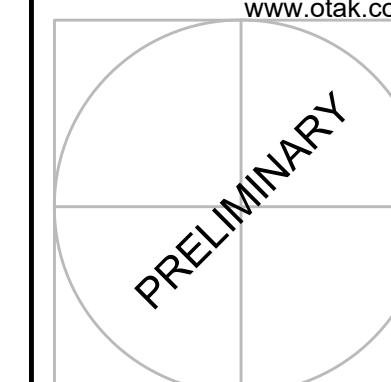
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| OTAK CAD                  | KJB        |
| DRAWN BY                  | CHECKED BY |
| LAND USE SUBMITTAL STATUS |            |
| OCTOBER 8, 2021           |            |
| DATE                      |            |
| 20141                     |            |
| PROJECT NUMBER            |            |

**P2.10**

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If this drawing is not 22" x 34", it has been reduced/enlarged. Scale accordingly.

**EXHIBIT FP-2**





**FROG POND ESTATES**  
17 DETACHED SINGLE FAMILY LOTS  
CITY OF WILSONVILLE, OREGON

PRELIMINARY UTILITY PLAN

**KEY NOTES**

- ① CONNECT TO EXISTING SANITARY SEWER.
- ② CONNECT TO EXISTING STORM SEWER.
- ③ CONNECT TO EXISTING WATER LINE.
- ④ PROPOSED RAIN GARDEN (CITY STD. DWG. ST-6020)
- ⑤ CONNECT TO EXISTING CULVERT.
- ⑥ STORM SEWER OUTFALL TO RAIN GARDEN.
- ⑦ EXISTING FLOW SPLIT MANHOLE WITH PIPE STUB WEST.
- ⑧ EXISTING FIRE HYDRANT.
- ⑨ PROPOSED SEWER LATERAL CONNECTION TO EXISTING SEWER LINE.
- ⑩ PROPOSED STORM LATERAL CONNECTION TO EXISTING STORM LINE.
- ⑪ PROPOSED WATER SERVICE CONNECTION TO EXISTING WATER LINE.
- ⑫ REMOVE EXISTING FIRE HYDRANT AND EXTEND WATER LINE.
- ⑬ EXISTING FLOW SPLIT MANHOLE.

**LEGEND**

| SITE   | PROPOSED |
|--|----------|
| PROJECT LIMITS   | -----    |
| STORM DRAIN MANHOLE  | ⊕        |
| STORM DRAIN CLEAN OUT  | ⊙        |
| LIDA FLOW CONTROL STRUCTURE (BEEHIVE: CITY STANDARD DWG. ST-6120)  | •        |
| CATCH BASIN  | ■        |
| STORM DRAIN MAIN   | SD       |
| STORM DRAIN LATERAL  | SD       |
| SANITARY SEWER MANHOLE   | ⊕        |
| SANITARY SEWER CLEAN OUT   | ⊙        |
| SANITARY SEWER MAIN  | SS       |
| SANITARY SEWER LATERAL   | SS       |
| WATER VALVE  | ⊕        |
| WATER BLOW-OFF   | ⊕        |
| WATER METER  | ⊕        |
| WATER FIRE HYDRANT   | ⊕        |
| WATER MAIN   | W        |
| WATER LATERAL  | W        |
| STREET LIGHT<br>PGE OPTION "B" LED WITH WESTBROOKE 35W LED AND 18" DECORATIVE ALUMINUM POLE (20' MOUNTING HEIGHT W/ 4' MAST ARM) | ⊕        |

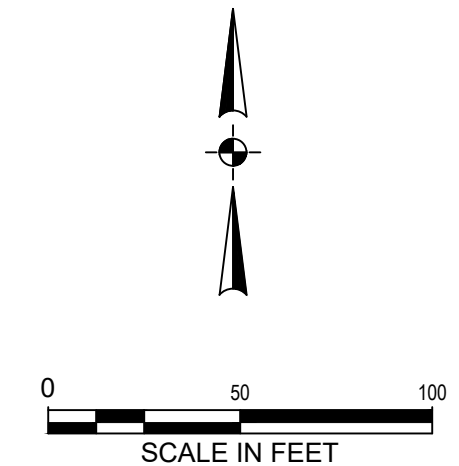


APPROVED PLANS

APPROVAL OF PLANS IS NOT AN APPROVAL OF OMISSIONS OR OVERSIGHTS.

*Jason D. Gale*  
Deputy Fire Marshal II

TVFR Permit # 2021-0108



**EXHIBIT FP-3**

| TITLE | DATE | DESCRIPTION |
|-------|------|-------------|
|       |      |             |

|                           |
|---------------------------|
| REVISIONS                 |
| NAV/D88 DATUM             |
| OTAK CAD KJB              |
| DRAWN BY CHECKED BY       |
| LAND USE SUBMITTAL STATUS |
| OCTOBER 8, 2021 DATE      |
| 20141 PROJECT NUMBER      |
| <b>P4.00</b>              |
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Plotted: Oct 08, 2021 - 10:42am. Keith Buismann - L:\Project\20100100\20141\CADD\ACADD\Draw\Frog Pond - Estates\20141P4.00.dwg - Layout Name: P4.00

