April 21, 2020

Darren Wyss, Associate Planner
City of West Linn
22500 Salamo Road
West Linn, OR 97068

RE: WAP-20-01/WRG-20-01/MIS-20-01/LLA-20-01

Mr. Wyss:

Please accept this letter and the accompanying materials as our complete response to the City's February 5, 2020 determination that our application was incomplete (see Attachment J). We believe the materials provided herein fully respond to the incompleteness items outlined in the City's letter and provide the necessary basis to deem the application complete. We look forward to continuing to work with City staff on any design and associated issues, as necessary, during the review and approval process.

Responses to your comments are as follows:

1. ***Approved application for vacation of public utility easement along north property line of Tax Lot 802. Please submit the approved easement vacation document. The current proposal shows the future structure located in the easement.***

Response: Per an April 8, 2020 email correspondence with Amy Pepper, City of West Linn Development Review Engineer (see Attachment A), approval of the subject easement vacation is imminent. We expect the easement vacation to be approved prior to or shortly after the City receives this response. This criterion will be met.

2. ***Egress/Ingress and Utility Easement – Clackamas County Document No. 2019-6706. Please submit a copy of the easement for proof of legal access.***

Response: A copy of the requested easement is provided in Attachment B. This criterion is met. Please note that the site plan has been revised so that access from this easement is no longer required. Access to the subject site is now planned to occur directly via 9th Street.

3. ***CDC Chapter 27.050(C) – Written Responses. Please provide additional findings for all criteria in 27.060, 27.070, and 27.080 that directly respond to the criteria. For example, 27.060(B): Please provide calculations that prove this criteria is being met and not just see Exhibit A.***

Response: As requested by City Staff, please see below for more elaborate responses to the Applicant's January 7, 2020 submittal. Please note that these are derived from information contained in the accompanying exhibits, and most of this information is unchanged from the previous submittal.

27.060 Approval Criteria

The Planning Director shall make written findings with respect to the following criteria when approving, approving with conditions, or denying an application for development in flood management areas:

A. Development, excavation, and fill shall be performed in a manner to maintain or increase flood storage and conveyance capacity and not increase design flood elevations.

Response: A detailed evaluation of cuts and fills is included in Attachment C. Additionally, the application includes a letter (Attachment D), certifying that the site results in no net change to the flood capacity of the floodplain. This criterion is met.

B. No net fill increase in any floodplain is allowed. All fill placed in a floodplain shall be balanced with an equal amount of soil material removal. Excavation areas shall not exceed fill areas by more than 50 percent of the square footage. Any excavation below the ordinary high water line shall not count toward compensating for fill.

Response: A detailed evaluation of cuts and fills is included in Attachment C. This evaluation concludes that preliminary grading will result in ±520-square-feet of net fill on Lot 802 which is balanced by an equivalent amount of cut on Lot 803. Additionally, the application includes a letter (Attachment D), certifying that the site results in no net change to the flood capacity of the floodplain. This criterion is met.

C. Excavation to balance a fill shall be located on the same lot or parcel as the fill unless it is not reasonable or practicable to do so. In such cases, the excavation shall be located in the same drainage basin and as close as possible to the fill site, so long as the proposed excavation and fill will not increase flood impacts for surrounding properties as determined through hydrologic and hydraulic analysis.

Response: As illustrated in the preliminary plans, there is not sufficient area on Lot 802, where land is both above the ordinary high-water mark and outside of a protected water resource, to balance cut and fill on Lot 802. In lieu of balancing cut/fills on Lot 802, the application elects to utilize the flexibility in this section to balance fills on Lot 802 with an equivalent amount of cut on Lot 803, which is also owned by the Applicant. As provided in Attachment C, Sheet P05, the balanced cut/fill will not impact the flood capacity of the floodplain.

D. Minimum finished floor elevations must be at least one foot above the design flood height or highest flood of record, whichever is higher, for new habitable structures in the flood area.

Response: The base flood elevation on the subject property is 75.1 feet. As shown on the revised site plan in Attachment C, the building footprint was shifted north approximately 10 feet. The revised Preliminary Plan indicates a finished floor elevation of 76.2 feet which meets the requirement to be at least one foot above the BFE. This criterion is met.

E. Temporary fills permitted during construction shall be removed.

Response: This response has not been revised from the Applicant's January 7, 2020 submittal. Temporary fills are not anticipated. This criterion does not apply.

F. Prohibit encroachments, including fill, new construction, substantial improvements, and other development in floodways unless certification by a professional civil engineer licensed to practice in the State of Oregon is provided demonstrating that encroachments shall not result in any increase in flood levels during the occurrence of the base flood discharge.

Response: This response has not been revised from the Applicant's January 7, 2020 submittal. The planned development is not located in or near, nor will encroach into, the floodway. This criterion does not apply.

G. All proposed improvements to the floodplain or floodway which might impact the flood-carrying capacity of the river shall be designed by a professional civil engineer licensed to practice in the State of Oregon.

Response: A letter in response to this criterion is in Attachment D. The criterion is met.

H. New culverts, stream crossings, and transportation projects shall be designed as balanced cut and fill projects or designed not to significantly raise the design flood elevation. Such projects shall be designed to minimize the area of fill in flood management areas and to minimize erosive velocities. Stream crossings shall be as close to perpendicular to the stream as practicable. Bridges shall be used instead of culverts wherever practicable.

Response: This response has not been revised from the Applicant's January 7, 2020 submittal. This application includes half-street improvements along the 9th Street frontage. These improvements have been designed to minimize impacts to the floodplain and nearby wetlands. This criterion is met.

I. Excavation and fill required for the construction of detention facilities or structures, and other facilities, such as levees, specifically shall be designed to reduce or mitigate flood impacts and improve water quality. Levees shall not be used to create vacant buildable land.

Response: A conceptual stormwater facility is included in the preliminary plans as is necessary to treat and/or detain stormwater runoff from new impervious areas on Lot 802. This facility is accounted for in the overall analysis, cited above, to determine that no impacts to the floodplain are expected. The criterion is met.

J. The applicant shall provide evidence that all necessary permits have been obtained from those federal, State, or local governmental agencies from which prior approval is required.

Response: Attachment F is a revised pre-construction FEMA Flood Elevation Certificate. A completed elevation certificate will be furnished to the City following the completion of new home construction on Tax Lot 802. This criterion is met.

27.070 Construction Materials and Methods

A. All new construction and substantial improvements shall be constructed with materials and utility equipment resistant to flood damage using methods and practices that minimize flood damage.

Response: The majority of new public and private utilities will be placed underground and will be resistant to flood impacts. Final construction plans will include notes to the contractors to ensure that they utilize methods and practices during construction that will minimize flood damage. This criterion can be met.

B. Electrical, heating, ventilation, plumbing, and air conditioning equipment and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

Response: New HVAC and other above-grade equipment will be located at least 1-foot above the base floor elevation. This criterion can be met.

C. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system.

Response: The proposed water service to the property will be located below ground in enclosed pipes that are designed to resist infiltration. This criterion is met.

D. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters.

Response: The planned sanitary sewer service to the property will be located below ground in enclosed pipes that are designed to resist infiltration. This criterion is met.

E. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

Response: The application does not include on-site waste disposal systems. The criterion does not apply.

F. All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure.

Response: The construction and substantial improvements will be anchored to prevent flotation, collapse, or lateral movement of the structure. The final construction plans will have notes to direct the contractor to put these measures in place during construction. This criterion can be met.

27.080 Residential Construction

A. New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated to at least one foot above the base flood elevation.

Response: Attachment F is the revised Preconstruction Elevation Certificate which demonstrates that the base flood elevation (BFE) is 75.1 feet and the first floor of the building will be set at or above an elevation of ±76.2 feet. This elevation exceeds the minimum of at least one foot above the BFE of 75.1 feet. This criterion has been met.

B. Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must be certified by either a professional civil engineer or an architect licensed to practice in the State of Oregon, and must meet or exceed the following minimum criteria:

1. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided.

Response: Attachment F confirms that there are 11 permanent flood openings in the foundation with a total net area of ±1,300 square inches. The square footage of the enclosed area is ±1,207 square feet. The area of flood openings exceeds the 1 square inch per 1 square foot of enclosed area as required above. The criterion is met.

2. The bottom of all openings shall be no higher than one foot above grade.

Response: Attachment F demonstrates that all 11 permanent flood openings are within 1-foot above adjacent grade, and the preliminary foundation plan illustrates the locations of each of these openings in Attachment E. This criterion is met.

3. Openings may be equipped with screens, louvers, or other coverings or devices; provided, that they permit the automatic entry or exit of floodwaters.

Response: The Applicant is aware that the flood openings may be equipped with various coverings as mentioned above and that they must permit automatic entry and exit of floodwaters. This criterion can be met.

4. Fully enclosed areas below the base flood elevation shall only be used for parking, access, and limited storage.

Response: The Applicant is aware that the fully enclosed areas below the BFE shall only be used for parking, access, and limited storage. This criterion can be met.

5. Service equipment (e.g., furnaces, water heaters, washer/dryers, etc.) is not permitted below the base flood elevation.

Response: Attachment F describes the lowest elevation of machinery or equipment servicing the building will be at or above the BFE of 75.1 feet. This criterion can be met.

6. *All walls, floors, and ceiling materials located below the base flood elevation must be unfinished and constructed of materials resistant to flood damage.*

Response: The Applicant is aware that all walls, floors, and ceiling material located below BFE must be unfinished and resistant to flood damage. This criterion can be met.

C. *Crawlspaces. Crawlspaces are a commonly used method of elevating buildings in special flood hazard areas (SFHAs) to or above the base flood elevation (BFE), and are allowed subject to the following requirements:*

1. *The building is subject to the Flood-Resistant Construction provisions of the Oregon Residential Specialty Code.*

Response: The application does not seek approval for new home construction. At time of building permit submittal, the City's Building Department staff will ensure that the building meets all applicable provisions of the Oregon Residential Specialty Code. This criterion can be met.

2. *They shall be designed by a professional engineer or architect licensed to practice in the State of Oregon to meet the standards contained in the most current Federal Emergency Management Agency's (FEMA) Technical Bulletin.*

Response: The application does not seek approval for new home construction. At time of building permit submittal, the City's Building Department staff will ensure that the building meets all applicable provisions of the Oregon Residential Specialty Code. This criterion can be met.

3. *The building must be designed and adequately anchored to resist flotation, collapse, and lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy.*

Response: The application does not seek approval for new home construction. At time of building permit submittal, the City's Building Department staff will ensure that the building meets all applicable provisions of the Oregon Residential Specialty Code. This criterion can be met.

4. *Flood vent openings shall be provided on at least two sides that equalize hydrostatic pressures by allowing for the automatic entry and exit of floodwaters. The total area of the flood vent openings must be no less than one square inch for each square foot of enclosed area. The bottom of each flood vent opening can be no more than one foot above the lowest adjacent exterior grade. For guidance on flood openings, see FEMA Technical Bulletin 1-93, Openings in Foundation Walls.*

Response: Attachment F provides that there are 11 permanent flood openings in the foundation, on at least two sides of the foundation perimeter, with a total net area of ±1,300 square inches. The square footage of the enclosed area is ±1,207 square feet. As provided

above, flood vents will be located within one foot of the adjacent exterior grade. This criterion is met.

5. *Portions of the building below the BFE must be constructed with materials resistant to flood damage. This includes not only the foundation walls (studs and sheathing), but also any joists, insulation, or other materials that extend below the BFE. For more detailed guidance on flood-resistant materials see FEMA Technical Bulletin 2-93, Flood-Resistant Materials Requirements.*

Response: The application does not seek approval for new home construction. At time of building permit submittal, the City's Building Department staff will ensure that the building meets all applicable provisions of the Oregon Residential Specialty Code. This criterion can be met.

6. *Utility systems within the crawlspace must be elevated above BFE or designed so that floodwaters cannot enter or accumulate within the system components during flood conditions. Ductwork, in particular, must either be placed above the BFE or sealed from floodwaters. For further guidance on the placement of building utility systems in crawlspaces, see FEMA 348, Protecting Building Utilities From Flood Damage. Flood-resistant materials and utilities, access, and ventilation openings in crawlspaces are further addressed in this bulletin.*

Response: The Applicant is aware that utility systems within the crawlspace must be elevated above BFE or designed in a way that floodwaters cannot enter or accumulate within the system components. The City will review the final construction plans and locations of utility systems upon building permit submittal. This criterion can be met.

7. *The interior grade of a crawlspace below the BFE must not be more than two feet below the lowest adjacent exterior grade (LAG).*

Response: As illustrated in the Existing Conditions Plan, the BFE is at 75.1 feet. The Preliminary Grading Plan shows that the finished grade adjacent the conceptual building foundation will be at 76.0 feet. Per this criterion, the interior grade of the crawlspace may not be below 74.0 feet. The foundation plan in Attachment E, confirms that new home construction can occur consistent with this requirement. At time of building permit submittal, the City's Building Department staff will ensure that the building meets this provision. The criterion can be met.

8. *The height of the below-grade crawlspace, measured from the interior grade of the crawlspace to the top of the crawlspace foundation wall, must not exceed four feet at any point. This limitation will also prevent these crawlspaces from being converted into habitable spaces.*

Response: As described above, the minimum crawlspace elevation is 74.0 feet. Based on this criterion, the top of the foundation wall may not be above 78.0 feet. As shown in the preliminary plans, the minimum finished floor elevation is 76.2 feet. The Applicant

anticipates that the future home plans will include a maximum foundation wall elevation that is between 74.0 feet and 78.0 feet. The City's Building Department will confirm compliance with this criterion at time of building permit review/issuance. The criterion can be met.

9. *There must be an adequate drainage system that removes floodwaters from the interior area of the crawlspace. Possible options include natural drainage through porous, well-drained soils and drainage systems such as low-point drains, perforated pipes, drainage tiles, or gravel or crushed stone drainage by gravity.*

Response: The Applicant anticipates that floodwaters will exit the interior area of the crawlspace via flood vents and gravity drainage through porous materials, such as gravel or crushed stone. The Building Department will confirm compliance with this criterion at time of building permit review/issuance. The criterion can be met.

10. *The velocity of floodwaters at the site should not exceed five feet per second for any crawlspace. For velocities in excess of five feet per second, other foundation types should be used.*

Response: The Applicant is not aware of potential floodwater velocities at the site, nor is floodwater modeling required for the requested work. The Applicant expects to coordinate with the Building Department on a foundation and home design that meets applicable flood and Oregon Structural Specialty Code requirements at time of building permit review/issuance. The criterion can be met.

11. *For more detailed information refer to FEMA Technical Bulletin 11-01 or the most current edition.*

12. *The use of below-grade crawlspaces to elevate the building to one foot above the BFE may cause an increase in flood insurance premiums, which are beyond the control of the City.*

Response: The Applicant is aware of the FEMA information and that using below-grade crawlspaces to elevate a building to one-foot above BFE may cause an increase in flood insurance premiums.

D. *A poured slab placed over fill can be used to elevate the lowest floor of a structure above the base flood elevation. However, when a building site is filled, it is still in the floodplain and no basements are permitted.*

Response: This application does not include a request to pour a slab over fill to elevate the lowest floor of the proposed structure above the BFE. The Applicant expects to coordinate with the Building Department on a foundation and home design that meets applicable flood and Oregon Structural Specialty Code requirements at time of building permit review/issuance. The criterion can be met.

E. *Placing a structure on piers, piles, and posts is allowed provided supporting members are designed to resist hydrostatic and hydrodynamic forces.*

Response: The proposed foundation plan in Attachment E shows that the conceptual home will be primarily supported by a perimeter foundation wall with limited footings/piers for patios. As described above, the foundation includes sufficient design elements to comply with applicable requirements for flood resistance. Piers/footings will be similarly designed, and such will be confirmed by the Building Department during new home permit review/issuance. The criterion can be met.

4. ***CDC Chapter 27.050(D) – Map of proposed alteration. Please provide a map that illustrates the location of all cuts and fills, including the total quantity of each.***

Response: Attachment C, Sheet P05 includes a map of the location of all cuts and fills, including the total quantity of each. This criterion is met.

5. ***CDC Chapter 27.050(G) – Elevation of lowest floor. Please provide an updated Sheet P04 or an explanation of the elevation of the southwest corner of the proposed structure and it being located below the 100-year flood elevation.***

Response: An updated Sheet P04 with a finished floor elevation of 76.2 feet is included in Attachment C. This criterion is met.

6. ***CDC Chapter 27.060(G) – Flood carrying capacity. Please submit certification by a professional civil engineer that the improvements located within the floodplain will maintain flood storage and conveyance capacity and not increase design flood elevations.***

Response: All proposed improvements within the area floodplain have been designed by a professional civil engineer licensed to practice in the State of Oregon. Based on the advice of City staff, proposed cuts and fills across the site are completely balanced and therefore have no net effect on the flood storage and conveyance capacity of the floodplain. A letter attesting to such is included as Attachment D.

7. ***CDC Chapter 28.090.C(1) – Written Responses. Please provide additional findings for all criteria in 28.110 that directly respond to the criteria. For example 28.110.B(4): provide calculations of impervious surfaces and explain how this proposal is disturbing the minimum amount of HCA necessary when there are reduced setbacks that can be applied.***

Response: Attachment C includes revised Preliminary Plans which show the conceptual building outline at the 7.5-foot side setback. The subject property only has HCA land available for future development, so the building envelope was moved north, further from the wetland boundary. The Applicant has requested approval for a reduced front setback of 12 feet to reduce the impacts of disturbance to the HCA.

The new impervious surface area of the proposed development, including the structure and garage, is ±2,453 square feet which is less than half of the allowable 5,000 square feet. Attachment H is a Preliminary Stormwater Report and provides the calculations for impervious area in Section 2.6. The calculations are as follows:

New Roof Area (Home and Garage):	±2,228 square feet
New Driveway, Patio, Deck:	±225 square feet
TOTAL:	±2,453 square feet

This criterion is met.

8. ***CDC Chapter 28.090.C(2) – Site Plan with HCA Boundaries. Please provide a site plan that includes the existing HCA boundary shown by low, moderate, and high.***

Response: The Natural Resources Site Assessment Report provided to the City in the January 7, 2020 submittal, included an HCA Map as Figure 6 which shows the boundaries of the HCA. Attached as Attachment G, Figures 7 and 7A include a revised HCA map which includes the HCA Boundary by low, moderate, and/or high.

Also included in Exhibit G is a map from Metromap that identifies the subject property with the HCA boundaries. This criterion is met.

9. ***CDC Chapter 32.050.F(9) – Significant Trees. Please contact the City Arborist for a significant tree determination. If significant trees are on the subject property, please submit an updated existing conditions map and identify which are to be retained or removed. If no significant trees are on the subject property, an email from the City Arborist will be sufficient.***

Response: On March 31, 2020 Ron Jones, City Arborist, called AKS Engineering and Forestry and stated that there are no significant trees on the subject property, and he would send Mr. Wyss an email verifying the results of his Significant Tree Determination. We anticipate a formal response from Mr. Jones by the time this response is received by the City.

10. ***CDC Chapter 32.050.G(3) – Anchored Chain Link Fence. Please update Site Plans to show appropriate protection fencing for the WRA.***

Response: The revised Construction Management Plan included as Attachment C, Sheet P06, illustrates the anchored chain link fence around the WRA. This criterion is met.

11. ***CDC Chapter 32.050(H) – Mitigation Plan.***

32.090(B) – Please specify whether all mitigation will be on subject property or some will be off-site as the submittal provides conflicting information.

Response: All proposed mitigation will be located on the subject property (Tax Lot 802). The proposed Mitigation Plan includes on-site mitigation by restoring, creating, and enhancing the WRA located on the project site. Included in Attachment G, Figure 7, is a color map which illustrates the impact, mitigation, and WRA areas within the project boundaries. Those areas are further described as follows:

WRA Permanent Impacts:	±3,588	square feet
Native Planting Mitigation Area:	±5,000	square feet
WRA to Remain within Project Area:	±24,801	square feet
Total WRA in Project Area Excluding Proposed Right-Of-Way:	±33,441	square feet
Moderate HCA to remain within Project Area:	±24,464	square feet
Moderate HCA Impacts Beyond WRA:	±1,412	square feet

32.090(C) – Please submit calculations for required mitigation and an updated map showing locations.

Response: The amount of mitigation required is based on the square footage of the permanent disturbance area, where 1-square-foot of created, enhanced, or restored area onsite is required for every square foot disturbed. The proposed on-site enhancement mitigation is ±5,000 square feet, which meets the City's 1:1 mitigation ratio requirement for a maximum disturbed area of 5,000 square feet.

A revised Natural Resources Site Plan included as Attachment G, Sheet 7A illustrates the locations of the mitigated area in color. This criterion is met.

32.090(E) – Please identify responsible parties for the mitigation plan and an implementation schedule including maintenance, monitoring, and reporting.

Response: The revised WRA/HCA Mitigation Enhancement Planting Specifications included as Attachment G, Page 2 states that monitoring of the mitigation site is the ongoing responsibility of the property owner, and that plants that die must be replaced in kind. This statement is also included in the notes for the Maintenance and Monitoring Plan located in Attachment C, Preliminary WRA-HCA Mitigation Enhancement Planting Plan, Sheet P11. This criterion is met.

12. ***CDC Chapter 32.50(I) – Re-vegetation Plan. Please provide additional findings for all criteria in 32.100 that directly respond to the criteria.***

32.100.A.3(a) – Please provide calculations.

Response: Attachment C, Sheet P11 illustrates the plant calculations and coverage as follows:

REQUIRED:
Total disturbed area = 5,000 square feet divided by 500 = 10
10 x 5 trees = 50 trees
10 x 25 shrubs = 250 shrubs

PROPOSED:
50 trees
250 shrubs

The above calculations exceed the City's requirements in CDC Chapter 32.100 for revegetation. This criterion is met.

32.100.A.3(b) – Please provide a site plan showing the locations/distances of required plantings.

Response: The revised WRA/HCA Mitigation Enhancement Planting Specifications attached as Attachment G, Page 1, provides detailed planting specifications, including scientific name, common name, size, spacing and, quantities of all revegetation.

As requested, a revised map is included as Attachment C, Preliminary WRA-HCA Mitigation Enhancement Planting Plan, Sheet P11.

32.100.A(5 to 8) – Please identify responsible parties for monitoring/reporting of re-vegetated sites and who is responsible for weeding and replacement of dead plants.

Response: The revised WRA/HCA Mitigation Enhancement Planting Specifications included as Attachment G, Page 2 states that monitoring and reporting of the mitigation site is the ongoing responsibility of the property owner, and that plants that die must be replaced in kind. This statement is also included in the notes for the Maintenance and Monitoring Plan located in Attachment C, Preliminary WRA-HCA Mitigation Enhancement Planting Plan, Sheet P11. This criterion is met.

13. ***Provide foundation plans certified by a professional engineer of no increase in base flood elevation (including impact from the deck).***

Response: Attachment E is a Preliminary/Conceptual Foundation Plan, prepared by Alan Mascord Design Associates and is intended to respond to planning related building information that is necessary for the requested land use permits. A new foundation plan will be provided to the City with the forthcoming Building Permit application and will include more specific detail with regard to foundation and home design. Such revised building plans will conform to all applicable criteria here.

Additionally, Attachment D includes a letter, prepared by a licensed professional engineer, attesting that cuts and fills across the site have been balanced and as such no net change to the flood elevation is expected.

Sincerely,

AKS ENGINEERING & FORESTRY, LLC

Zach Pelz, AICP
3700 River Road North, Suite 1
Keizer, OR 97303
503-400-6028 | PelzZ@aks-eng.com

Attachments:

- A: City of West Linn Email Approving PUE Vacation
- B: Copy of Recorded Easement 2019-6706
- C: Revised Preliminary Plans
- D: Certified Engineer Letter
- E: Preliminary Foundation Plan
- F: Revised Pre-Construction Elevation Certificate
- G: WRA/HCA Mitigation Enhancement Planting Specifications
- H: City of West Linn Arborist Email
- I: Preliminary Stormwater Report
- J: City of West Linn Incomplete Letter Dated February 5, 2020

Attachment A: City of West Linn Email Approving PUE Vacation

From: Pepper, Amy
To: Rhonda Mackey
Subject: RE: 9th Street PUE Vacation / Response to Incompleteness
Date: Wednesday, April 8, 2020 12:34:10 PM

Rhonda ~

I'll give you a call later this afternoon. I've already notified Darren that your application appears complete and I'm working on processing the paperwork on our end to have the easement vacated.

Amy

From: Rhonda Mackey [mailto:rhondam@aks-eng.com]
Sent: Tuesday, April 7, 2020 8:29 AM
To: Pepper, Amy <APepper@westlinnoregon.gov>
Subject: RE: 9th Street PUE Vacation / Response to Incompleteness

Good morning, Amy –

This follows up my voicemail I left this morning on your office phone.

We are finalizing responses to Darren's incompleteness items on the consolidated application for 9th Street and would like to include your findings with our submittal. I have a couple questions for you as well. Please call me at your earliest opportunity to discuss this project. I am currently working from home, so please call my cell at (503) 580-4723.

Thanks, Amy.

Rhonda M. Mackey
Land Use Planning
AKS ENGINEERING & FORESTRY, LLC
3700 River Road N, Suite 1 | Keizer, OR 97303
P: 503.400.6028 Ext. 409 | F: 503.400.7722 | www.aks-eng.com | RhondaM@aks-eng.com
Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

From: Rhonda Mackey
Sent: Tuesday, March 31, 2020 5:21 PM
To: 'Pepper, Amy' <APepper@westlinnoregon.gov>
Subject: RE: 9th Street PUE Vacation / Response to Incompleteness

Good afternoon, Amy –

I wanted to check in with you on the progress for this decision. Do you have an estimated time that we could expect a decision on the PUE Vacation?

Rhonda M. Mackey
Land Use Planning
AKS ENGINEERING & FORESTRY, LLC
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From: Rhonda Mackey
Sent: Thursday, March 26, 2020 1:09 PM
To: Pepper, Amy <APepper@westlinnoregon.gov>
Subject: FW: 9th Street PUE Vacation / Response to Incompleteness

Hi Amy –

I'm not sure what happened to Page 12, but it is attached for your reference.

As for Centurylink, according to Utiliquest and OregonOneCall, Centurylink is not in the service members listed for that area. They notified all utility companies that service the project area, which were Comcast, PGE, and NWN.

Rhonda M. Mackey
Land Use Planning
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Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

From: Pepper, Amy <APepper@westlinnoregon.gov>
Sent: Thursday, March 26, 2020 9:43 AM
To: Rhonda Mackey <rhondam@aks-eng.com>

Subject: RE: 9th Street PUE Vacation / Response to Incompleteness

Rhonda ~

Page 12 of your submittal did not come through. It doesn't appear that a CenturyLink provided a release. Please confirm.

Thanks!

Amy

From: Rhonda Mackey [mailto:rhondam@aks-eng.com]
Sent: Thursday, March 26, 2020 9:11 AM
To: Pepper, Amy <APepper@westlinnoregon.gov>
Subject: RE: 9th Street PUE Vacation / Response to Incompleteness

Good morning, Amy –

I know that everywhere is short-staffed and crazy right now, but could you tell me when we could expect a decision on this PUE Vacation?

Rhonda M. Mackey
Land Use Planning
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Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

From: Pepper, Amy <APepper@westlinnoregon.gov>
Sent: Tuesday, March 17, 2020 1:45 PM
To: Rhonda Mackey <rhondam@aks-eng.com>
Subject: RE: 9th Street PUE Vacation / Response to Incompleteness

Rhonda ~

Your submittal has been received. We are closed to the public now and trying to accommodate remote work schedules. Circumstances seem to be changing fairly rapidly, but the submittal has

been received.

Amy

From: Rhonda Mackey [mailto:rhondam@aks-eng.com]
Sent: Tuesday, March 17, 2020 1:43 PM
To: Pepper, Amy <APepper@westlinnoregon.gov>
Subject: FW: 9th Street PUE Vacation / Response to Incompleteness

Good afternoon, Amy –

I wanted to check in and make sure you received my email below. I know a lot of jurisdictions are closed and/or short staffed, but wanted to make sure you get this for your continued review. Please confirm receipt.

Thank you!

Rhonda M. Mackey
Land Use Planning
AKS ENGINEERING & FORESTRY, LLC
3700 River Road N, Suite 1 | Keizer, OR 97303
P: 503.400.6028 Ext. 409 | F: 503.400.7722 | www.aks-eng.com |RhondaM@aks-eng.com
Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

From: Rhonda Mackey
Sent: Thursday, March 12, 2020 1:52 PM
To: Pepper, Amy <APepper@westlinnoregon.gov>
Cc: Stacey Morrill <MorrillS@aks-eng.com>
Subject: 9th Street PUE Vacation / Response to Incompleteness

Good afternoon, Amy –

Attached for your review is our complete response to your January 15, 2020 incompleteness determination for the requested PUE vacation on Clackamas County Assessor's Map 31E02AC, Tax Lot 802. Included as Exhibit C is a copy of your letter for reference. If you have any questions, or need additional information, please do not hesitate to contact us. Otherwise, we look forward to receiving your comments/decision.

Sincerely,

Rhonda M. Mackey
Land Use Planning

AKS ENGINEERING & FORESTRY, LLC
3700 River Road N, Suite 1 | Keizer, OR 97303
P: 503.400.6028 Ext. 409 | F: 503.400.7722 | www.aks-eng.com |RhondaM@aks-eng.com
Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

Amy Pepper
Senior Project Engineer
Public Works

22500 Salamo Rd
West Linn, Oregon 97068
apepper@westlinnoregon.gov
westlinnoregon.gov
503-722-3437

Click to Connect!

Attachment B: Copy of Recorded Easement 2019-6706

Clackamas County Official Records
Sherry Hall, County Clerk

2019-006706

$128.00

02206751201900067060080085

02/07/2019 02:37:48 PM

D-E Cnt=1 Stn=2 COUNTER3
$40.00 $16.00 $62.00 $10.00

After Recording
Please Return To:
Thomas and Heather Farwell
1220 Ninth St.
West Linn, Oregon 97968

PRIVATE ACCESS AND UTILITY EASEMENT

RECITALS

A. Parties (collectively referred to as the parties)

(1) Persse means: Andrew Persse and Kami Persse.
(2) Malibar means: Malibar Group LLC, Retirement Plan FBO: Roy Marvin

B. Properties (collectively referred to as the properties)

(i) Persse parcel means: Document No. 2018-075762 Clackamas County, State of Oregon

(ii) Malibar parcel means: Document No. 2017-055155, Excepting therefrom Parcel 1 and 2 of PP Plat 2018-007, Clackamas County, State of Oregon.

C. Easement means: a non-exclusive easement for access and utilities, over and across the following described property benefiting the Malibar Parcel and burdening the Persse Parcel:

The easement area is described in EXHBIT A and shown on EXHIBIT B

D. Purpose The parties intend, by this agreement, to establish an easement for access and utilities. This easement shall benefit the Malibar Parcel and burden the Persse Parcel.

AGREEMENTS

1. **Consideration.** The consideration for this agreement is non-monetary.

2. **Grant of Easement.** Persse grants to Malibar a non-exclusive easement for access and utilities over the Easement.

3. **Maintenance:**

   a.) Malibar shall be responsible for the maintenance in the Easement Area.

   b.) Malibar shall have the right to perform maintenance for the Easement over the following described exhibit A:

4. **Additional Provisions:**

   a.) Malibar agrees to save and hold Persse harmless from all claims of third parties arising from Malibar's use of the rights herein granted.

5. **Future owners.** This agreement shall run with, benefit and burden the properties and shall benefit and bind the parties and their respective successors in interest.

6. **Attorney Fees.** In the event of action, arbitration, litigation, or appeal to enforce any provision of this agreement, the prevailing party shall be entitled to reasonable attorney fees and court costs.

Dated this 1st day of February 2019.

GRANTOR:

Andrew Persse

STATE OF OREGON, County of Clackamas) ss.

The foregoing instrument was acknowledged before me this 1st day of February, 2019 by Andrew Persse.

Heather Kesten
Notary Public for Oregon
My Commission Expires 10-19-20

OFFICIAL STAMP
HEATHER KESTEN
NOTARY PUBLIC-OREGON
COMMISSION NO. 955533
MY COMMISSION EXPIRES OCTOBER 19, 2020

GRANTOR:

Kami Persse

STATE OF OREGON, County of Clackamas) **ss.**

The foregoing instrument was acknowledged before me this 1st **day of** February **, 2019 by Kami Persse.**

Heather Kesten

Notary Public for Oregon
My Commission Expires 10-19-20

OFFICIAL STAMP
HEATHER KESTEN
NOTARY PUBLIC-OREGON
COMMISSION NO. 955533
MY COMMISSION EXPIRES OCTOBER 19, 2020

AKS ENGINEERING & FORESTRY, LLC
12965 SW Herman Road, Suite 100, Tualatin, OR 97062
P: (503) 563-6151 F: (503) 563-6152
AKS Job #5926
ENGINEERING & FORESTRY
OFFICES IN: TUALATIN, OR - VANCOUVER, WA - SALEM-KEIZER, OR

EXHIBIT A

Easement Description

A portion of vacated right-of-way, located in the Northeast One-Quarter of Section 2, Township 3 South, Range 1 East, Willamette Meridian, City of West Linn, Clackamas County, Oregon, and being more particularly described as follows:

Beginning at the southeasterly corner of Lot D, Tract 21 of the plat "Willamette & Tualatin Tracts", Plat No. 198, Clackamas County Plat Records, also being the intersection of the northerly right-of-way line of vacated 3rd Avenue (20.00 feet from centerline) and the westerly right-of-way line of 9th Street (20.00 feet from centerline); thence along said westerly right-of-way line, South 22°19'40" East 20.00 feet to the centerline of said vacated 3rd Avenue; thence along said centerline, South 67°37'35" West 254.41 feet; thence leaving said centerline, North 22°19'40" West 20.00 feet to the northerly right-of-way line of said vacated 3rd Avenue (20.00 feet from centerline); thence along said northerly right-of-way line, North 67°37'35" East 254.41 feet to the Point of Beginning.

The above described tract of land contains 5,088 square feet, more or less.

11/9/2018

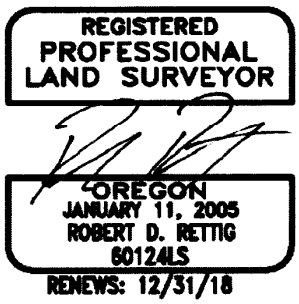
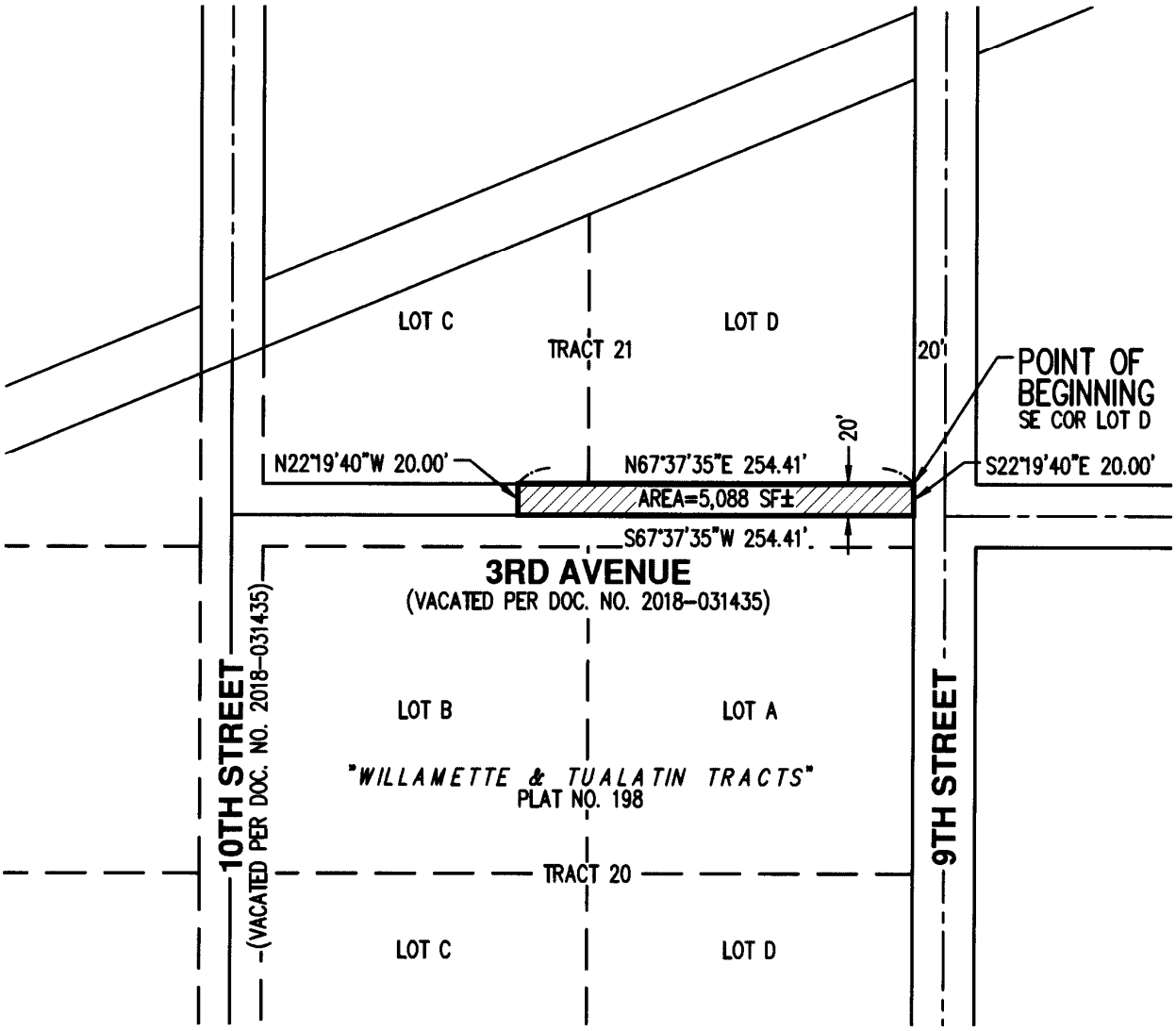


EXHIBIT B

A PORTION OF VACATED RIGHT-OF-WAY,
LOCATED IN THE NORTHEAST 1/4 OF SECTION 2,
TOWNSHIP 3 SOUTH, RANGE 1 EAST, WILLAMETTE MERIDIAN,
CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON



11/9/2018

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
JANUARY 11, 2005
ROBERT D. RETTIG
60124LS

RENEWS: 12/31/20

PREPARED FOR

ENCORE HOMES LLC
7989 SE TOWHEE COURT
MILWAUKIE, OR 97267

SCALE: 1"=100 FEET

100 0 40 60 80 100

N

EASEMENT MAP	EXHIBIT B
AKS ENGINEERING & FORESTRY, LLC 12965 SW HERMAN RD, STE 100 TUALATIN, OR 97062 P: 503.563.6151 F: 503.563.6152 aks-eng.com	DRWN: WCB CHKD: RDR AKS JOB: 5926

DWG: 5926 20181109 EXB | EXB

Attached for Legiblity Purposes

After Recording
Please Return To:
Thomas and Heather Farwell
1220 Ninth St.
West Linn, Oregon 97968

PRIVATE ACCESS AND UTILITY EASEMENT

RECITALS

A. Parties (collectively referred to as the parties)

(1)	**Persse**	**means: Andrew Persse and Kami Persse.**
(2)	**Malibar**	**means: Malibar Group LLC, Retirement Plan FBO: Roy Marvin**

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(ii) Malibar parcel — **means: Document No. 2017-055155, Excepting therefrom Parcel 1 and 2 of PP Plat 2018-_____, Clackamas County, State of Oregon.**

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   a.) **Malibar agrees to save and hold Persse harmless from all claims of third parties arising from Malibar's use of the rights herein granted.**

5. **Future owners.** **This agreement shall run with, benefit and burden the properties and shall benefit and bind the parties and their respective successors in interest.**

6. **Attorney Fees.** **In the event of action, arbitration, litigation, or appeal to enforce any provision of this agreement, the prevailing party shall be entitled to reasonable attorney fees and court costs.**

Dated this _____day of _____2019.

GRANTOR:

_____
Andrew Persse

STATE OF OREGON, County of _____) ss.

The foregoing instrument was acknowledged before me this _____day of _____, 2019 by Andrew Persse.

_____
Notary Public for Oregon
My Commission Expires _____

GRANTOR:

_____
Kami Persse

STATE OF OREGON, County of _____) ss.

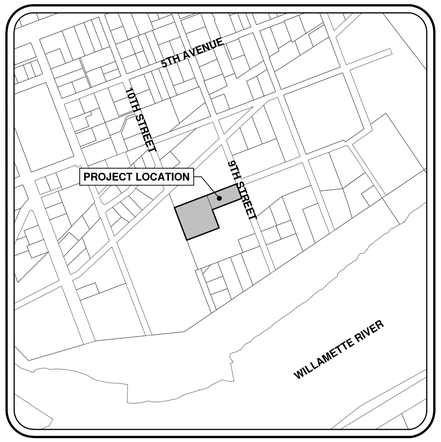
The foregoing instrument was acknowledged before me this _____day of _____, 2019 by Kami Persse.

_____
Notary Public for Oregon
My Commission Expires _____

Attachment C: Revised Preliminary Plans

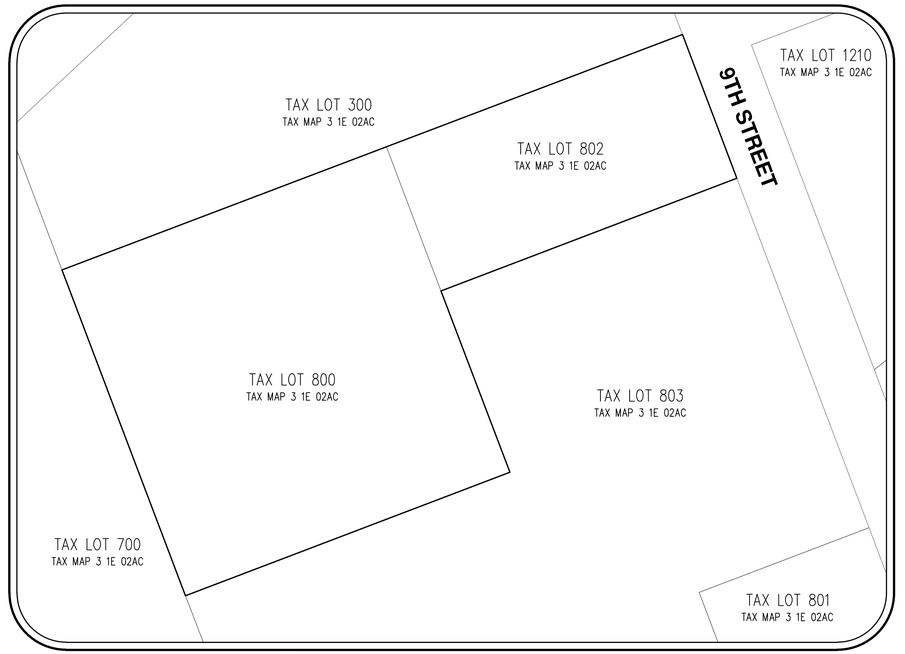
9TH STREET CONSOLIDATED LAND USE APPLICATION

PRELIMINARY PLANS



VICINITY MAP

NOT TO SCALE



N

SITE MAP

SCALE: 1" = 50'

LEGEND

	EXISTING	PROPOSED		EXISTING	PROPOSED
DECIDUOUS TREE			STORM DRAIN CLEAN OUT		
CONIFEROUS TREE			STORM DRAIN CATCH BASIN		
			STORM DRAIN AREA DRAIN		
FIRE HYDRANT			STORM DRAIN MANHOLE		
WATER BLOWOFF			GAS METER		
WATER METER			GAS VALVE		
WATER VALVE			GUY WIRE ANCHOR		
DOUBLE CHECK VALVE			UTILITY POLE		
AIR RELEASE VALVE			POWER VAULT	P	P
SANITARY SEWER CLEAN OUT			POWER JUNCTION BOX		
SANITARY SEWER MANHOLE			POWER PEDESTAL		
SIGN			COMMUNICATIONS VAULT	C	C
STREET LIGHT			COMMUNICATIONS JUNCTION BOX		
MAILBOX	MB	MB	COMMUNICATIONS RISER		

	EXISTING	PROPOSED
RIGHT-OF-WAY LINE		
BOUNDARY LINE		
PROPERTY LINE		
CENTERLINE		
DITCH		
CURB		
EDGE OF PAVEMENT		
EASEMENT		
FENCE LINE	XXX XXX XXX	
GRAVEL EDGE		
POWER LINE	PWR PWR	PWR PWR
OVERHEAD WIRE	OHW	OHW OHW
COMMUNICATIONS LINE	COM COM	COM COM
FIBER OPTIC LINE	CFO CFO	CFO CFO
GAS LINE	GAS GAS	GAS GAS GAS
STORM DRAIN LINE	STM STM	STM STM
SANITARY SEWER LINE	SAN SAN	SAN SAN
WATER LINE	WAT WAT	WAT WAT

APPLICANT:

MALIBAR GROUP, LLC
615 NW TERRITORIAL ROAD
CANBY, OR 97013

PLANNING/CIVIL ENGINEERING/SURVEYING/ LANDSCAPE ARCHITECTURE/ARBORISTS (APPLICANT'S CONSULTANT):

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN ROAD, SUITE 100
TUALATIN, OR 97062
CONTACT: JONATHON MORSE/ZACH PELZ
PHONE: (503) 563-6151
FAX: (503) 563-6152

SITE LOCATION AND ZONING:

CLACKAMAS COUNTY ASSESSOR'S MAP 3 1E 2AC TAX LOT 802
WEST LINN, OR 97068
ZONING: R10

SITE DESCRIPTION:

TAX LOT 800 AND 802, CLACKAMAS COUNTY ASSESSOR'S MAP 3 1E 2AC. LOCATED IN THE SOUTHWEST 1/4 OF THE NORTHEAST 1/4 OF SECTION 2, TOWNSHIP 3 SOUTH, RANGE 1 EAST, WILLAMETTE MERIDIAN, CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON.

PROJECT PURPOSE:

PROPERTY LINE ADJUSTMENT, NATURAL RESOURCES OVERLAY PERMIT, AND ASSOCIATED FRONTAGE IMPROVEMENTS.

BENCHMARK:

VERTICAL DATUM: ELEVATIONS ARE BASED ON NGS BENCHMARK NO. RD1501, LOCATED ON HWY 99E ELEVATION = 81.25 FEET (NAVD 88).

SHEET INDEX

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

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

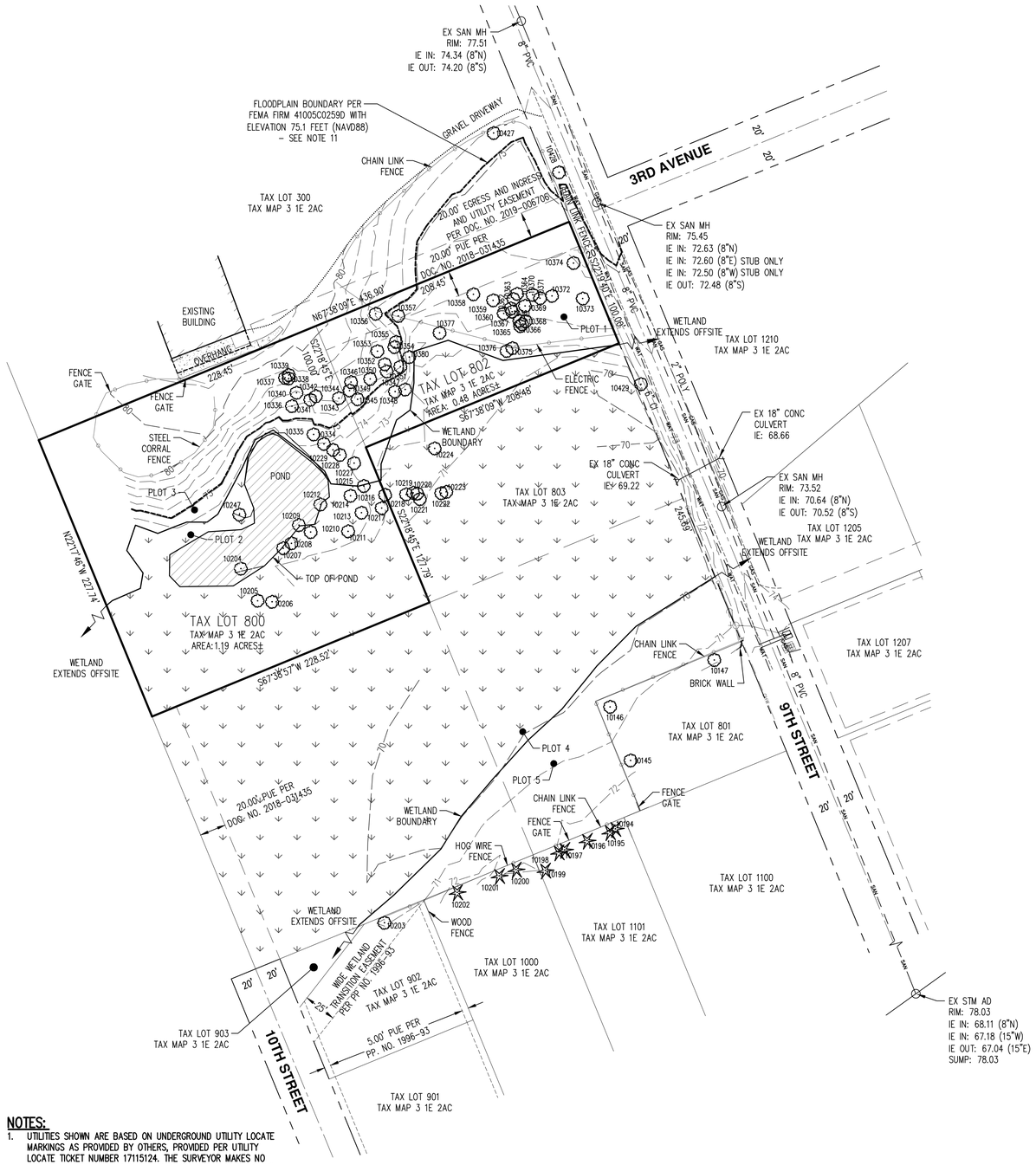
COVER SHEET WITH VICINITY AND SITE MAP
9TH STREET CONSOLIDATED LAND USE APPLICATION
WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 12, 2010
JONATHON M. MORSE
RENEWAL DATE: 12/31/20

JOB NUMBER:	5926
DATE:	04/21/2020
DESIGNED BY:	APC & LTP
DRAWN BY:	APC
CHECKED BY:	JMM

P01

AKS DRAWING FILE: 5926 COVERLDWG | LAYOUT: COVR



TREE TABLE			
TREE NUMBER	TYPE	DBH (IN.)	PRESERVE/REMOVE
10145	DECIDUOUS	9	PRESERVE
10146	DECIDUOUS	8	PRESERVE
10147	DECIDUOUS	8	PRESERVE
10194	CONIFEROUS	22	PRESERVE
10195	CONIFEROUS	22	PRESERVE
10196	CONIFEROUS	16	PRESERVE
10197	CONIFEROUS	14	PRESERVE
10198	CONIFEROUS	24	PRESERVE
10199	CONIFEROUS	48	PRESERVE
10200	CONIFEROUS	28	PRESERVE
10201	CONIFEROUS	18,18,18	PRESERVE
10202	CONIFEROUS	60	PRESERVE
10203	DECIDUOUS	16	PRESERVE
10204	DECIDUOUS	13	PRESERVE
10205	DECIDUOUS	47	PRESERVE
10206	DECIDUOUS	20	PRESERVE
10207	DECIDUOUS	12	PRESERVE
10208	DECIDUOUS	12	PRESERVE
10209	DECIDUOUS	5,6	PRESERVE
10210	DECIDUOUS	14	PRESERVE

TREE TABLE			
TREE NUMBER	TYPE	DBH (IN.)	PRESERVE/REMOVE
10211	DECIDUOUS	40	PRESERVE
10212	DECIDUOUS	6,7	PRESERVE
10213	DECIDUOUS	20	PRESERVE
10214	DECIDUOUS	22	PRESERVE
10215	DECIDUOUS	29	PRESERVE
10216	DECIDUOUS	5,7,8	PRESERVE
10217	DECIDUOUS	6,7	PRESERVE
10218	DECIDUOUS	5,6,9	PRESERVE
10219	DECIDUOUS	8	PRESERVE
10220	DECIDUOUS	6	PRESERVE
10221	DECIDUOUS	5,7	PRESERVE
10222	DECIDUOUS	6	PRESERVE
10223	DECIDUOUS	5,6	PRESERVE
10224	DECIDUOUS	13	PRESERVE
10227	DECIDUOUS	7,7,9	PRESERVE
10228	DECIDUOUS	8,8,9	PRESERVE
10229	DECIDUOUS	8,11	PRESERVE
10247	DECIDUOUS	15	PRESERVE
10334	DECIDUOUS	8,9	PRESERVE
10335	DECIDUOUS	7,8,8,9	PRESERVE

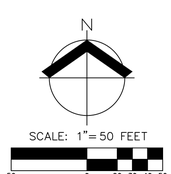
TREE TABLE			
TREE NUMBER	TYPE	DBH (IN.)	PRESERVE/REMOVE
10336	DECIDUOUS	10	PRESERVE
10337	DECIDUOUS	10,11	PRESERVE
10338	DECIDUOUS	10	PRESERVE
10339	DECIDUOUS	6	PRESERVE
10340	DECIDUOUS	13	PRESERVE
10341	DECIDUOUS	34	PRESERVE
10342	DECIDUOUS	12,13	PRESERVE
10343	DECIDUOUS	29	PRESERVE
10344	DECIDUOUS	22	PRESERVE
10345	DECIDUOUS	23	PRESERVE
10346	DECIDUOUS	10	PRESERVE
10347	DECIDUOUS	8,14,20	PRESERVE
10348	DECIDUOUS	7,9,16,16,16	PRESERVE
10349	DECIDUOUS	16	PRESERVE
10350	DECIDUOUS	20	PRESERVE
10351	DECIDUOUS	22	PRESERVE
10352	DECIDUOUS	7,9	PRESERVE
10353	DECIDUOUS	20	PRESERVE
10354	DECIDUOUS	26	PRESERVE
10355	DECIDUOUS	7,12	PRESERVE

TREE TABLE			
TREE NUMBER	TYPE	DBH (IN.)	PRESERVE/REMOVE
10356	DECIDUOUS	20	PRESERVE
10357	DECIDUOUS	9	PRESERVE
10358	DECIDUOUS	42	REMOVE
10359	DECIDUOUS	28	REMOVE
10360	DECIDUOUS	17	REMOVE
10361	DECIDUOUS	11	REMOVE
10362	DECIDUOUS	8	REMOVE
10363	DECIDUOUS	11	REMOVE
10364	DECIDUOUS	15	REMOVE
10365	DECIDUOUS	19	REMOVE
10366	DECIDUOUS	12	REMOVE
10367	DECIDUOUS	7	REMOVE
10368	DECIDUOUS	7,7,12	REMOVE
10369	DECIDUOUS	7	REMOVE
10370	DECIDUOUS	6,11,13	REMOVE
10371	DECIDUOUS	6,14,15	REMOVE
10372	DECIDUOUS	7	REMOVE
10373	DECIDUOUS	19	REMOVE
10374	DECIDUOUS	20	REMOVE
10375	DECIDUOUS	8,10	PRESERVE

TREE TABLE			
TREE NUMBER	TYPE	DBH (IN.)	PRESERVE/REMOVE
10376	DECIDUOUS	12	PRESERVE
10377	DECIDUOUS	9,11	PRESERVE
10380	DECIDUOUS	6	PRESERVE
10427	DECIDUOUS	22	PRESERVE
10428	DECIDUOUS	34	PRESERVE
10429	DECIDUOUS	6,6,8,8	PRESERVE

NOTES:

1. UTILITIES SHOWN ARE BASED ON UNDERGROUND UTILITY LOCATE MARKINGS AS PROVIDED BY OTHERS, PROVIDED PER UTILITY LOCATE TICKET NUMBER 17115124. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND LOCATES REPRESENT THE ONLY UTILITIES IN THE AREA. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
2. FIELD WORK WAS CONDUCTED MAY 16–17, 2017.
3. VERTICAL DATUM: ELEVATIONS ARE BASED ON NGS BENCHMARK NO. RD1501, LOCATED ON HWY 99E ELEVATION = 81.25 FEET (NAVD 88).
4. THIS MAP DOES NOT CONSTITUTE A PROPERTY BOUNDARY SURVEY.
5. SURVEY IS ONLY VALID WITH SURVEYOR'S STAMP AND SIGNATURE.
6. BUILDING FOOTPRINTS ARE MEASURED TO SIDING UNLESS NOTED OTHERWISE. CONTACT SURVEYOR WITH QUESTIONS REGARDING BUILDING TIES.
7. CONTOUR INTERVAL IS 1 FOOT.
8. TREES WITH DIAMETER OF 6" AND GREATER ARE SHOWN. TREE DIAMETERS WERE MEASURED UTILIZING A DIAMETER TAPE AT BREAST HEIGHT. TREE INFORMATION IS SUBJECT TO CHANGE UPON ARBORIST INSPECTION.
10. WETLAND BOUNDARIES SHOWN WERE DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON MARCH 27, 2017 AND WERE PROFESSIONALLY SURVEYED BY AKS ON JUNE 23, 2017.
11. SUBJECT PROPERTY IS SUBJECT TO FEMA FLOOD INSURANCE RATE MAP (FIRM) 41005C0259D WITH AN EFFECTIVE DATE OF JUNE 17, 2008. PORTIONS OF PROPERTY BELOW THE BASE FLOOD ELEVATION (ELEVATION 75.1 – NAVD88) ARE IN ZONE AE.



AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

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

EXISTING CONDITIONS PLAN
9TH STREET CONSOLIDATED LAND USE APPLICATION
WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

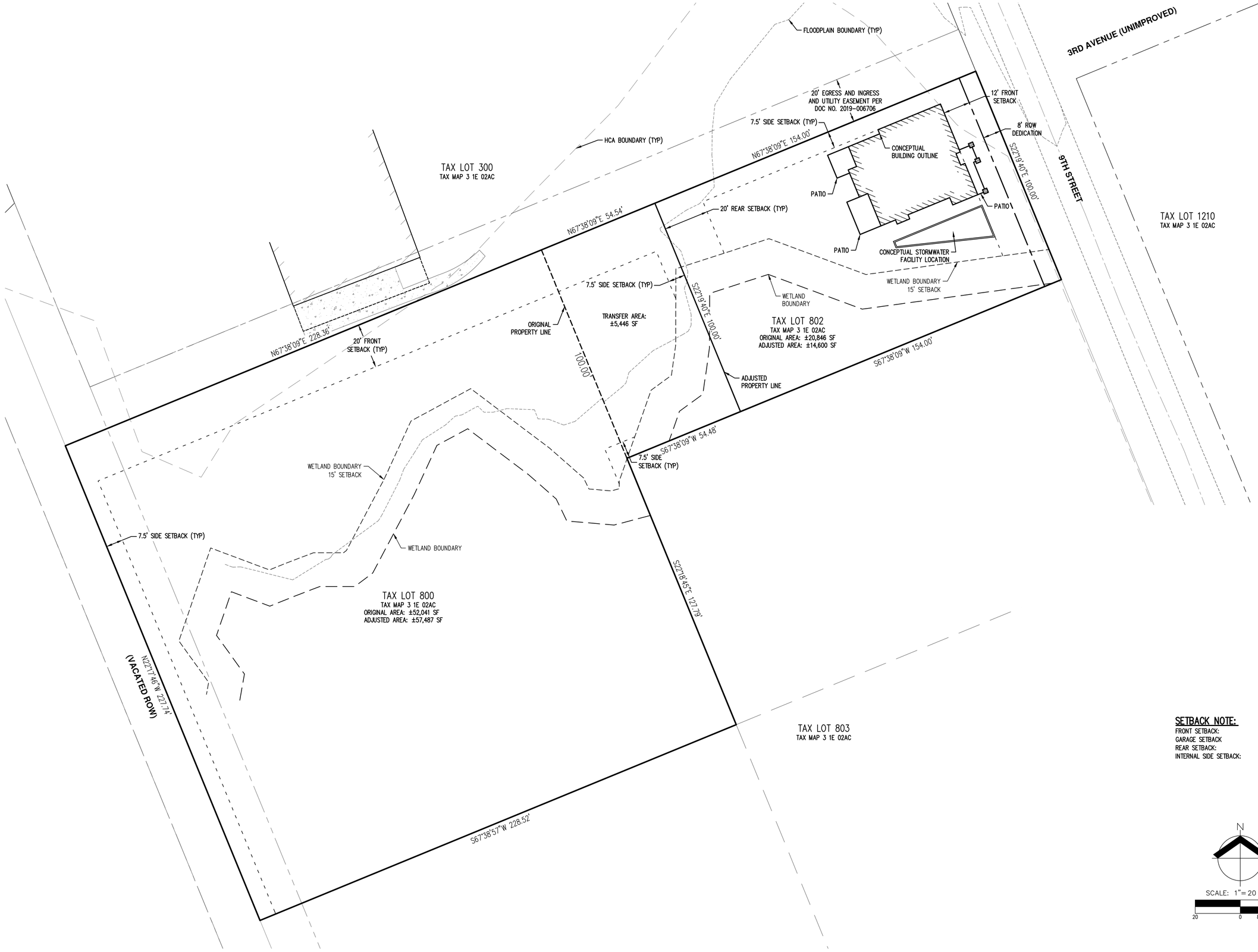
REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JANUARY 11, 2005
ROBERT D. RETTIG
60124LS
RENEWS: 12/31/20

REVISED COPY

JOB NUMBER:	5926
DATE:	12/17/2019
DESIGNED BY:	APC &
DRAWN BY:	MTB
CHECKED BY:	RDR

P02

AKS DRAWING FILE: 5926EXCOND.DWG | LAYOUT: LAYOUT1



SETBACK NOTE:

FRONT SETBACK:	12'
GARAGE SETBACK	18'
REAR SETBACK:	20'
INTERNAL SIDE SETBACK:	7.5'

N

SCALE: 1"=20 FEET

20 0 8 12 16 20

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

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

PRELIMINARY PLA PLAN WITH BUILDING SETBACKS

9TH STREET CONSOLIDATED LAND USE APPLICATION

WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

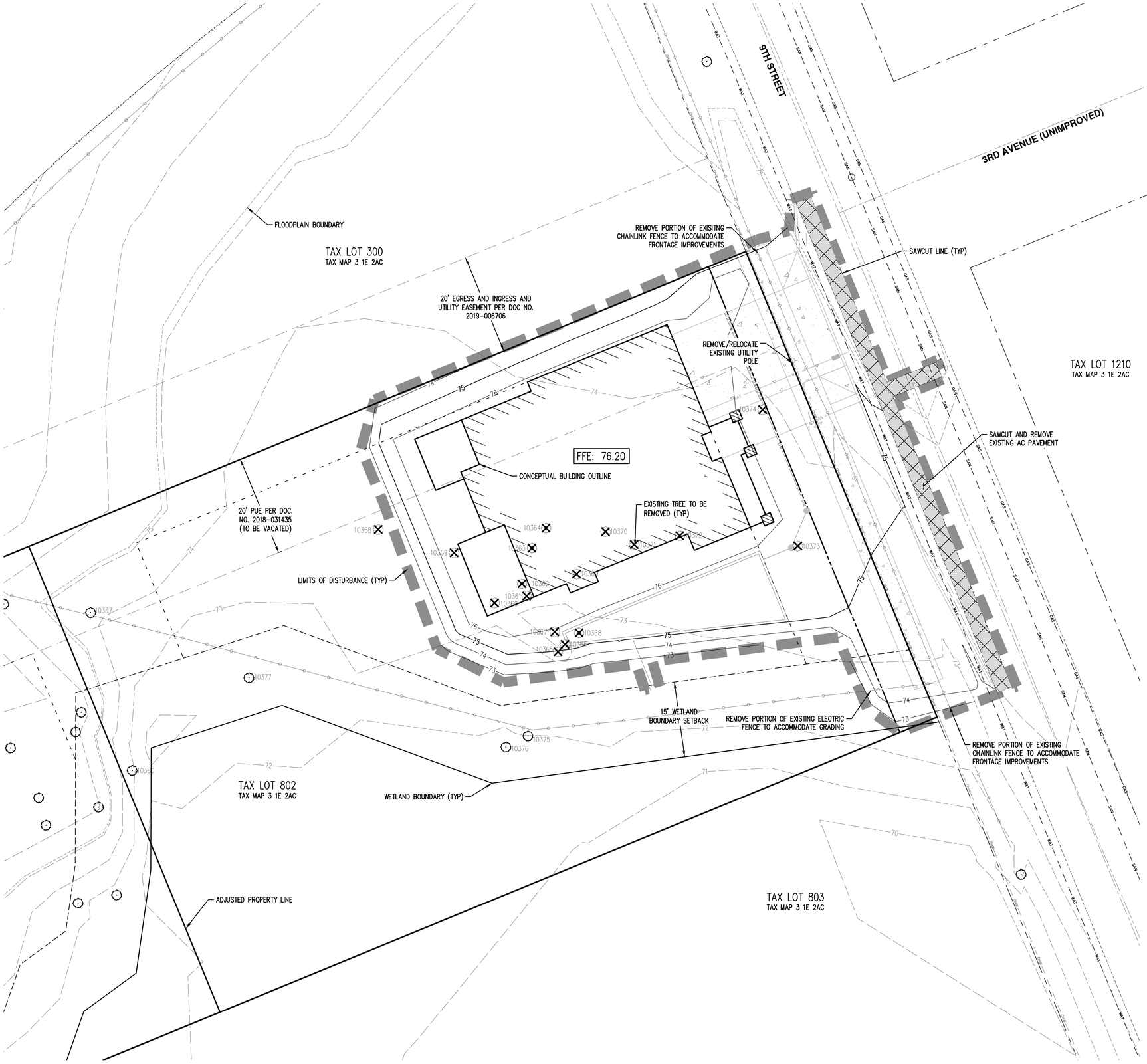
REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 12, 2005
JASON T. PORTER
RENEWAL DATE: 12/31/20

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JANUARY 19, 2010
COMMON M. MORSE
RENEWAL DATE: 12/31/20

JOB NUMBER:	5926
DATE:	04/21/2020
DESIGNED BY:	APC & LTP
DRAWN BY:	APC
CHECKED BY:	JMM

P03

AKS DRAWING FILE: 5926 20191031 PLA.DWG | LAYOUT: P03



LEGEND

EXISTING GROUND CONTOUR (1 FT)	74
EXISTING GROUND CONTOUR (5 FT)	75
FINISHED GRADE CONTOUR (1 FT)	74
FINISHED GRADE CONTOUR (5 FT)	75
LIMITS OF DISTURBANCE	
AC PAVEMENT TO BE REMOVED	

SUMMARY OF SITE DISTURBANCE

MAXIMUM DISTURBED AREA (MDA) ALLOWED IN WRA:	5,000± SF
PERMANENTLY DISTURBED AREA IN WRA:	3,588± SF
UN-UTILIZED MDA IN WRA:	1,412± SF
TEMPORARILY DISTURBED AREA IN WRA:	0± SF
TOTAL DISTURBED AREA ON TAX LOT 802:	5,000± SF

SITE CUT AND FILL VOLUMES:

*CUT VOLUME:	230± C.Y.
**FILL VOLUME:	750± C.Y.
NET VOLUME:	520± C.Y. (FILL)

*INCLUDES STRIPING VOLUME.

**FILL ON TAX LOT 802 TO BE BALANCED WITH CUT ON TAX LOT 803.

SEE SHEET P05 FOR ADDITIONAL INFORMATION

N

SCALE: 1"=10 FEET

10 0 2 5 10

ORIGINAL PAGE SIZE: 22" x 34"

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503.563.6151
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FORESTRY · PLANNING · LANDSCAPE ARCHITECTURE

PRELIMINARY DEMOLITION AND GRADING PLAN

9TH STREET CONSOLIDATED LAND USE APPLICATION

WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 15, 2014
JASON M. MORSE

RENEWAL DATE: 12/31/20

JOB NUMBER:	5926
DATE:	04/21/2020
DESIGNED BY:	APC & LTP
DRAWN BY:	APC
CHECKED BY:	JMM

P04

AKS DRAWING FILE: 5926 GRADING AND ESC.DWG | LAYOUT: P04

CUT TABLE				
NUMBER	MINIMUM ELEVATION	MAXIMUM ELEVATION	AREA (SF)	COLOR
1	-0.83	0.00	17,055	

FILL TABLE				
NUMBER	MINIMUM ELEVATION	MAXIMUM ELEVATION	AREA (SF)	COLOR
2	0.00	1.00	558	
3	1.00	2.00	806	
4	2.00	3.00	3,689	
5	3.00	4.00	222	

NOTE:
CUT AND FILL DEPTHS SHOWN ARE PRELIMINARY AND SUBJECT TO CHANGE.

CUT AND FILL VOLUMES SUMMARY:

TAX LOT 802:
*CUT VOLUME: 230± C.Y.
**FILL VOLUME: 750± C.Y.
NET VOLUME: 520± C.Y. (FILL)

TAX LOT 803:
CUT VOLUME: 520± C.Y.
FILL VOLUME: 0 C.Y.
NET VOLUME: 520± C.Y. (CUT)

*INCLUDES STRIPING VOLUME.

**FILL ON TAX LOT 802 TO BE BALANCED WITH CUT ON TAX LOT 803.

DISTURBED AREAS SUMMARY:

TAX LOT 802:
PERMANENTLY DISTURBED AREA IN WRA: 3,588± SF
TOTAL DISTURBED AREA: 5,000± SF

TAX LOT 803:
TOTAL TEMPORARILY DISTURBED AREA: 17,055± SF

N

SCALE: 1"= 30 FEET

30 0 6 15 30

ORIGINAL PAGE SIZE: 22" x 34"

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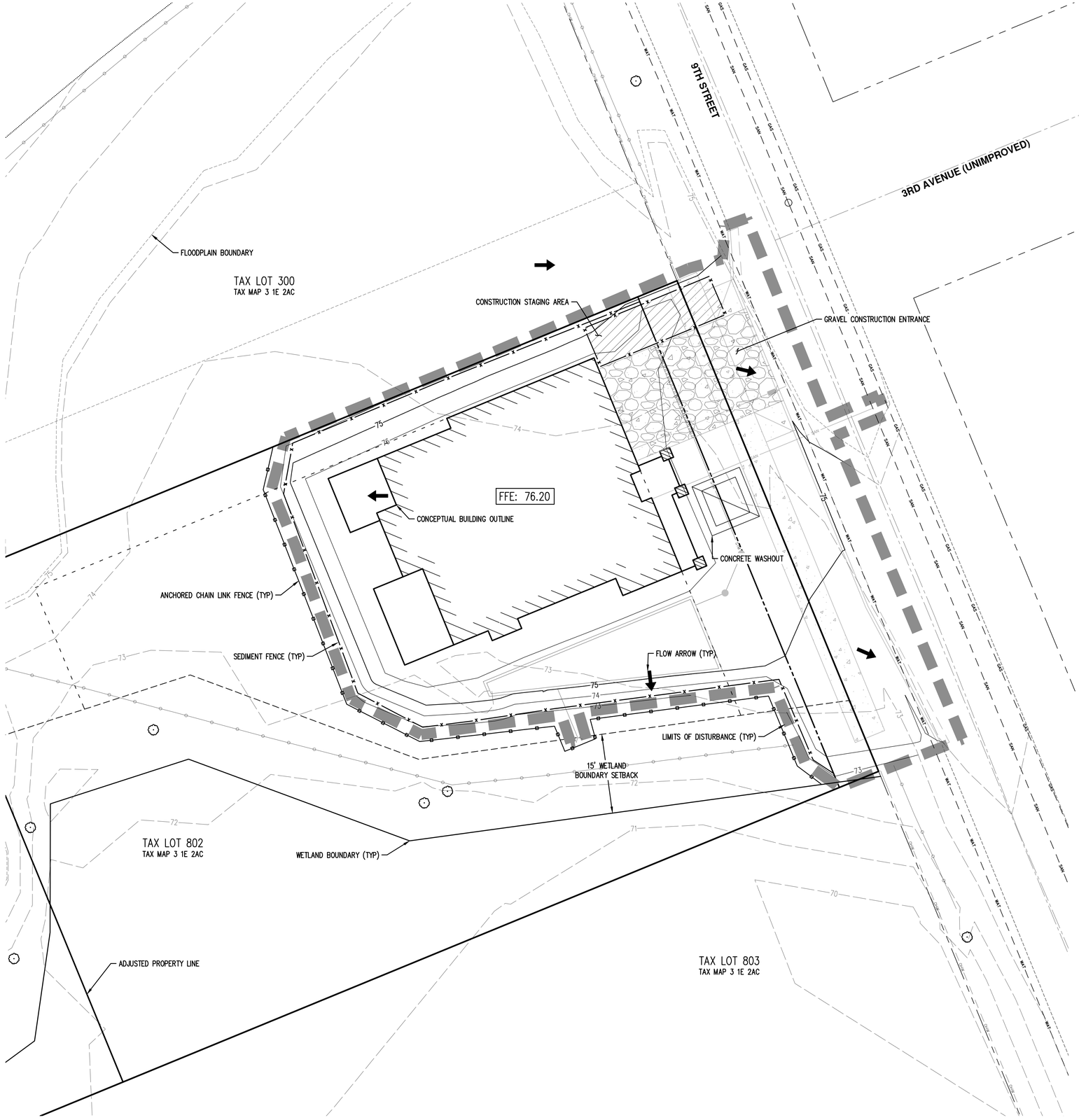
PRELIMINARY CUT AND FILL MAP
9TH STREET
CONSOLIDATED LAND USE APPLICATION
WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 13, 2007
CAMERON M. MORSE
RENEWAL DATE: 12/31/20

JOB NUMBER:	5926
DATE:	04/21/2020
DESIGNED BY:	APC & LTP
DRAWN BY:	APC
CHECKED BY:	JMM

P05

AKS DRAWING FILE: 5926 CUT MAP.DWG | LAYOUT: CUT



LEGEND

- EXISTING GROUND CONTOUR (1 FT)
- EXISTING GROUND CONTOUR (5 FT) — 350
- FINISHED GRADE CONTOUR (1 FT)
- FINISHED GRADE CONTOUR (5 FT) — 345
- SEDIMENT FENCE
- ANCHORED CHAIN LINK FENCE
- CONCRETE WASHOUT AREA
- DRAINAGE FLOW DIRECTION
- GRAVEL CONSTRUCTION ENTRANCE
- LIMITS OF DISTURBANCE

N

SCALE: 1" = 10 FEET

10 0 2 5 10

ORIGINAL PAGE SIZE: 22" x 34"

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CONSTRUCTION MANAGEMENT PLAN

9TH STREET CONSOLIDATED LAND USE APPLICATION

WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

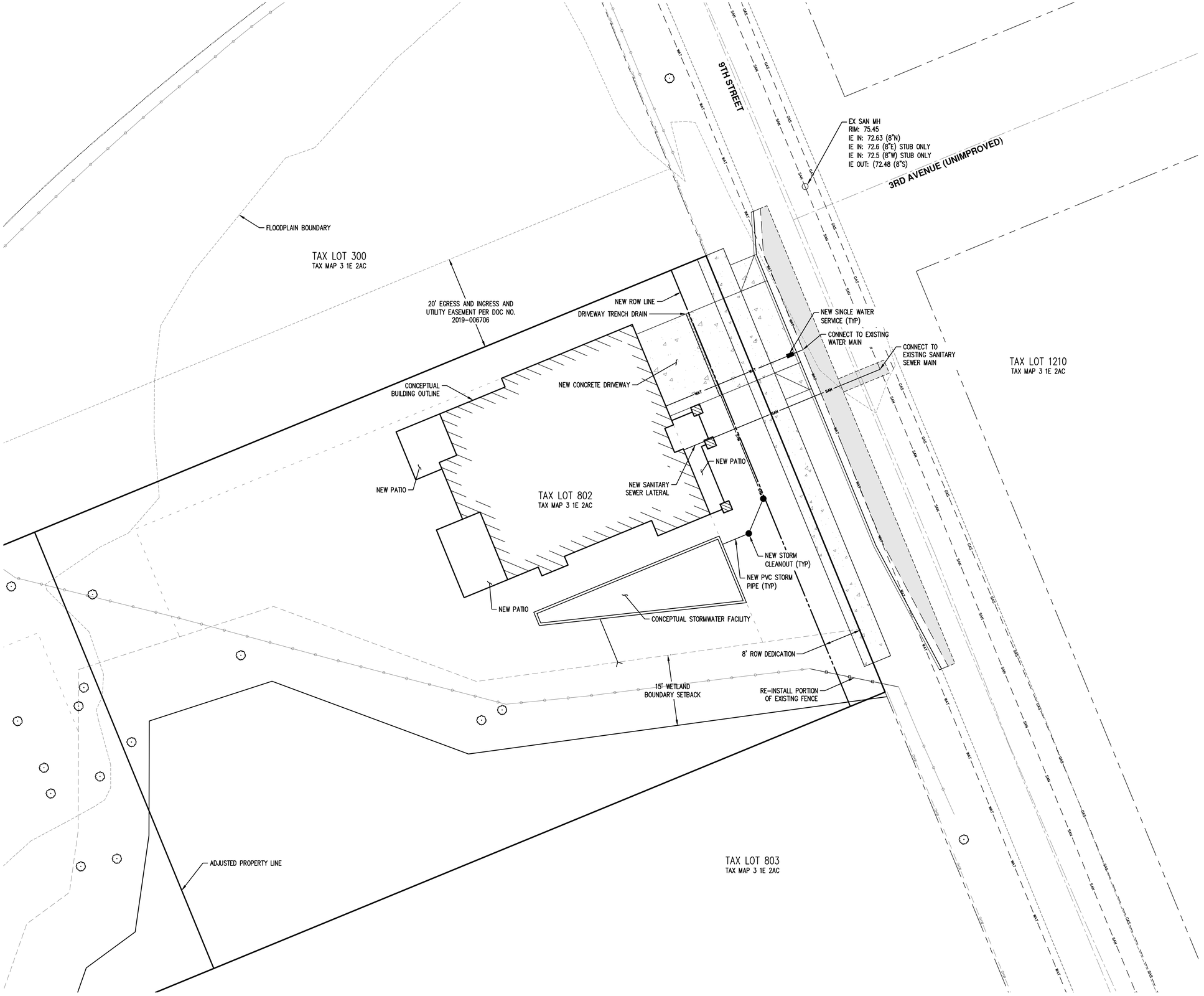
REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 12, 2005
COMMON M. MORSE

RENEWAL DATE: 12/31/20

JOB NUMBER:	5926
DATE:	04/21/2020
DESIGNED BY:	APC & LTP
DRAWN BY:	APC
CHECKED BY:	JMM

P06

AKS DRAWING FILE: 5926 CONST MNGMT.DWG | LAYOUT: P05



NOTES:

1. UTILITIES SHOWN ARE CONCEPTUAL AND FOR PLANNING PURPOSES ONLY.
2. DRIVEWAY LOCATION IS CONCEPTUAL AND FOR PLANNING PURPOSES ONLY.

N

SCALE: 1"=10 FEET

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ORIGINAL PAGE SIZE: 22" x 34"

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PRELIMINARY COMPOSITE UTILITY AND SITE PLAN

9TH STREET CONSOLIDATED LAND USE APPLICATION

WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

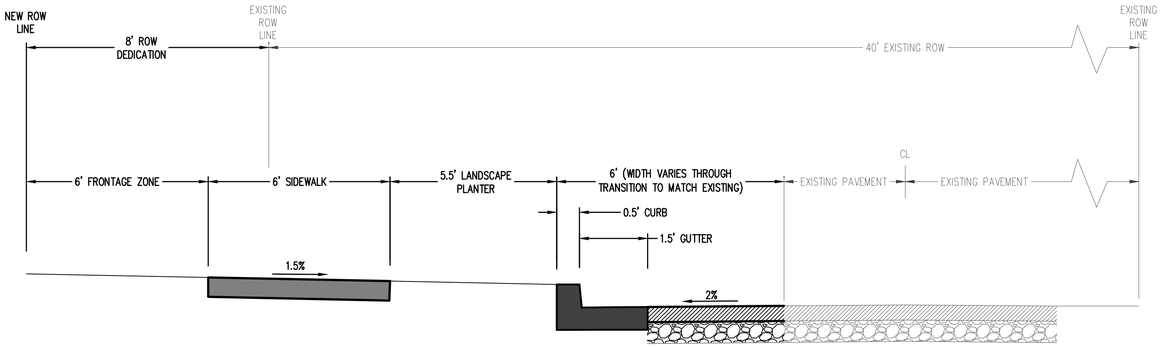
REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 15, 2014
JONATHON M. MORSE

RENEWAL DATE: 12/31/20

JOB NUMBER:	5926
DATE:	04/21/2020
DESIGNED BY:	APC & LTP
DRAWN BY:	APC
CHECKED BY:	JMM

P07

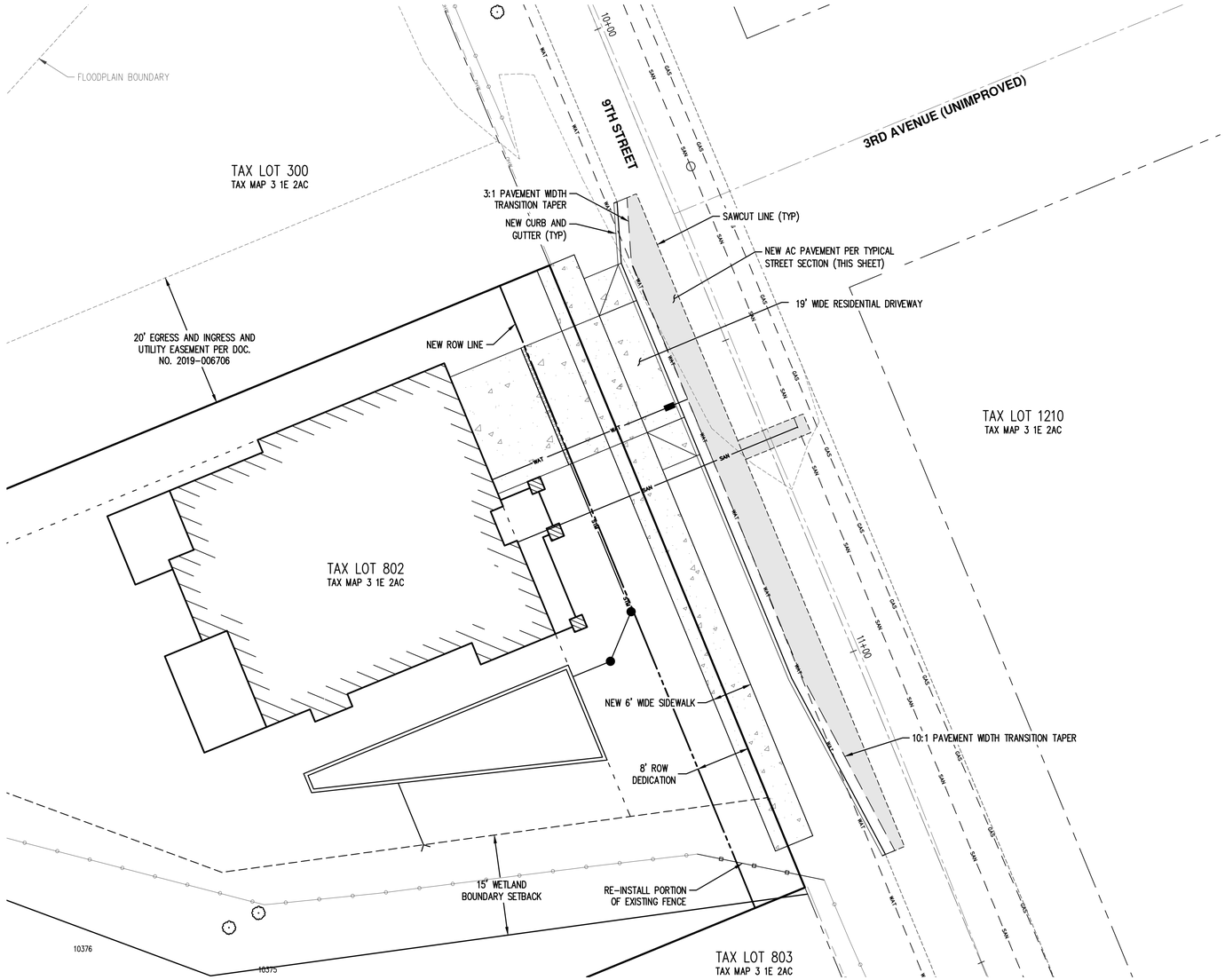
AKS DRAWING FILE: 5926 UTILITY.DWG | LAYOUT: P05

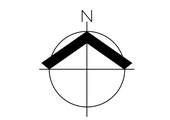


9TH STREET TYPICAL SECTION

STA. 10+00.00 – STA. 11+29.73

NOT TO SCALE





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PRELIMINARY STREET PLAN
9TH STREET
CONSOLIDATED LAND USE APPLICATION

WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 12, 2005
JOHN M. MORSE
RENEWAL DATE: 12/31/20

JOB NUMBER:	5926
DATE:	04/21/2020
DESIGNED BY:	APC & LTP
DRAWN BY:	APC
CHECKED BY:	JMM

P08

AKS DRAWING FILE: 5926 STREET.DWG | LAYOUT: P06

P09

JOB NUMBER: 5926
DATE: 04/21/2020
DESIGNED BY: APC & LTP
DRAWN BY: APC
CHECKED BY: JMM

RENEWAL DATE: 12/31/20

PRELIMINARY AERIAL PHOTOGRAPH PLAN
9TH STREET
CONSOLIDATED LAND USE APPLICATION
WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

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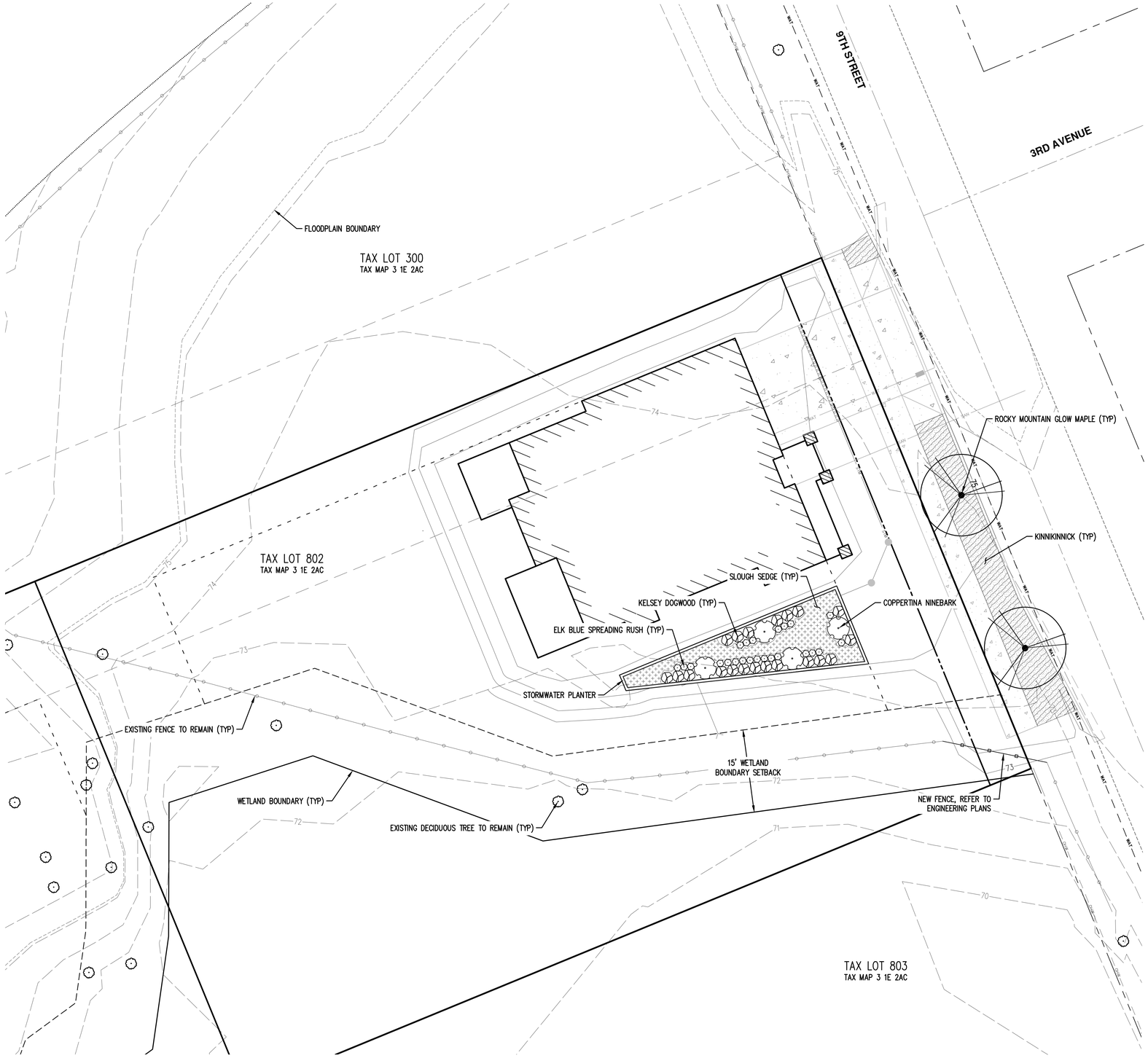


PRELIMINARY PLANT SCHEDULE - STREET TREES

STREET TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE/CONTAINER	SPACING
	2	ACER GRANDIDENTATUM 'SCHMIDT'	ROCKY MOUNTAIN GLOW MAPLE	2" CAL. B&B	AS SHOWN

GROUND COVERS	QTY	BOTANICAL NAME	COMMON NAME	SIZE/CONTAINER	SPACING
	98	ARCTOSTAPHYLOS UVA-URSI	KINNIKINNICK	1 GAL CONT	24" o.c.

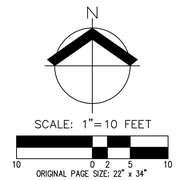
PRELIMINARY PLANT SCHEDULE - STORMWATER PLANTER

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE/CONTAINER	SPACING
	20	CORNUS SERICEA 'KELSEYI'	KELSEY DOGWOOD	1 GAL CONT.	24" o.c.
	4	PHYSOCARPUS OPULIFOLIUS 'COPPERTINA'	COPPERTINA NINEBARK	3 GAL CONT.	48" o.c.

HERBACEOUS PLANTS	QTY	BOTANICAL NAME	COMMON NAME	SIZE/CONTAINER	SPACING
	23	JUNCUS PATENS 'ELK BLUE'	SPREADING RUSH	1 GAL CONT.	15" o.c.
	103	CAREX OBNUPTA	SLOUGH SEDGE	1 GAL CONT	15" o.c.

GENERAL NOTES

1. PLANTING PLAN IS PRELIMINARY AND MEANT TO PORTRAY THE CHARACTER OF THE SITE LANDSCAPING. REVISIONS OR SUBSTITUTIONS TO PLANTINGS, INCLUDING CHANGES TO LOCATION, QUANTITIES, SPECIES, SIZES, SPACING, ETC. MAY BE MADE WHERE ALLOWED BY CITY OF WEST LINN DESIGN STANDARDS, PRIOR TO INSTALLATION.
2. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PLANT AND MATERIAL QUANTITIES. IF DISCREPANCIES OCCUR, DESIGN INTENT PREVAILS OVER QUANTITIES LISTED.
3. ALL PLANTS AND TREES INSTALLED WITHIN THE CITY OF WEST LINN SHALL CONFORM WITH AMERICAN STANDARDS FOR NURSERY STOCK, ANSI Z60.1 CURRENT EDITION IN ALL WAYS. PLANTS SHALL BE SOUND, HEALTHY, VIGOROUS, AND FREE OF PLANT DISEASE AND INSECT PESTS AND THEIR EGGS. CONTAINER STOCK SHALL BE GROWN FOR AT LEAST 8-MONTHS IN CONTAINERS IN WHICH DELIVERED AND SHALL NOT BE ROOT BOUND OR HAVE GIRDLING ROOTS. TREES SHALL NOT HAVE BEEN TOPPED OR HEADED. PLANTS AND TREES WITH BROKEN TOPS, BRANCHES OR INJURED TRUNKS SHALL BE REJECTED.
4. MULCH: APPLY 3" DEEP WELL-AGED MEDIUM GRIND OR SHREDDED DARK HEMLOCK BARK MULCH IN PLANTING BEDS, EXCLUDING STORMWATER PLANTER, TAKING CARE NOT TO COVER FOLIAGE OR BURY ROOT CROWNS OF PLANT MATERIAL.
5. ALL PLANTS AND PLANTINGS WITHIN THE STORMWATER PLANTER SHALL CONFORM TO STORMWATER DESIGN STANDARDS AS ADOPTED BY CITY OF WEST LINN AND TO AMERICAN NURSERY STANDARDS (ANSI Z60.1). PLANTINGS SHOULD PREFERABLY BE INSTALLED BETWEEN FEBRUARY 1 AND MAY 1 OR BETWEEN OCTOBER 1 AND NOVEMBER 15. IF PLANTING OCCURS DURING OTHER TIMES OF THE YEAR, ADDITIONAL MEASURES, SUCH AS DEEP WATERING, MAY BE NECESSARY TO ENSURE PLANT SURVIVAL.
6. SOIL PLACEMENT AND PLANTING SHALL OCCUR IN CONDITIONS THAT DO NOT RESULT IN OVER-COMPACTION OR EROSION, SATURATED SOIL OR OTHER CONDITIONS SUCH AS FREEZING OR ABOVE AVERAGE TEMPERATURES, RAINY CONDITIONS, ETC. SOIL SHALL BE IN FRIABLE (WORKABLE) CONDITION WHEN PLACED. FINISH GRADE OF NEW PLANTING AREAS SHALL SEAMLESSLY MEET FINISH GRADE SET IN GRADING PLANS.
7. TEMPORARY IRRIGATION HAND WATERING, OR OTHER METHODS OF IRRIGATION FOR NEW PLANTS SHALL BE PROVIDED FOR 2 YEARS OR UNTIL ESTABLISHED.
8. STORMWATER PLANTER IS TO BE MAINTAINED IN GOOD CONDITION, FREE OF WEEDS AND OTHER INVASIVE SPECIES.



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PRELIMINARY STREET TREE AND STORMWATER FACILITY PLANTING PLAN

9TH STREET CONSOLIDATED LAND USE APPLICATION

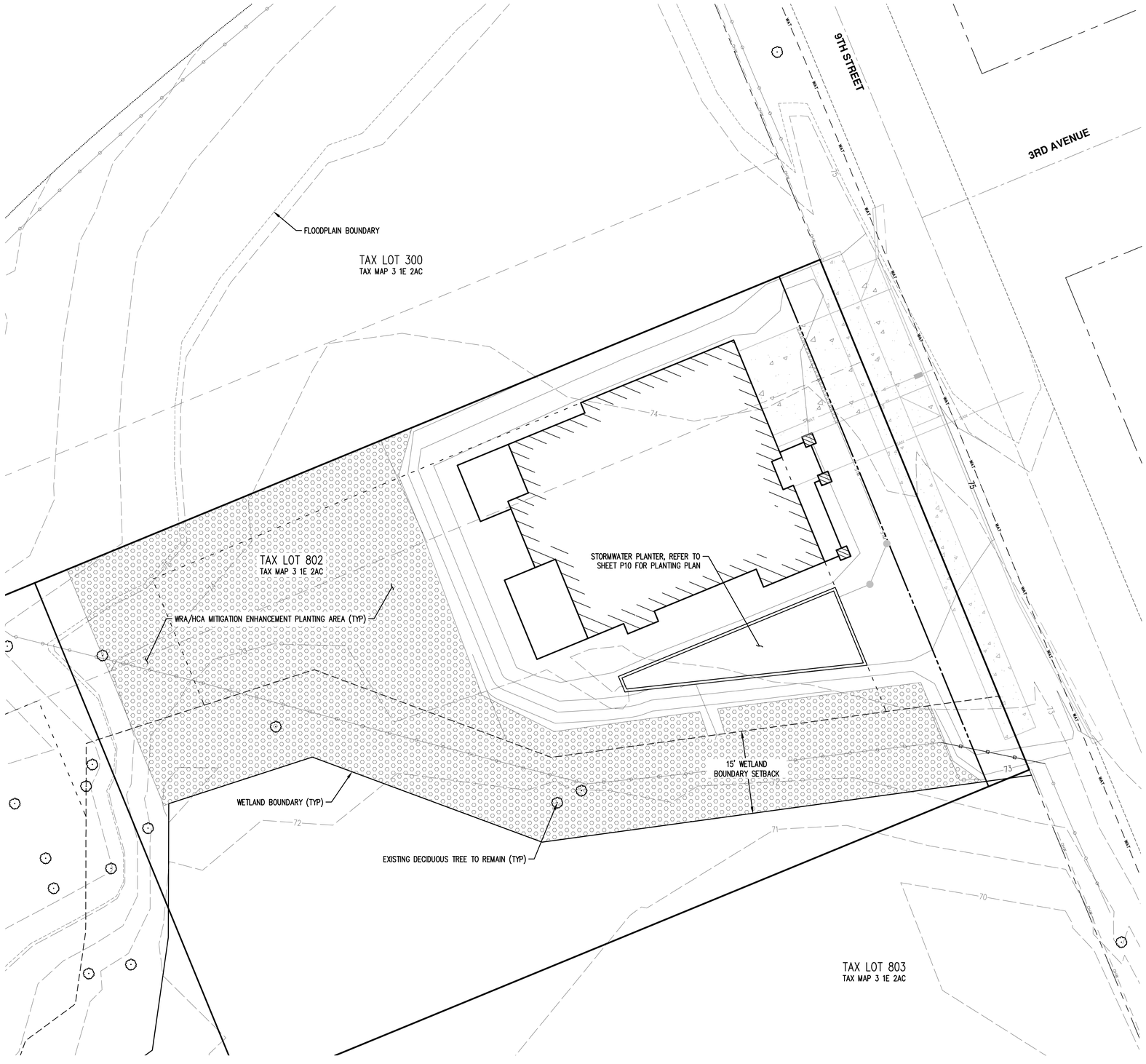
WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

REGISTERED LANDSCAPE ARCHITECT
OREGON
HEATHER BAUMAN
10/27/19
PRELIMINARY NOT FOR CONSTRUCTION

JOB NUMBER:	5926
DATE:	04/21/2020
DESIGNED BY:	TEB
DRAWN BY:	TEB
CHECKED BY:	KAH/TEB

P10

AKS DRAWING FILE: 5926 LANDSCAPE.DWG | LAYOUT: P10



Tax Lots 800 & 803 West Linn – WRA/HCA Mitigation Enhancement Planting Specifications

Planting specifications for the enhancement of 5,000 square feet of on-site enhancement area.

Scientific Name	Common Name	Size*	Spacing/Seeding Rate	Quantity
Trees (total 50)				
Alnus rubra	red alder	1 gallon	8-12 feet on center	25
Populus balsamifera	Balsam poplar	1 gallon	8-12 feet on center	25
Shrubs (total 250)				
Acer circinatum	vine maple	1 gallon	4-5 feet on center	50
Holodiscus discolor	oceanspray	1 gallon	4-5 feet on center	50
Sambucus racemose	red elderberry	1 gallon	4-5 feet on center	50
Symphoricarpos albus	snowberry	1 gallon	4-5 feet on center	50
Rosa gymnocarpa	baldhip rose	1 gallon	4-5 feet on center	50
Seed Mix				
Agrostis exarata	spike bent grass	seed	1 lb pls/acre	As needed for bare-soil
Glyceria elata	tall manna-grass	seed	2 lbs pls/acre	areas >25 square feet

**Bare-root plants may be substituted for container plants based on availability. If bare-root plants are used, they must be planted during the late winter/early spring dormancy period.*

Planting Notes (per City of West Linn Community Development Code (CDC) Chapter 32, Water Resource Area Protection, Section 32.100, Re-Vegetation Plan Requirements):

1) Plantings should preferably be installed between December 1 and February 28 for bare roots and seeds and between October 15 and April 30 for containers.

2) Tree plantings must be at least 0.5 inches in caliper measured at 6 inches above the ground level or soil line. Shrub plantings must be in at least a 1-gallon container, or the equivalent in ball and burlap, and must be at least 12 inches in height. All plantings must be selected from the Portland Plant List.

3) All non-native, invasive, or noxious vegetation shall be removed from mitigation planting area prior to installing native enhancement plantings. Invasive species control shall continue throughout the maintenance period.

4) Irrigation may be necessary for the survival of the enhancement plantings. Irrigation or other water practices (i.e., polymer plus watering) are recommended during the three-year monitoring period following planting. Watering shall be provided at a rate of at least 1 inch per week between June 15 and October 15.

5) Plantings shall be mulched a minimum of 3 inches in depth and 18 inches in diameter to retain moisture and discourage weed growth around newly installed plant material.

6) When weather or other conditions prohibit planting according to schedule, the applicant will ensure that disturbed areas are correctly protected with erosion control measures and provide the City with funds in the amount of 125% of a bid from a recognized landscaper or nursery to cover the cost of the plant materials, installation, and any follow-up maintenance. Once the planting conditions are favorable, the applicant will proceed with the plantings and receive the funds back from the City upon completion, or the City will complete the plantings using those funds.

7) Temporarily disturbed portions of lot 803 (necessary to balance fill on lot 802) will be restored and revegetated per 32.090.A

Maintenance and Monitoring Plan

1) **Monitoring and Reporting:** The City requires a three-year maintenance period for the WRA mitigation enhancement area. Monitoring of the mitigation site is the ongoing responsibility of the property owner. Plants that die must be replaced in kind.

2) **Plant Survival:** The City's success criterion for WRA enhancement is 80% survival of tree and shrub plantings expected by the third anniversary of the date the mitigation planting was installed. If any mortality is noted on the site, the factor likely to have caused mortality of the plantings is to be determined and corrected if possible. If survival falls below 80% at any time during the three-year maintenance period, the plantings shall be replaced and other corrective measures, such as mulching or irrigation, may need to be implemented.

N

SCALE: 1"=10 FEET

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ORIGINAL PAGE SIZE: 22" x 34"

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TUALATIN, OR 97062
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PRELIMINARY WRA-HCA MITIGATION ENHANCEMENT PLANTING PLAN

9TH STREET CONSOLIDATED LAND USE APPLICATION

WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

REGISTERED LANDSCAPE ARCHITECT
OREGON
PRELIMINARY NOT FOR CONSTRUCTION
04/21/19

JOB NUMBER:	5926
DATE:	04/21/2020
DESIGNED BY:	TEB
DRAWN BY:	TEB
CHECKED BY:	KAH/TEB

P11

AKS DRAWING FILE: 5926 LANDSCAPE.DWG | LAYOUT: P11

Attachment D: Certified Engineer Letter

April 16, 2020

Darren Wyss
Associate Planner
City of West Linn
22500 Salamo Road
West Linn, OR 97068

RE: WAP-20-01/WRG-20-01/MIS-20-01/LLA-20-01 Floodplain Carrying Capacity

Darren

This letter is intended to provide preliminary certification that the conceptual improvements associated with the above-mentioned application will maintain flood storage and conveyance capacity and not increase design flood elevations.

The subject site consists of Tax Lots 800, 802, and 803, Clackamas County Assessor's Map 3 1E 2AC, located approximately 500 feet north of the intersection of Volpp Street and 9th Street in West Linn. The site topography generally slopes toward the wetland in the central area of the site with slopes varying from 0% to ±25%. The floodplain boundary was determined per FEMA Flood Insurance Rate Map 41005C0259D with a base flood elevation of 75.1 feet (NAVD88), and portions of the property below the base flood elevation are in zone AE. The floodplain boundary running through the northern portion of the site was located based on a topographic survey performed by AKS Engineering & Forestry May 16-17, 2017.

Based on a preliminary cut/fill analysis, the conceptual site improvements will achieve a balanced cut/fill condition within the floodplain. Any new fills associated with on-site improvements that fall within the floodplain will be offset by cuts located on the south side of Tax Lot 803.

During the building permit application process, the new home's crawlspace will be designed per all applicable FEMA and City of West Linn requirements for improvements within the floodplain. A final cut/fill analysis will be performed at this time to verify that improvements within the floodplain will result in a net cut/fill balance.

Please let me know if you have any questions.

Sincerely,

AKS ENGINEERING & FORESTRY, LLC

Jonathon Morse, PE
12965 SW Herman Road, Suite 100
Tualatin, OR 97062
503-563-6151 | jonm@aks-eng.com

REGISTERED PROFESSIONAL ENGINEER
77922PE
OREGON
JANUARY 12, 2010
JONATHON M. MORSE

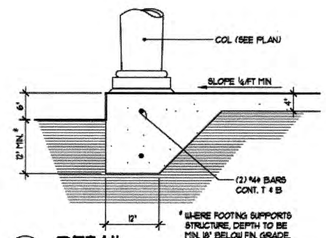
RENEWAL DATE: 12/31/20

Attachment E: Preliminary Foundation Plan

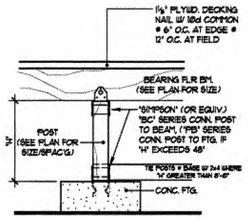
ISOLATED FOOTING SCHEDULE

TAG	PAD SIZE	REINFORCING	MAX. BRG
-	18" DIA. x 7"	N.A.	2,474 #
F20	20"x20"x10"	N.A.	3,898 #
F24	24"x24"x12"	N.A.	5,409 #
F28	28"x28"x14"	N.A.	7,211 #
F30	30"x30"x15"	N.A.	8,283 #
F36	36"x36"x15"	(4) #4 BARS @ 7" O.C. EW	12,803 #
F42	# 42"x42"x12"	(5) #4 BARS @ 8" O.C. EW	16,337 #
F48	## 48"x48"x12"	(6) #4 BARS @ 9" O.C. EW	21,600 #
FB4	### 54"x54"x12"	(6) #4 BARS @ 9" O.C. EW	27,337 #
F60	### 60"x60"x12"	(7) #4 BARS @ 9" O.C. EW	33,750 #

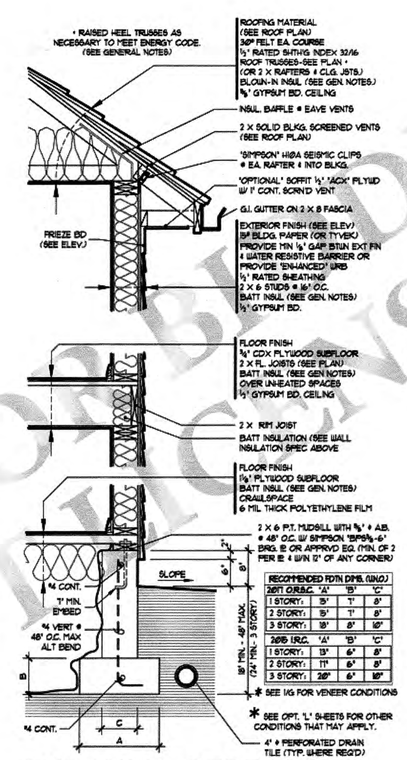
A56/PED MIN. 4x4 #2 D.F. COLUMN (U.N.O. - SEE PLANS)
6x6 #2 D.F. COLUMN FOR MAX. BRG.
3½"x3½" PSL COLUMN FOR MAX. BRG. (OR 6x6 TO 18,521 #)
5¼"x5¼" PSL COLUMN FOR MAX. BRG.
(SEE POST-CONN. DETAIL) SOIL B.P.=1500 PSF



1 DETAIL
SCALE : 3/4" = 1'-0"



POST & BM. CONN.
3/4" = 1'-0" PBCONN2

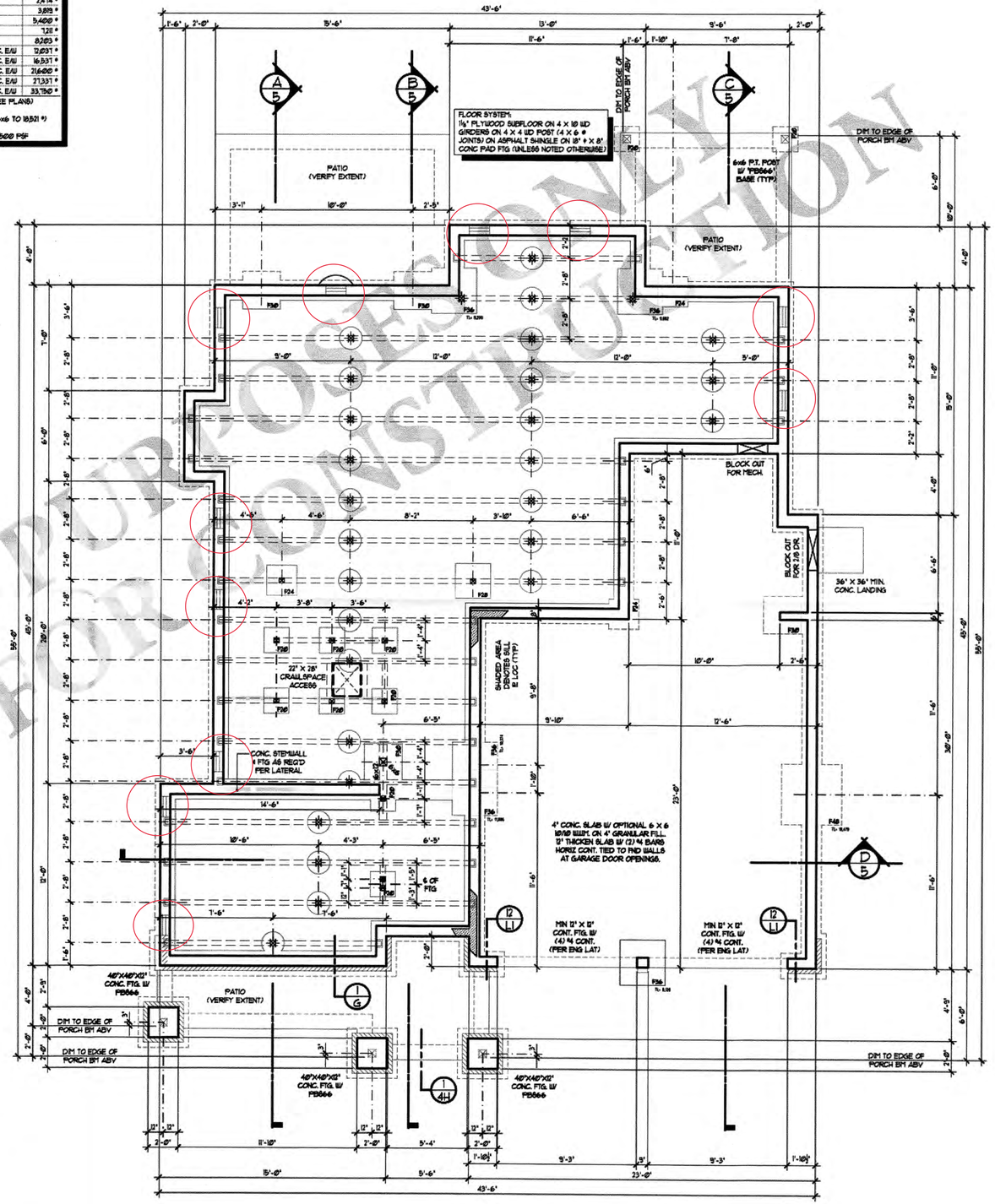


RECOMMENDED FDTN DIMS. (UNO)			
2011 O.R.S.C.	"A"	"B"	"C"
1 STORY:	15"	7"	8"
2 STORY:	15"	7"	8"
3 STORY:	18"	8"	10"
2015 I.R.C.	"A"	"B"	"C"
1 STORY:	13"	6"	8"
2 STORY:	17"	6"	8"
3 STORY:	20"	6"	10"

* SEE I/G FOR VENEER CONDITIONS

* SEE OPT. 'L' SHEETS FOR OTHER CONDITIONS THAT MAY APPLY.

TYP. WALL SECTION
SCALE : 3/4" = 1'-0" REV. 01/04/18 2PRSWSOP



FOUNDATION PLAN
SCALE : 1/4" = 1'-0"

REFER TO ENGINEERING SHEETS FOR LATERAL SPECIFICATIONS PRIOR TO CONSTRUCTION

Mascord COLLECTION
ALAN MASCORD DESIGN ASSOCIATES, INC.
1337 NW REED ST, SUITE 100 PORTLAND, OR 97209 503/295-9151 FAX: 503/961-1921
http://www.mascord.com

2230CE-4H-ESLINGER-2
PROJECT MANAGER:MHS
DRAWN 02/16/18 RJV

RESIDENCE FOR:
ESLINGER HOMES 2
6040 LARKVIEW BLVD.
LAKE OSWEGO, OREGON.

25# SNOW LOAD

UPPER FLOOR	1435 SQ. FT.	
MAIN FLOOR	1205 SQ. FT.	
TOTAL AREA	2640 SQ. FT.	
GARAGE AREA		+ 648 SQ. FT.

2230CE
4 H

Attachment F: Revised Pre-Construction Elevation Certificate

U.S. DEPARTMENT OF HOMELAND SECURITY
Federal Emergency Management Agency
National Flood Insurance Program

OMB No. 1660-0008
Expiration Date: November 30, 2022

ELEVATION CERTIFICATE

Important: Follow the instructions on pages 1–9.

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

SECTION A – PROPERTY INFORMATION

FOR INSURANCE COMPANY USE

A1. Building Owner's Name
Malibar Group, LLC

Policy Number:

A2. Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No.
No Site Address

Company NAIC Number:

City	State	ZIP Code
West Linn	Oregon	97068

A3. Property Description (Lot and Block Numbers, Tax Parcel Number, Legal Description, etc.)
Tax Lot 802, Clackamas County Tax Map 3 1E 2AC

A4. Building Use (e.g., Residential, Non-Residential, Addition, Accessory, etc.) Residential

A5. Latitude/Longitude: Lat. 45.342073 Long. -122.647541 Horizontal Datum: ☐ NAD 1927 ☒ NAD 1983

A6. Attach at least 2 photographs of the building if the Certificate is being used to obtain flood insurance.

A7. Building Diagram Number 8

A8. For a building with a crawlspace or enclosure(s):

a) Square footage of crawlspace or enclosure(s) 1207.00 sq ft

b) Number of permanent flood openings in the crawlspace or enclosure(s) within 1.0 foot above adjacent grade 11

c) Total net area of flood openings in A8.b 1300.00 sq in

d) Engineered flood openings? ☒ Yes ☐ No

A9. For a building with an attached garage:

a) Square footage of attached garage 659.00 sq ft

b) Number of permanent flood openings in the attached garage within 1.0 foot above adjacent grade 0

c) Total net area of flood openings in A9.b 0.00 sq in

d) Engineered flood openings? ☐ Yes ☒ No

SECTION B – FLOOD INSURANCE RATE MAP (FIRM) INFORMATION

B1. NFIP Community Name & Community Number	B2. County Name	B3. State
City of West Linn 410024	Clackamas County	Oregon

B4. Map/Panel Number	B5. Suffix	B6. FIRM Index Date	B7. FIRM Panel Effective/ Revised Date	B8. Flood Zone(s)	B9. Base Flood Elevation(s) (Zone AO, use Base Flood Depth)
41005C0259	D	01-18-2019	06-17-2008	AE	75.1

B10. Indicate the source of the Base Flood Elevation (BFE) data or base flood depth entered in Item B9:
☒ FIS Profile ☐ FIRM ☐ Community Determined ☐ Other/Source:

B11. Indicate elevation datum used for BFE in Item B9: ☐ NGVD 1929 ☒ NAVD 1988 ☐ Other/Source:

B12. Is the building located in a Coastal Barrier Resources System (CBRS) area or Otherwise Protected Area (OPA)? ☐ Yes ☒ No

Designation Date: ☐ CBRS ☐ OPA

ELEVATION CERTIFICATE

OMB No. 1660-0008
Expiration Date: November 30, 2022

IMPORTANT: In these spaces, copy the corresponding information from Section A.			FOR INSURANCE COMPANY USE
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. No Site Address			Policy Number:
City West Linn	State Oregon	ZIP Code 97068	Company NAIC Number

SECTION C – BUILDING ELEVATION INFORMATION (SURVEY REQUIRED)

C1. Building elevations are based on: ☒ Construction Drawings* ☐ Building Under Construction* ☐ Finished Construction

*A new Elevation Certificate will be required when construction of the building is complete.

C2. Elevations – Zones A1–A30, AE, AH, A (with BFE), VE, V1–V30, V (with BFE), AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO. Complete Items C2.a–h below according to the building diagram specified in Item A7. In Puerto Rico only, enter meters.

Benchmark Utilized: NGS NO. RD1501 Vertical Datum: NAVD 88

Indicate elevation datum used for the elevations in items a) through h) below.

☐ NGVD 1929 ☒ NAVD 1988 ☐ Other/Source: _____

Datum used for building elevations must be the same as that used for the BFE.

		Check the measurement used.	
a) Top of bottom floor (including basement, crawlspace, or enclosure floor)	74.2	☒ feet	☐ meters
b) Top of the next higher floor	76.2	☒ feet	☐ meters
c) Bottom of the lowest horizontal structural member (V Zones only)	N/A	☐ feet	☐ meters
d) Attached garage (top of slab)	74.2	☒ feet	☐ meters
e) Lowest elevation of machinery or equipment servicing the building (Describe type of equipment and location in Comments)	76.2	☒ feet	☐ meters
f) Lowest adjacent (finished) grade next to building (LAG)	74.2	☒ feet	☐ meters
g) Highest adjacent (finished) grade next to building (HAG)	75.7	☒ feet	☐ meters
h) Lowest adjacent grade at lowest elevation of deck or stairs, including structural support	N/A	☐ feet	☐ meters

SECTION D – SURVEYOR, ENGINEER, OR ARCHITECT CERTIFICATION

This certification is to be signed and sealed by a land surveyor, engineer, or architect authorized by law to certify elevation information. *I certify that the information on this Certificate represents my best efforts to interpret the data available. I understand that any false statement may be punishable by fine or imprisonment under 18 U.S. Code, Section 1001.*

Were latitude and longitude in Section A provided by a licensed land surveyor? ☒ Yes ☐ No ☐ Check here if attachments.

Certifier's Name Benjamin Huff	License Number 84738PLS	
Title Land Surveyor		
Company Name AKS Engineering and Forestry		
Address 12965 SW Herman Road, Suite 100		
City Tualatin	State Oregon	ZIP Code 97062

REGISTERED PROFESSIONAL LAND SURVEYOR

Benjamin R. Huff

OREGON
MARCH 14, 2017
BENJAMIN R HUFF
84738PLS
RENEWS: 6/30/21

Signature	Date	Telephone	Ext.
Benjamin R. Huff	04-13-2020	(503) 563-6151	212

Copy all pages of this Elevation Certificate and all attachments for (1) community official, (2) insurance agent/company, and (3) building owner.

Comments (including type of equipment and location, per C2(e), if applicable)

*This pre-construction elevation certificate is to be included in a Consolidated Land Use Application. Values reported in this certificate were taken from the consolidated land us application plan-set, and are subject to change upon final engineering design.

*This certificate assumes 9 standard vents will be installed, covering 100 square feet of net area each, and 2 engineered vents will be installed, covering 200 square feet of net area each, for a total of 1300 square feet of coverage area.

ELEVATION CERTIFICATE

OMB No. 1660-0008
Expiration Date: November 30, 2022

IMPORTANT: In these spaces, copy the corresponding information from Section A.			FOR INSURANCE COMPANY USE
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. No Site Address			Policy Number:
City West Linn	State Oregon	ZIP Code 97068	Company NAIC Number

SECTION E – BUILDING ELEVATION INFORMATION (SURVEY NOT REQUIRED) FOR ZONE AO AND ZONE A (WITHOUT BFE)

For Zones AO and A (without BFE), complete Items E1–E5. If the Certificate is intended to support a LOMA or LOMR-F request, complete Sections A, B,and C. For Items E1–E4, use natural grade, if available. Check the measurement used. In Puerto Rico only, enter meters.

E1. Provide elevation information for the following and check the appropriate boxes to show whether the elevation is above or below the highest adjacent grade (HAG) and the lowest adjacent grade (LAG).

a) Top of bottom floor (including basement, crawlspace, or enclosure) is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

b) Top of bottom floor (including basement, crawlspace, or enclosure) is _____ ☐ feet ☐ meters ☐ above or ☐ below the LAG.

E2. For Building Diagrams 6–9 with permanent flood openings provided in Section A Items 8 and/or 9 (see pages 1–2 of Instructions), the next higher floor (elevation C2.b in the diagrams) of the building is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E3. Attached garage (top of slab) is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E4. Top of platform of machinery and/or equipment servicing the building is _____ ☐ feet ☐ meters ☐ above or ☐ below the HAG.

E5. Zone AO only: If no flood depth number is available, is the top of the bottom floor elevated in accordance with the community's floodplain management ordinance? ☐ Yes ☐ No ☐ Unknown. The local official must certify this information in Section G.

SECTION F – PROPERTY OWNER (OR OWNER'S REPRESENTATIVE) CERTIFICATION

The property owner or owner's authorized representative who completes Sections A, B, and E for Zone A (without a FEMA-issued or community-issued BFE) or Zone AO must sign here. The statements in Sections A, B, and E are correct to the best of my knowledge.

Property Owner or Owner's Authorized Representative's Name			
Address	City	State	ZIP Code
Signature	Date	Telephone	

Comments

☐ Check here if attachments.

ELEVATION CERTIFICATE

OMB No. 1660-0008
Expiration Date: November 30, 2022

IMPORTANT: In these spaces, copy the corresponding information from Section A.			FOR INSURANCE COMPANY USE
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. No Site Address			Policy Number:
City West Linn	State Oregon	ZIP Code 97068	Company NAIC Number

SECTION G – COMMUNITY INFORMATION (OPTIONAL)

The local official who is authorized by law or ordinance to administer the community's floodplain management ordinance can complete Sections A, B, C (or E), and G of this Elevation Certificate. Complete the applicable item(s) and sign below. Check the measurement used in Items G8–G10. In Puerto Rico only, enter meters.

G1. ☐ The information in Section C was taken from other documentation that has been signed and sealed by a licensed surveyor, engineer, or architect who is authorized by law to certify elevation information. (Indicate the source and date of the elevation data in the Comments area below.)

G2. ☐ A community official completed Section E for a building located in Zone A (without a FEMA-issued or community-issued BFE) or Zone AO.

G3. ☐ The following information (Items G4–G10) is provided for community floodplain management purposes.

G4. Permit Number	G5. Date Permit Issued	G6. Date Certificate of Compliance/Occupancy Issued

G7. This permit has been issued for: ☐ New Construction ☐ Substantial Improvement

G8. Elevation of as-built lowest floor (including basement) of the building: _____ ☐ feet ☐ meters Datum _____

G9. BFE or (in Zone AO) depth of flooding at the building site: _____ ☐ feet ☐ meters Datum _____

G10. Community's design flood elevation: _____ ☐ feet ☐ meters Datum _____

Local Official's Name	Title
Community Name	**Telephone**
Signature	**Date**

Comments (including type of equipment and location, per C2(e), if applicable)

☐ Check here if attachments.

ELEVATION CERTIFICATE

BUILDING PHOTOGRAPHS

See Instructions for Item A6.

OMB No. 1660-0008
Expiration Date: November 30, 2022

IMPORTANT: In these spaces, copy the corresponding information from Section A.			FOR INSURANCE COMPANY USE
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. No Site Address			Policy Number:
City West Linn	State Oregon	ZIP Code 97068	Company NAIC Number

If using the Elevation Certificate to obtain NFIP flood insurance, affix at least 2 building photographs below according to the instructions for Item A6. Identify all photographs with date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8. If submitting more photographs than will fit on this page, use the Continuation Page.

Photo One

Photo One

Photo One Caption

Clear Photo One

Photo Two

Photo Two

Photo Two Caption

Clear Photo Two

ELEVATION CERTIFICATE

BUILDING PHOTOGRAPHS

Continuation Page

OMB No. 1660-0008
Expiration Date: November 30, 2022

IMPORTANT: In these spaces, copy the corresponding information from Section A.			FOR INSURANCE COMPANY USE
Building Street Address (including Apt., Unit, Suite, and/or Bldg. No.) or P.O. Route and Box No. No Site Address			Policy Number:
City West Linn	State Oregon	ZIP Code 97068	Company NAIC Number

If submitting more photographs than will fit on the preceding page, affix the additional photographs below. Identify all photographs with: date taken; "Front View" and "Rear View"; and, if required, "Right Side View" and "Left Side View." When applicable, photographs must show the foundation with representative examples of the flood openings or vents, as indicated in Section A8.

Photo Three

Photo Three

Photo Three Caption

Clear Photo Three

Photo Four

Photo Four

Photo Four Caption

Clear Photo Four

Attachment G: WRA/HCA Mitigation Enhancement Planting Specifications

Tax Lots 800 & 803 West Linn –
WRA/HCA Mitigation Enhancement Planting Specifications

Planting specifications for the enhancement of 5,000 square feet of on-site enhancement area.

Scientific Name	Common Name	Size*	Spacing/Seeding Rate	Quantity
Trees (total 50)				
Alnus rubra	red alder	1 gallon	8-12 feet on center	25
Populus balsamifera	Balsam poplar	1 gallon	8-12 feet on center	25
Shrubs (total 250)				
Acer circinatum	vine maple	1 gallon	4-5 feet on center	50
Holodiscus discolor	oceanspray	1 gallon	4-5 feet on center	50
Sambucus racemose	red elderberry	1 gallon	4-5 feet on center	50
Symphoricarpos albus	snowberry	1 gallon	4-5 feet on center	50
Rosa gymnocarpa	baldhip rose	1 gallon	4-5 feet on center	50
Seed Mix				
Agrostis exarata	spike bent grass	seed	1 lb pls/acre	As needed for bare-soil areas >25 square feet
Glyceria elata	tall manna-grass	seed	2 lbs pls/acre	

**Bare-root plants may be substituted for container plants based on availability. If bare-root plants are used, they must be planted during the late winter/early spring dormancy period.*

Planting Notes (per City of West Linn Community Development Code (CDC) Chapter 32, Water Resource Area Protection, Section 32.100, Re-Vegetation Plan Requirements):

1) Plantings should preferably be installed between December 1 and February 28 for bare roots and seeds and between October 15 and April 30 for containers.

2) Tree plantings must be at least 0.5 inches in caliper measured at 6 inches above the ground level or soil line. Shrub plantings must be in at least a 1-gallon container, or the equivalent in ball and burlap, and must be at least 12 inches in height. All plantings must be selected from the Portland Plant List.

3) All non-native, invasive, or noxious vegetation shall be removed from mitigation planting area prior to installing native enhancement plantings. Invasive species control shall continue throughout the maintenance period.

4) Irrigation may be necessary for the survival of the enhancement plantings. Irrigation or other water practices (i.e., polymer plus watering) are recommended during the three-year monitoring period following planting. Watering shall be provided at a rate of at least 1 inch per week between June 15 and October 15.

5) Plantings shall be mulched a minimum of 3 inches in depth and 18 inches in diameter to retain moisture and discourage weed growth around newly installed plant material.

6) When weather or other conditions prohibit planting according to schedule, the applicant will ensure that disturbed areas are correctly protected with erosion control measures and provide the City with funds in the amount of 125% of a bid from a recognized landscaper or nursery to cover the cost of the plant materials, installation, and any follow-up maintenance. Once the

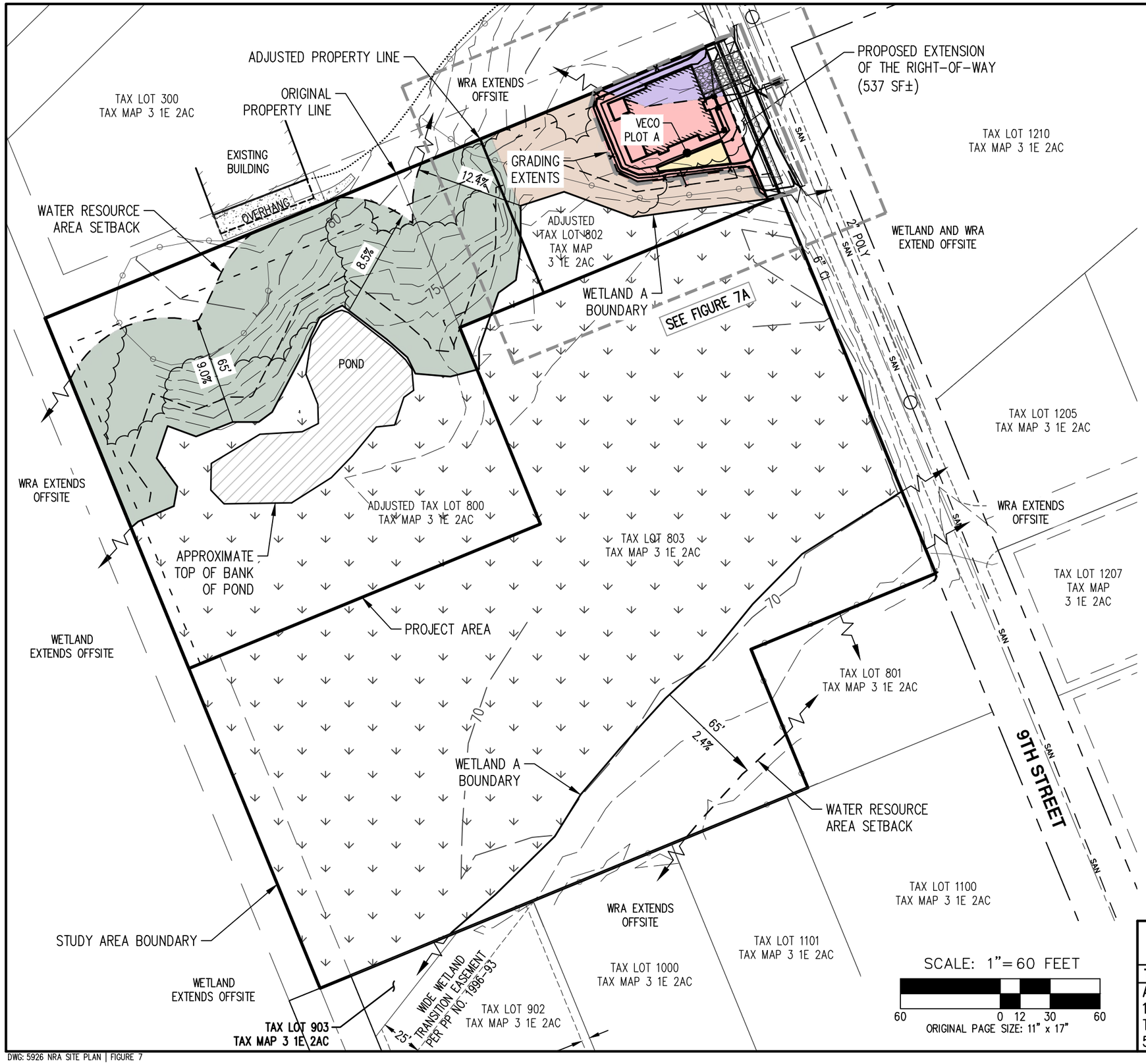
planting conditions are favorable, the applicant will proceed with the plantings and receive the funds back from the City upon completion, or the City will complete the plantings using those funds.

7) Temporarily disturbed portions of lot 803 (necessary to balance fill on lot 802) will be restored and revegetated per 32.090.A

Maintenance and Monitoring Plan

1) **Monitoring and Reporting:** The City requires a three-year maintenance period for the WRA mitigation enhancement area. Monitoring of the mitigation site is the ongoing responsibility of the property owner. Plants that die must be replaced in kind.

2) **Plant Survival:** The City's success criterion for WRA enhancement is 80% survival of tree and shrub plantings expected by the third anniversary of the date the mitigation planting was installed. If any mortality is noted on the site, the factor likely to have caused mortality of the plantings is to be determined and corrected if possible. If survival falls below 80% at any time during the three-year maintenance period, the plantings shall be replaced and other corrective measures, such as mulching or irrigation, may need to be implemented.



LEGEND:

- WETLAND A AREA TO REMAIN WITHIN STUDY AREA: 116,431 SF± (2.67 ACRES±)
- APPROXIMATE POND AREA WITHIN WETLAND A TO REMAIN: 6,368 SF± (0.15 ACRES±)

TOTAL WETLAND A AREA INCLUDING POND: 122,799 SF± (2.82 ACRES±)

- WATER RESOURCE AREA (WRA) PERMANENT IMPACTS: 3,588 SF± (0.08 ACRES±)
- WATER RESOURCE AREA (WRA) TEMPORARY IMPACTS: 389 SF± (0.01 ACRES±)
- NATIVE PLANTING MITIGATION AREA: 5,000 SF± (0.11 ACRES±)
- WRA/MODERATE VALUE HCA TO REMAIN WITHIN PROJECT AREA: 24,464 SF± (0.56 ACRES±)

TOTAL WRA IN PROJECT AREA (EXCLUDING PROPOSED RIGHT-OF-WAY EXTENSION AREA): 33,441 SF± (0.77 ACRES±)

- MODERATE VALUE HCA IMPACTS BEYOND WRA: 1,412 SF± (0.03 ACRES±)
- EXISTING EDGE OF CANOPY COVER PER MAY 2019 GOOGLE EARTH AERIAL

IMPACTED TREE CANOPY AREA: 3,358 SF± (0.08 ACRES±)

WETLAND BOUNDARY SHOWN WAS DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON MARCH 27, 2017, AND WAS PROFESSIONALLY SURVEYED BY AKS ON MAY 16–17, 2017.

1–FOOT INTERVAL GROUND CONTOURS DERIVED FROM LAND SURVEY.

SITE PLAN SHOWN IS PRELIMINARY ONLY AND SUBJECT TO CHANGE.

TREES WITH DIAMETER OF 6" AND GREATER ARE SHOWN. TREE DIAMETERS WERE MEASURED UTILIZING A DIAMETER TAPE AT BREAST HEIGHT. TREE INFORMATION IS SUBJECT TO CHANGE UPON ARBORIST INSPECTION.

N

DATE: 04/20/2020

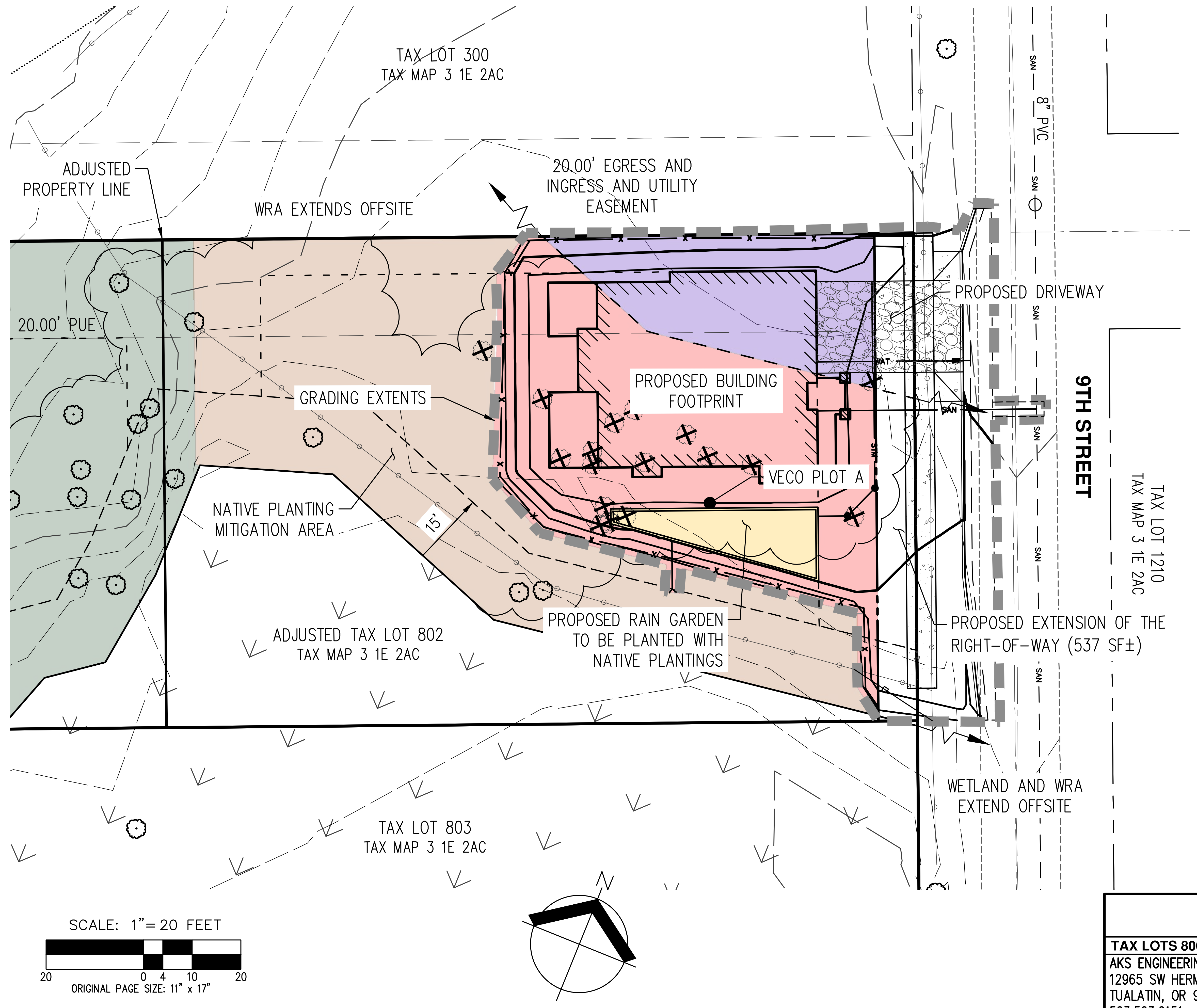
REVISED SITE PLAN OVERVIEW

TAX LOTS 800 & 802 SITE ASSESSMENT REPORT

FIGURE 7

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: JRI
CHKD: SAR
AKS JOB: 5926



LEGEND:

- WETLAND A AREA TO REMAIN WITHIN STUDY AREA: 116,431 SF± (2.67 ACRES±)
- APPROXIMATE POND AREA WITHIN WETLAND A TO REMAIN: 6,368 SF± (0.15 ACRES±)

TOTAL WETLAND A AREA INCLUDING POND: 122,799 SF± (2.82 ACRES±)

- WATER RESOURCE AREA (WRA) PERMANENT IMPACTS: 3,588 SF± (0.08 ACRES±)
- WATER RESOURCE AREA (WRA) TEMPORARY IMPACTS: 389 SF± (0.01 ACRES±)
- NATIVE PLANTING MITIGATION AREA: 5,000 SF± (0.11 ACRES±)
- WRA/MODERATE VALUE HCA TO REMAIN WITHIN PROJECT AREA: 24,464 SF± (0.56 ACRES±)

TOTAL WRA IN PROJECT AREA (EXCLUDING PROPOSED RIGHT-OF-WAY EXTENSION AREA): 33,441 SF± (0.77 ACRES±)

- MODERATE VALUE HCA IMPACTS BEYOND WRA: 1,412 SF± (0.03 ACRES±)
- TREE TO BE REMOVED
- EXISTING EDGE OF CANOPY COVER PER MAY 2019 GOOGLE EARTH AERIAL

IMPACTED TREE CANOPY AREA: 3,358 SF± (0.08 ACRES±)

WETLAND BOUNDARY SHOWN WAS DELINEATED BY AKS ENGINEERING & FORESTRY, LLC. ON MARCH 27, 2017, AND WAS PROFESSIONALLY SURVEYED BY AKS ON MAY 16–17, 2017.

1–FOOT INTERVAL GROUND CONTOURS DERIVED FROM LAND SURVEY.

SITE PLAN SHOWN IS PRELIMINARY ONLY AND SUBJECT TO CHANGE.

TREES WITH DIAMETER OF 6" AND GREATER ARE SHOWN. TREE DIAMETERS WERE MEASURED UTILIZING A DIAMETER TAPE AT BREAST HEIGHT. TREE INFORMATION IS SUBJECT TO CHANGE UPON ARBORIST INSPECTION.

DATE: 04/20/2020

REVISED SITE PLAN

TAX LOTS 800 & 802 SITE ASSESSMENT REPORT

FIGURE **7A**

AKS ENGINEERING & FORESTRY, LLC
12965 SW HERMAN RD, STE 100
TUALATIN, OR 97062
503.563.6151 WWW.AKS-ENG.COM

DRWN: JRI
CHKD: SAR
AKS JOB: 5926

DWG: 5926 NRA SITE PLAN | FIGURE 7A

Metro | Metromap Help RLIS Contact Air Photo Viewer RLIS Subscriber Sign In v2.6.0.0

Enter an Address, place, taxlot, zipcode or intersection Search

Help Print Bookmark More

Info Taxlots Layers

Common

- Taxlots
  - Taxlots
- Bike There!

Outdoor Recreation and Conservation Areas

- Parks and/or Natural Areas
- Cemeteries
- Golf Courses
- Home Owner's Associations
- Schools
- Other

Boundary

- City Boundaries
- Fire Districts
- Hauler Boundaries
- Metro Boundary
- Metro Council Districts
- Neighborhoods
- Park Districts
- School Districts
- Sewer Districts
- Transit Districts
- Urban Growth Boundary (UGB)
- Voter Precincts
- Water Districts
- Zipcodes

Clear All Layers

Attachment H: City of West Linn Arborist Email

From: Jones, Ron
To: Rhonda Mackey; Wyss, Darren
Subject: RE: 9th Street PLA / WAP-20-01/WRG-20-01/LLA-20-01
Date: Tuesday, April 14, 2020 2:06:13 PM

Hi Rhonda, Darren,

I apologize for not responding back to earlier than this.

I looked at the property off 9th Street. I found no trees of significance on subject property.

Thank you,

Ron

From: Rhonda Mackey [mailto:rhondam@aks-eng.com]
Sent: Monday, April 13, 2020 1:20 PM
To: Jones, Ron <rjones@westlinnoregon.gov>
Subject: RE: 9th Street PLA / WAP-20-01/WRG-20-01/LLA-20-01

Hi Ron –

It's me again. Someone from West Linn called me at the office today, but there wasn't a message… was hoping it was you.

Please let me know if you had a chance to send him the email, or if you could do it today and cc me, that would be fantastic. We are looking to resubmit back to Darren by tomorrow.

Please let me know. Thank you!!

Rhonda M. Mackey
Land Use Planning
AKS ENGINEERING & FORESTRY, LLC
3700 River Road N, Suite 1 | Keizer, OR 97303
P: 503.400.6028 Ext. 409 | F: 503.400.7722 | www.aks-eng.com |RhondaM@aks-eng.com
Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

From: Rhonda Mackey
Sent: Tuesday, April 7, 2020 9:43 AM
To: Jones, Ron <rjones@westlinnoregon.gov>
Subject: RE: 9th Street PLA / WAP-20-01/WRG-20-01/LLA-20-01

Good morning, Ron –

I am following up on our phone call last week. I understood that you were going to send an email to Darren with your assessment of the Significant Tree Determination, but I have not seen it.

If you sent it to him, will you please send me a copy of it? If you have not, could you please do that and cc me?

Thanks, Ron!

Rhonda M. Mackey
Land Use Planning
AKS ENGINEERING & FORESTRY, LLC
3700 River Road N, Suite 1 | Keizer, OR 97303
P: 503.400.6028 Ext. 409 | F: 503.400.7722 | www.aks-eng.com |RhondaM@aks-eng.com
Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

From: Jones, Ron <rjones@westlinnoregon.gov>
Sent: Tuesday, March 31, 2020 3:46 PM
To: Rhonda Mackey <rhondam@aks-eng.com>
Cc: Zach Pelz <pelzz@aks-eng.com>; Warner, Kenneth <kwarner@westlinnoregon.gov>; Wiencken, Tarra <twiencken@westlinnoregon.gov>
Subject: RE: 9th Street PLA / WAP-20-01/WRG-20-01/LLA-20-01

Hi Rhonda,

I drove by the site on 9th Street.
I'll be glad to meet with you. I'll be home tomorrow, but Thursday or Friday I should be in. I'll give you a call , or you can call me at 503-502-5301.

Thank you,

Ron

From: Rhonda Mackey [mailto:rhondam@aks-eng.com]
Sent: Tuesday, March 31, 2020 10:52 AM

To: Jones, Ron <rjones@westlinnoregon.gov>
Cc: Zach Pelz <pelzz@aks-eng.com>
Subject: RE: 9th Street PLA / WAP-20-01/WRG-20-01/LLA-20-01

Good morning, Mr. Jones –

I wanted to follow up on my email below. Please give me a call when you get the opportunity so that we can discuss your availability or alternative options.

Thank you!

Rhonda M. Mackey
Land Use Planning
AKS ENGINEERING & FORESTRY, LLC
3700 River Road N, Suite 1 | Keizer, OR 97303
P: 503.400.6028 Ext. 409 | F: 503.400.7722 | www.aks-eng.com |RhondaM@aks-eng.com
Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

From: Rhonda Mackey
Sent: Wednesday, March 25, 2020 3:05 PM
To: rjones@westlinnoregon.gov
Subject: 9th Street PLA / WAP-20-01/WRG-20-01/LLA-20-01

Good afternoon, Mr. Jones –

AKS is working with our client on a project under review with the City of West Linn Planning Dept. We received the attached incompleteness letter which requires we contact you and schedule a Significant Tree Determination visit. I understand that you may be working remotely, so I wanted to email you in hopes that we can get this visit on your schedule. Please let me know your availability, or call me on my cell at (503) 580-4723 to discuss our options.

Thank you in advance for your time.

Sincerely,

Rhonda M. Mackey
AKS ENGINEERING & FORESTRY, LLC
3700 River Rd N, Ste. 10 | Keizer, OR 97303
P: 503.400.6028 Ext. 409 | F: 503.400.7722 | www.aks-eng.com |RhondaM@aks-eng.com
Offices in: Bend, OR | Keizer, OR | Tualatin, OR | Vancouver, WA

shall not be liable for any changes made to the electronic data transferred. Distribution of electronic data to others is prohibited without the express written consent of AKS Engineering and Forestry.

Ron Jones
Parks Program Manager
Parks and Recreation

4100 Norfolk
West Linn, Oregon 97068
rjones@westlinnoregon.gov
westlinnoregon.gov
503-722-4728

Click to Connect!

Attachment I: Preliminary Stormwater Report

9th Street
West Linn, Oregon
Preliminary Stormwater Report

Date:	April 2020
Client:	Malibar Group, LLC
Engineering Contact:	Jonathon Morse, PE
Engineering Firm:	AKS Engineering & Forestry, LLC
AKS Job No.:	5926

AKS ENGINEERING & FORESTRY
12965 SW Herman Road, Suite 100
Tualatin, OR 97062
P: (503) 563-6151
www.aks-eng.com

Engineer's Certification

As the design engineer for the above-mentioned development project, I hereby certify that the storm water management facilities have been designed in accordance with the City of West Linn *Public Works Design Standards* (2010) and the City of Portland *Stormwater Management Manual* (2016). The technical information and data contained in this report was prepared under the direction and supervision of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

RENEWAL DATE: 12/31/20

Table of Contents

Tables

Appendices

Preliminary Stormwater Report

9TH STREET

WEST LINN, OREGON

1.0 Purpose Statement

The purpose of this report is to:

- Show compliance with all City of West Linn stormwater drainage requirements and design criteria.
- Provide site data, calculations, maps, drawings, cross-sections, analysis, and other information needed to support and verify the findings and conclusions of the drainage report.
- Prepare a conceptual stormwater drainage plan to mitigate the stormwater drainage impacts of the development.
- Provide evidence (plans) that the planned drainage system and facilities will meet required design criteria, will fit on the site, and will, to the greatest extent possible, avoid or minimize destruction or loss of natural resources.
- Provide design criteria needed to prepare construction plans and specifications.

2.0 Project Overview

2.1 Location

The subject site is located on Tax Lot 802 of Clackamas County Assessor's Map 3 1E 2AC, ±500 feet north of the intersection of Volpp Street and 9th Street.

2.2 Soil Classification

The Natural Resources Conservation Service (NRCS) Soil Survey of Clackamas County, Oregon (Appendix 4-1) classifies the on-site soils as Wapato silty clay loam, 0 to 3 percent slopes (HSG B) and Cloquato silt loam, 0 to 3 percent slopes (HSG C/D).

On November 13th, 2019 the project geotechnical engineer conducted a site evaluation (Appendix 5-1). On-site soil infiltration testing was not performed due to groundwater seepage observed at various depths in all the test pits. It is the opinion of the geotechnical contractor, GeoPacific Engineering, Inc., that on-site stormwater infiltration is not feasible at this site.

2.3 Existing Site

The subject site is currently undeveloped land.

2.4 Project Overview

Planned improvements include the construction of a new single-family residence with associated on-site improvements (e.g., paved driveway, utilities, etc.) and the construction of a private stormwater management facility.

2.5 Design Criteria

New impervious areas created with this project will be greater than 1,000 square feet. Per the City of West Linn *Public Works Design Standards* (2010) Section 2, Storm Drain Requirements, stormwater quality and detention will be required as follows:

- Stormwater discharge from the subject site for the 2-, 10-, and 25-year storm events shall not exceed that of the pre-developed condition.
- Removal of 70 percent of total suspended solids (TSS) from 90 percent of the average annual runoff is required per the City of Portland *Stormwater Management Manual* (2016) Chapter 1, Requirements and Policies, Stormwater Management and Conveyance Requirements.

2.6 Impervious Area Calculations

This project will add approximately 2,453 square feet of new impervious area, including 2,228 square feet of impervious roof area and 225 square feet of impervious driveway and patio/deck area (see Appendix 2-1).

Table 2-1: Impervious Area Table	
Post-Developed Condition	**Area (square feet)**
New Roof Area (Home and Garage)	2,228
New Driveway, Patio, Deck	225
Total New	**2,453**

3.0 Existing Drainage Characteristics

3.1 On-site Drainage Characteristics

Based on the site topographic survey, onsite slopes range between 1 and 20 percent, with the site generally draining south towards an existing wetland.

3.2 Uphill Drainage Characteristics

There are no observed drainage channels entering the site from the uphill drainage area.

The area uphill of the subject site consists of single-family residential homes on large developed lots with partially landscaped yards.

3.3 Downhill Drainage Characteristics

The subject site drains down slope into the existing wetland to the south. Wetland drainage is conveyed across 9th street via an existing 18-inch culvert.

4.0 Proposed Drainage Conveyance Systems

4.1 On-site Conveyance

Stormwater runoff generated by the newly created impervious areas will be managed on site via a private, lined and vegetated stormwater planter.

Stormwater runoff from the home's impervious roof area will be captured by the new home's gutter system and routed via closed-conduit storm pipe into the stormwater planter for detention. Stormwater runoff generated by the impervious patio/deck areas, will be captured by an area drain where it will also be piped to the same stormwater planter for treatment and detention.

Stormwater runoff from the new impervious driveway area will be captured by a trench drain where it will be piped via closed-conduit storm pipe to the stormwater planter for treatment and detention.

The City of Portland's Presumptive Approach Calculator web application (PAC) was used to determine the approximate required size of the planned stormwater facility. The lined planter's size reduces the discharge rate from 10- and 25-year storm events to that of the pre-development discharge rate. Planter design is preliminary and will be finalized with the building permit application.

4.2 Uphill Conveyance

The site topographic survey indicates there are no defined drainage channels entering the site and there does not appear to be any significant sheet, shallow concentrated, or channelized flow entering the subject site.

4.3 Downstream Conveyance

Stormwater runoff generated from storm events will be conveyed through the private, lined and vegetated planter and discharged to the adjacent ground via an outlet pipe where it will sheet flow and disperse into the adjacent wetland.

5.0 Surface Water Quality and Detention Facilities

5.1 Private Stormwater Management Facility

Stormwater management will consist of a private, lined and vegetated stormwater planter system located on-site. The PAC was used to determine the approximate required size of the planned stormwater facility. The lined planter reduces the discharge rate from 10- and 25-year events to that of the pre-development discharge rate. Planter design is preliminary and will be finalized with the building permit application.

Table 5-1 provides a comparison between the pre-developed and post-developed runoff for the 2-, 5-, 10-, and 25-year storm events showing onsite detention.

Table 5-1: Pre-Developed vs. Post-Developed Runoff Comparison

Storm Event	Pre-Developed Runoff (cubic feet per second)	Post-Developed Runoff (cubic feet per second)
2-Year Storm Event	0.003	0.008
5-Year Storm Event	0.007	0.008
10-Year Storm Event	0.012	0.008
25-Year Storm Event	0.017	0.015

As designed, stormwater runoff generated by the new impervious areas will be detained on site and outflow will be reduced to pre-developed rate for 10- and 25-year storm events.

APPENDIX 1-1

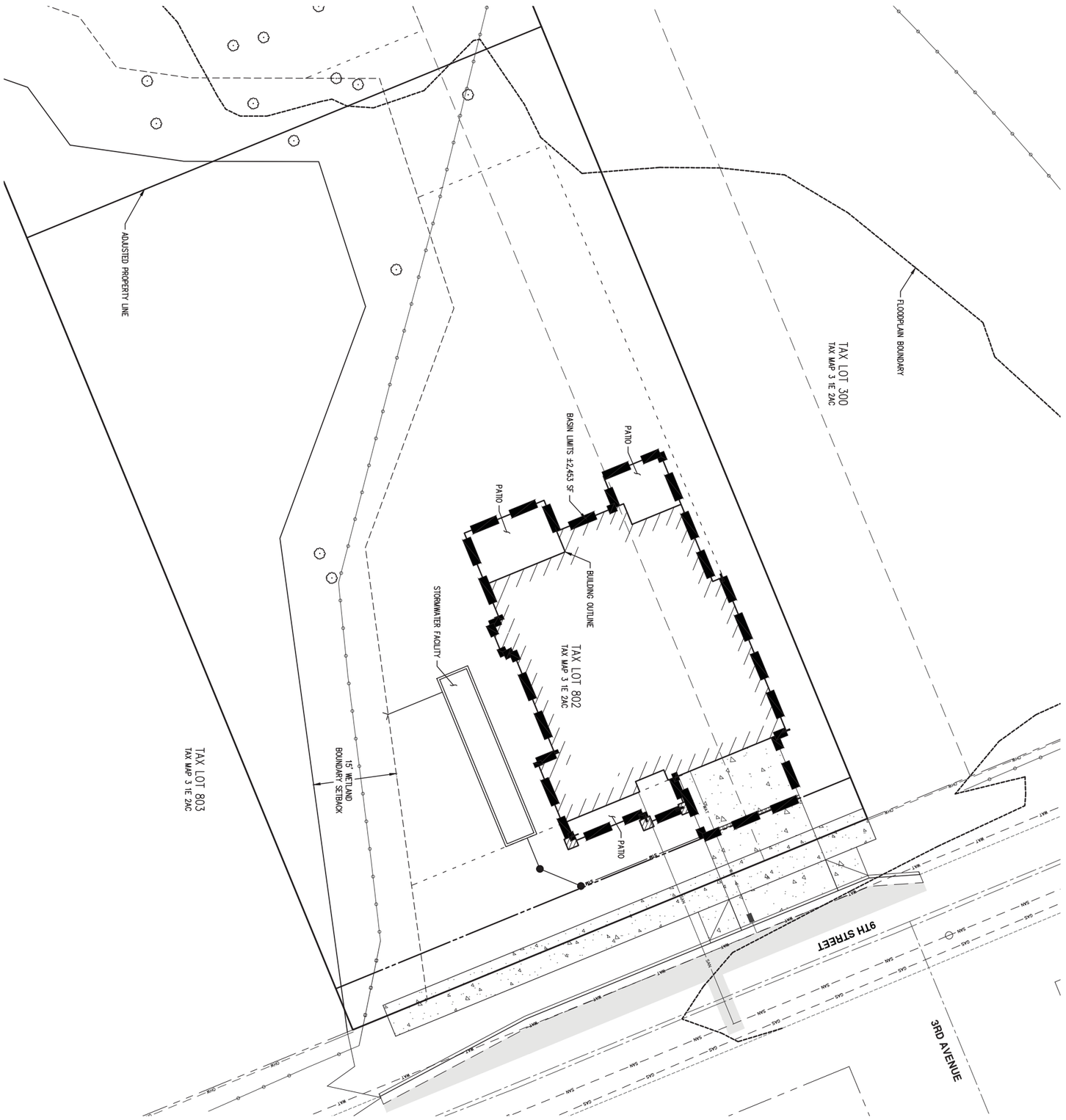
VICINITY MAP

VICINITY MAP

SCALE 1" = 100'

APPENDIX 2-1

BASIN MAP



SCALE: 1"=10 FEET
ORIGINAL PAGE SIZE: 22" x 34"

N

10

JOB NUMBER: 5926
DATE: 04/02/2020
DESIGNED BY: APC & LTP
DRAWN BY: APC
CHECKED BY: JMM

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 13, 2007
CHRISTOPHER M. MORSE
RENEWAL DATE: 12/31/20

BASIN MAP
9TH STREET
CONSOLIDATED LAND USE APPLICATION
WEST LINN, OREGON (TAX LOT 802 TAX MAP 3 1E 2AC)

AKS ENGINEERING & FORESTRY, LLC
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TUALATIN, OR 97062
503.563.6151
WWW.AKS-ENG.COM

AKS

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

APPENDIX 3-1

PORTLAND PRESUMPTIVE APPROACH CALCULATOR REPORT

PAC Report

Project Name 9th Street Updated Plans	Permit No.	Created 3/22/20 1:50 PM
Project Address 9th Street West Linn, OR 97068	Designer Andreas Collins	Last Modified 3/24/20 1:12 PM
	Company AKS Engineering	Report Generated 3/24/20 1:12 PM

Project Summary

Single family residential home

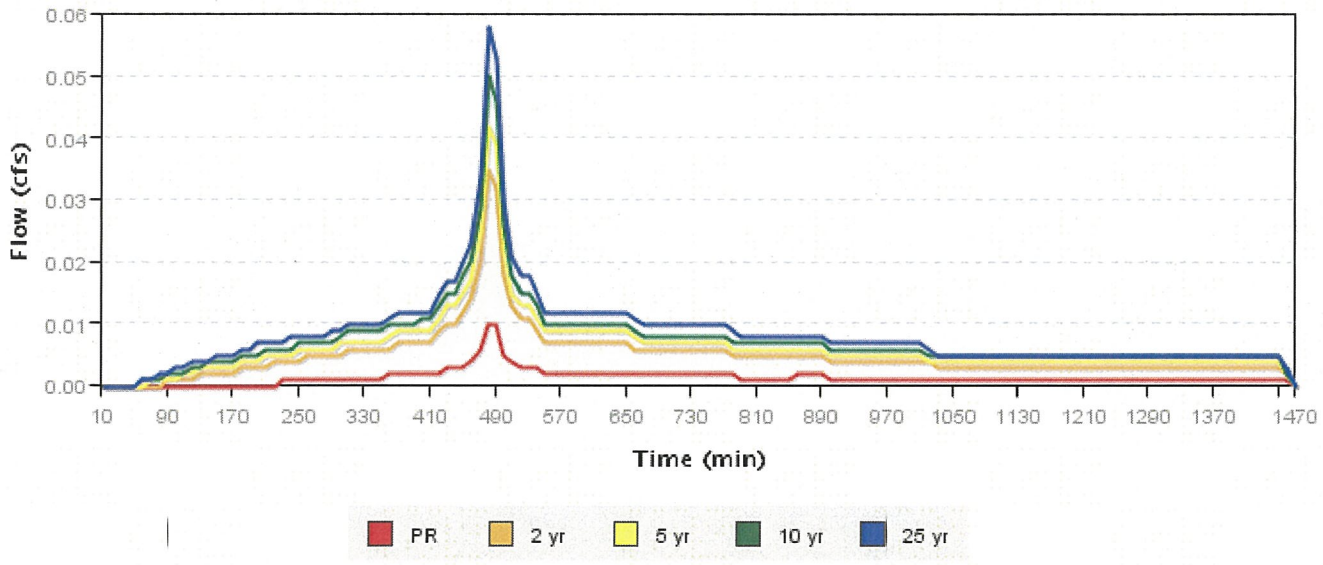
Catchment Name	Impervious Area (sq ft)	Native Soil Design Infiltration Rate	Hierarchy Category	Facility Type	Facility Config	Facility Size (sq ft)	Facility Sizing Ratio	PR Results	Flow Control Results
Planter	2453	0.00	3	Planter (Flat)	D	166	6.8%	Pass	Fail

Catchment Planter

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	**Encased Falling Head**
	Native Soil Infiltration Rate (I_{test})	**0.00** ⚠
Correction Factor	CF_{test}	**2**
Design Infiltration Rates	Native Soil (I_{dsgn})	**0.00 in/hr** ⚠
	Imported Growing Medium	**2.00 in/hr**
Catchment Information	Hierarchy Category	**3**
	Disposal Point	**B**
	Hierarchy Description	**Off-site flow to drainageway, river, or storm-only pipe system**
	Pollution Reduction Requirement	**Pass**
	10-year Storm Requirement	**N/A**
	Flow Control Requirement	**If discharging to an overland drainage system or to a storm sewer that discharges to an overland drainage system, including streams, drainageways, and ditches, the 2-year post-development peak flow must be equal or less than half of the 2-year pre-development rate and the 5, 10, and 25-year post-development peak rate must be equal or less than the pre-development rates for the corresponding design storms.**
	Impervious Area	**2453 sq ft** **0.056 acre**
	Time of Concentration (Tc)	**5**
	Pre-Development Curve Number (CN_{pre})	**72**
	Post-Development Curve Number (CN_{post})	**98**

⚠ Indicates value is outside of recommended range

SBUH Results



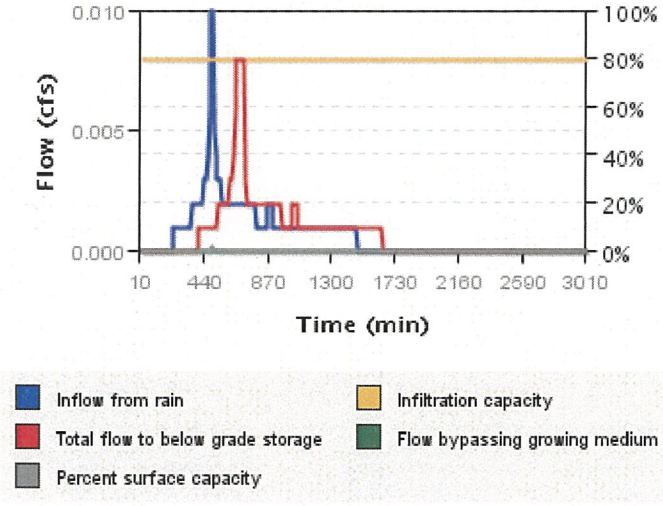
	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0	0.141	0.01	128.176
2 yr	0.003	97.611	0.035	443.86
5 yr	0.007	153.159	0.042	545.526
10 yr	0.012	215.874	0.05	647.345
25 yr	0.017	284.222	0.058	749.259

Facility Planter

Facility Details	Facility Type	**Planter (Flat)**
	Facility Configuration	**D: Lined Facility with RS and Ud**
	Facility Shape	**Planter**
	Above Grade Storage Data	
	Bottom Area	**166 sq ft**
	Bottom Width	**5.00 ft**
	Storage Depth 1	**12.0 in**
	Growing Medium Depth	**18 in**
	Surface Capacity at Depth 1	**166.0 cu ft**
	Design Infiltration Rate for Native Soil	**0.000 in/hr**
	Infiltration Capacity	**0.008 cfs**
Facility Facts	Total Facility Area Including Freeboard	**166.00 sq ft**
	Sizing Ratio	**6.8%**
Pollution Reduction Results	Pollution Reduction Score	**Pass**
	Overflow Volume	**134.558 cf**
	Surface Capacity Used	**2%**
Flow Control Results	Flow Control Score	**Fail**
	Overflow Volume	**644.380 cf**
	Surface Capacity Used	**90%**

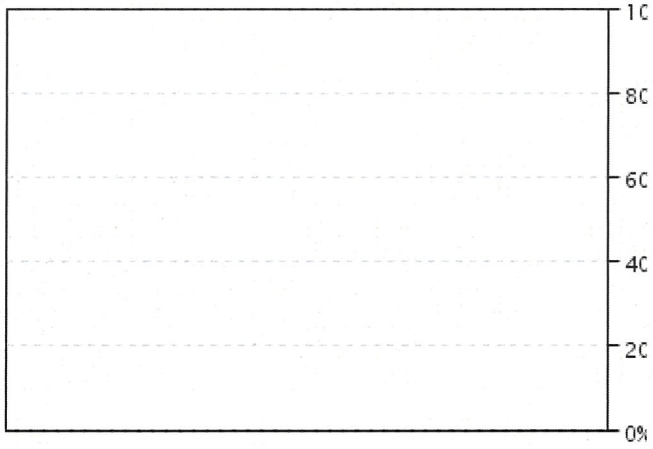
	Post-development outflow (cfs)		Pre-development inflow (cfs)	
2 year	0.008	≤ ½ of	0.003	**Fail**
5 year	0.008	≤	0.007	**Fail**
10 year	0.008	≤	0.012	**Pass**
25 year	0.015	≤	0.017	**Pass**

Pollution Reduction Event Surface Facility Modeling

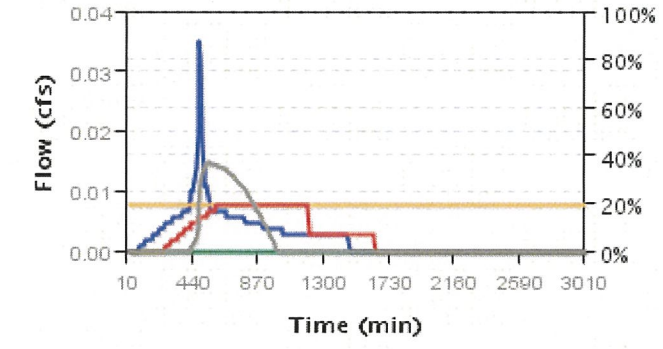


Inflow from rain
Infiltration capacity
Total flow to below grade storage
Flow bypassing growing medium
Percent surface capacity

Pollution Reduction Event Below Grade Modeling

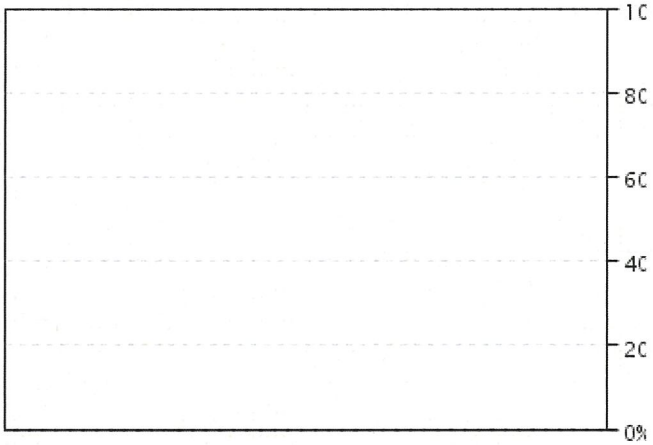


2 Year Event Surface Facility Modeling

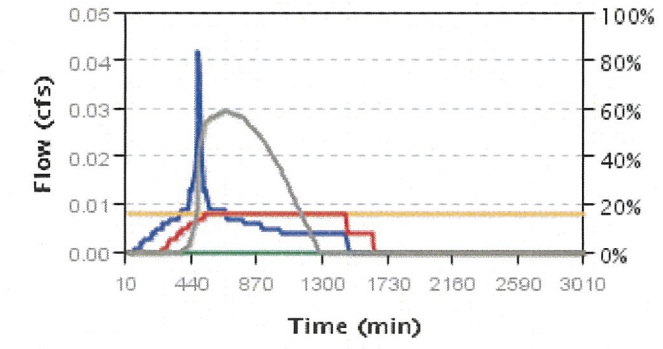


Inflow from rain
Infiltration capacity
Total flow to below grade storage
Flow bypassing growing medium
Percent surface capacity

2 Year Event Below Grade Modeling

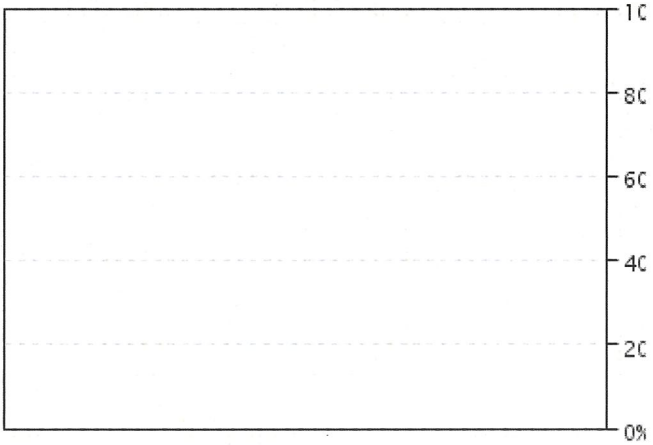


5 Year Event Surface Facility Modeling

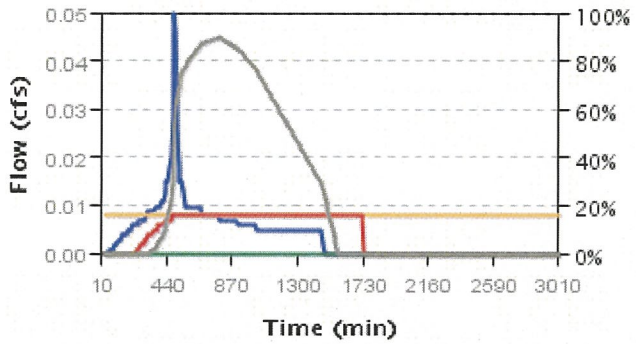


Inflow from rain
Infiltration capacity
Total flow to below grade storage
Flow bypassing growing medium
Percent surface capacity

5 Year Event Below Grade Modeling

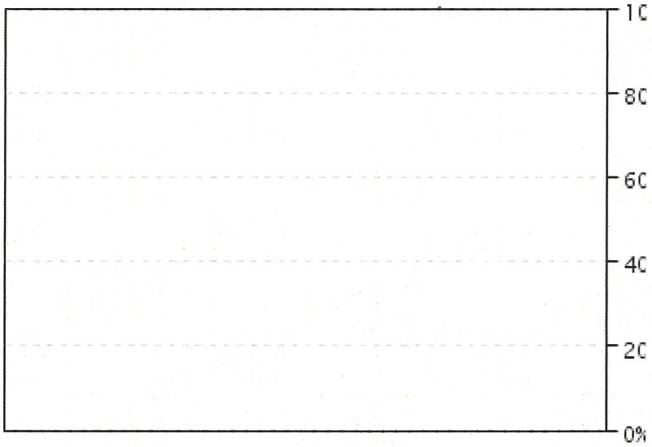


10 Year Event Surface Facility Modeling

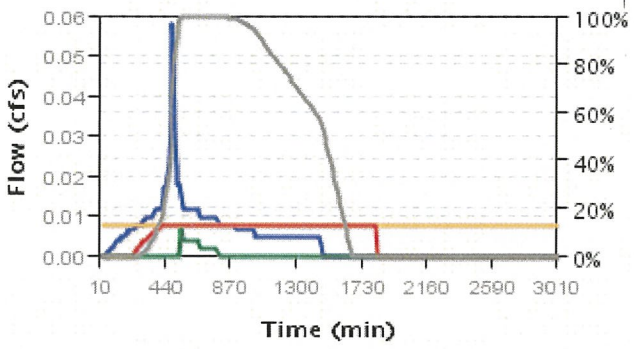


Inflow from rain
Infiltration capacity
Total flow to below grade storage
Flow bypassing growing medium
Percent surface capacity

10 Year Event Below Grade Modeling

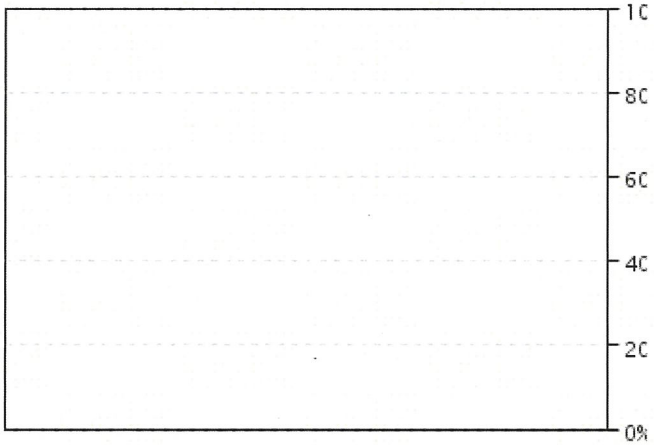


25 Year Event Surface Facility Modeling



Inflow from rain
Infiltration capacity
Total flow to below grade storage
Flow bypassing growing medium
Percent surface capacity

25 Year Event Below Grade Modeling



APPENDIX 4-1

SOIL INFORMATION FROM THE NRCS SOIL SURVEY OF CLACKAMAS COUNTY, OREGON

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Clackamas County Area, Oregon

Tax Lot 802

December 17, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:630 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 5 10 20 30

Feet
0 30 60 120 180

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 15, Sep 10, 2019

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 13, 2019—Jul 25, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Cloquato silt loam	0.2	16.6%
84	Wapato silty clay loam	0.8	83.4%
Totals for Area of Interest		**1.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Clackamas County Area, Oregon

19—Cloquato silt loam

Map Unit Setting

National map unit symbol: 223k
Elevation: 50 to 1,200 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Cloquato and similar soils: 85 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cloquato

Setting

Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium

Typical profile

H1 - 0 to 15 inches: silt loam
H2 - 15 to 42 inches: silt loam
H3 - 42 to 60 inches: sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water storage in profile: High (about 11.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B
Forage suitability group: Well drained < 15% Slopes (G002XY002OR)
Hydric soil rating: No

Minor Components

Wapato

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear

Across-slope shape: Linear
Hydric soil rating: Yes

Aquolls
Percent of map unit: 1 percent
Landform: Flood plains
Hydric soil rating: Yes

84—Wapato silty clay loam

Map Unit Setting
National map unit symbol: 227j
Elevation: 100 to 1,500 feet
Mean annual precipitation: 40 to 60 inches
Mean annual air temperature: 52 to 54 degrees F
Frost-free period: 165 to 210 days
Farmland classification: Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition
Wapato and similar soils: 85 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wapato

Setting
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile
H1 - 0 to 18 inches: silty clay loam
H2 - 18 to 45 inches: silty clay loam
H3 - 45 to 60 inches: silty clay

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Available water storage in profile: High (about 10.3 inches)

Interpretive groups
Land capability classification (irrigated): 3w

Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Forage suitability group: Poorly Drained (G002XY006OR)
Hydric soil rating: Yes

Minor Components

Cove

Percent of map unit: 6 percent
Landform: Flood plains
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Humaquepts

Percent of map unit: 4 percent
Landform: Flood plains
Hydric soil rating: Yes

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APPENDIX 5-1

GEOTECHNICAL ENGINEERING REPORT FROM GEOPACIFIC ENGINEERING, INC.

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

Geotechnical Engineering Report

9th Street
Clackamas County Tax Map 3 1E 02AC Lot 800 and 802
West Linn, Oregon

GeoPacific Engineering, Inc. Project No. 19-5350
November 26, 2019

14835 SW 72nd Avenue
Portland, Oregon 97224

Tel (503) 598-8445
Fax (503) 941-9281

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Real-World Geotechnical Solutions
Investigation • Design • Construction Support

November 26, 2019
Project No. 19-5350

Mr. Roy Marvin
Malibar Group Retirement Plan FBO
615 W Territorial Road
Canby, Oregon 97013
Cellular Phone: 541-621-2109

CC: Zach Pelz, AKS Engineering & Forestry, LLC.
Email: pelzz@aks-eng.com

SUBJECT: GEOTECHNICAL ENGINEERING REPORT
9TH STREET
CLACKAMAS COUNTY TAX LOTS 3 1E 02AC 800 & 802
WEST LINN, OREGON 97068

PROJECT INFORMATION

This report presents the results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our investigation was to evaluate subsurface conditions at the site, and to provide geotechnical recommendations for site development. This geotechnical study was performed in accordance with GeoPacific Proposal No. P-7124, dated October 8, 2019, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services*.

SITE AND PROJECT DESCRIPTION

The subject property is composed of two parcels, identified as 31E02AC 0800 and 0802 and located on the southwest side of 9th Street in the City of West Linn, Clackamas County, Oregon. The combined parcels are approximately 1.80 acres in size and slope gently to the east at grades of less than 10 percent, in the direction of the Willamette River. The site is bordered by 9th Street to the northeast, by a wooded area and baseball fields to the southwest, by grass fields of a designated wetland to the south east, and by residential properties to the northwest. Ground elevations range from 70 to 80 feet above mean sea level. The site is currently unimproved, however; several flattened areas are present in the western portion of the site, adjacent to a neighboring stable. There is also an existing pond near the center of the western parcel. Vegetation consists of numerous dense trees to the southeast and grass lawns to the northwest.

It is our understanding that proposed development will include construction of two building lots for single family homes, construction of a private drive, improvements to the south bound lane of 9th Street, and associated underground utilities. A grading plan was not provided for our review; however, we anticipate cuts and fill will be less than 4 feet.

REGIONAL GEOLOGIC SETTING

The subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The southern portions of the site are underlain by alluvium, consisting of silt and clay with trace sand. The soils were deposited in a flood plain of the modern Willamette River, near the mouth of a tributary, the Tualatin River (Gannet and Caldwell, 1998, Beeson et all, 1989).

The alluvium and northern portion of the site are underlain by the Quaternary age (last 2.6 million years) Willamette Formation, a catastrophic flood deposit associated with repeated glacial outburst flooding of the Willamette Valley (Yeats et al., 1996). The last of these outburst floods occurred about 10,000 years ago. These deposits typically consist of horizontally layered, micaceous, silt to coarse sand forming poorly-defined to distinct beds less than 3 feet thick.

The Willamette Formation is underlain by the 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.

REGIONAL SEISMIC SETTING

At least three major fault zones capable of generating damaging earthquakes are thought to exist in the vicinity of the subject site. These include the Cascadia Subduction Zone, the Portland Hills Fault Zone, and the Bolton Fault Zone.

Cascadia Subduction Zone

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993;

Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies roughly along the Oregon coast at depths of between 20 and 40 miles.

Portland Hills Fault Zone

The Portland Hills Fault Zone is a series of NW-trending faults that include the central Portland Hills Fault, the western Oatfield Fault, and the eastern East Bank Fault. These faults occur in a northwest-trending zone that varies in width between 3.5 and 5.0 miles. The combined three faults vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years) sediment (Madin, 1990).

The Portland Hills Fault occurs along the Willamette River at the base of the Portland Hills and is about 5 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills and is about 4 miles east of the site. The Oatfield Fault is considered to be potentially seismogenic (Wong, et al., 2000). Madin and Mabey (1993) indicate the Portland Hills Fault Zone has experienced Late Quaternary (last 780,000 years) fault movement; however, movement has not been detected in the last 20,000 years. The East Bank Fault occurs along the eastern margin of the Willamette River, and is located approximately 12 miles north of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000).

No historical seismicity is correlated with the mapped portion of the Portland Hills Fault Zone, but in 1991 a M3.5 earthquake occurred on a NW-trending shear plane located 1.3 miles east of the fault (Yelin, 1992). Although there is no definitive evidence of recent activity, the Portland Hills Fault Zone is assumed to be potentially active (Geomatrix Consultants, 1995).

Bolton Fault Zone

The Bolton Fault Zone is a NW-trending fault that lies about 2 miles northeast of the subject site (DOGAMI: HazVu, 2019). The USGS: Earthquake Hazards Program and geologic mapping of the area (Beeson et al, 1989) indicate that a large northeast-facing cliff of Miocene Columbia River Basalt is caused by offset of approximately 200 meters in the fault, which is likely a southwest-dipping reverse fault. This cliff face roughly parallels the existing Highway 43 in the City of West Linn. Unambiguous evidence of Quaternary (last 2.6 million years) displacement has not been presented to date, but the fault is considered potentially active due to the bedrock escarpment along the alignment of the fault (Unruh et al., 1994).

FIELD EXPLORATION AND SUBSURFACE CONDITIONS

On November 13, 2019, GeoPacific explored subsurface conditions at the site by excavating four exploratory test pits to depths of 9 to 11 feet with an extendable back-hoe, operated by Dan Fischer Excavating. The approximate test pit locations are shown on Figure 2. It should be noted that test pit locations were located in the field by pacing or taping distances from apparent property corners and other site features shown on the plans provided. As such, the locations of the explorations should be considered approximate.

A GeoPacific geologist continuously monitored the field exploration program and logged the test pit explorations. Soils observed in the explorations were classified in general accordance with the Unified Soil Classification System. Rock hardness was classified in accordance with Table 1, modified from the ODOT Rock Hardness Classification Chart. During exploration, our geologist also noted geotechnical conditions such as soil consistency, moisture and groundwater conditions. Logs of test pits are attached to this report. The following report sections are based on the exploration program and summarize subsurface conditions encountered at the site.

Table 1. Rock Hardness Classification Chart

ODOT Rock Hardness Rating	Field Criteria	Unconfined Compressive Strength	Typical Equipment Needed for Excavation
Extremely Soft (R0)	Indented by thumbnail	<100 psi	Small excavator
Very Soft (R1)	Scratched by thumbnail, crumbled by rock hammer	100-1,000 psi	Small excavator
Soft (R2)	Not scratched by thumbnail, indented by rock hammer	1,000-4,000 psi	Medium excavator (slow digging with small excavator)
Medium Hard (R3)	Scratched or fractured by rock hammer	4,000-8,000 psi	Medium to large excavator (slow to very slow digging), typically requires chipping with hydraulic hammer or mass excavation)
Hard (R4)	Scratched or fractured w/ difficulty	8,000-16,000 psi	Slow chipping with hydraulic hammer and/or blasting
Very Hard (R5)	Not scratched or fractured after many blows, hammer rebounds	>16,000 psi	Blasting

Summary test pit logs are attached. The stratigraphic contacts shown on the individual logs represent the approximate boundaries between soil types. The actual transitions may be more gradual. The soil and groundwater conditions depicted are only for the specific dates and locations reported, and therefore, are not necessarily representative of other locations and times. Soil and groundwater conditions encountered in the explorations are summarized below.

At the completion of exploration, the test pits were backfilled with the excavated spoils and tamped with the backhoe bucket. This backfill should not be expected to behave as compacted structural fill and some minor settling of the ground surface may occur.

Soils

Topsoil Horizon: Directly underlying the ground surface in all test pit explorations was a topsoil horizon consisting of dark brown, highly organic SILT (OL). The topsoil horizon was generally loose, contained fine roots throughout, and extended to depths of 6 to 12 inches.

Undocumented Fill: Beneath the topsoil layer in test pits TP-1, TP-2 and TP-4 was undocumented fill consisting of asphaltic concrete fragments and cobbles to boulders up to several feet in diameter mixed with clayey-silt soils. The undocumented fill extended to 6.5 feet below existing surface grade in test pit TP-1, 7 feet in test pit TP-2 and 3.5 feet in test pit TP-4.

Willamette Formation: Underlying undocumented fill in test pits TP-1, TP-2 and TP-4 and the topsoil horizon in test pit TP-3 were fine-grained soils belonging to the Willamette Formation. Near surface soils in test pit TP-3 were a light brown, moist, clayey SILT (ML) that was stiff to very stiff consistency. Field pocket penetrometer measurements indicate an approximate unconfined compressive strength of 3.0 to 4.5 tons/ft^2 in the upper four feet of test pit TP-3. At depth in test pit TP-3 and beneath the undocumented fill in test pits TP-1, TP-2 and TP-4 was soft to stiff, CLAY (CL) to SILT (ML) with trace fine-grained sand, that ranged in color from light tan with orange and gray mottling to a blue-gray. The Willamette Formation soils ranged from moist to wet and were generally soft in areas of seepage. This material extended beyond the maximum depth of our explorations, approximately 11 feet below the ground surface.

Groundwater and Soil Moisture

On November 13, 2019, groundwater seepage was encountered in all our test pit explorations. Locations and depths of seepage observed are presented below in Table 2. Soil moistures observed were generally considered to be moist to wet. Soils observed at depth, particularly in the southern test pits, TP-1 and TP-4, display a blue-gray color typically observed in anaerobic environments and areas were moisture is present throughout the year.

According to the *Estimated Depth to Groundwater in the Portland, Oregon Area, (United States Geological Survey, 2019)*, groundwater is expected to be present at an approximate depth of 4-10 feet below the ground surface. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors. Perched groundwater may be encountered in localized areas. Seeps and springs may exist in areas not explored and may become evident during site grading.

Table 2- Summary of Groundwater Seepage Encountered

Exploration Designation	Depth (feet)	Soil Type	Visually Estimated Flow Rate
TP-1	4 & 10	Fill & SILT (ML)	¼ Gal/min
TP-2	6 to 7	Organic SILT (OL)	¼ gal/min
TP-3	8 to 11	SILT (ML)	Static
TP-4	2, 4 & 7	Fill & SILT (ML)	½ gal/min

Infiltration Testing

On November 13, 2019, soil infiltration testing was not performed due to groundwater seepage observed at various depths in all of our test pits explorations. It is our opinion that onsite infiltration is not a feasible option for the proposed structures.

CONCLUSIONS AND RECOMMENDATIONS

Our investigation indicates that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and sufficient geotechnical monitoring is incorporated into the construction phases of the project. The primary geotechnical concerns associated with development at the property are:

1) The presence of soft to loose undocumented fill. Undocumented fill consisting of asphaltic concrete fragments, cobbles to boulders and soil was observed in test pits TP-1, TP-2 and TP-4 to depths of 6.5 feet, 7 feet and 3.5 feet, respectfully.

2) The presence of groundwater seepage and low permeability of onsite soils. Onsite infiltration testing could not be performed due to the presence of groundwater seepage at various elevations in all of our test pit explorations (see test pit logs) and the fine-grained native soil types observed in our explorations typically exhibit low permeability.

Site Preparation Recommendations

Areas of proposed buildings, new roadways, and areas to receive fill should be cleared of vegetation and any organic and inorganic debris or fill. Existing buried structures should be demolished and any cavities structurally backfilled. Inorganic debris and organic materials from clearing should be removed from the site.

Existing fill and any organic-rich topsoil should then be stripped from construction areas of the site or where engineered fill is to be placed. The estimated depth necessary for removal of topsoil is approximately 8 to 10 inches – deeper stripping may be necessary to remove large tree roots in isolated areas. Undocumented fill was encountered in test pits TP-1, TP-2 and TP-4 to depths of 6.5 feet, 7 feet and 3.5 feet, respectfully.

The final depth of soil removal will be determined on the basis of a site inspection after the stripping/ excavation has been performed. Stripped topsoil should preferably be removed from the site. Any remaining topsoil should be stockpiled only in designated areas and stripping operations should be observed and documented by the geotechnical engineer or his representative.

Any remaining undocumented fills and subsurface structures (tile drains, basements, driveway and landscaping fill, old utility lines, septic leach fields, etc.) should be removed and the excavations backfilled with engineered fill.

Once stripping of a particular area is approved, the area must be ripped or tilled to a depth of 12 inches, moisture conditioned, root-picked, and compacted in-place prior to the placement of engineered fill or crushed aggregate base for pavement. Exposed subgrade soils should be evaluated by the geotechnical engineer. 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, over-excavated and replaced with engineered fill (as described below) or stabilized with rock prior to placement of engineered fill. The depth of over-excavation, if required, should be evaluated by the geotechnical engineer at the time of construction.

Engineered Fill

All grading for the proposed development should be performed as engineered grading in accordance with the applicable building code at time of construction with the exceptions and additions noted herein.

Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill. Imported fill material must be approved by the geotechnical engineer prior to being imported to the site. Oversize material greater than 6 inches in size should not be used within 3 feet of foundation footings, and material greater than 12 inches in diameter should not be used in engineered fill.

Engineered fill should be compacted in horizontal lifts not exceeding 8 inches using standard compaction equipment. We recommend that engineered fill be compacted to at least 95% of the maximum dry density determined by ASTM D698 (Standard Proctor) or equivalent. Field density testing should conform to ASTM D2922 and D3017, or D1556. All engineered fill should be observed and tested by the project geotechnical engineer or his representative. Rocky fill may need to be evaluated by proofrolling and should be placed wet of optimum moisture content. Typically, one density test is performed for at least every 2 vertical feet of fill placed or every 500 yd^3, whichever requires more testing. Because testing is performed on an on-call basis, we recommend that the earthwork contractor be held contractually responsible for test scheduling and frequency.

Site earthwork will be impacted by soil moisture and shallow groundwater conditions. Earthwork in wet weather would likely require extensive use of cement or lime treatment, or other special measures, at considerable additional cost compared to earthwork performed under dry-weather conditions.

Excavating Conditions and Utility Trench Backfill

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. 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.

Saturated soils and groundwater may be encountered in utility trenches, particularly during the wet season. We anticipate that dewatering systems consisting of ditches, sumps and pumps would be adequate for control of perched groundwater. 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.

PVC pipe should be installed in accordance with the procedures specified in ASTM D2321. We recommend that trench backfill be compacted to at least 95% of the maximum dry density obtained by Modified Proctor ASTM D1557 or equivalent. Initial backfill lift thickness 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.

Erosion Control Considerations

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion except in areas of moderately sloping topography. In our opinion, the primary concern regarding erosion potential will occur during construction, in areas that have been stripped of vegetation. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which should include judicious use of straw wattles and silt fences. If used, these erosion control devices should be in place and remain in place throughout site preparation and construction.

Erosion and sedimentation of exposed soils can also be minimized by quickly re-vegetating exposed areas of soil, and by staging construction such that large areas of the project site are not denuded and exposed at the same time. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets. Areas of exposed soil requiring permanent stabilization should be seeded with an approved grass seed mixture, or hydroseeded with an approved seed-mulch-fertilizer mixture.

Wet Weather Earthwork

Soils underlying the site are likely to be 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 areas where fill may be proposed to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Material used as engineered fill should consist of clean, granular soil containing less than 5 percent passing the No. 200 sieve. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;

- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed, and suitable compaction and site drainage is achieved; and
- Geotextile silt fences, straw wattles, and fiber rolls should be strategically located to control erosion.

Spread Foundations

The proposed residential structures may be supported on shallow foundations bearing on engineered fill placed and compacted over competent native soils, appropriately designed and constructed as recommended in this report. Foundation design, construction, and setback requirements should conform to the applicable building code at the time of construction. For maximization of bearing strength and protection against frost heave, spread footings should be embedded at a minimum depth of 12 inches below exterior grade. Foundations should be designed by a licensed structural engineer.

The anticipated allowable soil bearing pressure is 1,500 lbs/ft^2 for footings bearing on moisture conditioned and re-compacted native soils and/or structural fill. A maximum chimney and column load of 30 kips is recommended for the site. The recommended maximum allowable bearing pressure may be increased by 1/3 for short-term transient conditions such as wind and seismic loading. For heavier loads, the geotechnical engineer should be consulted. The coefficient of friction between on-site soil and poured-in-place concrete may be taken as 0.42, which includes no factor of safety. The maximum anticipated total and differential footing movements (generally from soil expansion and/or settlement) are 1 inch and ¾ inch over a span of 20 feet, respectively. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied. Excavations near structural footings should not extend within a 1H:1V plane projected downward from the bottom edge of footings.

Footing excavations should penetrate through topsoil and any loose soil to competent subgrade that is either

1) suitable for bearing support,
2) moisture conditioned and compacted and/or
3) over-excavated and replaced with structural fill.

All footing excavations should be trimmed neat, and all loose or softened soil should be removed from the excavation bottom prior to placing reinforcing steel bars. Due to the moisture sensitivity of on-site native soils, foundations constructed during the wet weather season may require over-excavation of footings and backfill with compacted, crushed aggregate.

Our recommendations are for house construction incorporating raised wood floors and conventional spread footing foundations. If living space of the structures will incorporate basements, a geotechnical engineer should be consulted to make additional recommendations for retaining walls, water-proofing, underslab drainage and wall subdrains. After site development, a Final Soil Engineer's Report should either confirm or modify the above recommendations.

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 150 kcf (87 pci) should be assumed for the fine-grained soils anticipated to be present in the upper four feet at the site. This value assumes the concrete slab system is designed and constructed as recommended herein, with a minimum thickness of 8 inches of 1½"-0 crushed aggregate beneath the slab. The total thickness of crushed aggregate will be dependent on the subgrade conditions at the time of construction and should be verified visually by proof-rolling. Under-slab aggregate should be compacted to at least 90 percent of its maximum dry density as determined by ASTM D1557 (Modified Proctor) or equivalent.

In areas where moisture will be detrimental to floor coverings or equipment inside the proposed structure, appropriate vapor barrier and damp-proofing measures should be implemented. A commonly applied vapor barrier system consists of a 10-mil polyethylene vapor barrier placed directly over the capillary break material. 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 GeoPacific's area of expertise.

Permanent Below-Grade Walls

Lateral earth pressures against below-grade retaining walls will depend upon the inclination of any adjacent slopes, type of backfill, degree of wall restraint, method of backfill placement, degree of backfill compaction, drainage provisions, and magnitude and location of any adjacent surcharge loads. At-rest soil pressure is exerted on a retaining wall when it is restrained against rotation. In contrast, active soil pressure will be exerted on a wall if its top is allowed to rotate or yield a distance of roughly 0.001 times its height or greater.

If the subject retaining walls will be free to rotate at the top, they should be designed for an active earth pressure equivalent to that generated by a fluid weighing 35 pcf for level backfill against the wall. For restrained wall, an at-rest equivalent fluid pressure of 55 pcf should be used in design, again assuming level backfill against the wall. These values assume that the recommended drainage provisions are incorporated, and hydrostatic pressures are not allowed to develop against the wall.

During a seismic event, lateral earth pressures acting on below-grade structural walls will increase by an incremental amount that corresponds to the earthquake loading. Based on the Mononobe-Okabe equation and peak horizontal accelerations appropriate for the site location, seismic loading should be modeled using the active or at-rest earth pressures recommended above, plus an incremental rectangular-shaped seismic load of magnitude 6.5H, where H is the total height of the wall.

We assume relatively level ground surface below the base of the walls. As such, we recommend passive earth pressure of 320 pcf for use in design, assuming wall footings are cast against competent native soils or engineered fill. If the ground surface slopes down and away from the base of any of the walls, a lower passive earth pressure should be used and GeoPacific should be contacted for additional recommendations.

A coefficient of friction of 0.42 may be assumed along the interface between the base of the wall footing and subgrade soils. The recommended coefficient of friction and passive earth pressure values do not include a safety factor, and an appropriate safety factor should be included in design. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

The above recommendations for lateral earth pressures assume that the backfill behind the subsurface walls will consist of properly compacted structural fill, and no adjacent surcharge loading. If the walls will be subjected to the influence of surcharge loading within a horizontal distance equal to or less than the height of the wall, the walls should be designed for the additional horizontal pressure. For uniform surcharge pressures, a uniformly distributed lateral pressure of 0.3 times the surcharge pressure should be added. Traffic surcharges may be estimated using an additional vertical load of 250 psf (2 feet of additional fill), in accordance with local practice.

The recommended equivalent fluid densities assume a free-draining condition behind the walls so that hydrostatic pressures do not build-up. This can be accomplished by placing a 12 to 18-inch wide zone of sand and gravel containing less than 5 percent passing the No. 200 sieve against the walls. A 3-inch minimum diameter perforated, plastic drain pipe should be installed at the base of the walls and connected to a suitable discharge point to remove water in this zone of sand and gravel. The drain pipe should be wrapped in filter fabric (Mirafi 140N or other as approved by the geotechnical engineer) to minimize clogging.

Wall drains are recommended to prevent detrimental effects of surface water runoff on foundations – not to dewater groundwater. Drains should not be expected to eliminate all potential sources of water entering a basement or beneath a slab-on-grade. An adequate grade to a low point outlet drain in the crawlspace is required by code. Underslab drains are sometimes added beneath the slab when placed over soils of low permeability and shallow, perched groundwater.

Water collected from the wall drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. Down spouts and roof drains should not be connected to the wall drains in

order to reduce the potential for clogging. The drains should include clean-outs to allow periodic maintenance and inspection. Grades around the proposed structure should be sloped such that surface water drains away from the building.

GeoPacific should be contacted during construction to verify subgrade strength in wall keyway excavations, to verify that backslope soils are in accordance with our assumptions, and to take density tests on the wall backfill materials.

Structures should be located a horizontal distance of at least 1.5H away from the back of the retaining wall, where H is the total height of the wall. GeoPacific should be contacted for additional foundation recommendations where structures are located closer than 1.5H to the top of any wall.

Drainage

The upslope edge of perimeter footings may be provided with a drainage system consisting of 3-inch diameter, slotted, plastic pipe embedded in a minimum of 1 ft^3 per lineal foot of clean, free-draining gravel or uncompacted 3/4"-0 rock. Water collected from the footing drains should be directed into the local storm drain system or another suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. Down spouts and roof drains should not be connected to the foundation drains in order to reduce the potential for clogging. The footing drains should include clean-outs to allow periodic maintenance and inspection. Grades around the proposed structure should be sloped such that surface water drains away from the building. Footing drain recommendations are given to prevent detrimental effects of groundwater on foundations and should not be expected to eliminate all potential sources of water entering a crawlspace. An adequate grade to a low point outlet drain in the crawlspace is required by code.

Flexible Pavement Design: 9th Street Half Street Improvement

We understand that, as part of development, improvements must be made to the existing south bound lane of 9th Street, within the property boundaries. The City of West Linn Public Works Design Standards, Section Five – Street Requirements states an approved section for Local / Neighborhood streets. Table 3 presents the approved Local / Neighborhood street section for the City of West Linn with estimated structural coefficients.

Table 3 – City of West Linn Minimum Dry-Weather Pavement Section for 9th Street

Material Layer	Section Thickness (in.)	Structural Coefficient	Compaction Standard
Asphaltic Concrete (AC)	4	0.42	91%/ 92% of Rice Density AASHTO T-209
Crushed Aggregate Base ¾"-0 (leveling course)	2	0.10	95% of Modified Proctor AASHTO T-180
Crushed Aggregate Base 1½"-0	10	0.10	95% of Modified Proctor AASHTO T-180
Subgrade	12	5,000 PSI	95% of Standard Proctor AASHTO T-99 or equivalent
Calculated Structural Number		1.88	

Road Subgrade Preparation

The subgrade should be ripped or tilled to a depth of 12 inches, moisture conditioned, root-picked, and compacted in-place prior to the placement of crushed aggregate base for pavement. Any pockets of organic debris or loose fill encountered during ripping or tilling should be removed and replaced with engineered fill (see *Site Preparation* section). In order to verify subgrade strength, we recommend proof-rolling directly on subgrade with a loaded dump truck during dry weather and on top of base course in wet weather. Soft areas that pump, rut, or weave should be stabilized prior to paving.

If pavement areas are to be constructed during wet weather, the subgrade and construction plan should be reviewed by the project geotechnical engineer at the time of construction so that condition specific recommendations can be provided. The moisture sensitive subgrade soils make the site a difficult wet weather construction project. General recommendations for wet weather pavement sections are provided below.

During placement of pavement section materials, density testing should be performed to verify compliance with project specifications. Generally, one subgrade, one base course, and one asphalt compaction test is performed for every 100 to 200 linear feet of paving.

Wet Weather Construction Pavement Section

This section presents our recommendations for wet weather pavement section and construction for new pavement sections at the project. These wet weather pavement section recommendations are intended for use in situations where it is not feasible to compact the subgrade soils, due to wet subgrade soil conditions, and/or construction during wet weather.

Based on our site review, we recommend a wet weather section with a minimum subgrade deepening of 6 inches to accommodate a working subbase of additional 1½"-0 crushed rock. Geotextile fabric, Mirafi 500x or equivalent, should be placed on subgrade soils prior to placement of base rock.

In some instances, it may be preferable to use Special Treated Base (STB) in combination with over-excavation and increasing the thickness of the rock section. GeoPacific should be consulted for additional recommendations regarding use of STB in wet weather pavement sections if it is desired to pursue this alternative. Cement treatment of the subgrade may also be considered instead of over-excavation. For planning purposes, we anticipate that treatment of the onsite soils would involve mixing cement powder to approximately 6 percent cement content and a mixing depth on the order of 12 to 18 inches.

With implementation of the above recommendations, it is our opinion that the resulting pavement section will provide equivalent or greater structural strength than the dry weather pavement section currently planned. However, it should be noted that construction in wet weather is risky and the performance of pavement subgrades depend on a number of factors including the weather conditions, the contractor's methods, and the amount of traffic the road is subjected to. There is a potential that soft spots may develop even with implementation of the wet weather provisions recommended in this letter. If soft spots in the subgrade are identified during roadway excavation, or develop prior to paving, the soft spots should be over-excavated and backfilled with additional crushed rock.

During subgrade excavation, care should be taken to avoid disturbing the subgrade soils. Removals should be performed using an excavator with a smooth-bladed bucket. Truck traffic should be limited until an adequate working surface has been established. We suggest that the crushed rock be spread using bulldozer equipment rather than dump trucks, to reduce the amount of traffic and potential disturbance of subgrade soils.

Care should be taken to avoid over-compaction of the base course materials, which could create pumping, unstable subgrade soil conditions. Heavy and/or vibratory compaction efforts should be applied with caution. Following placement and compaction of the crushed rock to project specifications (95 percent of Modified Proctor), a finish proof-roll should be performed before paving.

The above recommendations are subject to field verification. GeoPacific should be on-site during construction to verify subgrade strength and to take density tests on the engineered fill, base rock and asphaltic pavement materials.

Seismic Design

The Oregon Department of Geology and Mineral Industries (Dogami), Oregon HazVu: Statewide GeoHazards Viewer indicates that the site is in an area where *severe* ground shaking is anticipated during an earthquake (Dogami HazVu, 2019). Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2018 International Building Code (IBC) with applicable Oregon Structural Specialty Code (OSSC) revisions (current 2019). We recommend Site Class D be used for design per the OSSC, Table 1613.5.2 and as defined in ASCE 7-16, Chapter 20, Table 20.3-1. Design values determined for the site using the ATC (Applied Technology Council) *ASCE7-10 Hazards by Location online Tool* website are summarized in Table 3.

Table 3 - Recommended Earthquake Ground Motion Factors (ASCE 7-16)

Parameter	Value
Location (Lat, Long), degrees	45.3426, -122.6486
Probabilistic Ground Motion Values, 2% Probability of Exceedance in 50 yrs	
Site Modified Peak Ground Acceleration	0.459 g
Short Period, S_s	0.831 g
1.0 Sec Period, S_1	0.376 g
Soil Factors for Site Class D:	
F_a	1.168
F_v	1.924
$SD_s = 2/3 \times F_a \times S_s$	0.647 g
$SD_1 = 2/3 \times F_v \times S_1$	0.482 g
Seismic Design Category	D

* F_v value reported in the above table is a straight-line interpolation of mapped spectral response acceleration at 1-second period, S_1 per Table 1613.2.3(2) of OSSC 2019 with the assumption that Exception 2 of ASCE 7-16 Chapter 11.4.8 is met per the Structural Engineer. If Exception 2 is not met, and the long-period site coefficient (F_v) is required for design, GeoPacific Engineering can be consulted to provide a site-specific procedure as per ASCE 7-16, Chapter 21.

Soil Liquefaction

Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to ground shaking caused by strong earthquakes. Soil liquefaction is generally limited to loose, sands and granular soils located below the water table. The Oregon Department of Geology and Mineral Industries (DOGAMI), Oregon HazVu: 2019 Statewide GeoHazards Viewer indicates that the site is in an area considered to be at *low* to *high* risk for soil liquefaction during an earthquake (DOGAMI:HazVu, 2019).

An in-depth analysis of seismic hazards is beyond the scope of this study. However, if additional information is desired regarding the potential for soil liquefaction during a seismic event, GeoPacific may be consulted to perform additional subsurface explorations, consisting of soil borings and/or CPT testing, and to perform a quantitative liquefaction analysis.

UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and his/her consultants for use in design of this project only. The conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Within the limitations of scope, schedule and budget, GeoPacific executed these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology at the time the report was prepared. No warranty, express or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,

GEOPACIFIC ENGINEERING, INC.

REGISTERED PROFESSIONAL ENGINEER
14743PE
OREGON
JAN. 23, 1990
JAMES D. IMBRIE
EXPIRES: 06/30/2021

Michael T. Baker, G.I.T.
Geotechnical Staff

James D. Imbrie, G.E., C.E.G.
Principal Geotechnical Engineer

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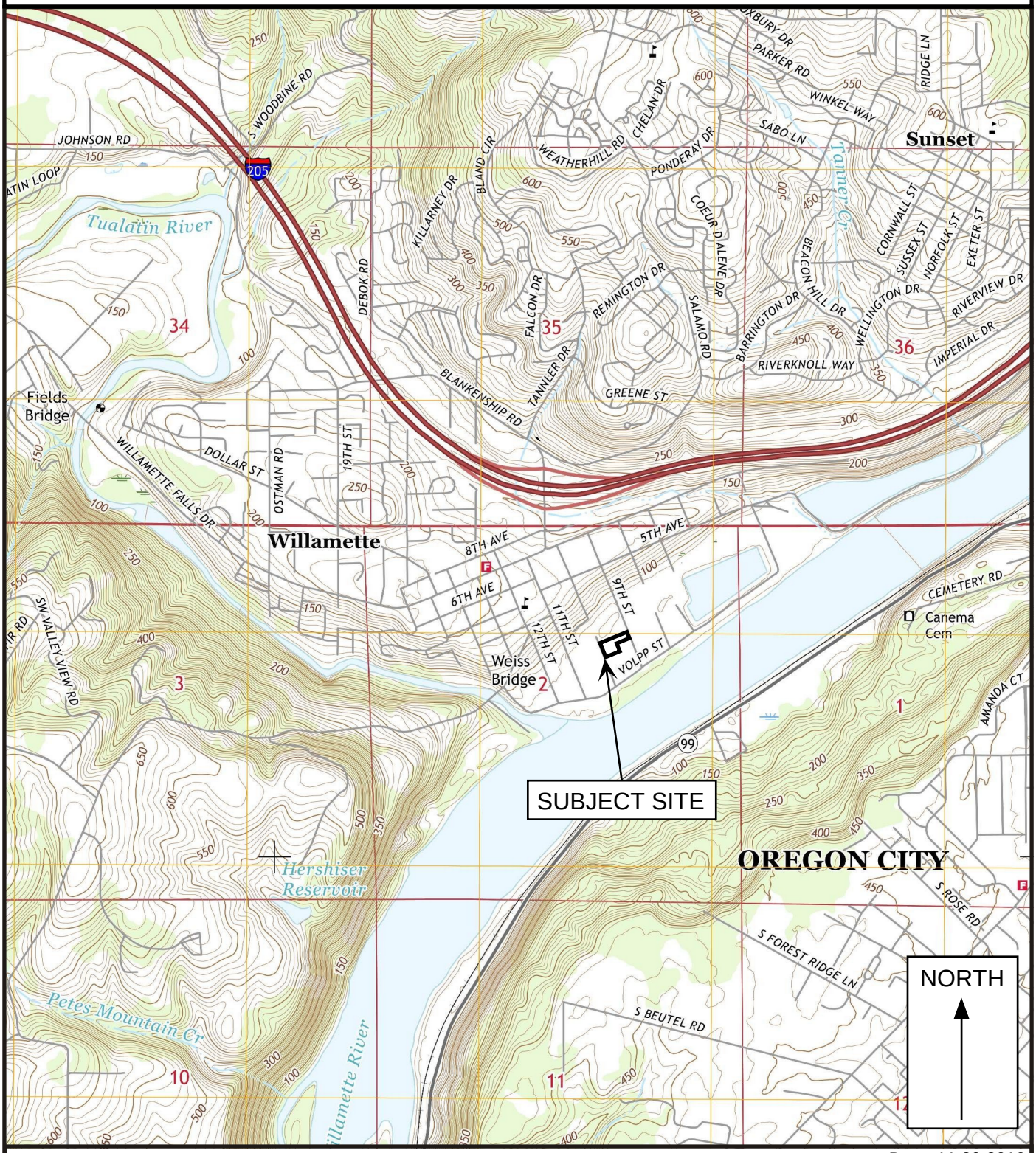
CHECKLIST OF RECOMMENDED GEOTECHNICAL TESTING AND OBSERVATION

Item No.	Procedure	Timing	By Whom	Done
1	Preconstruction meeting	Prior to beginning site work	Contractor, Developer, Civil and Geotechnical Engineers	
2	Fill removal from site or sorting and stockpiling	Prior to mass stripping	Soil Technician/ Geotechnical Engineer	
3	Stripping, aeration, and root-picking operations	During stripping	Soil Technician	
4	Compaction testing of engineered fill (95% of Standard Proctor)	During filling, tested every 2 vertical feet	Soil Technician	
5	Compaction testing of trench backfill (95% of Standard Proctor)	During backfilling, tested every 4 vertical feet for every 200 lineal feet	Soil Technician	
6	Street Subgrade Inspection	Prior to placing base course	Soil Technician	
7	Base course compaction (95% of Modified Proctor)	Prior to paving, tested every 200 lineal feet	Soil Technician	
8	Footing Subgrade Inspection	Prior to placement of forms	Soil Technician/ Geotechnical Engineer	
9	Final Geotechnical Engineer's Report	Completion of project	Geotechnical Engineer	

FIGURES

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 ft

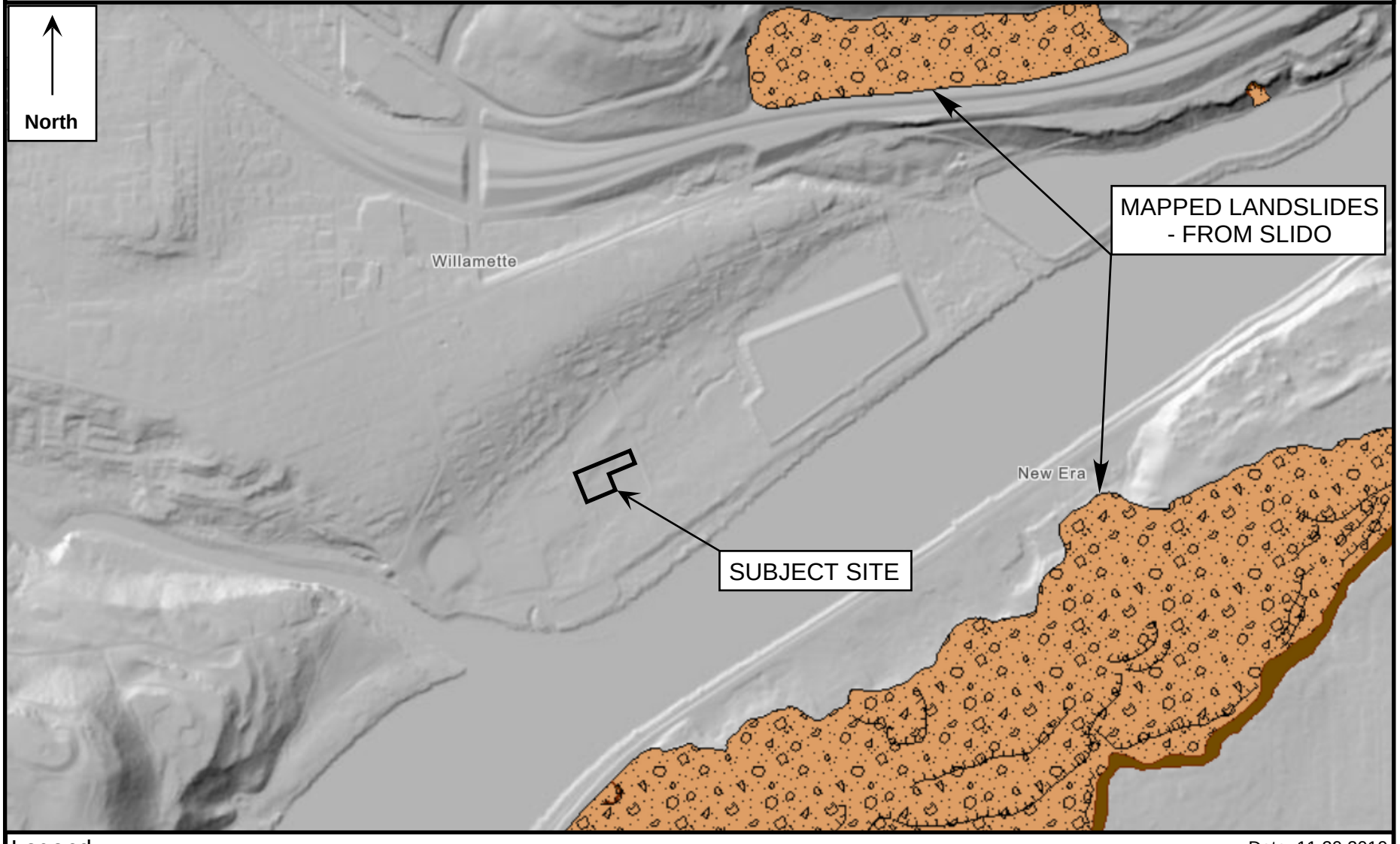
Date: 11.20.2019
Drawn by: MTB

Base maps: U.S. Geological Survey 7.5 minute Topographic Map Series, Canby, Oregon Quadrangle, 2017.

Project:	9th Street West Linn, Oregon	Project No. 19-5350	FIGURE 1A

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

LIDAR BASED VICINITY MAP - WITH MAPPED LANDSLIDES



Legend

Approximate Scale 1 in = 1000 ft

Date: 11.20.2019
Drawn by: MTB

Base map: Oregon Department of Geology and Mineral Industries, 2019, Statewide Landslide Information Database for Oregon (SLIDO): http://www.gis.dogami.oregon.gov/slido

Project: 9th Street West Linn, Oregon	Project No. 19-5350	FIGURE 1B

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

SITE AERIAL AND EXPLORATION LOCATIONS

Legend

Site Boundary

TP-1
2ft
Test Pit Designation, Approximate Location and Approximate Depth of Fill including Buried Topsoil

PDCP 1
PDCP Designation and Approximate Location

Drawn by: MTB Date: 11.21.2019

0 80'
APPROXIMATE SCALE 1"=80'

Project: 9th Street West Linn, Oregon	Project No. 19-5350	FIGURE 2

GeoPacific Engineering, Inc.

Real-World Geotechnical Solutions
Investigation • Design • Construction Support

EXPLORATION LOGS

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: 9th Street West Linn, Oregon	Project No. 19-5350	Exploration No. **TP-1**

Depth (ft)	Sample Type	tons/sq.ft.	Moisture Content (%)	Water Bearing Zone	Material Description
0					Soft, organic SILT (OL), brown, grass roots, very moist [Topsoil Horizon]
1		4.0			Loose, GRAVEL (GM), composed of fractured rock and asphalt fragments up to 12 inch in diameter with sand and silt, moist [Undocumented Fill]
2		1.0			Soft to medium stiff, lean CLAY (CL), light brown, homogenous, tree roots, moist [Undocumented Fill]
3		1.0			
4		1.5		~4 ft	
5	100 to 1,000 g				Soft to medium stiff, CLAY (CL-CH), dark gray to brown, very plastic, moist, in lower portion this layer was dark brown to black fragments of extremely soft (R0) to soft (R1) minerals from 1/4 inch to 1.5 inch in diameter, fragments of angular vesicular medium hard (R3) BASALT, moist [Undocumented Fill]
6					
7					
8					Medium stiff to stiff, SILT (ML) with sand, blue-gray, slightly plastic, homogenous, very moist to wet [Willamette Formation]
9					
10				~10.5 ft	
11					Test Pit terminated at 11 feet.
12					Groundwater seepage encountered in excavation at 4 feet and 10.5 feet. Flow visually estimated at 1/4 gallons per minute.
13					
14					

LEGEND

100 to 1,000 g — Bag Sample; Split-Spoon; Shelby Tube Sample; Seepage; Static Water Table; Water Bearing Zone

Date Drilled: 11.13.2019
Logged By: MTB
Surface Elevation: 74 Feet

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: 9th Street West Linn, Oregon	Project No. 19-5350	Exploration No. **TP-2**

Depth (ft)	Sample Type	tons/sq.ft.	Moisture Content (%)	Water Bearing Zone	Material Description
0					Soft, organic SILT (OL), brown, grass roots, moist [Topsoil Horizon]
1		0.5			
2		1.0			
3		1.5			Loose to medium dense, GRAVEL (GM), composed of medium hard (R3) angular BASALT and asphaltic concrete fragments up to several feet in diameter in a matrix of soft silty CLAY to clayey SILT (CL-ML), moist [Undocumented Fill]
4		1.5			
5					
6					
6				Seepage	Soft, organic SILT (OL), brown, grass roots, moist [Buried Topsoil Horizon]
7					
8					Medium stiff, lean CLAY (CL), blue-gray, moderately plastic, homogenous, moist [Willamette Formation]
9	100 to 1,000 g				
10					Soft to medium stiff, SILT with fine grained sand to sandy SILT (ML-SM), tan with faint orange mottling in thin bands approximately 1/8 to 1/2 inch in thickness, wet [Willamette Formation]
11					Test Pit terminated at 11 feet.
12					Groundwater seepage encountered in excavation at 6 to 7 feet. Flow visually estimated at 1/4 gallons per minute.
13					
14					

LEGEND

100 to 1,000 g — Bag Sample; Split-Spoon; Shelby Tube Sample; Seepage; Static Water Table; Water Bearing Zone

Date Drilled: 11.13.2019

Logged By: MTB

Surface Elevation: 80 Feet

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: 9th Street West Linn, Oregon	Project No. 19-5350	Exploration No. **TP-3**

Depth (ft)	Sample Type	tons/sq.ft.	Moisture Content (%)	Water Bearing Zone	Material Description
0					Stiff, organic SILT (OL), brown, grass roots wood debris, moist [Topsoil Horizon]
1		3.0			
2		3.5			
3		4.5			Stiff to very stiff, SILT (ML), light brown, moderately plastic, homogenous, sparse tree roots to 3 feet, moist [Willamette Formation]
4		4.5			
5					
6					
7					
8				▽	Stiff, SILT (ML) with fine-grained sand to sandy SILT (SM), tan with gray and orange mottling, moist to approximately 8 feet than very moist to wet [Willamette Formation]
9					
10					
11					Test Pit terminated at 11 feet. Groundwater seepage encountered in excavation at 8 feet.
12					
13					
14					

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Seepage | Static Water Table | Water Bearing Zone

Date Drilled: 11.13.2019
Logged By: MTB
Surface Elevation: 80 Feet

GeoPacific Engineering, Inc.
14835 SW 72nd Avenue
Portland, Oregon 97224
Tel: (503) 598-8445 Fax: (503) 941-9281

TEST PIT LOG

Project: 9th Street West Linn, Oregon	Project No. 19-5350	Exploration No. **TP-4**

Depth (ft)	Sample Type	tons/sq.ft.	Moisture Content (%)	Water Bearing Zone	Material Description
1		1.0			Soft, organic SILT (OL), brown, grass roots, moist to very moist [Topsoil Horizon]
2		1.0			Soft to very stiff CLAY (CL), reddish brown, black staining, heavily weathered BASALT fragments, moist to wet [Undocumented Fill]
3		4.5			
4		1.0			
5					
6					Medium stiff to stiff, SILT (ML) with sand, blue-gray, slightly plastic, homogenous, very moist to wet [Willamette Formation]
7					
8					
9					Test Pit terminated at 9 feet. Groundwater seepage encountered in excavation at 2, 4 and 7 feet.
10					
11					
12					
13					
14					

LEGEND

Bag Sample (100 to 1,000 g) | Split-Spoon | Shelby Tube Sample | Seepage | Static Water Table | Water Bearing Zone

Date Drilled: 11.13.2019
Logged By: MTB
Surface Elevation: 72 Feet

GeoPacific Engineering, Inc.
Real-World Geotechnical Solutions
Investigiation, Design, Construction Support

14835 SW 72nd Avenue
Portland, Oregon 97224

Tel (503) 598-8445
Fax (503) 941-9281

Portable Dynamic Cone Penetrometer (PDCP) / California Bearing Ratio (CBR) Correlation

Project: 9th Street West Linn **Date:** 11.20.2019 **Existing A/C Thickness:** 0 Inches **Test:** PDCP-1
Project No. 19-5350 **Engineer:** MTB **Existing Base Aggregate Thickness:** 0 Inches
Location: SW Shoulder of 9th Street at N Property Corner **Subgrade:** Fill **Notes:** Location on Figures 2
Portable Dynamic Cone: KSE DCP K-100 Model, ASTM D6951, 17.6 lbs Hammer

Length of Shaft	Ref Height at Start	Depth Below Ground at Start
in	in	in
38.75	3.6	2.6

Blows	Ref Height (in)	Depth Below Ground (in)	Depth Below Ground (ft)	Depth Below Ground (mm)	Inches/Blow	mm/Blow	CBR	Corellated PSI
5	10.9	9.9	0.8	251.5	1.5	37.1	5.1	4193
5	13.4	12.4	1.0	315.0	0.5	12.7	16.9	6368
5	21	20.0	1.7	508.0	1.5	38.6	4.9	4127
5	26.7	25.7	2.1	652.8	1.1	29.0	6.7	4617
5	29.5	28.5	2.4	723.9	0.6	14.2	14.9	6092
5	32.9	31.9	2.7	810.3	0.7	17.3	12.0	5648
5	35.9	34.9	2.9	886.5	0.6	15.2	13.8	5931
					Average	23.44	8.5	
				Average Soil Resilient Modulus per ODOT Pavement Design Guide		5014		

Portable Dynamic Cone Penetrometer (PDCP) / California Bearing Ratio (CBR) Correlation

Project: 9th Street West Linn **Date:** 11.20.2019 **Existing A/C Thickness:** 0 Inches **Test:** PDCP-2
Project No. 19-5350 **Engineer:** MTB **Existing Base Aggregate Thickness:** 0 Inches
Location: SW Shoulder of 9th Street at S Property Corner **Subgrade:** Fill **Notes:** Location on Figures 2
Portable Dynamic Cone: KSE DCP K-100 Model, ASTM D6951, 17.6 lbs Hammer

Length of Shaft	Ref Height at Start	Depth Below Ground at Start
in	in	in
38.75	3	2

Blows	Ref Height (in)	Depth Below Ground (in)	Depth Below Ground (ft)	Depth Below Ground (mm)	Inches/Blow	mm/Blow	CBR	Corellated PSI
5	9.8	8.8	0.7	223.5	1.4	34.5	5.5	4310
5	12.7	11.7	1.0	297.2	0.6	14.7	14.4	6010
5	14.2	13.2	1.1	335.3	0.3	7.6	30.0	7772
5	16.6	15.6	1.3	396.2	0.5	12.2	17.7	6470
5	22.8	21.8	1.8	553.7	1.2	31.5	6.1	4468
5	25.6	24.6	2.1	624.8	0.6	14.2	14.9	6092
5	28	27.0	2.3	685.8	0.5	12.2	17.7	6470
5	32.8	31.8	2.7	807.7	1.0	24.4	8.2	4937
5	34.4	33.4	2.8	848.4	0.3	8.1	27.9	7578
					Average	17.72	11.7	
				Average Soil Resilient Modulus per ODOT Pavement Design Guide		5592		

GeoPacific Engineering, Inc.

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Investigation • Design • Construction Support

PHOTOGRAPHIC LOG

Overhead of the Property

GeoPacific Engineering, Inc.

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Proximity to Willamette River

GeoPacific Engineering, Inc.

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Test Pits TP-2 & TP-3

Test Pit TP-1 Undocumented Fill

Test Pit TP-1

Test Pit TP-2 Undocumented Fill

GeoPacific Engineering, Inc.

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Test Pit TP-3

Test Pit TP-4

Test Pit TP-4

Attachment J: City of West Linn Incomplete Letter Dated February 5, 2020

February 5, 2020

Roy Marvin
615 NW Territorial Road
Canby, OR 97013

SUBJECT: WAP-20-01/WRG-20-01/MIS-20-01/LLA-20-01 Application for a property line adjustment between Taxlots 800 and 802 3S-1E-02AC and Water Resource Area review, Willamette River Greenway review, and Flood Management Area review for future construction of a single-family home on Taxlot 802.

Dear Mr. Marvin:

You submitted this application on January 7, 2020. The Planning and Engineering Departments find that this application is **incomplete.** The following items must be addressed:

1. *Approved application for vacation of public utility easement along north property line of Taxlot 802.*

Please submit the approved easement vacation document. The current proposal shows the future structure located in the easement.

2. *Egress/Ingress and Utility Easement – Clackamas County Document No. 2019-6706.*

Please submit a copy of the easement for proof of legal access.

3. *CDC Chapter 27.050(C) – Written responses*

Please provide additional findings for all criteria in 27.060, 27.070, and 27.080 that directly respond to the criteria. For example 27.060(B): Please provide calculations that prove this criteria is being met and not just see Exhibit A.

4. *CDC Chapter 27.050(D) – Map of proposed alteration*

Please provide a map that illustrates the location of all cuts and fills, including the total quantity of each.

5. *CDC Chapter 27.050(G) – Elevation of lowest floor*

Please provide an updated Sheet P04 or an explanation of the elevation of the southwest corner of the proposed structure and it being located below the 100-year flood elevation.

6. CDC Chapter 27.060(G) – Flood carrying capacity

Please submit certification by a professional civil engineer that the improvements located within the floodplain will maintain flood storage and conveyance capacity and not increase design flood elevations.

7. CDC Chapter 28.090.C(1) – Written Responses

Please provide additional findings for all criteria in 28.110 that directly respond to the criteria. For example 28.110.B(4): provide calculations of impervious surfaces and explain how this proposal is disturbing the minimum amount of HCA necessary when there are reduced setbacks that can be applied.

8. CDC Chapter 28.090.C(2) – Site Plan with HCA Boundaries

Please provide a site plan that includes the existing HCA boundary shown by low, moderate, and high.

9. CDC Chapter 32.050.F(9) – Significant Trees

Please contact the City Arborist for a significant tree determination. If significant trees are on the subject property, please submit an updated existing conditions map and identify which are to be retained or removed. If no significant trees are on the subject property, an email from the City Arborist will be sufficient.

10. CDC Chapter 32.050.G(3) – Anchored Chain Link Fence

Please update Site Plans to show appropriate protection fencing for the WRA.

11. CDC Chapter 32.050(H) – Mitigation Plan

32.090(B) – Please specify whether all mitigation will be on subject property or some will be off-site as the submittal provides conflicting information.

32.090(C) – Please submit calculations for required mitigation and an updated map showing locations.

32.090(E) – Please identify responsible parties for the mitigation plan and an implementation schedule including maintenance, monitoring, and reporting.

12. *CDC Chapter 32.050(I) – Re-vegetation Plan*

Please provide additional findings for all criteria in 32.100 that directly respond to the criteria.

32.100.A.3(a) – Please provide calculations.

32.100.A.3(b) – Please provide a site plan showing the locations/distances of required plantings.

32.100.A(5 to 8) – Please identify responsible parties for monitoring/reporting of revegetated sites and who is responsible for weeding and replacement of dead plants.

* Pursuant to CDC 99.035, the Planning Director may require information in addition to that required by a specific chapter in the Community Development Code or may waive a specific requirement for information or a requirement to address a certain approval standards.

Pursuant to ORS 227.178 "If an application for a permit, limited land use decision or zone change is incomplete, the governing body or its designee shall notify the applicant in writing of exactly what information is missing within 30 days of receipt of the application and allow the applicant to submit the

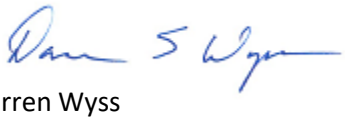
missing information. The application shall be deemed complete for the purpose of subsection (1) of this section upon receipt by the governing body or its designee of:

(a) All of the missing information;
(b) Some of the missing information and written notice from the applicant that no other information will be provided; or
(c) Written notice from the applicant that none of the missing information will be provided.

You now have 180 days, through July 5, 2020, to make the application complete by providing the information outlined above. On the 181st day after first being submitted, the application will be considered void if the applicant has been notified of the missing information and has not submitted the information as requested above or a written notice responding to the above options.

Please contact me at 503-742-6064, or by email at dwyss@westlinnoregon.gov if you have any questions or comments.

Sincerely,



Darren Wyss

Associate Planner