



# CITY OF MILWAUKIE

## AGENDA

February 26, 2019

### PLANNING COMMISSION

City Hall Council Chambers  
10722 SS Main Street  
[www.milwaukieoregon.gov](http://www.milwaukieoregon.gov)

- 1.0 Call to Order - Procedural Matters** — 6:30 PM
- 2.0 Planning Commission Minutes** – Motion Needed
- 3.0 Information Items**
- 4.0 Audience Participation** – This is an opportunity for the public to comment on any item not on the agenda
- 5.0 Public Hearings** – Public hearings will follow the procedure listed on reverse
  - 5.1 Summary: Bonaventure Senior Housing Facility  
Applicant/Owner: Bonaventure Senior Living / Turning Point Church  
Address: 13333 SE Rusk Rd  
File: CU-2018-003 (master file)  
Staff: Brett Kolver, Associate Planner
- 6.0 Worksession Items**
- 7.0 Planning Department Other Business/Updates**
- 8.0 Planning Commission Committee Updates and Discussion Items** – This is an opportunity for comment or discussion for items not on the agenda.
- 9.0 Forecast for Future Meetings:**
  - March 12, 2019
    - 1. Public Hearing: VR-2019-002 Harlene St Driveway Width
    - 2. Public Hearing: AP-2019-001 Appeal of MLP-2018-001 (continued)
    - 3. Worksession: Comprehensive Plan Update – Housing
  - March 26, 2019
    - 1. TBD

## Milwaukie Planning Commission Statement

The Planning Commission serves as an advisory body to, and a resource for, the City Council in land use matters. In this capacity, the mission of the Planning Commission is to articulate the Community's values and commitment to socially and environmentally responsible uses of its resources as reflected in the Comprehensive Plan

- 1. PROCEDURAL MATTERS.** If you wish to speak at this meeting, please fill out a yellow card and give to planning staff. Please turn off all personal communication devices during meeting. For background information on agenda items, call the Planning Department at 503-786-7600 or email [planning@milwaukieoregon.gov](mailto:planning@milwaukieoregon.gov). Thank you.
- 2. PLANNING COMMISSION and CITY COUNCIL MINUTES.** City Council and Planning Commission minutes can be found on the City website at [www.milwaukieoregon.gov/meetings](http://www.milwaukieoregon.gov/meetings).
- 3. FORECAST FOR FUTURE MEETING.** These items are tentatively scheduled, but may be rescheduled prior to the meeting date. Please contact staff with any questions you may have.
- 4. TIME LIMIT POLICY.** The Commission intends to end each meeting by 10:00pm. The Planning Commission will pause discussion of agenda items at 9:45pm to discuss whether to continue the agenda item to a future date or finish the agenda item.

### Public Hearing Procedure

Those who wish to testify should come to the front podium, state his or her name and address for the record, and remain at the podium until the Chairperson has asked if there are any questions from the Commissioners.

- 1. STAFF REPORT.** Each hearing starts with a brief review of the staff report by staff. The report lists the criteria for the land use action being considered, as well as a recommended decision with reasons for that recommendation.
- 2. CORRESPONDENCE.** Staff will report any verbal or written correspondence that has been received since the Commission was presented with its meeting packet.
- 3. APPLICANT'S PRESENTATION.**
- 4. PUBLIC TESTIMONY IN SUPPORT.** Testimony from those in favor of the application.
- 5. NEUTRAL PUBLIC TESTIMONY.** Comments or questions from interested persons who are neither in favor of nor opposed to the application.
- 6. PUBLIC TESTIMONY IN OPPOSITION.** Testimony from those in opposition to the application.
- 7. QUESTIONS FROM COMMISSIONERS.** The commission will have the opportunity to ask for clarification from staff, the applicant, or those who have already testified.
- 8. REBUTTAL TESTIMONY FROM APPLICANT.** After all public testimony, the commission will take rebuttal testimony from the applicant.
- 9. CLOSING OF PUBLIC HEARING.** The Chairperson will close the public portion of the hearing. The Commission will then enter into deliberation. From this point in the hearing the Commission will not receive any additional testimony from the audience, but may ask questions of anyone who has testified.
- 10. COMMISSION DISCUSSION AND ACTION.** It is the Commission's intention to make a decision this evening on each issue on the agenda. Planning Commission decisions may be appealed to the City Council. If you wish to appeal a decision, please contact the Planning Department for information on the procedures and fees involved.
- 11. MEETING CONTINUANCE.** Prior to the close of the first public hearing, any person may request an opportunity to present additional information at another time. If there is such a request, the Planning Commission will either continue the public hearing to a date certain, or leave the record open for at least seven days for additional written evidence, argument, or testimony. The Planning Commission may ask the applicant to consider granting an extension of the 120-day time period for making a decision if a delay in making a decision could impact the ability of the City to take final action on the application, including resolution of all local appeals.

*The City of Milwaukie will make reasonable accommodation for people with disabilities. Please notify us no less than five (5) business days prior to the meeting.*

#### **Milwaukie Planning Commission:**

Kim Travis, Chair  
John Henry Burns, Vice Chair  
Adam Argo  
Joseph Edge  
Sherry Grau  
Greg Hemer  
Robert Massey

#### **Planning Department Staff:**

Denny Egner, Planning Director  
David Levitan, Senior Planner  
Brett Kelder, Associate Planner  
Vera Koliass, Associate Planner  
Mary Heberling, Assistant Planner  
Alicia Martin, Administrative Specialist II



# CITY OF MILWAUKIE

**To:** Planning Commission

**Through:** Dennis Egner, Planning Director

**From:** Brett Kelter, Associate Planner

**Date:** February 19, 2019, for February 26, 2019, Public Hearing

**Subject:** **File:** CU-2018-003 (master file)  
**Applicant:** Bonaventure Senior Living  
**Property Owner:** Turning Point Church  
**Address:** 13333 SE Rusk Rd  
**Legal Description (Map & Tax Lot):** 2S2E06AD, lots 600, 700, 900, 901  
**NDA:** Lake Road

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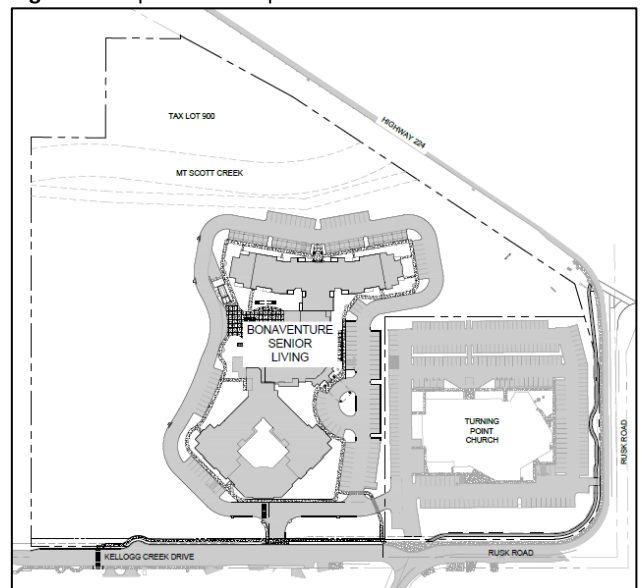
## ACTION REQUESTED

Approve land use application master file #CU-2018-003 and its associated applications and adopt the recommended Findings and Conditions of Approval found in Attachments 1 and 2 (to be distributed under separate cover). This action would allow for development of a 170-unit senior housing facility, including limited disturbance to the designated natural resource areas on the site.

## BACKGROUND INFORMATION

The 17.5-acre subject property at 13333 SE Rusk Rd is currently developed with the Turning Point Church in the southeast corner of the site. Mount Scott Creek flows across the northern portion of the property, with a 0.7-acre wetland and 100-year floodplain boundary in the low-lying western half of the site. The application package, submitted by Bonaventure Senior Living, includes a proposal to consolidate the underlying lots and a boundary adjustment to establish the church on its own lot, with the larger remaining property to be used for a 170-unit senior housing facility (see Figure 1).

Figure 1. Proposed development

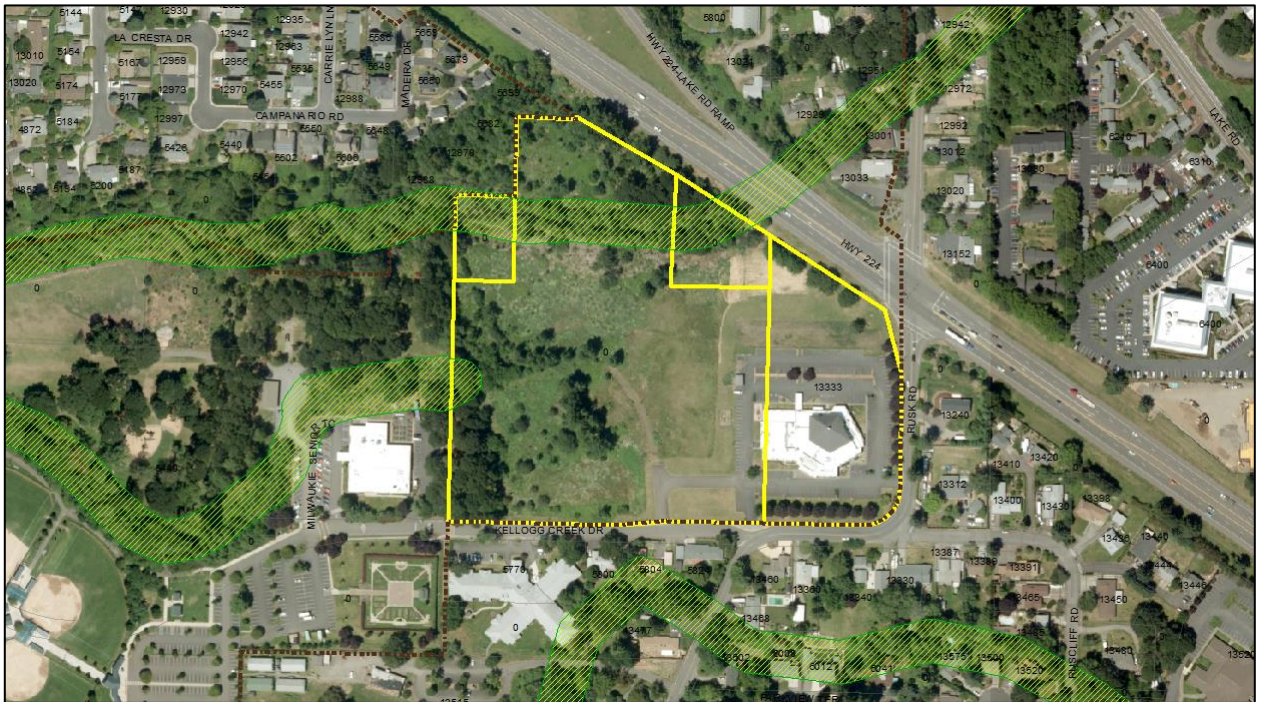


The proposal is to establish 170 units of senior housing in a multistory building ranging from 1 to 4 stories in height. The facility would provide 78 independent living suites (1- and 2-bedroom units with full kitchens), 60 assisted living suites (1- and 2-bedroom units, with all meals provided in a communal dining room), and 32 memory care suites (rooms located in a secured section of the building, with a separate serving kitchen and shared dining room and common amenities). A looped driveway would circle the building for access and circulation, with 139 off-street parking spaces for staff, visitors, and the residents of independent living residents (approximately 30% of residents in independent living units are expected to keep a car on site). The remainder of the site, to the west and on the north side of Mount Scott Creek, would remain undeveloped to preserve the designated natural resource and floodplain areas on the property.

### A. Site and Vicinity

The site is located at 13333 SE Rusk Rd. The southeastern corner of the site (approximately 3.7 acres) contains the Turning Point Church, with ingress from Rusk Road and an additional access to Kellogg Creek Drive through the proposed development site to the west. The remainder of the site (approximately 13.8 acres) is undeveloped (see Figure 2).

Figure 2. Site and vicinity



Mount Scott Creek flows east to west across the property, leaving an approximately 2-acre section of the site largely inaccessible on the north side of the creek. A delineated wetland approximately 0.7 acres in size extends across the low-lying area on the western portion of the property. Water Quality Resource (WQR) and Habitat Conservation Area (HCA) designations follow the creek and wetland, and the 100-year floodplain covers a substantial portion of the low-lying western half of the site. South of the wetland, along the southwest boundary of the property, a stand of mature white oak trees is not currently

included in the HCA designation; however, the applicant's Natural Resource Review report includes a re-evaluation of the natural resources on the site and proposes to update the City's Natural Resource Administrative Map (NR Map) to extend the HCA designation to include the oak trees.

Highway 224 runs along the northeastern border of the site; the Turning Point Church is adjacent to the east. To the south, across Kellogg Creek Drive in unincorporated Clackamas County, there are 3 single-family houses (zoned R-10) and the Deerfield Village assisted living facility. Adjacent to the west is North Clackamas Park, with the Milwaukie Center and an open wetland area immediately adjacent to the subject property. Another unincorporated R-10 residential neighborhood is across Mount Scott Creek to the northwest.

## B. Zoning Designation

Residential R-10 and Residential R-3 (site is split-zoned—see Figure 3)

## C. Comprehensive Plan Designation

Low Density Residential (LD) and Medium Density Residential (Med. D)

## D. Land Use History

- **June 1981:** City Council approved Ordinance 13-1981 to annex the subject property into Milwaukie (land use file #A-80-07). A concurrent request to re-zone the property from R-10 to R-2 was withdrawn (file #ZC-80-07).
- **October 1984:** Planning Commission approved a Community Service Overlay for use of the site by the Milwaukie Assembly of God (file #CS-84-02).
- **October 1987:** City Council approved Ordinance 1638 to amend the Comprehensive Plan map's land use designation for the subject property and Ordinance 1639 to change the zoning of the western portion of the property from R-10 to R-3. In addition, a conditional use was approved for a 162-unit senior housing project on the western portion of the site (file #s CPA-87-01, ZC-87-05, and CU-87-05).
- **November 1987:** Planning Director approved a minor land partition to separate the existing church on the east side of the site from the senior housing project approved by file #CU-87-05 (file #MLP-87-04). The senior housing project (named Parkside Village) was never developed and the partition was never finalized.

Figure 3. Zoning designation



- **July 1992:** Planning Commission approved a 5,500-sq-ft addition to the church building for classrooms, foyer, chapel, and storage; as well as the establishment of a regulation softball field on the northern portion of the site (file #s CSO-92-03 and NR-92-01). The staff report indicates that portions of the wetlands on site were filled in 1980 and again in 1990 in violation of Division of State Lands (DSL) regulations; the fill was required to be removed and the wetlands restored in 1991. It does not appear that the softball field was ever developed.
- **September 1997:** Planning Commission denied a sign permit request to locate an electronic reader board sign on the property near the intersection of Highway 224 and Rusk Rd (file #SP-97-01).
- **September 2014:** Planning Director approved a minor modification to the existing Community Service Use for the church, for removal of approximately 75 of 300 existing parking spaces as part of a natural resource restoration effort near Mount Scott Creek (file #s CSU-14-06 and NR-14-06). The site was overparked by approximately 100 spaces, so the proposal brought the off-street parking situation closer into conformance with the applicable standards. The project involved revegetating the area where the spaces were removed and did not directly impact any designated natural areas, but it required approval of a Construction Management Plan due to its location within 100 ft of the HCA on the site.
- **January 2018:** Applicant (Brownstone Development) withdrew their application for a 92-unit Planned Development on the site (master file #PD-2017-001). The proposal was subject to the Type IV review process and was recommended for approval in July 2017 by the Planning Commission. The City Council held multiple public hearings on the proposal and was encouraging revisions to the proposal before the applicant decided to withdraw the application.

## E. Proposal

The applicant is seeking land use approvals to establish a 170-unit senior housing facility on a large parcel at 13333 SE Rusk Rd currently owned by the Turning Point Church. The proposal includes the following elements:

- 170 units of senior housing (78 independent living units, 60 assisted living units, 32 memory care suites)
- Multistory building, ranging from 1 to 4 stories in height
- Looped driveway, with 139 off-street parking spaces
- On-site open stormwater facilities (swales)
- Preservation of designated natural resources and floodplain on western half of site
- Lot consolidation and property line adjustment to locate church and senior housing facility on separate lots

For more detailed information on the proposal, see the Applicant's Materials in Attachment 3.

The project requires approval of the following applications:

1. Conditional Use (master file, #CU-2018-003)

The independent and assisted living units are classified as senior and retirement housing, which requires conditional use approval in the R-10 and R-3 residential zones.

2. Community Service Use, establishment (CSU-2018-019)

The memory care suites are classified as a nursing or convalescent home, which requires approval as a new community service use (CSU). In addition, the proposal includes signage, which is normally limited in residential zones but can be allowed to a greater degree for CSUs through the Type III review process.

3. Natural Resource Review (NR-2018-006)

The proposal to disturb portions of the Water Quality Resource (WQR) and Habitat Conservation Area (HCA) on the site must provide an analysis of alternatives and to avoid, minimize, and mitigate for impacts. In addition, the applicant has proposed to revise the City's Natural Resource Administrative Map (NR Map) to more accurately show the location of the HCA on the site.

4. Variance Request (VR-2018-017)

As proposed, the project requires 3 variances: (1) to exceed the maximum allowed building height of 2.5 stories or 35 ft for senior and retirement housing; (2) for relief from the requirement to provide a pedestrian walkway connection into the site from Rusk Rd (required for every 300 ft of street frontage); and (3) for relief from the requirement that a nursing and convalescent home provide access from a collector or arterial street.

5. Parking Modification (P-2018-003)

Although the City's off-street parking requirements (established in MMC Table 19.605.1) include specific standards for senior and retirement housing and nursing and convalescent homes, the applicant has requested a parking modification to assert that a different number of spaces is more appropriate for the proposed use.

6. Transportation Facilities Review (TFR-2018-002)

The project's impacts on traffic must be evaluated to determine whether improvements to the transportation system are warranted.

7. Lot Consolidation (LC-2018-002)

The proposal includes consolidation of 3 of the underlying lots on the western half of the site into one, leaving the existing church use mostly on a fourth underlying lot.

8. Property Line Adjustment (PLA-2018-001)

The proposal includes a boundary adjustment to retain the existing church on one distinct lot and the proposed senior housing facility on the newly consolidated western lot.

9. Community Service Use, minor modification (CSU-2018-020)

Reduction of the area of church use on the property constitutes a minor modification of the church's existing CSU approval.

## KEY ISSUES

### Summary

Staff has identified the following key issues for the Planning Commission's deliberation. Aspects of the proposal not listed below are addressed in the Findings (see Attachment 1) and generally require less analysis and discretion by the Commission.

- A. Floodplain: Would the proposed development impact the 100-year floodplain?
- B. Natural Resources: Does the proposed development present the least impact to natural resources with a reasonable footprint for the building and off-street parking?
- C. Transportation: How would the proposed development impact the local street system and what improvements would be provided?

### Analysis

#### **A. Floodplain: Would the proposed development impact the 100-year floodplain?**

FEMA's current GIS-based map shows the 100-year floodplain covering a significant portion of the site, including a large area that would be disturbed by the proposed development. However, the applicant has used FEMA's modeling and base flood elevation data and applied it specifically to the existing contours on the site, resulting in a significant adjustment to the floodplain boundary. As proposed, the new development would not impact any of the revised floodplain. The applicant has acknowledged that an official Letter of Map Revision (LOMR) must be obtained from FEMA to avoid the need for additional study and review and requirements to balance cut and fill. The applicant is confident in the revised mapping and understands that failure to produce a LOMR will effectively invalidate this land use approval.

#### **B. Natural Resources: Does the proposed development present the least impact to natural resources with a reasonable footprint for the building and improvements?**

The footprint of the proposed new building and associated parking, access, stormwater facilities, and constructed open space are focused on the eastern half of the property, generally avoiding the delineated wetland and riparian areas along Mount Scott Creek.



However, the proposed locations of approximately 34 parking spaces and 3 stormwater facilities do encroach into portions of the designated Water Quality Resource (WQR) and Habitat Conservation Area (HCA). ESA, the City's on-call Natural Resource consultant, has reviewed the applicant's materials and suggested that the off-street parking spaces closest to Mount Scott Creek could be shifted or eliminated to reduce impacts to the HCA. Likewise, ESA suggested that the locations or configurations of 3 of the stormwater facilities could be adjusted to reduce impacts.

Unless the applicant demonstrates that such adjustments are not feasible, staff recommends that the site plans be adjusted accordingly to reduce impacts to the HCA. The 20 parking spaces closest to Mount Scott Creek could be relocated farther east, or they could be eliminated completely and still allow the project to provide the minimum 119 spaces that the applicant's own parking assessment concluded was an acceptable minimum for a facility of this scale.

Staff will coordinate with the applicant on this issue prior to the hearing, and it is possible that an alternative site layout will be available for discussion on February 26. Alternately, the applicant may choose to provide a justification of the current site plan. At present, the findings are structured to approve the proposal but with the condition to revise the site plan to further reduce impacts to the WQR and HCA, with mitigation planting numbers adjusted accordingly.

**C. Transportation: How would the proposed development impact the local street system and what improvements would be provided?**

The applicant's TIS concluded that the proposed development's impacts on the surrounding transportation system would be minimal and that the system would continue to operate at the same level of service as before the proposed development. The estimated number of new peak-hour trips generated is less than for the townhouse-type development that was proposed for the site in 2017, though roughly the same street improvements would be provided.

As proposed for the site in 2017, the right-turn lane on Rusk Rd at the OR 224 intersection would be extended to allow for better queuing, which would alleviate some congestion at the traffic signal. Although the impacts of the proposed development do not warrant requiring the applicant to make that improvement, the applicant has proposed to construct the right-turn lane and will receive the appropriate credit on a portion of the System Development Charges (SDCs) owed by the new senior housing development.

A bicycle connection is required from the Rusk Rd intersection with OR 224 all the way to the subject property's western boundary at the entrance to North Clackamas Park. Rather than bringing a bike route through the development property like the previous townhome proposal, the applicant has proposed to construct a separated bike path along the Rusk Rd frontage of the church property, with an easement to allow public access. As proposed, the path is only 5 ft wide, which is not adequate for two-way bicycle traffic, so the path will have to be widened. There appears to be adequate room for a wider path, though several of

the existing trees shading the church parking lot may have to be removed. Replacement trees would be required to maintain the parking lot's compliance with landscaping standards. The bike path would transition to an on-street bike lane on Kellogg Creek Dr, and further design is needed to demonstrate how eastbound cyclists on Kellogg Creek Dr would safely access the path as they approach Rusk Rd. With the necessary adjustments, the proposed bicycle facilities are a welcome improvement to the larger network.

In addition to the bike lane, a new sidewalk would be constructed on the north side of Kellogg Creek Dr along the frontage of the proposed senior housing development, replacing the existing curb-tight sidewalk with one separated from the street by a landscape strip and street trees. To avoid impacts to the existing Oregon oak woodland in the southwest corner of the site, the applicant has proposed to end the new sidewalk east of the woodland and construct a mid-block pedestrian crossing to the existing sidewalk on the south side of the street. The existing crossing closer to the park entrance would be removed, and the existing sidewalk would be brought up to ADA standards if needed. Two proposed pedestrian connections would link the senior housing development site to the new sidewalk on Kellogg Creek Dr, facilitating safe access from the new facility to North Clackamas Park and the Milwaukie Center.

The applicant has proposed to provide 14 bicycle parking spaces (a minimum of 12 are required) to serve visitors and staff. Although the proposed development is not a multifamily project and the multifamily design guidelines are not technically applicable, staff believes it is reasonable to assume that at least some of the independent living residents may have bicycles and need a place to store them. Staff recommends that at least 24 more bike parking spaces be provided (for 30% of the 78 independent living units) and that they be located in a secure room(s) inside the building or at least be covered and conveniently located for residents.

No carpool/vanpool spaces are proposed, but at least 12 such spaces are required (10% of the total required vehicle spaces). Staff recommends that 12 carpool/vanpool spaces be provided in accordance with the standards of MMC Section 19.610, to incentivize this mode of shared transportation and potentially reduce the total number of vehicles that access the site throughout each day.

## CONCLUSIONS

### A. Staff recommendation to the Planning Commission is as follows:

1. Approve the Conditional Use and Community Service Use applications (CU-2018-003 and CSU-2018-019) for the proposed senior and retirement housing and nursing and convalescent home uses. This would result in development of 170 units of senior housing, including 78 independent living suites, 60 assisted living suites, and 32 memory care suites.
2. Approve the Natural Resource Review (NR-2018-006), which would allow minimal disturbance as conditioned to the WQR and HCA on the site, with an approved

mitigation plan. The approval would also revise the NR map to more accurately show the HCA designation, including extending it to encompass the stand of white oak trees in the southwestern corner of the site.

3. Approve the Variance Request (VR-2018-017), which would do the following: (1) allow the building to exceed the maximum allowed height for senior and retirement housing, up to 4 stories; (2) waive the requirement to provide a pedestrian walkway connection into the site from Rusk Rd; and (3) waive the requirement that a nursing and convalescent home must provide access from a collector or arterial street.
4. Approve the Parking Modification (P-2018-003), which would confirm that the 139 proposed off-street parking spaces are appropriate and sufficient for the facility.
5. Approve the Transportation Facilities Review (TFR-2018-002), which would confirm that the public improvements proposed and conditioned for the project are sufficient and proportional to the impacts on the transportation system.
6. Approve the Lot Consolidation and Property Line Adjustment (LC-2018-002 and PLA-2018-001), which would consolidate the underlying lots on the subject property and establish the existing church use and the proposed senior housing facility on their own distinct lots.
7. Approve the CSU minor modification (CSU-2018-020), which would confirm that the reduction of the area of church use on the property does not represent an increase in the intensity of use of the site and meets all applicable requirements of the zoning code.
8. Adopt the attached Findings and Conditions of Approval.

**B. Staff recommends the following key conditions of approval (see Attachment 2 for the full list of Conditions of Approval):**

- Adjust the location/configuration of parking spaces and stormwater facilities to reduce impacts to the WQR and HCA.
- Revise the mitigation plan to better address nuisance species removal and accommodation for existing native vegetation (particularly existing Oregon oaks).
- Extend the right-turn lane on Rusk Rd at the OR 224 intersection by at least 100 ft.
- Widen the proposed bike path along the Rusk Rd frontage to be a minimum of 10 ft wide, with a design for safe access for eastbound bikes on Kellogg Creek Dr. Replace trees removed from alongside the church parking lot as needed.
- Provide at least 24 additional bike parking spaces for the independent living residents, located in a secure room(s) inside the building or at least covered and conveniently located.
- Provide trees as required in all perimeter landscaping areas on both properties.

## CODE AUTHORITY AND DECISION-MAKING PROCESS

The proposal is subject to the following provisions of the Milwaukie Municipal Code (MMC).

- MMC Chapter 19.1000 Review Procedures (incl. MMC 19.1006 Type III Review)
- MMC Title 12 Streets, Sidewalks, and Public Places
- MMC Chapter 13.14 Stormwater Management
- MMC Section 14.08.090 Conditional and Community Service Use Signs
- MMC Title 17 Land Division
- MMC Title 18 Flood Hazard Regulations
- MMC Section 19.301 Low Density Residential Zones (including R-10)
- MMC Section 19.302 Medium and High Density Residential Zones (including R-3)
- MMC Section 19.402 Natural Resources
- MMC Chapter 19.500 Supplementary Development Regulations
- MMC Chapter 19.600 Off-Street Parking and Loading
- MMC Chapter 19.700 Public Facility Improvements
- MMC Section 19.905 Conditional Uses
- MMC Section 19.904 Community Service Uses
- MMC Section 19.911 Variances

This application is subject to Type III review, which requires the Planning Commission to consider whether the applicant has demonstrated compliance with the code sections shown above. In Type III reviews, the Commission assesses the application against review criteria and development standards and evaluates testimony and evidence received at the public hearing.

The Commission has 4 decision-making options as follows:

- A. Approve the application subject to the recommended Findings and Conditions of Approval.
- B. Approve the application with modified Findings and Conditions of Approval. Such modifications need to be read into the record.
- C. Deny the application upon finding that it does not meet approval criteria.
- D. Continue the hearing.

The final decision on these applications, which includes any appeals to the City Council, must be made by May 11, 2019, in accordance with the Oregon Revised Statutes and the Milwaukie Zoning Ordinance. The applicant can waive the time period in which the application must be decided.

## COMMENTS

Notice of the proposed changes was given to the following agencies and persons: City of Milwaukie Building, Engineering, Public Works, and Police Departments; City Attorney; Lake Road Neighborhood District Association (NDA); Oak Grove Community Council; Clackamas Fire District #1 (CFD#1); Clackamas County Department of Transportation and Development (DTD); Metro; TriMet; ODOT; North Clackamas Parks & Recreation District; North Clackamas School District; and properties within 500 ft of the subject site. The extended notification boundary is greater than the 300-ft notice required by MMC Subsection 19.1006.3.D but matches the notice area for the public information meeting held by the applicant prior to submittal of the application.

The following is a summary of the comments received by the City. See Attachment 4 for further details.

- **Marah Danielson, Development Review Planner, ODOT Region 1:** ODOT supports the Traffic Impact Analysis recommendation that, “The Applicant should collaborate with the City of Milwaukie to construct a northbound right turn lane on Rusk Rd at OR 224 in conjunction with the site development.” The installation of a northbound right-turn lane will improve operations at the intersection of Rusk Rd and OR 224 for this development as well as future growth in the area.
- **Sarah Hartung, Senior Biologist, ESA (City’s on-call Natural Resource consultant):** ESA has provided a memo serving as peer review of the applicant’s Natural Resource Review report.

*Staff Response: The conclusions of ESA’s report are integrated into the Recommended Findings and Conditions as appropriate.*

- **Ed Hacmac, property owner at 13033 SE Rusk Rd:** Senior housing is needed, and the development will not affect the local school system one way or the other. The biggest impacts will be related to traffic, and the Rusk Rd intersections with Ruscliff Rd and Kellogg Creek Dr need to be reconfigured for safety. Suggestions include a roundabout at Rusk Rd and Kellogg Creek Dr and addition of a travel lane along the church’s frontage. The recommended right-turn lane at the intersection of Rusk Rd and OR 224 will help, but Rusk Rd should be widened all the way from OR 224 to Kellogg Creek Dr. Locating improvements along the church’s frontage seems fairer and less disruptive than pushing them onto the east side of Rusk Rd.

*Staff Response: Staff concurs with the applicant’s Traffic Impact Study (TIS), which concluded that the surrounding transportation system would continue to operate at the same level of service as before the proposed development.*

- **George McKee, property owner/resident in the area:** He would like to ensure that the proposed development does not include new equipment (e.g., air conditioning, heating, etc.) that would contribute to noise pollution in the surrounding residential area. The highway and existing businesses in the area already generate noise that affects the quality of life for nearby residents.

*Staff Response: Staff has recommended a condition that any outdoor mechanical equipment be buffered for sound as needed to ensure that noise levels remain within the permissible levels established in MMC Section 8.08.090.*

- **Kenneth Kent, Senior Planner, Clackamas County Department of Transportation and Development, Engineering Division:** Both Kellogg Creek Dr and Rusk Rd are under the County's jurisdiction, so County standards and requirements apply where frontage improvements are concerned. The applicant's Traffic Impact Study (TIS) recommends a reduction of the driveway to single-lane width (12 ft) and channelization to facilitate right-in-only movements. The County would prefer that the existing church driveway at Rusk Rd be closed but will accept the proposed driveway modification. The TIS indicates a need for additional storage for the northbound right-turn lane on Rusk Rd at OR 224, so an extension of the existing right-turn lane is required for at least 100 ft. The proposed bike path must be at least 10 ft wide, must be designed to extend west of the bulb-out and ramp down to the pavement on Kellogg Creek Dr, and shall be maintained by the City through an intergovernmental agreement.

Along the Kellogg Creek Dr frontage, a minimum 7-ft right-of-way dedication is required, with the following half-street improvements: minimum 16-ft roadway, curb or curb and gutter, 5-ft landscape strip with street trees, 5-ft sidewalk, and no bike lane striping. It is acceptable to limit sidewalk construction on the north side of Kellogg Creek Dr as needed to preserve the existing oak trees, with a mid-block crossing pedestrian crossing to the existing sidewalk on the south side of the street. The proposed mid-block crossing shall be designed as per County standards, and the existing south-side sidewalk shall be upgraded to current ADA standards (from the crossing point west to the existing crossing near the park entrance).

*Staff Response: The County's requirements have been integrated into the Recommended Findings and Conditions as appropriate. The City plans to take jurisdiction of Kellogg Creek Dr in the near future and would prefer to have a striped bike lane to make a safer connection to North Clackamas Park.*

- **Izak Hamilton, Fire Inspector, CFD#1:** Standard comments related to fire access and water supply.
- **Dalton Vodden, Associate Engineer, City of Milwaukie Engineering Department:** Comments related to the proposal's compliance with MMC Title 12 Streets, Sidewalks, and Public Places; MMC Chapter 13.14 Stormwater Management; MMC Title 18 Flood Hazard Regulations; and MMC Chapter 19.700 Public Facility Improvements, with relevant recommended conditions of approval.

*Staff Response: The Engineering Department's requirements have been integrated into the Recommended Findings and Conditions as appropriate.*

## ATTACHMENTS

Attachments are provided as indicated by the checked boxes. All material is available for viewing upon request.

	Early PC Mailing	PC Packet	Public Copies	Packet
1. Recommended Findings in Support of Approval (to be distributed under separate cover)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Recommended Conditions of Approval (to be distributed under separate cover)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Applicant's Narrative and Supporting Documentation, stamped received on December 5, 2018, unless noted otherwise.				
a. Resubmittal letter (stamped January 11, 2019)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
b. Narrative for CSU & Conditional Use (Jan. 28, 2019)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
c. Exhibit A—Preliminary Plan Set (Jan. 28, 2019)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
• Sheet A3.1 Exterior Elevations (revised Feb. 1, 2019)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
d. Exhibit B—Parking Assessment Memo	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e. Exhibit C—Preapplication Meeting Summary	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
f. Exhibit D—Traffic Impact Analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
g. Exhibit E—Preliminary Drainage Report (Feb. 7, 2019)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
h. Exhibit F—Signage Plan (Feb. 1, 2019)				
i. Natural Resource Review (Dec. 31, 2018)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
j. Narrative for Property Line Adjustment (PLA)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
k. Neighborhood Meeting Materials	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
l. Application forms & authorizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Comments Received	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Key:

Early PC Mailing = paper materials provided to Planning Commission at the time of public notice 20 days prior to the hearing.

PC Packet = paper materials provided to Planning Commission 7 days prior to the hearing.

Public Copies = paper copies of the packet available for review at City facilities and at the Planning Commission meeting.

Packet = packet materials available online at <https://www.milwaukieoregon.gov/planning/cu-2018-003>.



January 11, 2019

Brett Kelter, Associate Planner  
City of Milwaukie Community Development  
6101 SE Johnson Creek Blvd.  
Milwaukie, OR 97206

**Subject:           Completeness Items for CU-2018-003**

Dear Brett,

We are providing this letter and attached materials in response to your incompleteness letter dated January 4, 2019 for a proposed senior living facility at 13333 SE Rusk Road. The incompleteness items identified in your letter are listed below along with a response indicating how they have been addressed.

**1. MMC Subsection 19.504.9 On-Site Walkways and Circulation**

*A walkway into the site is required for every 300 ft of street frontage (MMC Subsection 19.504.9.B). As noted in the narrative, the frontage on Kellogg Creek Dr exceeds 600 ft, so 2 walkway connections into the site are required. The site plan shows 1 connection at the driveway onto Kellogg Creek Dr, and the narrative indicates that it is not appropriate to provide a second connection. That may be the case, but a formal variance request is required if relief is sought from the standard. The same is true for the limited site frontage on Rusk Rd (approximately 64 ft, which requires 1 walkway connection).*

**Response:** The site plan has been revised to show an additional connection into the site from Kellogg Creek Drive, located at the eastern edge of the site next to the church property. For the limited site frontage on SE Rusk Road, the applicant is requesting a variance to the standard. The narrative has been updated to include the variance request and address the applicable variance criteria.

**2. MMC Section 19.609 Bicycle Parking**

*The requirement for bicycle parking applies to community service uses, which includes the proposed memory care units. While it may be true that bicycle parking is not necessary for memory care residents themselves, the spirit of the requirement extends to employees and visitors. If bicycle parking will not be provided, a variance request is required. If the applicant wishes to make the case that bicycle parking should be required at a level less than 10% of the vehicle parking spaces, that could be addressed in the applicant's requested parking determination, as per the procedure outlined in MMC Subsection 19.605.2.*

**Response:** The site plan has been updated to include 14 bicycle parking spaces (which is 10 percent of the 139 vehicle parking spaces on the site). The narrative has been updated to reflect this change and address applicable bicycle parking standards.



### 3. MMC Section 19.904 Community Service Uses (CSUs)

#### a. MMC Subsection 19.904.5.C Minor Modifications

*The proposed boundary change to place the Turning Point Church on a separate lot significantly reduces the amount of landscaping on the church site. It is not clear from the application materials whether the proposed change will reduce the minimum required landscaping below the level allowed for institutional and religious CSUs (15% of the site area). The materials should be revised to address this issue and include a variance request if necessary.*

**Response:** An attachment is provided with this submittal to demonstrate the amount of vegetated area that will remain on the church property. As shown in Attachment 1, approximately 25 percent of the church site will be vegetated, which exceeds the requirement.

#### b. MMC Subsection 19.904.8 Specific Standards for Nursing or Convalescent Homes

*The facility is subject to the standard established in MMC Subsection 19.904.8.B requiring access onto an arterial or collector street. As the narrative has noted that the facility proposes to access onto a local street (Kellogg Creek Dr), a variance request is required for relief from this standard.*

**Response:** Connection to an arterial or collector street is not feasible; therefore, the applicant requests a variance to this standard. The narrative has been updated to include the variance request and address the applicable variance criteria.

### 4. Title 18 Flood Hazard Regulations

*The narrative and application materials indicate that the actual location of the 100-year floodplain is different than what is shown on the relevant FEMA map. The narrative should be expanded to address Title 18 in the Milwaukie Municipal Code at least enough to explain whether and/or when the applicant proposes to officially revise the FEMA map and otherwise address the floodplain shown on the site.*

**Response:** The narrative has been updated to include Title 18.

### 5. Stormwater Management

- a. *Remove the reference to WES sizing methodology in the preliminary drainage report. The basin sizing provided in Figure 2 of the Proposed Basin Delineation plan does not match the basin sizes used in the Presumptive Approach Calculator. Proposed facilities must be designed to relevant on-site basin sizes. Please revise as needed.*
- b. *Basin A appears to drain to 2 separate facilities. Please revise to have separate sub-basins or connected facilities.*

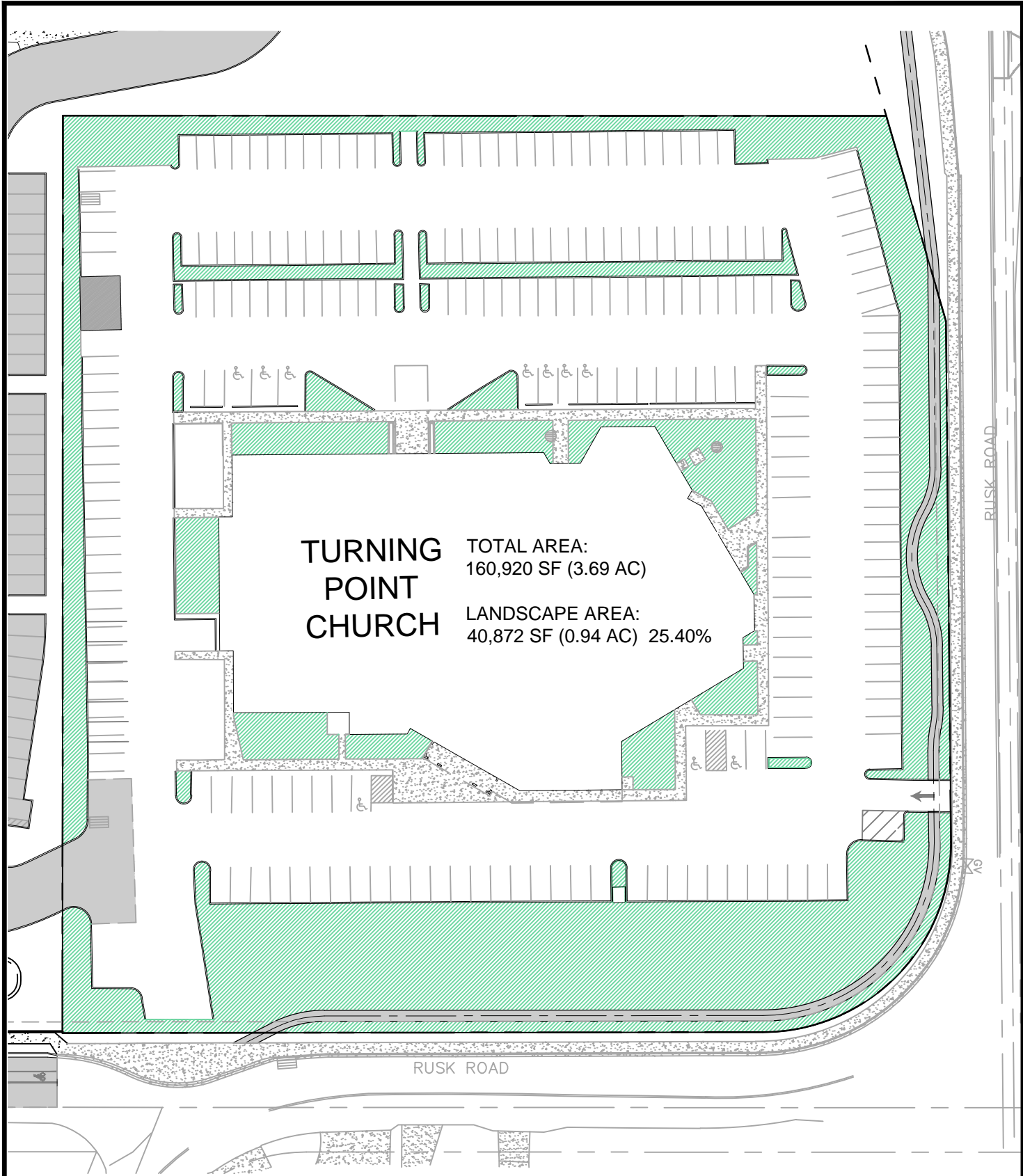
**Response:** An updated drainage report will be provided to the City that addresses the comments above. The updated report will be provided separately from this submittal but will be provided in time for incorporation into the staff report (no later than January 28).

With submittal of this information, we request that you deem our application complete as of the date of this letter and begin the review process. We understand that our first hearing before the Planning Commission will be February 26, 2019 – please confirm. Thank you for your review and please contact me if you have any questions.

Sincerely,

Serah Breakstone, AICP  
Senior Planner

Q:\221\14497-01\65\CAD\Exhibits\Welland Sections\Church Landscape area.dwg PLOT DATE 2019-1-9 09:30 SAVED DATE 2019-01-09 08:55 USER: semmens



**TURNING POINT CHURCH**  
TOTAL AREA: 160,920 SF (3.69 AC)  
LANDSCAPE AREA: 40,872 SF (0.94 AC) 25.40%

**SITE PLAN**  
SCALE: 1" = 60'



**DOWL**  
WWW.DOWL.COM  
720 SW Washington Street, #750  
Portland, Oregon 97205  
971-280-8641

**Bonaventure Senior Living  
TPC Landscape Area**  
Milwaukie, Oregon

PROJECT	14497.01
DATE	1/7/19

**PAGE 1/1**

**SITE INFORMATION**

TOTAL SITE AREA	605,385.03 SF	13.890 ACRES	100.00%
LOT COVERAGE	167,270.40 SF	3.840 ACRES	27.63%
LANDSCAPE/OPEN SPACE AREA	438,113.63 SF	10.058 ACRES	72.37%

<b>PARKING</b>	
132	STANDARD PARKING STALLS
6	ADA PARKING STALLS
1	ADA WHEELCHAIR USER ONLY PARKING STALL
139	TOTAL PARKING STALLS

**LEGEND:**

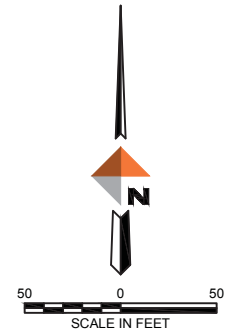
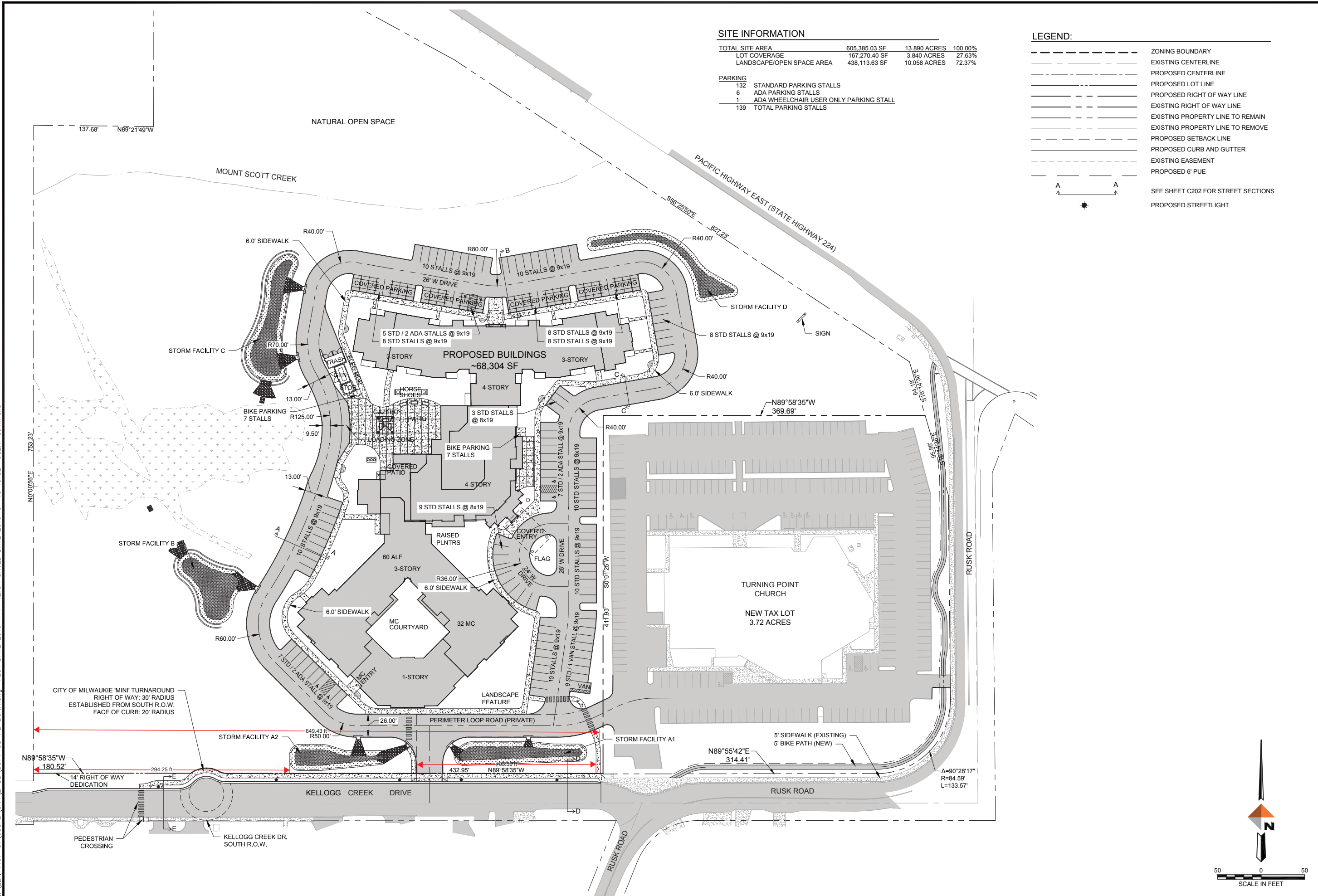
- ZONING BOUNDARY
  - EXISTING CENTERLINE
  - PROPOSED CENTERLINE
  - PROPOSED LOT LINE
  - PROPOSED RIGHT OF WAY LINE
  - EXISTING RIGHT OF WAY LINE
  - EXISTING PROPERTY LINE TO REMAIN
  - EXISTING PROPERTY LINE TO REMOVE
  - PROPOSED SETBACK LINE
  - PROPOSED CURB AND GUTTER
  - EXISTING EASEMENT
  - PROPOSED 6' PUE
- SEE SHEET C202 FOR STREET SECTIONS
- PROPOSED STREETLIGHT



**DOWL**  
 WWW.DOWL.COM  
 720 SW Washington Street, #750  
 Portland, Oregon 97205  
 971-280-8641

**BONAVENTURE SENIOR HOUSING**  
 PRELIMINARY SITE PLAN  
 BONAVENTURE SENIOR HOUSING  
 MILWAUKIE, OREGON  
 13333 RUSK ROAD MILWAUKIE, OR 97222

PROJECT 14497-01  
 DATE 11/30/2018  
 © DOWL 2016  
 SHEET  
**C201**



G:\22\14497-01\65CAD\Civil\2-DD\_SCI4-CS-PL-BONA.dwg PLOT DATE 2019-11-11 12:54 SAVED DATE 2019-01-10 16:52 USER: semmens

# **BONAVENTURE SENIOR HOUSING Milwaukie, Oregon**

A Land Use Application for:

**Community Service Use  
Conditional Use  
Variance  
Sign Review  
Natural Resources Review  
Parking Determination  
Transportation Facilities Review  
Minor Modification to CSU**

Applicant:

**Bonaventure Senior Living**

Submitted:

**December 2018**

**Revised & Resubmitted January 2019**

Prepared by:



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## EXHIBITS

- A. Preliminary Plan Set
- B. Parking Assessment Memo
- C. Pre-application Meeting Summary
- D. Traffic Impact Analysis
- E. Preliminary Drainage Report
- F. Sign Plan

## I. PROJECT TEAM

### Applicant

**Bonaventure Senior Housing**  
3425 Boone Road SE  
Salem, OR 97317  
Contact: Daniel Dobson  
503.373.3154  
ddobson@liveBSL.com

### Property Owner

**Turning Point Church**  
13333 Rusk Road  
Milwaukie, OR 97222  
Contact: Pastor Bob Mihuc  
503.305.8704  
bob@turningpointcares.org

### Planning/Civil Engineering

**DOWL**  
720 SW Washington Street, Suite 750  
Portland, OR 97221  
Contact: Serah Breakstone, AICP  
503.280.8661  
sbreakstone@dowl.com

### Traffic Engineering

**Kittelson & Associates, Inc.**  
610 SW Alder Street, Suite 700  
Portland, OR 97205  
Contact: Chris Brehmer, PE  
503.535.7433  
cbrehmer@kittelson.com

### Natural Resources

**Pacific Habitat Services**  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070  
Contact: John van Staveren  
503.570.0800  
jvs@pacifichabitat.com

### Arborist

**Morgan Holen & Associates**  
3 Monroe Parkway, Suite P220  
Lake Oswego, Oregon 97035  
Contact: Morgan Holen  
971.409.9354  
morgan.holen@comcast.net



## II. INTRODUCTION

### Summary of Proposal

The applicant, Bonaventure Senior Housing, is proposing a new senior living facility on a site located at 13333 Rusk Road in Milwaukie. The site currently consists of four tax lots, all under the same ownership (Turning Point Church). Those tax lots are:

- Tax Lot 22E06AD00600 – 4.05 acres
- Tax Lot 22E06AD00700 – 1.00 acres
- Tax Lot 22E06AD00900 – 0.63 acres
- Tax Lot 22E06AD00901 – 12.35 acres

The total site size is 18.03 acres. The applicant is also requesting a property line adjustment and lot consolidation to reconfigure the site into two lots. One lot will be used for the proposed new development and the other will continue to be the site of the existing Turning Point Church.

Bonaventure is a family of companies dedicated to the development, construction, and operation of exceptional senior living communities in the Western United States. The senior living facility proposed in Milwaukie will consist of a single, stair-stepped building that would house 170 senior living units on approximately six acres. Specifically, the proposed building will consist of:

- **78 Independent Living Suites:** One- and two-bedroom suites ranging from 570 to 1,150 square feet. While these residents receive some meals and services such as housekeeping and social programs, these units have complete kitchens and balconies. Approximately 30% of these residents are anticipated to keep a car on site.
- **60 Assisted Living Suites:** One- and two-bedroom suites ranging from 500 to 1,130 square feet. These residents are served all meals in a restaurant-style communal dining room; therefore, these suites are equipped with a microwave and refrigerator only for snacks. These residents are not anticipated to drive and tend to receive additional services to assist with activities of daily living.
- **32 Memory Care Suites:** This is a secured section of the building, with its own separate and enhanced administrative and care staff. It has a separate serving kitchen, dining room, outdoor area, and common amenities. The Memory Care units do not have any individual kitchen facilities.

Interior amenities include a large lobby and reception area, café, formal living room/parlor with public computers for resident use, hobby workshop, fitness center, piano lounge, beauty salon, large theater for movies and special events, activity space for cooking/baking programs, and a hospitality bar for meals and social functions.

Outside activity areas include a combination of open and covered patios where staff can engage residents in various scheduled activities and occasional meals in fair weather. Outdoor planting areas are provided for resident use as well as horseshoe pits and other exterior amenity areas.

The proposed development will take access from SE Kellogg Creek Drive, with additional emergency-only access available from SE Rusk Road through the church parking lot. The senior living facility will have on-site parking and drive aisles, but no new public roads are proposed as part of the development.

### Zoning & Land Uses

The subject site currently has split zoning, with the western portion of the site zoned R-3 and the eastern portion of the site zoned R-10. See Figure 2 and the existing conditions plan (Sheet C100) in Exhibit A. The table below describes the uses and zoning on properties surrounding the subject site.

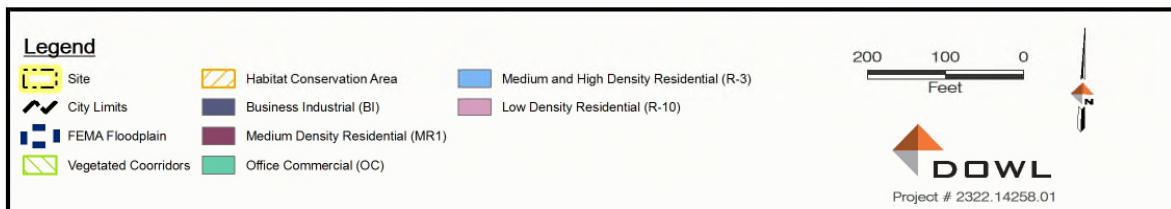
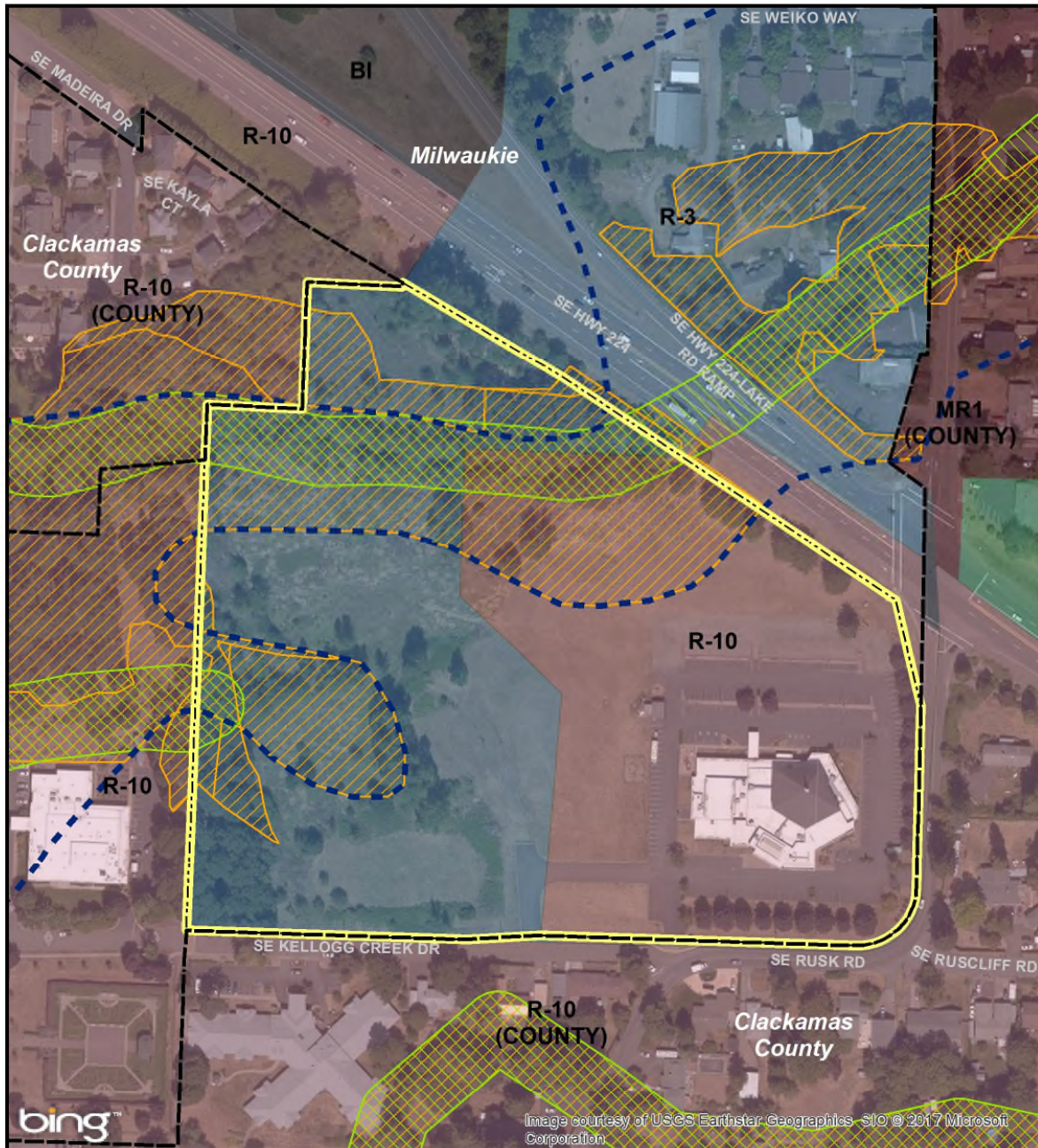
**Table 1: Surrounding Uses**

	<u>Zoning</u>	<u>Land Uses</u>
North	R-10	Single-family residences, Highway 224 right-of-way
East	R-10	Turning Point Church, SE Rusk Road, and single-family residences
South	R-10	SE Kellogg Creek Road, single-family residences, Deerfield Village Assisted Living Center
West	R-10	The Milwaukie Center, North Clackamas Park

**Figure 1: Vicinity Map**



Figure 2: Zoning & Existing Natural Resource Mapping



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## **Natural Resources**

The site contains approximately 4.5 acres of FEMA mapped floodplain area, which is regulated by Chapter 18.04 of the Milwaukie Municipal Code. The site also contains approximately 5.6 acres of designated Habitat Conservation Area (HCA) (See Figure 2 Natural Resource Areas). HCA lands are natural resources that have been identified by the City for protection and are regulated under Chapter 19.402 of the Milwaukie Zoning Code. Impacts to floodplain and HCA are permitted by the City if certain conditions can be met and mitigation of those impacts is provided.

## **Wetlands**

Wetlands have been identified on the site and delineated by Pacific Habitat Services. A wetland delineation report prepared by Pacific Habitat Services will be provided. Impacts to the wetlands will occur in order to accommodate development on the site. Those impacts require a permit from the US Army Corps of Engineers (US Corps). A permit application for wetland impacts will be submitted as required.

## **Modifications to the Church Property**

As noted previously, a property line adjustment request has been submitted to the City to reconfigure lots to result in a separate tax lot for the existing church and associated parking areas. As part of the proposed subdivision development, minor changes to the church property will occur, including:

- The church entrance from Rusk Road will be reconfigured to ensure that it is used only as an entrance; exit onto Rusk Road from that access point would not be permitted due to sight distance issues.

Because the church use is an approved Community Service Use (CSU) per Milwaukie's code (Section 19.904), a minor modification to the CSU approval is required by the City.

## **Request**

This application package contains the following requests for approvals from the City of Milwaukie:

- Type III Conditional Use for the independent and assisted living units
- Type III Community Service Use for the memory care units
- Type III Variances (three)
- Type III Sign Review
- Type III Natural Resources Review/HCA Verification
- Type II Parking Determination to allow a reduced parking ratio
- Type II Transportation Facilities Review
- Type I Minor Modification to CSU approval (for the church)

### III. COMPLIANCE WITH CITY OF MILWAUKIE DEVELOPMENT CODE

Section II of this narrative contains sections of the Milwaukie Municipal Code along with responses to demonstrate how the proposed project meets the applicable standards and requirements. Sections of the code that are not applicable are generally not included here unless necessary for context.

#### Title 14 Signs

##### 14.08 Administration and Enforcement

##### 14.08.090 CONDITIONAL AND COMMUNITY SERVICE USE SIGNS

A. Signs for conditional and community service uses shall be limited to those allowed in the underlying zone, except as allowed by Subsections 14.08.090.B and C.

B. The standards of the underlying zone may be increased to the standards in Table 14.08.090.B, pursuant to a Type I review.

C. The standards of the underlying zone may be increased to the standards in Table 14.08.090.C per Section 19.1006 Type III Review.

Table 14.08.090.C Standards for Conditional and Community Service Use Signs with Minor Quasi-Judicial Review				
Sign Type	Size	Number	Height	Location
Monument or freestanding sign	Max. 40 SF per display surface Max. length 20 ft.	One	Max. 12 ft. above ground	Not in the public right-of-way
Wall sign	10% of the building face up to 40 SF	One per building face		
Daily display	Max. 12 SF per display surface	One per frontage		Not in the public right-of-way except as allowed in MMC Section 14.20.040

**Response:** The applicant is requesting signs for the Conditional Use and Community Service Use based on Table 14.08.090.C through this Type III application. Proposed signs for the Bonaventure site are shown in Exhibit F are described below:

1. One wall sign on the southeast building elevation facing Kellogg Creek Drive. The sign will be 40 square feet.
2. One wall sign on the northeast building elevation facing toward OR-224. The sign will be 40 square feet.
3. One monument sign at the northeast corner of the site, near the intersection of OR-224 and Rusk Road. The sign will be 40 square feet and 12 feet high.
4. One pedestal sign at the site entrance on Kellogg Creek Drive. The sign is 4 square feet and 3 feet high. Per MMC 14.12.010.A, this sign is allowed outright and does not require a sign permit.

All signs are consistent with applicable standards. No sign adjustment is requested.

##### 14.08.100 SIGNS VISIBLE FROM STATE HIGHWAYS

A proposed sign that would be visible from a State highway may require a permit from the Oregon Department of Transportation. The Planning Director may require an applicant for a sign that would be visible from a State highway to submit documentation from the Oregon Department of Transportation indicating whether the proposed sign is considered an outdoor advertising sign that requires a permit from the Oregon Department of Transportation and whether the site is legal for an outdoor advertising sign. The Planning Director will withhold

issuance of the permit if there is not conclusive evidence that the sign could be approved, or could be conditioned to be approved, by the Oregon Department of Transportation.

**Response:** Per ODOT’s Outdoor Advertising Sign Program website<sup>1</sup>, a sign permit from ODOT is not required if no funds are exchanged and the sign is located at a place of business. No funds will be exchanged for the proposed sign near OR-224 and it will be located on the Bonaventure site, which is a place of business. Therefore, no sign permit from ODOT is required.

**Title 18 Flood Hazard Areas**

There is mapped FEMA 100-year floodplain on the senior living site; however, the current FEMA mapping does not accurately reflect the actual location of the 100-year floodplain. The applicant is requesting a conditional letter of map revision (CLOMR) from FEMA to revise the floodplain boundary on the site based on actual elevations and detailed topographic survey of the site. The request to FEMA must include a Community Acknowledgement Form signed by the City’s engineer stating they agree with the revision. The City engineer has indicated that the form will be signed after preliminary land use approval at the public hearing. Once that occurs, the CLOMR request will be submitted to FEMA.

**Title 19 Zoning**

**Chapter 19.300 Base Zones**

**19.301 LOW DENSITY RESIDENTIAL ZONES\***

*19.301.2 Allowed Uses in Low Density Residential Zones*

**Response:** The independent and assisted living units are considered “senior and retirement housing” which is allowed in the R-10 zone through a Conditional Use approval per Table 19.301.2. The memory care units are considered a “community service use”, which are allowed in all zones through a Community Service Use approval. Therefore, the proposed senior living facility is an allowed use in the R-10 zone.

**19.301.4 Development Standards**

*In the low density residential zones, the development standards in Table 19.301.4 apply. Notes and/or cross references to other applicable code sections are listed in the “Standards/Additional Provisions” column. Additional standards are provided in Subsection 19.301.5.*

*See Sections 19.201 Definitions and 19.202 Measurements for specific descriptions of standards and measurements listed in the table.*

<b>Standard</b>	<b>R-10</b>	<b>Response</b>
Minimum lot size	10,000 SF	Standard is met. The subject lot (after the related Property Line Adjustment) will exceed the minimum lot size.
Minimum lot width	70 feet	Standard is met. As shown on the Site Plan Sheet C201, the subject lot has dimensions that far exceed the minimum lot width, depth and frontage standards for the R-10 zone.
Minimum lot depth	100 feet	
Minimum street frontage	35 feet	

<sup>1</sup> <https://www.oregon.gov/ODOT/ROW/Pages/Sign-Resources.aspx>

<i>Minimum front yard</i>	<i>20 feet</i>	Standard is met. As shown on the Site Plan Sheet C201, the proposed building will be setback from all property lines by a distance that exceeds the minimum yard requirements for this zone.
<i>Minimum side yard</i>	<i>10 feet</i>	
<i>Minimum street side yard</i>	<i>20 feet</i>	
<i>Minimum rear yard</i>	<i>20 feet</i>	
<i>Maximum bldg. height</i>	<i>2.5 stories or 35 feet</i>	This standard applies to the independent and assisted living portions of the building. Some portions of the building exceed this limit; for those portions, a variance is requested. For the memory care portion of the building, this standard is superseded by the standard for Community Service Uses in Section 19.904.8 which establishes a height limit of 45 feet for nursing or convalescent homes. The memory care portion of the building is one story and approximately 10.6 feet high, and therefore complies with this standard.
<i>Side yard height plane limit: Height above ground Slope of plane</i>	<i>20 feet 45 degrees</i>	Standard is met. As shown on the Site Plan Sheet C201, the proposed building will be located far enough away from the required side yard that the side yard height plane limit will not apply.
<i>Maximum lot coverage</i>	<i>30 percent</i>	As shown on the Site Plan Sheet C201, the total site area is 605,385 square feet and the total lot coverage is 68,304 square feet, or 11.3 percent of the lot.
<i>Minimum vegetation</i>	<i>35 percent</i>	As shown on the Site Plan Sheet C201, the total site area is 605,385 square feet and the total landscaped/vegetated area is 438,024 square feet (including preserved natural areas), or approximately 72 percent of the site, which exceeds the standard.
<i>Minimum density</i>	<i>3.5 units/acre</i>	Staff has stated that density standards do not apply for this proposal. The proposed use is a senior living facility with a mix of unit types housed within one building. Further, the use is a community service use split across two zones that have different density standards.
<i>Maximum density</i>	<i>4.4 units/acre</i>	

**19.301.5 Additional Development Standards**

**A. Side Yards**

*In the R-7 Zone, one side yard shall be at least 5 ft and one side yard shall be at least 10 ft, except on a corner lot the street side yard shall be 20 ft.*

**Response:** Not applicable. The R-7 zoning does not apply to the subject site.

**B. Lot Coverage**

*The lot coverage standards in Subsection 19.301.4.B.4 are modified for specific uses and lot sizes as described below. The reductions and increases are combined for properties that are described by more than one of the situations below.*

**1. Decreased Lot Coverage for Large Lots**

*The maximum lot coverage percentage in Subsection 19.301.4.B.4 is reduced by 10 percentage points for a single-family detached dwelling, duplex, or residential home on a lot that is more than 2.5 times larger than the minimum lot size in Subsection 19.301.4.A.1.*

**Response:** Not applicable. This proposal does not include the uses listed in the standard above.

2. *Increased Lot Coverage for Single-Family Detached Dwellings*

**Response:** Not applicable. This proposal does not include detached single-family dwelling units.

3. *Increased Lot Coverage for Duplexes*

*The maximum lot coverage percentage in Subsection 19.301.4.B.4 is increased by 20 percentage points for a duplex.*

**Response:** Not applicable. This proposal does not include duplexes.

4. *Increased Lot Coverage for Detached Accessory Dwelling Units*

*The maximum lot coverage percentage in Subsection 19.301.4.B.4 is increased by 5 percentage points for the development of a new detached accessory dwelling unit. This allowance applies only to the detached accessory structure and does not allow for the primary structure or other accessory structures to exceed lot coverage standards.*

**Response:** Not applicable. This proposal does not include detached accessory dwelling units.

C. *Front Yard Minimum Vegetation*

*At least 40% of the front yard shall be vegetated. The front yard vegetation area required by this subsection counts toward the minimum required vegetation for the lot. A property may provide less than the 40% of the front yard vegetation requirement if it is necessary to provide a turnaround area so that vehicles can enter a collector or arterial street in a forward motion.*

**Response:** As shown on the landscape Sheet L111, the entire area between the proposed building and the front property line along Kellogg Creek Drive will be landscaped (except where the driveway is located). The landscaping will consist of vegetated storm facilities surrounded by shrubs, trees and ground cover.

D. *Residential Densities*

*The minimum and maximum development densities in Subsection 19.301.4.C.1 are applicable for land divisions and replats that change the number of lots.*

*If a proposal for a replat or land division is not able to meet the minimum density requirement—due to the dimensional requirements for lot width, lot depth, or lot frontage—the minimum density requirement shall instead be equal to the maximum number of lots that can be obtained from the site given its dimensional constraints. The inability of new lot lines to meet required yard dimensions from existing structures shall not be considered as a basis for automatically lowering the minimum density requirement.*



**Response:** The applicant is not proposing a land division or replat. In addition, density standards do not apply for the proposed senior living center. Therefore, this standard is not applicable.

*E. Accessory Structure Standards*

*Standards specific to accessory structures are contained in Section 19.502.*

**Response:** Not applicable. No accessory structures are proposed as part of this application.

*F. Number of Dwelling Structures*

*In the low density residential zones, 1 primary building designed for dwelling purposes shall be permitted per lot. See Subsection 19.504.4.*

**Response:** One primary building for senior living is proposed.

*G. Off-Street Parking and Loading*

*Off-street parking and loading is required as specified in Chapter 19.600.*

**Response:** Applicable standards from Section 19.600 are addressed later in this narrative.

*H. Public Facility Improvements*

*Transportation requirements and public facility improvements are required as specified in Chapter 19.700.*

**Response:** Applicable standards from Section 19.700 are addressed later in this narrative.

*I. Additional Standards*

*Depending upon the type of use and development proposed, the following sections of Chapter 19.500 Supplementary Development Regulations may apply. These sections are referenced for convenience, and do not limit or determine the applicability of other sections within the Milwaukie Municipal Code.*

- 1. Subsection 19.504.4 Buildings on the Same Lot*
- 2. Subsection 19.504.8 Flag Lot Design and Development Standards*
- 3. Subsection 19.505.1 Single-Family Dwellings and Duplexes*
- 4. Subsection 19.505.2 Garages and Carports*
- 5. Subsection 19.506.4 Manufactured Dwelling Siting and Design Standards, Siting Standards*

**Response:** Applicable standards from Section 19.500 are addressed later in this narrative.

**19.302 MEDIUM AND HIGH DENSITY RESIDENTIAL ZONES**

**19.302.2 Allowed Uses in Medium and High Density Residential Zones**

**Response:** The independent and assisted living units are considered “senior and retirement housing” which is allowed in the R-3 zone through a Conditional Use approval per Table 19.301.2. The memory care units are

considered a “community service use”, which are allowed in all zones through a Community Service Use approval. Therefore, the proposed senior living facility is an allowed use in the R-3 zone.

**19.302.4 Development Standards**

*In the medium and high density residential zones, the development standards in Table 19.302.4 apply. Notes and/or cross references to other applicable code sections are listed in the “Standards/Additional Provisions” column. Additional standards are provided in Section 19.302.5.*

*The standards in Subsection 19.302.4 are not applicable to cottage cluster development except where specifically referenced by Subsection 19.505.4.*

<b>Standard</b>	<b>R-3</b>	<b>Response</b>
<i>Minimum lot size</i>	<i>5,000 SF</i>	Standard is met. The subject lot will exceed the minimum lot size.
<i>Minimum lot width</i>	<i>50 feet</i>	Standard is met. As shown on the Site Plan Sheet C201, the subject lot has dimensions that far exceed the minimum lot width, depth and frontage standards for the R-3 zone.
<i>Minimum lot depth</i>	<i>80 feet</i>	
<i>Minimum street frontage</i>	<i>35 feet</i>	
<i>Minimum front yard</i>	<i>15 feet</i>	Standard is met. As shown on the Site Plan Sheet C201, the building will be set back from all property lines at distances that exceed the minimums.
<i>Minimum side yard</i>	<i>0 feet</i>	
<i>Minimum street side yard</i>	<i>15 feet</i>	
<i>Minimum rear yard</i>	<i>15 feet</i>	
<i>Maximum bldg. height</i>	<i>2.5 stories or 35 feet</i>	This standard applies to the independent and assisted living portions of the building. Some portions of the building exceed this limit; for those portions, a variance is requested. For the memory care portion of the building, this standard is superseded by the standard for Community Service Uses in Section 19.904.8 which establishes a height limit of 45 feet for nursing or convalescent homes. The memory care portion of the building is one story and approximately 10.6 feet high, and therefore complies with the standard.
<i>Side yard height plane limit: Height above ground Slope if plane</i>	<i>20 feet 45 degrees</i>	Standard is met. As shown on the Site Plan Sheet C201, the proposed building will be located away far enough from the required side yard that the side yard height plane limit will not apply.
<i>Maximum lot coverage</i>	<i>40 percent</i>	Standard is met. As shown on the Site Plan Sheet C201, the total site area is 605,385 square feet and the total lot coverage is 68,304 square feet, or 11.3 percent of the lot.
<i>Minimum vegetation</i>	<i>35 percent</i>	As shown on the Site Plan Sheet C201, the total site area is 605,385 square feet and the total landscaped/vegetated area is 438,024 square feet (including preserved natural areas), or approximately 72 percent of the site, which exceeds the standard.

<i>Minimum density</i>	<i>11.6 units/acre</i>	Standard is not applicable. The proposed use is a senior living facility with a mix of unit types housed within one building. Further, the use is split across two zones that have different density standards. This is a unique situation and staff has stated that density standards do not apply for this proposal.
<i>Maximum density</i>	<i>14.5 units/acre</i>	

**19.302.5 Additional Development Standards**

**A. Side Yards**

*In the medium and high density zones, the required side yard is determined as described below. These measurements apply only to required side yards and do not apply to required street side yards.*

- 1. The side yard for development other than a rowhouse shall be at least 5 ft.*
- 2. There is no required side yard for rowhouses that share 2 common walls. The required side yard for an exterior rowhouse that has only 1 common wall is 0 ft for the common wall and 5 ft for the opposite side yard. An exterior rowhouse on a corner lot shall meet the required street side yard setback in Subsection 19.302.4.B.1.b.*

**Response:** No rowhouses are proposed as part of this development. The applicable minimum side yard of five feet will be met.

**B. Lot Coverage**

*The lot coverage standards in Subsection 19.302.4.B.4 are modified for specific uses and lot sizes as described below. The reductions and increases are additive for lots that are described by one or more of the situations below.*

- 1. Increased Lot Coverage for Single-Family Detached Dwellings*
- 2. Increased Lot Coverage for Duplexes and Rowhouses. The maximum lot coverage percentage in Subsection 19.302.4.B.4 is increased by 20 percentage points for a duplex or rowhouse.*
- 3. Increased Lot Coverage for Detached Accessory Dwelling Units*

**Response:** Not applicable. The proposal does not include the uses listed in (1-3) above.

**C. Minimum Vegetation**

*At least half of the minimum required vegetation area must be suitable for outdoor recreation by residents, and not have extreme topography or dense vegetation that precludes access.*

**Response:** Per the table above, the required minimum amount of vegetation on the site is 35 percent, or 211,885 square feet. Half of the required minimum is therefore 105,942 square feet. There are several areas on the site that are relatively flat and do not have dense vegetation; those areas could be suitable for outdoor recreation (nature walks and scenic viewing) by the residents or visitors of the senior living center. Those areas are:

- Approximately 34,685 square feet located north of the church property and south of OR-224. That area is very flat and has little vegetation; it is also outside the HCA and WQR areas on the site.

- Approximately 31,485 square feet located in the southern part of the site between the development and the large stand of white oak trees. That area is also flat, without dense vegetation, and mostly outside the HCA and WQR areas.
- Approximately 44,310 square feet located in the northwest corner of the site, south of Mount Scott Creek. The area is relatively flat and without dense vegetation. Most of this area is within the HCA but outside the WQR boundary.

These areas together total 110,480 square feet, which exceeds the required amount. No formal access (walkways, etc.) to those areas is proposed as part of this application. However, they are available and suitable for outdoor recreation and there are no barriers between those areas and the developed portion of the site.

#### D. Front Yard Minimum Vegetation

*At least 40% of the front yard shall be vegetated. The front yard vegetation area required by this subsection counts toward the minimum required vegetation for the lot. A property may provide less than the 40% of the front yard vegetation requirement if it is necessary to provide a turnaround area so that vehicles can enter a collector or arterial street in a forward motion.*

**Response:** As shown on the landscape Sheet L111, the entire area between the proposed building and the front property line along Kellogg Creek Drive will be landscaped (except where the driveway is located). The landscaping will consist of vegetated storm facilities surrounded by shrubs, trees and ground cover.

#### E. Height Exceptions

*1 additional story may be permitted in excess of the required maximum standard. For each additional story, an additional 10% of site area beyond the minimum is required to be retained in vegetation.*

**Response:** This standard applies to the independent and assisted living portions of the building. Those portions can be allowed an additional story due to the large amount of the site that will be retained as natural open space. Per the standards in Section 19.302.4, 35 percent of the site must be vegetated. As shown on the site plan, approximately 72 percent of the site will be either landscaped or remain as natural open space. Therefore, this height exception applies, and the building may be 3½ stories high (on the R-3 portion of the site). However, portions of the building are four stories and therefore exceed this limit. A variance is requested for those portions of the building that exceed the height limit. Variance criteria are addressed later in this narrative.

#### F. Residential Densities

*1. The minimum and maximum development densities in Subsection 19.302.4.C.1 are applicable for land divisions, replats that change the number of lots, and any development that would change the number of dwelling units on a lot. Development of a single-family detached dwelling or an accessory dwelling is exempt from the minimum and maximum density requirements.*

**Response:** The applicant is not proposing a land division or replat. In addition, density standards do not apply to the proposed senior living center. Therefore, this standard is not applicable.

*2. Multifamily development in the R-2, R-1, and R-1-B Zones is subject to the minimum site size requirements in Table 19.302.5.F.2. In the event that the minimum site size requirements conflict with*

*the development densities in Subsection 19.302.4.C.1, the site size requirements in Table 19.302.F.2 shall prevail.*

**Response:** Not applicable. This project does not propose multifamily development in the R-2, R-1 or R-1-B zones.

#### *G. Accessory Structure Standards*

*Standards specific to accessory structures are contained in Section 19.502.*

**Response:** Not applicable. The proposal does not include accessory structures.

#### *H. Building Limitations*

*1. In the R-3 Zone, 1 single-family detached dwelling or 1 duplex is permitted per lot. See Subsection 19.504.4. A detached accessory dwelling may be permitted in addition to a single-family detached dwelling, per Subsection 19.910.1.*

**Response:** Not applicable. The proposal does not include any single-family detached or duplex units.

*2. Multifamily buildings shall not have an overall horizontal distance exceeding 150 linear ft as measured from end wall to end wall.*

**Response:** Not applicable. The proposal does not include multifamily buildings.

#### *I. Transition Measures*

*The following transition measures apply to multifamily development that abuts an R-10-, R-7-, or R-5-zoned property.*

**Response:** Not applicable. The proposal does not include multifamily development.

#### *J. Off-Street Parking and Loading*

*Off-street parking and loading is required as specified in Chapter 19.600.*

**Response:** Applicable standards from Section 19.600 are addressed later in this narrative.

#### *K. Public Facility Improvements*

*Transportation requirements and public facility improvements are required as specified in Chapter 19.700.*

**Response:** Applicable standards from Section 19.700 are addressed later in this narrative.

#### *L. Additional Standards*

*Depending upon the type of use and development proposed, the following sections of Chapter 19.500 Supplementary Development Regulations may apply. These sections are referenced for convenience, and do not limit or determine the applicability of other sections within the Milwaukie Municipal Code.*

*1. Subsection 19.504.4 Buildings on the Same Lot*

2. *Subsection 19.504.8 Flag Lot Design and Development Standards*
3. *Subsection 19.504.9 On-Site Walkways and Circulation*
4. *Subsection 19.504.10 Setbacks Adjacent to Transit*
5. *Subsection 19.505.1 Single-Family Dwellings and Duplexes*
6. *Subsection 19.505.2 Garages and Carports*
7. *Subsection 19.505.3 Multifamily Housing*
8. *Subsection 19.505.4 Cottage Cluster Housing*
9. *Subsection 19.505.8 Building Orientation to Transit*
10. *Subsection 19.506.4 Manufactured Dwelling Siting and Design Standards, Siting Standards*

**Response:** Applicable standards from Section 19.500 are addressed later in this narrative.

## Chapter 400 Overlay Zones & Special Areas

### Section 19.402 Natural Resources

#### 19.402.3 Applicability

A. *The regulations in Section 19.402 apply to all properties that contain, or are within 100 ft of a WQR and/or HCA (including any locally significant Goal 5 wetlands or habitat areas identified by the City of Milwaukie) as shown on the Milwaukie Natural Resource Administrative Map (hereafter “NR Administrative Map”).*

**Response:** The subject property contains areas designated as HCA per the NR Administrative Map. Therefore, the regulations of 19.402 apply.

K. *Activities that are not exempt per Subsection 19.402.4, or prohibited per Subsection 19.402.5, are subject to the Type I, II, or III review process as outlined in Table 19.402.3.K.*

**Response:** This proposal includes activities that are not exempt or prohibited. Therefore, this proposal is subject to a Type III Natural Resources Review. A Natural Resource Review report prepared by Pacific Habitat Services will be provided. That report will include a detailed description of impacts to designated natural resources on the site and responses to applicable standards and criteria from Chapter 19.402 to demonstrate how the project will comply with this section of code.

## Chapter 500 Supplementary Development Regulations

### 19.504 SITE DESIGN STANDARDS

#### 19.504.1 Clear Vision Areas

*A clear vision area shall be maintained on the corners of all property at the intersection of 2 streets or a street and a railroad according to the provisions of the clear vision ordinance in Chapter 12.24.*

**Response:** The site does not have a corner at the intersection of two streets or at the intersection of a street and railroad crossing. Therefore, this standard does not apply.

#### 19.504.2 Maintenance of Minimum Ordinance Requirements

*No lot area, yard, other open space, or off-street parking or loading area shall be reduced by conveyance or otherwise below the minimum requirements of this title, except by dedication or conveyance for a public use.*

**Response:** The minimum ordinance requirements applicable to this site will be maintained. Lot area, yards, open space, off-street parking and loading will not be reduced below the minimum requirements.

#### 19.504.3 Dual Use of Required Open Space

*No lot area, yard, or other open space or off-street parking or loading area which is required by this title for one use shall be used to meet the required lot area, yard, or other open space or off-street parking area for another use, except as provided in Subsection 19.605.4.*

**Response:** Dual use of required open space, parking and loading areas is not proposed and will not occur as part of this project.

#### 19.504.4 Buildings on the Same Lot

*A. In R-10, R-7, and R-5 Zones, 1 primary dwelling shall be permitted per lot. A detached accessory dwelling unit may be permitted per Subsection 19.910.1.*

*B. In the R-3 Zone, 1 single-family detached dwelling shall be permitted per lot. A detached accessory dwelling unit may be permitted per Subsection 19.910.1. Multifamily housing, with multiple structures designed for dwelling purposes, may be permitted as a conditional use per Section 19.905.*

**Response:** The proposed development is for one senior living building split across two zones (R-10 and R-3). Multiple buildings are not proposed.

#### 19.504.5 Distance from Property Line

*Where a side or rear yard is not required and a structure is not to be erected at the property line, it shall be set back at least 3 ft from the property line.*

**Response:** Not applicable. Side and rear yards are required in the R-3 and R-10 zones.

#### 19.504.9 On-Site Walkways and Circulation

##### A. Requirement



*All development subject to Chapter 19.700 (excluding single-family and multifamily residential development) shall provide a system of walkways that encourages safe and convenient pedestrian movement within and through the development site. Redevelopment projects that involve remodeling or changes in use shall be brought closer into conformance with this requirement to the greatest extent practicable. On-site walkways shall link the site with the public street sidewalk system. Walkways are required between parts of a site where the public is invited to walk. Walkways are not required between buildings or portions of a site that are not intended or likely to be used by pedestrians, such as truck loading docks and warehouses.*

**Response:** As shown on the site plan, a walkway will be provided around the entire building to connect the parking areas with building entrances. The walkway will also connect to the public sidewalk along Kellogg Creek Road at the driveway.

*B. Location. A walkway into the site shall be provided for every 300 ft of street frontage.*

**Response:** The site has approximately 653 feet of street frontage along Kellogg Creek Drive, which requires two walkway connections into the site. As shown on the Site Plan Sheet C201, two walkway connections into the site will be provided from Kellogg Creek Drive. The site also has approximately 64 feet of frontage along SE Rusk Road. However, providing a connection along that frontage is not appropriate for this use. As such, the applicant requests a variance to the standard. Applicable variance criteria are addressed later in this narrative.

*C. Connections*

*Walkways shall connect building entrances to one another and building entrances to adjacent public streets and existing or planned transit stops. On-site walkways shall connect with walkways, sidewalks, bicycle facilities, alleys, and other bicycle or pedestrian connections on adjacent properties used or planned for commercial, multifamily, institutional, or park use. The City may require connections to be constructed and extended to the property line at the time of development.*

**Response:** As shown on the site plan, a walkway will be provided around the entire building to connect the parking areas with building entrances. The walkway will also connect to the public sidewalk along Kellogg Creek Drive at two locations. The sidewalk along Kellogg Creek Drive connects to the adjacent North Clackamas Park, providing a safe and direct connection for residents of the senior center to the nearby park amenities.

*D. Routing*

*Walkways shall be reasonably direct. Driveway crossings shall be minimized. Internal parking lot circulation and design shall provide reasonably direct access for pedestrians from streets and transit stops to primary buildings on the site.*

**Response:** As shown on the site plan, the on-site walkway loops around the entire building and provides direct access for residents and employees from the various parking areas to the nearest building entrance. The on-site walkway connects to the public sidewalk along Kellogg Creek Drive at two locations, which provides a direct connection to the adjacent park amenities.

*E. Design Standards*

*Walkways shall be constructed with a hard surface material, shall be permeable for stormwater, and shall be no less than 5 ft in width. If adjacent to a parking area where vehicles will overhang the walkway, a 7-ft-wide*

walkway shall be provided. The walkways shall be separated from parking areas and internal driveways using curbing, landscaping, or distinctive paving materials. On-site walkways shall be lighted to an average 5/10-footcandle level. Stairs or ramps shall be provided where necessary to provide a direct route.

**Response:** Walkways will be six feet in width, permeable, and will be separated from parking areas and the drive aisle by curbing. Wheel stops will be installed in the parking spaces to prohibit overhang into the walkway. On-site walkways will be lit consistent with this standard. No stairs or ramps are proposed as part of the on-site walkways.

**19.504.11 Preliminary Circulation Plan**

A preliminary circulation plan is intended to guide site development by establishing a plan for multimodal access, connectivity, and circulation. A preliminary circulation plan is a conceptual plan, in that it does not establish a precise alignment for street, pedestrian, or bicycle facilities.

A. *Applicability.* A preliminary circulation plan is required for nonresidential development on sites 3 acres and larger that are subject to development review per Section 19.906 and where any of the following is true:

1. The site is vacant.
2. The proposed new development or redevelopment will result in reconfiguration of the transportation and development pattern for > 50% of the site.
3. The development is in the Flex Space Overlay Zone.

**Response:** The proposed senior living center is a residential use. Therefore, this section is not applicable.

**19.505 BUILDING DESIGN STANDARDS**

**19.505.3 Multifamily Housing**

B. *Applicability.* The design elements in Table 19.505.3.D in this subsection apply, as described below, to all multifamily and congregate housing developments with 3 or more dwelling units on a single lot. Cottage cluster housing and rowhouses on their own lots are subject to separate standards and are therefore exempt from Subsection 19.505.3. Housing development that is on a single lot and emulates the style of cottage cluster housing or rowhouses is subject to the standards of this subsection.

**Response:** The design standards in this section do not technically apply to the proposed senior living center. However, for context, this narrative describes how the proposed development will be consistent with the design guidelines, where appropriate and applicable. The table below lists the design guidelines found in Table 19.505.3.D Multifamily Design Guidelines and Standards, and briefly describes how the proposed senior living development will be consistent with the overall intent of the design guidelines.

Design Guideline from Table 19.505.3.D	Response
<p>1. <i>Private open space.</i> The development should provide private open space for each dwelling unit. Private open space should have direct access from the dwelling unit and should be visually and/or physically separate from common areas.</p> <p><i>The development may provide common open space in lieu of private opens space if the common open space is well designed, adequately sized, and functionally similar to</i></p>	<p>The proposed senior living facility will provide a variety of common open spaces for residents, including an outdoor plaza and a secure outdoor courtyard for memory care residents. In addition, a large portion of the site (approximately half) will remain as natural open space that can be accessed by residents of the facility. Common open space is also available at North Clackamas Park, directly adjacent to the site.</p>

Design Guideline from Table 19.505.3.D	Response
<i>private open space.</i>	
2. <i>Public open space. The development should provide sufficient open space for the purpose of outdoor recreation, scenic amenity, or shared outdoor space for people to gather.</i>	
3. <i>Pedestrian circulation. Site design should promote safe, direct, and usable pedestrian facilities and connections throughout the development. Ground-floor units should provide a clear transition from the public realm to the private dwellings.</i>	The site has been designed to provide safe and convenient pedestrian access around the site, and to minimize walking distance between parking areas and building entrances. A walkway will be provided around the building to connect parking areas to building entrances.
4. <i>Vehicle and bicycle parking. Vehicle parking should be integrated into the site in a manner that does not detract from the design of the building, the street frontage, or the site. Bicycle parking should be secure, sheltered, and conveniently located.</i>	Vehicle parking on the site has been designed to provide safe and convenient parking for all users of the facility, including residents, visitors and employees. Parking has been distributed around the building to help minimize walking distances between parking spaces and building entrances. Residents and visitors can park in those spaces that are nearest the portion of the building they are accessing. Employees will be directed to park in the spaces furthest from the building to reserve the most convenient spaces for residents of the facility.
5. <i>Building entrances and orientation. Buildings should be located with the principal façade oriented to the street or a street-facing open space such as a courtyard. Building entrances should be well-defined and protect people from the elements.</i>	The proposed senior living development will have multiple entrances, two of which will be visible from Kellogg Creek Drive. The memory care entrance will face Kellogg Creek Drive and will be well-defined through pillars that extend out from the building. This entrance will also be covered. Another building entrance will be located further back from Kellogg Creek Drive on the east side of the building. This entrance will be large, covered, and will have a drop-off/pick-up area for residents and visitors. See the elevations on Sheet A3.1 for details.
6. <i>Building façade design. Changes in wall planes, layering, horizontal datums, vertical datums, building materials, color, and/or fenestration shall be incorporated to create simple and visually interesting buildings.</i> <i>Windows and doors should be designed to create depth and shadows and to emphasize wall thickness and give expression to residential buildings.</i> <i>Windows should be used to provide articulation to the façade and visibility into the street.</i> <i>Building façades shall be compatible with adjacent building façades.</i>	As shown on the elevations on Sheet A3.1, the proposed building will provide articulation on all sides through the use of varied building materials and colors, a combination of vertical and horizontal siding, ample widow coverage, balconies and pillars, building offsets, and articulated rooflines.
7. <i>Building materials. Buildings should be constructed with architectural materials that provide a sense of permanence and high quality.</i> <i>Street-facing façades shall consist predominantly of a simple palette of long-lasting materials such as brick, stone, stucco, wood siding, and wood shingles.</i> <i>A hierarchy of building materials shall be incorporated. The</i>	As shown on Sheet A3.1, a variety of building materials and colors will be included in the proposed building. A hierarchy of building materials will define the different portions and stories of the building. Building materials will be durable and high-quality.

<b>Design Guideline from Table 19.505.3.D</b>	<b>Response</b>
<i>materials shall be durable and reflect a sense of permanence and quality of development.</i>	
<i>8. Landscaping. Landscaping of multifamily developments should be used to provide a canopy for open spaces and courtyards, and to buffer the development from adjacent properties. Existing, healthy trees should be preserved whenever possible. Landscape strategies that conserve water shall be included. Hardscapes shall be shaded where possible, as a means of reducing energy costs (heat island effect) and improving stormwater management.</i>	As shown on the planting plans (Sheets L100-L121), landscaping will be provided throughout the development to enhance the visual aesthetic of the building, emphasize building entrances, and provide pleasant outdoor gathering spaces for residents. The large stand of White Oak trees located in the southwest corner of the site will be preserved. Other healthy trees within the wetland area and near Mount Scott Creek will also be preserved. The paved plaza located near the middle of the development will include a gazebo and tree for shading.
<i>9. Screening. Mechanical equipment, garbage collection areas, and other site equipment and utilities should be screened so they are not visible from the street and public or private open spaces. Screening should be visually compatible with other architectural elements in the development.</i>	Mechanical equipment and trash storage areas will be located near the northwest corner of the building, away from the public street and adjacent properties. As shown on Sheet A3.1, the trash storage area will be fully enclosed using materials similar in color to the main building.
<i>10. Recycling areas. Recycling areas should be appropriately sized to accommodate the amount of recyclable materials generated by residents. Areas should be located such that they provide convenient access for residents and for waste and recycling haulers. Recycling areas located outdoors should be appropriately screened or located so that they are not prominent features viewed from the street.</i>	The recycling area will be located in the same enclosure as the trash storage. Recycling storage will be sized appropriately for the proposed use and will be accessible to employees of the senior living center. A separate drive aisle will be provided to allow trash and recycling pick-up to occur without blocking the main drive aisle around the building. Staff will be responsible for collecting recyclables from residents to take to the storage area.
<i>11. Sustainability. Multifamily development should optimize energy efficiency by designing for building orientation for passive heat gain, shading, day-lighting, and natural ventilation. Sustainable materials, particularly those with recycled content, should be used whenever possible. Sustainable architectural elements shall be incorporated to increase occupant health and maximize a building's positive impact on the environment.</i>  <i>When appropriate to the context, buildings should be placed on the site giving consideration to optimum solar orientation. Methods for providing summer shading for south-facing walls, and the implementation of photovoltaic systems on the south-facing area of the roof, are to be considered.</i>	The main residential wing of the proposed building will be oriented along a solar-beneficial east/west axis, providing many residential units the advantage of passive heat gain, daylighting, and natural ventilation. The remainder of the building is oriented horizontally and vertically to maximize sun exposure into the memory care courtyard and adjacent unit windows.  Exact construction details and specifications have not been completed for this project; however, the building will incorporate elements of sustainable design. The building will be wood-framed construction and comprised of a variety of wood products. Bonaventure anticipates that the majority of wood products for the project will be locally sourced (within 500 miles of project site). Bonaventure building designs typically exceed base energy code standards and earn incentives for energy efficient design primarily in heating/ventilation/cooling systems and lighting.
<i>12. Privacy considerations. Multifamily development should consider the privacy of, and sight lines to, adjacent residential properties, and be oriented and/or screened to maximize the privacy of surrounding residences.</i>	The nearest adjacent residential properties are located to the south, across Kellogg Creek Drive. The proposed building will be setback from Kellogg Creek Drive approximately 75 feet and will be over 130 feet from the southern Kellogg Creek Drive right-of-way line. Privacy for adjacent residences will be provided primarily by distance. Trees will also be planted along the site's frontage with Kellogg Creek Drive, which will provide additional screening for the

Design Guideline from Table 19.505.3.D	Response
	residences across the street.
<p><i>13. Safety. Multifamily development should be designed to maximize visual surveillance, create defensible spaces, and define access to and from the site. Lighting should be provided that is adequate for safety and surveillance, while not imposing lighting impacts to nearby properties. The site should be generally consistent with the principles of Crime Prevention Through Environmental Design:</i></p> <ul style="list-style-type: none"> <li>· <i>Natural Surveillance: Areas where people and their activities can be readily observed.</i></li> <li>· <i>Natural Access Control: Guide how people come to and from a space through careful placement of entrances, landscaping, fences, and lighting.</i></li> <li>· <i>Territorial Reinforcement: Increased definition of space improves proprietary concern and reinforces social control</i></li> </ul>	<p>Safety for residents of the proposed senior living facility is a top priority and is considered in all aspects of the building design and site layout. The entire development is surrounded by an access drive that will be lit to ensure safety and surveillance. Windows will be placed along the ground floor of all building elevations. An on-site walkway will be provided to directly connect parking areas with building entrances. Outdoor gathering spaces are located close to the building to enhance surveillance. Access to the site is limited to one access point along Kellogg Creek Drive and all visitors must check in at the main entrance. All building entrances will be access-controlled.</p>

## **Chapter 19.600 Off-Street Parking and Loading**

### **19.604 GENERAL PARKING STANDARDS**

#### **19.604.1 Parking Provided with Development Activity**

*All required off-street parking areas shall be provided at the time the structure is built; at the time a structure or site is enlarged; or when there is change in use or an increase in density or intensity. All required off-street parking areas shall be provided in conformance with the standards of Chapter 19.600 prior to issuance of a certificate of occupancy, or final development permit approval, or as otherwise specified in any applicable land use decision.*

**Response:** As shown on the site plan, off-street parking will be provided on the site at the time the development is built and in conformance with applicable standards of this chapter.

#### **19.604.2 Parking Area Location**

*Accessory parking shall be located in one or more of the following areas:*

- A. On the same site as the primary use for which the parking is accessory.*
- B. On a site owned by the same entity as the site containing the primary use that meets the standards of Subsection 19.605.4.B.2. Accessory parking that is located in this manner shall not be considered a parking facility for purposes of the base zones in Chapter 19.300.*
- C. Where shared parking is approved in conformance with Subsection 19.605.4.*

**Response:** Parking will be located on the same site as the primary use. Shared parking is not proposed as part of this project.

#### **19.604.3 Use of Parking Areas**

*All required off-street parking areas shall continually be available for the parking of operable vehicles of intended users of the site. Required parking shall not be rented, leased, sold, or otherwise used for parking that is unrelated to the primary or accessory use of the site, except where a shared parking agreement per Subsection 19.605.4 has been recorded. Subsection 19.604.3 does not prohibit charging fees for parking when the parking serves the primary or accessory uses on site.*

**Response:** All required off-street parking will be continually available for residents, employees and visitors of the senior living development. Parking will not be rented, leased, sold or otherwise used for parking that is not related to the senior living center.

#### **19.604.4 Storage Prohibited**

*No required off-street parking area shall be used for storage of equipment or materials, except as specifically authorized by Subsection 19.607.2 Commercial Vehicle, Pleasure Craft, and Recreational Vehicle Parking. (Ord. 2025 § 2, 2011)*

**Response:** Off-street parking will not be used for storage.

## **19.605 VEHICLE PARKING QUANTITY REQUIREMENTS**

### **19.605.1 Minimum and Maximum Requirements**

A. *Development shall provide at least the minimum and not more than the maximum number of parking spaces as listed in Table 19.605.1. Modifications to the standards in Table 19.605.1 may be made as per Section 19.605. Where multiple ratios are listed, the Planning Director shall determine which ratio to apply to the proposed development or use.*

**Response:** There are three different unit types within the proposed senior living center: independent living, assisted living and memory care. The memory care units are considered “nursing, convalescent and extended-care” units and have a required parking ratio of one space per four beds, per Table 19.605.1. However, the independent living and assisted living units do not have a corresponding or similar use in Table 19.605.1 and therefore do not have an explicit parking requirement. For that reason, a parking determination is requested, consistent with Section 19.605.2, to establish an appropriate minimum and maximum parking standard for the proposed senior center.

### **19.605.2 Quantity Modifications and Required Parking Determinations**

*Subsection 19.605.2 allows for the modification of minimum and maximum parking ratios from Table 19.605.1 as well as the determination of minimum and maximum parking requirements. Parking determinations shall be made when the proposed use is not listed in Table 19.605.1 and for developments with large parking demands.*

#### **A. Applicability**

*The procedures of Subsection 19.605.2 shall apply in the following situations:*

- 1. If the proposed use is not listed in Table 19.605.1 and the quantity requirements for a similar listed use cannot be applied.*
- 2. If the applicant seeks a modification from the minimum required or maximum allowed quantities as calculated per Table 19.605.1.*

**Response:** Of the three proposed types of senior living, only the memory care units have a clear parking requirement per Table 19.605.1. The assisted living and independent living units do not. Therefore, a parking determination is requested for the entire development.

#### **B. Application**

*Determination of parking ratios in situations listed above shall be reviewed as a Type II land use decision, per Section 19.1005 Type II Review. The application for a determination must include the following:*

- 1. Describe the proposed uses of the site, including information about the size and types of the uses on site, and information about site users (employees, customers, etc.).*

**Response:** The proposed use is a senior living center with a mix of units that include independent living, assisted living and memory care facilities. The senior living center will employ approximately 50-60 employees over three shifts; on average there will be about 25 employees on the site at any given time. Visitors to the center are generally spaced throughout the day; visitors tend to stay about one hour. Peak visitor hours tend to be between 11:00 AM to 1:00 PM and 5:00 - 8:00 PM; peak number of visitors on the site at any one time is typically 10 visitors (requiring 10 parking spaces). Based on data derived from 45 Bonaventure senior living facilities with similar sizes and mix of units, residents of the facilities average 82 years of age. Generally, no more than 50 percent of the independent living residents drive and keep a vehicle on site (and therefore need a

parking space). Parking spaces are not needed for the assisted living and memory care residents because they do not drive.

2. *Identify factors specific to the proposed use and/or site, such as the proximity of transit, parking demand management programs, availability of shared parking, and/or special characteristics of the customer, client, employee or resident population that affect parking demand.*

**Response:** As noted above, the residents of the proposed senior living facility will have significantly lower parking demand than typical residential uses. Generally, no more than 50 percent of the independent living residents drive and maintain a vehicle on site (and therefore need a parking space). Parking spaces are not needed for the assisted living and memory care residents because they do not drive. As such, the primary users of parking on the site will be the independent living residents, employees and visitors.

3. *Provide data and analysis specified in Subsection 19.605.2.B.3 to support the determination request. The Planning Director may waive requirements of Subsection 19.605.2.B.3 if the information is not readily available or relevant, so long as sufficient documentation is provided to support the determination request.*
  - a. *Analyze parking demand information from professional literature that is pertinent to the proposed development. Such information may include data or literature from the Institute of Transportation Engineers, American Planning Association, Urban Land Institute, or other similar organizations.*
  - b. *Review parking standards for the proposed use or similar uses found in parking regulations from other jurisdictions.*
  - c. *Present parking quantity and parking use data from existing developments that are similar to the proposed development. The information about the existing development and its parking demand shall include enough detail to evaluate similarities and differences between the existing development and the proposed development.*
4. *Propose a minimum and maximum parking ratio. For phased projects, and for projects where the tenant mix is unknown or subject to change, the applicant may propose a range (low and high number of parking spaces) for each development phase and both a minimum and maximum number of parking spaces to be provided at buildout of the project.*
5. *Address the approval criteria in Subsection 19.605.2.C.*

**Response:** A Parking Assessment Memo dated December 13, 2016 is provided in Exhibit B that summarizes parking data for multiple Bonaventure senior living centers and establishes a parking ratio that can be applied to the proposed Milwaukie development. As shown in Table 2 of the exhibit, parking ratios for other senior living developments of similar size and type range from 0.38 to 1.01 parking spaces per unit, with an average of 0.70 spaces per unit (not including sites where parking was found to be inadequate). Based on this data, the applicant proposes a minimum parking ratio of 0.70 spaces per unit and a maximum ratio of 0.90 spaces per unit. The proposed development will have 170 units, which would require a minimum of 119 parking spaces and a maximum of 153 spaces. The development proposes 139 parking spaces, which is within this allowable range.

### C. *Approval Criteria*

*The Planning Director shall consider the following criteria in deciding whether to approve the determination or modification. The Planning Director, based on the applicant's materials and other data the Planning Director*



deems relevant, shall set the minimum parking requirement and maximum parking allowed. Conditions of approval may be placed on the decision to ensure compliance with the parking determination.

1. All modifications and determinations must demonstrate that the proposed parking quantities are reasonable based on existing parking demand for similar use in other locations; parking quantity requirements for the use in other jurisdictions; and professional literature about the parking demands of the proposed use.

**Response:** As demonstrated in the Parking Assessment Memo provided in Exhibit B, the proposed parking ratios for the senior living center will be reasonable and adequate based on parking demand for other Bonaventure facilities of similar size and mix of units.

2. In addition to the criteria in Subsection 19.605.2.C.1, requests for modifications to decrease the amount of minimum required parking shall meet the following criteria:
3. In addition to the criteria in Subsection 19.605.2.C.1, requests for modifications to increase the amount of maximum allowed parking shall meet the following criteria:

**Response:** The applicant is requesting a parking determination, not a modification. Therefore, criteria 2 and 3 are not applicable.

## 19.606 PARKING AREA DESIGN AND LANDSCAPING

### 19.606.1 Parking Space and Aisle Dimensions

A. The dimensions for required off-street parking spaces and abutting drive aisles, where required, shall be no less than in Table 19.606.1. The minimum dimensions listed in Table 19.606.1 are illustrated in Figure 19.606.1.

Table 19.606.1

Minimum Parking Space And Aisle Dimensions

Angle (A)	Width (B)	Curb Length (C)	1-Way Aisle Width (D)	2-Way Aisle Width (D)	Depth (E)
0° (Parallel)	8.5'	22'	12'	19'	8.5'
30°	9'	17'	12'	19'	16.5'
45°	9'	12'	13'	19'	18.5'
60°	9'	10'	17'	19'	19'
90°	9'	9'	22'	22'	18'

B. The dimension of vehicle parking spaces provided for disabled persons shall be according to federal and State requirements.

C. Parking spaces shall be provided with adequate aisles or turnaround areas so that all vehicles may enter the street in a forward manner.

D. Drive aisles shall be required in parking areas greater than 5 spaces. Drive aisles shall meet the minimum width standards of Subsection 19.606.1. Where a drive aisle or portion thereof does not abut a parking space(s),

*the minimum allowed width for a one-way drive aisle shall be 8 ft and the minimum allowed width for a two-way drive aisle shall be 16 ft.*

**Response:** All on-site parking spaces will be 90-degree with dimensions of 9 feet wide by 19 feet deep. Dimensions of the parking spaces will be consistent with the standards in the table above. See Sheet C201 for details. The width of the drive aisle on the site will be 26 feet, which exceeds the standard for a two-way drive aisle. On-site parking is configured so that all vehicles leaving the site may enter the street (Kellogg Creek Drive) in a forward manner.

**19.606.2 Landscaping**

**B. General Provisions**

- 1. Parking area landscaping shall be required for the surface parking areas of all uses, except for cottage clusters, rowhouses, duplexes, and single-family detached dwellings. Landscaping shall be based on the standards in Subsections 19.606.2.C-E.*
- 2. Landscaped areas required by Subsection 19.606.2 shall count toward the minimum amount of landscaped area required in other portions of Title 19.*
- 3. Parking areas with 10 or fewer spaces in the Downtown Mixed Use Zone are exempt from the requirements of Subsection 19.606.2.*

**Response:** As shown on the landscape Sheets L100-L112, parking area landscaping will be provided as required for the proposed surface parking on the site. Parking lot landscaping has been counted toward the overall minimum amount of required landscaping for the site (35 percent).

**C. Perimeter Landscaping.** *The perimeter landscaping of parking areas shall meet the following standards which are illustrated in Figure 19.606.2.C.*

- 1. Dimensions. The minimum width of perimeter landscape areas are shown in Table 19.606.2.C.1. Where a curb provides the border for a perimeter landscape area, the dimension shall be measured from the inside of the curb(s). The Planning Director may reduce the required minimum width of a perimeter landscaping area where existing development or site constraints make it infeasible to provide drive aisles, parking spaces, and the perimeter landscaping buffer width listed in Table 19.606.2.C.1.*

<b>Location</b>	<b>Downtown Zones</b>	<b>All Other Zones</b>
<i>Lot line abutting a right-of-way</i>	<i>4'</i>	<i>8'</i>
<i>Lot line abutting another property, except for abutting properties that share a parking area</i>	<i>0'</i>	<i>6'</i>

**Response:** The perimeter landscaping requirements apply where proposed parking abuts the church property to the east. As shown on the landscape plan Sheets L110 and L111, a landscaped strip at least six feet wide will be provided along the perimeter of those parking spaces.

2. *Planting Requirements. Landscaping requirements for perimeter buffer areas shall include 1 tree planted per 40 lineal ft of landscaped buffer area. Where the calculation of the number of trees does not result in a whole number, the result shall be rounded up to the next whole number. Trees shall be planted at evenly spaced intervals along the perimeter buffer to the greatest extent practicable. The remainder of the buffer area shall be grass, ground cover, mulch, shrubs, trees, or other landscape treatment other than concrete and pavement.*

**Response:** As shown in the landscape planting plan Sheets L110 and L111, planting in the parking lot perimeter landscape strip will be done consistent with this standard. The parking area on the east side of the site that abuts the church property has approximately 300 lineal feet, which requires eight trees. As shown on the landscape plans, nine trees will be provided in the landscape strip, which exceeds the requirement. The trees will be evenly spaced and the remainder of the strip will be planted with shrubs and groundcover.

3. *Additional Planting Requirements Adjacent to Residential Uses. In addition to the planting requirements of Subsection 19.606.2.D.2, all parking areas adjacent to a residential use shall have a continuous visual screen in the landscape perimeter area that abuts the residential use. The area of required screening is illustrated in Figure 19.606.2.C.3. The screen must be opaque throughout the year from 1 to 4 ft above ground to adequately screen vehicle lights. These standards must be met at the time of planting. Examples of acceptable visual screens are a fence or wall, an earth berm with plantings, and other plantings of trees and shrubs.*

**Response:** The adjacent property to the east of the senior living site is zoned residential but is developed with a church use. The standard in this section applies only where abutting a residential use, therefore, it does not apply.

#### D. Interior Landscaping

*The interior landscaping of parking areas shall meet the following standards which are illustrated in Figure 19.606.2.D.*

1. *General Requirements. Interior landscaping of parking areas shall be provided for sites where there are more than 10 parking spaces on the entire site. Landscaping that is contiguous to a perimeter landscaping area and exceeds the minimum width required by Subsection 19.606.2.C.1 will be counted as interior landscaping if it meets all other requirements of Subsection 19.606.2.D.*

**Response:** The proposed development will have more than 10 parking spaces; therefore, interior landscaping is required.

#### 2. *Required Amount of Interior Landscaped Area*

*At least 25 sq ft of interior landscaped area must be provided for each parking space. Planting areas must be at least 120 sq ft in area and dispersed throughout the parking area.*

**Response:** The proposed development will include 139 parking spaces, which requires 3,475 square feet of interior parking landscaping. As shown on the landscape plan Sheet L100, 5,347 square feet of interior parking lot landscaping will be provided, which exceeds the minimum. All interior landscape areas are at least 120 square feet in size and are dispersed throughout the parking areas.

3. *Location and Dimensions of Interior Landscaped Areas*

- a. *Interior landscaped area shall be either a divider median between opposing rows of parking, or a landscape island in the middle or at the end of a parking row.*
- b. *Interior landscaped areas must be a minimum of 6 ft in width. Where a curb provides the border for an interior landscape area, the dimension shall be measured from the inside of the curb(s).*

**Response:** Interior parking lot landscaping is provided in landscape islands at the ends and middles of parking rows. All landscape islands have been designed to be consistent with these dimensional standards.

4. *Planting Requirements for Interior Landscaped Areas*

- a. *For divider medians, at least 1 shade or canopy tree must be planted for every 40 linear ft. Where the calculation of the number of trees does not result in a whole number, the result shall be rounded up to the next whole number. Trees shall be planted at evenly spaced intervals to the greatest extent practicable.*
- b. *For landscape islands, at least 1 tree shall be planted per island. If 2 interior islands are located contiguously, they may be combined and counted as 2 islands with 2 trees planted.*
- c. *The remainder of any divider median or landscape island shall be grass, ground cover, mulch, shrubs, trees, or other landscape treatment other than concrete and pavement.*

**Response:** There are no divider medians in the proposed parking areas. Each landscaped island contains at least one tree, consistent with this standard. The remainder of the landscaped islands will be planted with shrubs and groundcover. See the planting plan Sheets L100-L121 for details.

5. *Additional Landscaping for Large Parking Areas. Parking areas with more than 100 spaces on a site shall not have more than 15 spaces in a row without providing an interior landscaped island. See Figure 19.606.2.D.5.*

**Response:** There are no rows of parking within the proposed development with more than 15 contiguous spaces. All proposed parking rows are 10 spaces or less.

E. *Other Parking Area Landscaping Provisions*

- 1. *Preservation of existing trees is encouraged in the off-street parking area and may be credited toward the total number of trees required, based on staff's review.*

**Response:** Preservation of existing trees in the off-street parking areas is not proposed.

- 2. *Installation of parking area landscaping shall be required before a certificate of occupancy is issued, unless a performance bond is posted with the City. Then landscaping shall be installed within 6 months thereafter or else the bond will be foreclosed and plant materials installed by the City.*

**Response:** Installation of required parking area landscaping will be done concurrently with site development. The applicant does not anticipate requesting a six-month delay.

3. *Parking area landscaping shall be maintained in good and healthy condition.*

**Response:** All on-site landscaping will be maintained in good and healthy condition by the property owner.

4. *Required parking landscaping areas may serve as stormwater management facilities for the site. The Engineering Director has the authority to review and approve the design of such areas for conformance with the Public Works Standards. This allowance does not exempt the off-street parking landscape area from meeting the design or planting standards of Subsection 19.606.2.*

**Response:** Proposed parking landscaped areas have not been designed to serve as stormwater facilities for the site. Stormwater facilities are separate from parking lot landscaping.

5. *Pedestrian walkways are allowed within perimeter and interior landscape buffer if the landscape buffer is at least 2 ft wider than required in Subsections 19.606.2.C.1 and 19.606.2.D.3.b.*

**Response:** Pedestrian walkways within the perimeter and interior landscaped areas are not proposed.

### **19.606.3 Additional Design Standards**

#### **A. Paving and Striping**

*Paving and striping are required for all required maneuvering and standing areas. Off-street parking areas shall have a durable and dust-free hard surface, shall be maintained for all-weather use, and shall be striped to show delineation of parking spaces and directional markings for driveways and accessways. Permeable paving surfaces may be used to reduce surface water runoff and protect water quality.*

**Response:** The off-street parking and maneuvering areas will be paved and striped as required and as shown on the Site Plan Sheet C201. Paving and striping will be durable and will be maintained by the property owner. Permeable paving is not proposed. A directional sign will be posted where the on-site drive aisle meets the church driveway to help guide visitors to the correct location (see note on Sheet C201).

#### **B. Wheel Stops**

*Parking bumpers or wheel stops, of a minimum 4-in height, shall be provided at parking spaces to prevent vehicles from encroaching on the street right-of-way, adjacent landscaped areas, or pedestrian walkways. Curbing may substitute for wheel stops if vehicles will not encroach into the minimum required width for landscape or pedestrian areas.*

**Response:** Wheel stops will be installed in all parking spaces and will be a minimum of four inches in height, consistent with this standard.

#### **C. Site Access and Drive Aisles**

1. *Accessways to parking areas shall be the minimum number necessary to provide access while not inhibiting the safe circulation and carrying capacity of the street. Driveway approaches shall comply with the access spacing standards of Chapter 12.16.*

**Response:** Access to parking areas on the site will be from the single driveway on Kellogg Creek Drive, via the drive aisle that loops through the site around the senior living building. The proposed driveway on Kellogg Creek

Drive will not inhibit safe circulation or the carrying capacity of Kellogg Creek Drive. The proposed driveway approach will be 30 feet wide and has been designed consistent with Chapter 12.16 standards. The proposed driveway is approximately 180 feet from the intersection of Rusk Road and Kellogg Creek Drive, which exceeds the required spacing per MMC 12.16.040.C (100 feet required).

2. *Drive aisles shall meet the dimensional requirements in Subsection 19.606.1.*

**Response:** The drive aisle on the site will be 26 feet wide, which is consistent with the requirement for a two-way drive aisle per Subsection 19.606.1.

3. *Parking drive aisles shall align with the approved driveway access and shall not be wider than the approved driveway access within 10 ft of the right-of-way boundary.*

**Response:** The parking drive aisle is a loop that aligns with the driveway access at Kellogg Creek Drive. The drive aisle is not wider than the proposed driveway access.

4. *Along collector and arterial streets, no parking space shall be located such that its maneuvering area is in an ingress or egress aisle within 20 ft of the back of the sidewalk, or from the right-of-way boundary where no sidewalk exists.*

**Response:** The site does not have frontage on a collector or arterial street. Therefore, this standard does not apply.

5. *Driveways and on-site circulation shall be designed so that vehicles enter the right-of-way in a forward motion.*

**Response:** The driveway and on-site circulation loop have been designed so that vehicles leaving the site will enter the right-of-way in Kellogg Creek Drive in a forward motion.

#### *D. Pedestrian Access and Circulation*

*Subsection 19.504.9 establishes standards that are applicable to an entire property for on-site walkways and circulation. The purpose of Subsection 19.606.3.D is to provide safe and convenient pedestrian access routes specifically through off-street parking areas. Walkways required by Subsection 19.606.3.D are considered part of the on-site walkway and circulation system required by Subsection 19.504.9.*

1. *Pedestrian access shall be provided for off-street parking areas so that no parking space is further than 100 ft away, measured along vehicle drive aisles, from a building entrance, or a walkway that meets the standards of Subsection 19.606.3.D.2.*

**Response:** As shown on the Site Plan Sheet C201, off-street parking areas are distributed around the perimeter of the building so that no parking space is more than 100 feet from a building entrance. A walkway will be provided around the site that connects the parking areas to building entrances.

2. *Walkways through off-street parking areas must be continuous, must lead to a building entrance, and meet the design standards of Subsection 19.504.9.E.*

**Response:** A continuous walkway will be provided around the perimeter of the building that connects the parking areas to building entrances. The walkway will be at least five feet wide and constructed of a hard-surface material, consistent with the standards in 19.504.9.E.

#### E. Internal Circulation

##### 1. General Circulation

*The Planning Director has the authority to review the pedestrian, bicycle, and vehicular circulation of the site and impose conditions to ensure safe and efficient on-site circulation. Such conditions may include, but are not limited to, on-site signage, pavement markings, addition or modification of curbs, and modifying drive aisle dimensions.*

##### 2. Connections to Adjacent Parking Areas

*Where feasible, parking areas shall be designed to connect with parking areas on adjacent sites to eliminate the use of the street for cross movements.*

**Response:** Proposed parking areas on the site will be connected to the parking area on the church site to the east. The church property will share the driveway onto Kellogg Creek Drive with the proposed senior center.

##### 3. Drive-Through Uses and Queuing Areas

**Response:** Drive-through uses are not proposed as part of this development. This section is not applicable.

#### F. Lighting

*Lighting is required for parking areas with more than 10 spaces. The Planning Director may require lighting for parking areas of less than 10 spaces if the parking area would not be safe due to the lack of lighting. Lighting shall be designed to enhance safe access for vehicles and pedestrians on the site, and shall meet the following standards:*

- 1. Lighting luminaires shall have a cutoff angle of 90 degrees or greater to ensure that lighting is directed toward the parking surface.*
- 2. Parking area lighting shall not cause a light trespass of more than 0.5 footcandles measured vertically at the boundaries of the site.*
- 3. Pedestrian walkways and bicycle parking areas in off-street parking areas shall have a minimum illumination level of 0.5 footcandles, measured horizontally at the ground level.*
- 4. Where practicable, lights shall be placed so they do not shine directly into any WQR and/or HCA location. The type, size, and intensity of lighting shall be selected so that impacts to habitat functions are minimized.*

**Response:** The proposed senior living development will be lit according to the above requirements. All parking areas will be lit, regardless of number of spaces, and lighting will be designed to avoid light trespass onto surrounding properties. Lighting equipment will have cutoff angles of 90 degrees or greater. The walkway around the site that connects the parking areas to building entrances will also be lit. Outdoor lighting will be designed so that it does not shine directly into the natural resource areas on the site. Lighting equipment specifications and photometrics will be provided on request during building permit review.

## **19.608 LOADING**

### **19.608.2. Number of Loading Spaces**

*The Planning Director shall determine whether to require off-street loading for commercial, industrial, public, and semipublic uses. The ratios listed below should be the minimum required unless the Planning Director finds that a different number of loading spaces are needed upon reviewing the loading needs of a proposed use.*

#### *B. Nonresidential and Mixed-Use Buildings*

*Buildings where any floor area is in nonresidential uses should meet the following standards:*

- 1. Less than 20,000 sq ft of total floor area: no loading spaces required.*
- 2. 20,000 to 50,000 sq ft of total floor area: 1 loading space.*
- 3. More than 50,000 sq ft of total floor area: 2 loading spaces.*

**Response:** The proposed senior center is most similar to a mixed-use building where approximately 30,000 square feet of the floor area will be in non-residential use (common spaces, activity areas and program rooms). One loading space is proposed for the senior living facility, located south of the trash enclosure and west of the outdoor patio and gazebo area.

### **19.608.3 Loading Space Standards**

*A. Loading spaces shall be at least 35 ft long and 10 ft wide, and shall have a height clearance of at least 13 ft.*

**Response:** The proposed loading space will be approximately 50 feet long and 12 feet wide and will have a height clearance of at least 13 feet, consistent with this standard.

*B. Loading areas shall be provided on the site and be separate from parking spaces.*

*C. Off-street loading areas shall have a durable and dust-free hard surface. Permeable paving surfaces may be used to reduce surface water runoff and protect water quality.*

*D. Lighting of loading areas shall conform to the standards of Subsection 19.606.3.F.*

**Response:** The proposed loading space will be provided on the site and separate from parking spaces. It will be paved and lit, consistent with the above requirements.

*E. Off-street loading areas for materials and merchandise shall be located outside of the minimum front and side yard requirements for structures.*

*F. Off-street loading areas shall be located where not a hindrance to drive aisles, walkways, public or private streets, or adjacent properties.*

**Response:** The proposed loading space will be located outside of required yards and will not be a hindrance to drive aisles, walkways, streets or adjacent properties.

### **19.608.4 Prohibitions**



A. *Loading activity for a site, regardless of whether loading spaces are required, shall not obstruct travel within the right-of-way.*

B. *The accumulation of goods in loading areas shall be prohibited when it renders the space useless for loading and unloading of goods and passengers. (Ord. 2110 § 2 (Exh. G), 2015; Ord. 2106 § 2 (Exh. F), 2015; Ord. 2025 § 2, 2011)*

**Response:** Loading activity for the proposed use will be located internal to the site and will not obstruct travel on Kellogg Creek Drive. The accumulation of goods within the loading area will not occur. The loading area will remain available for loading and unloading of goods.

## **19.609 BICYCLE PARKING**

### **19.609.2 Quantity of Spaces**

A. *The quantity of required bicycle parking spaces shall be as described in this subsection. In no case shall less than 2 spaces be provided.*

1. *Unless otherwise specified, the number of bicycle parking spaces shall be at least 10% of the minimum required vehicle parking for the use.*

**Response:** There are 139 vehicle parking spaces proposed for the senior living facility, which means 14 bicycle parking spaces are required. As shown on the site plan (Sheet C201), 14 bicycle parking spaces will be provided on the site. Seven bicycle parking spaces will be located at the western edge of the outdoor patio area, near the trash enclosure. The other seven spaces will be located near the center of the building on the east side; those spaces will be covered.

2. *The number of bicycle parking spaces at transit centers shall be provided at the ratio of at least 1 space per 100 daily boardings.*

3. *Multifamily residential development with 4 or more units shall provide 1 space per unit.*

**Response:** Subsections 2 and 3 above do not apply because the use is not a transit center or multifamily residential development.

B. *Covered or enclosed bicycle parking. A minimum of 50% of the bicycle spaces shall be covered and/or enclosed (in lockers or a secure room) in any of the following situations:*

1. *When 10% or more of vehicle parking is covered.*

2. *If more than 10 bicycle parking spaces are required.*

3. *Multifamily residential development with 4 or more units.*

**Response:** More than 10 bicycle parking spaces are required; therefore at least 50 percent of them must be covered. As shown on the site plan, the seven spaces located near the middle of the building on the east side will be covered.

### **19.609.3 Space Standards and Racks**

A. *The dimension of each bicycle parking space shall be a minimum of 2 x 6 ft. A 5-ft-wide access aisle must be provided. If spaces are covered, 7 ft of overhead clearance must be provided. Bicycle racks must be securely anchored and designed to allow the frame and 1 wheel to be locked to a rack using a high security, U-shaped, shackle lock.*

**Response:** Bicycle parking spaces will be at least 2x6 feet with five-foot access aisles. Where covered, at least seven feet of overhead clearance will be provided. Bicycle parking racks will be securely anchored.

B. *Lighting shall conform to the standards of Subsection 19.606.3.F.*

**Response:** Bicycle parking areas will be lit consistent with Subsection 19.606.3.F.

#### **19.609.4 Location**

A. *Bicycle parking facilities shall meet the following requirements:*

1. *Located within 50 ft of the main building entrance.*
2. *Closer to the entrance than the nearest non-ADA designated vehicle parking space.*
3. *Designed to provide direct access to a public right-of-way.*
4. *Dispersed for multiple entrances.*
5. *In a location that is visible to building occupants or from the main parking lot.*
6. *Designed not to impede pedestrians along sidewalks or public rights-of-way.*
7. *Separated from vehicle parking areas by curbing or other similar physical barriers.*

**Response:** As shown on the site plan Sheet C201, bicycle parking will be located within 50 feet of building entrances and will be consistent with the standards in 1-7 above.

#### **19.610 CARPOOL AND VANPOOL PARKING**

##### **19.610.1 Applicability**

*New industrial, institutional, and commercial development with 20 or more required parking spaces shall provide carpool/vanpool parking.*

**Response:** The proposed senior living center is not an industrial, institutional or commercial development. Therefore, this section does not apply.

### **Section 19.700 Public Facility Improvements**

#### **19.703 REVIEW PROCESS**

##### **19.703.1 Preapplication Conference**

*For all proposed development that requires a land use application and is subject to Chapter 19.700 per Section 19.702, the applicant shall schedule a preapplication conference with the City prior to submittal of the land use application. The Engineering Director may waive this requirement for proposals that are not complex.*

**Response:** A pre-application conference was held with the city on September 6, 2018 (see Exhibit C). A second meeting to review the traffic study was not required by the Engineering Director.

### **19.703.2 Application Submittal**

*For all proposed development that is subject to Chapter 19.700 per Section 19.702, one of the following types of applications is required.*

#### **B. Transportation Facilities Review (TFR) Land Use Application**

*If the proposed development triggers a transportation impact study (TIS) per Section 19.704, a TFR land use application shall be required. Compliance with Chapter 19.700 will be reviewed as part of the TFR application submittal and will be subject to a Type II review process as set forth in Section 19.1005. The TFR application shall be consolidated with, and processed concurrently with, any other required land use applications.*

**Response:** The proposed senior living center triggers a traffic impact statement (TIS). A TFR application is required and has been included as part of this land use submittal.

### **19.703.3 Approval Criteria**

*For all proposed development that is subject to Chapter 19.700 per Section 19.702, the required development permit and/or land use application shall demonstrate compliance with the following approval criteria at the time of submittal.*

#### **A. Procedures, Requirements, and Standards**

*Development and related public facility improvements shall comply with procedures, requirements, and standards of Chapter 19.700 and the Public Works Standards.*

**Response:** All development and related public facility improvements will comply with Chapter 19.700 and the City's Public Works Standards.

#### **B. Transportation Facility Improvements**

*Development shall provide transportation improvements and mitigation at the time of development in rough proportion to the potential impacts of the development per Section 19.705 Rough Proportionality, except as allowed by Section 19.706 Fee in Lieu of Construction.*

**Response:** The traffic study provided to the city (Exhibit D) identifies recommended improvements that will be done as part of the proposed development. Those recommendations include:

- Improvements to the Rusk Road driveway on the church property to the east of the development site. Those improvements should include signage and other improvements as needed to restrict vehicles from exiting the church driveway onto Rusk Road.
- Construct a northbound right-turn lane on Rusk Road at OR-224 subject to available right-of-way and transportation system development changes credits.
- Provide adequate intersection sight distance at the proposed site access on Kellogg Creek Drive.

The applicant is not requesting any fee-in-lieu of construction.

The proposed project will also include a new bicycle pathway that provides a public connection from the intersection of Rusk Road and OR-224 south to Kellogg Creek Drive and then west to North Clackamas Park. See Sheet C201 for details.

### C. Safety and Functionality Standards

*The City will not issue any development permits unless the proposed development complies with the City's basic safety and functionality standards, the purpose of which is to ensure that development does not occur in areas where the surrounding public facilities are inadequate. Upon submittal of a development permit application, an applicant shall demonstrate that the development property has or will have all of the following:*

1. *Adequate street drainage, as determined by the Engineering Director.*

**Response:** Adequate street drainage will be provided, as demonstrated in the Preliminary Drainage Report in Exhibit E.

2. *Safe access and clear vision at intersections, as determined by the Engineering Director.*

**Response:** Access to the proposed development will be provided along SE Kellogg Creek Drive. As demonstrated in the TIS provided to the City, the access point will be safe, adequate to serve the site, and consistent with City standards.

3. *Adequate public utilities, as determined by the Engineering Director.*

**Response:** As shown in the Composite Utilities Plan (Sheet C400), the development property has or will have adequate public utilities to serve the proposed development. Specifically:

- A Clackamas River Water main is available for connection in SE Kellogg Creek Drive and can provide service for the proposed development.
- There is an existing sanitary sewer line within SE Kellogg Creek Drive that is available for connection to serve the proposed development.
- The applicant has submitted a storm drainage report (Exhibit E) that demonstrates how stormwater will be managed on the site consistent with Milwaukie Public Works Standards and the Portland Stormwater Management Manual for design of water quality facilities.

4. *Access onto a public street with the minimum paved widths as stated in Subsection 19.703.3.C.5 below.*

5. *Adequate frontage improvements as follows:*

- a. *For local streets, a minimum paved width of 16 ft along the site's frontage.*
- b. *For nonlocal streets, a minimum paved width of 20 ft along the site's frontage.*
- c. *For all streets, a minimum horizontal right-of-way clearance of 20 ft along the site's frontage.*

**Response:** The proposed development will have access onto SE Kellogg Creek Drive, which has a local street designation and at least 16 feet of paved width. As part of this proposed development, standard half street improvements along the site's frontage with SE Kellogg Creek Drive will be constructed.

6. *Compliance with Level of Service D for all intersections impacted by the development, except those on Oregon Highway 99E that shall be subject to the following:*
  - a. *Level of Service F for the first hour of the morning or evening 2-hour peak period.*
  - b. *Level of Service E for the second hour of the morning or evening 2-hour peak period.*

**Response:** As demonstrated in the traffic study provided to the City (Exhibit D), all intersections within the study area will continue to operate within the City's operational standards upon buildout of the proposed development.

## **19.708 TRANSPORTATION FACILITY REQUIREMENTS**

### **19.708.1 General Street Requirements and Standards**

#### *A. Access Management*

*All development subject to Chapter 19.700 shall comply with access management standards contained in Chapter 12.16.*

**Response:** The proposed development will take access from SE Kellogg Creek Drive and will comply with all applicable access management standards in Chapter 12.16.

#### *B. Clear Vision*

*All development subject to Chapter 19.700 shall comply with clear vision standards contained in Chapter 12.24.*

**Response:** The proposed development will comply with the clear vision standards contained in Chapter 12.24.

#### *C. Development in Downtown Zones*

*Street design standards and right-of-way dedication for the downtown zones are subject to the requirements of the Milwaukie Public Works Standards, which implement the streetscape design of the Milwaukie Downtown and Riverfront Plan: Public Area Requirements (PAR). Unless specifically stated otherwise, the standards in Section 19.708 do not apply to development located in the downtown zones or on street sections shown in the PAR per Subsection 19.304.6.*

**Response:** Not applicable. The site is not in a downtown zone.

#### *D. Development in Non-Downtown Zones*

*Development in a non-downtown zone that has frontage on a street section shown in the PAR is subject to the requirements of the Milwaukie Public Works Standards, which implements the street design standards and right-of-way dedication requirements contained in the PAR for that street frontage. The following general provisions apply only to street frontages that are not shown in the PAR and for development that is not in any of the downtown zones listed in Subsection 19.708.1.C above:*

1. *Streets shall be designed and improved in accordance with the standards of this chapter and the Public Works Standards. ODOT facilities shall be designed consistent with State and federal standards. County facilities shall be designed consistent with County standards.*

**Response:** The site has frontage on Kellogg Creek Drive, which is a local street. Right-of-way dedication and half-street improvements to the local street standard will be provided as part of this project.

2. *Streets shall be designed according to their functional classification per Figure 8-3b of the TSP.*

**Response:** No new streets are proposed as part of this development. Half-street improvements to the local street standard will be provided along the site's frontage with Kellogg Creek Drive.

3. *Street right-of-way shall be dedicated to the public for street purposes in accordance with Subsection 19.708.2. Right-of-way shall be dedicated at the corners of street intersections to accommodate the required turning radii and transportation facilities in accordance with Section 19.708 and the Public Works Standards. Additional dedication may be required at intersections for improvements identified by the TSP or a required transportation impact study.*

**Response:** Right-of-way along the site's frontage with Kellogg Creek Drive will be dedicated in order to accommodate the required half-street improvement. No other right-of-way dedication is proposed or required.

4. *The City shall not approve any development permits for a proposed development unless it has frontage or approved access to a public street.*

**Response:** The proposed development has frontage on, and will take access from, SE Kellogg Creek Drive.

5. *Off-site street improvements shall only be required to ensure adequate access to the proposed development and to mitigate for off-site impacts of the proposed development.*

**Response:** The proposed development will include off-site improvements to the church access on Rusk Road. Those improvements will restrict vehicles from exiting onto Rusk Road, which is prohibited due to sight distance issues. The project will also provide a northbound right-turn lane from Rusk Road to OR-224 to reduce queuing durations at that intersection during peak hours.

6. *The following provisions apply to all new public streets and extensions to existing public streets.*

7. *Traffic calming may be required for existing or new streets. Traffic calming devices shall be designed in accordance with the Public Works Standards or with the approval of the Engineering Director.*

**Response:** New public streets are not proposed as part of this development. Therefore, the above standards are not applicable.

8. *Railroad Crossings*

*Where anticipated development impacts trigger a need to install or improve a railroad crossing, the cost for such improvements may be a condition of development approval.*

**Response:** The proposed development does not anticipate any need to improve or install a railroad crossing.

#### 9. Street Signs

*The City shall install all street signs, relative to traffic control and street names, as specified by the Engineering Director. The applicant shall reimburse the City for the cost of all such signs installed by the City.*

**Response:** The applicant understands the City will install any necessary street signs and the applicant will be required to reimburse the City for such costs.

#### 10. Streetlights

*The location of streetlights shall be noted on approved development plans. Streetlights shall be installed in accordance with the Public Works Standards or with the approval of the Engineering Director.*

**Response:** The location of streetlights is noted on the site plan Sheet C201. All streetlights will be installed in accordance with the Public Works Standards or as required by the Engineering Director.

#### E. Street Layout and Connectivity

#### F. Intersection Design and Spacing

**Response:** New streets and intersections are not proposed as part of this development. Therefore, the above sections are not applicable.

### 19.708.2 Street Design Standards

*Table 19.708.2 contains the street design elements and dimensional standards for street cross sections by functional classification. Dimensions are shown as ranges to allow for flexibility in developing the most appropriate cross section for a given street or portion of street based on existing conditions and the surrounding development pattern. The additional street design standards in Subsection 19.708.2.A augment the dimensional standards contained in Table 19.708.2. The Engineering Director will rely on Table 19.708.2 and Subsection 19.708.2.A to determine the full-width cross section for a specific street segment based on functional classification. The full-width cross section is the sum total of the widest dimension of all individual street elements. If the Engineering Director determines that a full-width cross section is appropriate and feasible, a full-width cross section will be required. If the Engineering Director determines that a full-width cross section is not appropriate or feasible, the Engineering Director will modify the full-width cross section requirement using the guidelines provided in Subsection 19.708.2.B. Standards for design speed, horizontal/vertical curves, grades, and curb return radii are specified in the Public Works Standards.*

**Response:** The proposed development will include half-street improvements along the site's frontage with Kellogg Creek to bring the street up to the applicable standard cross section. As shown on Sheet C202, the frontage improvements will include a 10 to 12-foot travel lane, 5-foot bike lane, 8-foot parking strip, 4-foot landscape strip and 5-foot sidewalk. Along the southwest corner of the site, the Kellogg Creek Drive frontage improvements will be modified to avoid impacts to the stand of Oregon white oak trees. The cross section along that portion of the frontage (west of the proposed turn-around) will not include a parking lane. In addition, the sidewalk will cross Kellogg Creek Drive and continue into the park on the south side of the street.

A. *Additional Street Design Standards*

*These standards augment the dimensional standards contained in Table 19.708.2 and may increase the width of an individual street element and/or the full-width right-of-way dimension.*

1. *Minimum 10-ft travel lane width shall be provided on local streets with no on-street parking.*

**Response:** The half-street improvement along the site's frontage with Kellogg Creek Drive will include a 10-foot travel lane.

2. *Where travel lanes are next to a curb line, an additional 1 ft of travel lane width shall be provided. Where a travel lane is located between curbs, an additional 2 ft of travel lane width shall be provided.*

**Response:** Not applicable. Travel lanes will be next to a planter strip.

3. *Where shared lanes or bicycle boulevards are planned, up to an additional 6 ft of travel lane width shall be provided.*

**Response:** Shared lanes and bicycle boulevards are not proposed.

4. *Bike lane widths may be reduced to a minimum of 4 ft where unusual circumstances exist, as determined by the Engineering Director, and where such a reduction would not result in a safety hazard.*

**Response:** The bike lane provided along the site's frontage with Kellogg Creek Drive will be 5 feet wide.

5. *Where a curb is required by the Engineering Director, it shall be designed in accordance with the Public Works Standards.*

**Response:** All curbs will be designed in accordance with Public Works Standards.

6. *Center turn lanes are not required for truck and bus routes on street classifications other than arterial roads.*

7. *On-street parking in industrial zones shall have a minimum width of 8 ft.*

8. *On-street parking in commercial zones shall have a minimum width of 7 ft.*

**Response:** Items 6-8 above are not applicable.

9. *On-street parking in residential zones shall have a minimum width of 6 ft.*

**Response:** On street parking provided with the half-street improvements on Kellogg Creek Drive will be 8 feet wide, consistent with the local street cross section.

10. *Sidewalk widths may be reduced to a minimum of 4 ft for short distances for the purpose of avoiding obstacles within the public right-of-way including, but not limited to, trees and power poles.*



**Response:** The sidewalk along the site’s frontage will be 5 feet wide. At the western end of the site, the sidewalk will cross Kellogg Creek Drive and continue on the south side of the street to avoid impacts to the stand of White Oaks in the southwest corner of the site.

*11. Landscape strip widths shall be measured from back of curb to front of sidewalk.*

**Response:** Landscape strips provided will be four feet wide, as measured in accordance with this standard.

*12. Where landscape strips are required, street trees shall be provided a minimum of every 40 ft in accordance with the Public Works Standards and the Milwaukie Street Tree List and Street Tree Planting Guidelines.*

**Response:** As shown on the landscape Sheet L100 in Exhibit A, street trees will be provided consistent with this standard.

*13. Where water quality treatment is provided within the public right-of-way, the landscape strip width may be increased to accommodate the required treatment area.*

**Response:** Water quality treatment is not proposed within the public right-of-way. Therefore, this standard is not applicable.

*14. A minimum of 6 in shall be required between a property line and the street element that abuts it; e.g., sidewalk or landscape strip.*

**Response:** As shown on the Typical Street Sections (Sheet C202) in Exhibit A, six inches will be provided between a property line and the street element that abuts it.

### **19.708.3 Sidewalk Requirements and Standards**

#### **B. Sidewalk Requirements**

##### **1. Requirements**

*Sidewalks shall be provided on the public street frontage of all development per the requirements of this chapter. Sidewalks shall generally be constructed within the dedicated public right-of-way, but may be located outside of the right-of-way within a public easement with the approval of the Engineering Director.*

**Response:** The half-street improvements along the site’s frontage with Kellogg Creek Drive will include a 5-foot sidewalk constructed within dedicated right-of-way. At the southwestern end of the site, the sidewalk will cross Kellogg Creek Drive and continue on the south side of the street to avoid impacts to the stand of White Oaks in the southwest corner of the site.

##### **2. Design Standards**

*Sidewalks shall be designed and improved in accordance with the requirements of this chapter and the Public Works Standards.*

**Response:** All sidewalks will be designed and improved in accordance with this chapter and the Public Works Standards.

***19.708.5 Pedestrian/Bicycle Path Requirements and Standards***

**Response:** The standards in this section are intended to provide connections within and from new residential subdivisions, multifamily developments, planned developments, shopping centers, and commercial districts to adjacent and nearby residential areas, transit stops, and neighborhood activity centers. The proposed senior living development does not match any of the listed development types. Therefore, this section is not applicable.

## CHAPTER 19.900 LAND USE APPLICATIONS

### Section 19.904 Community Service Uses

#### 19.904.2 Applicability

Any community service use shall be subject to the provisions of this section. Application must be submitted to establish or modify a community service use. Community service uses include certain private and public utilities, institutions, and recreational facilities as listed below:

A. *Institutions—Public/Private and Other Public Facilities*

5. *Nursing or convalescent home;*

**Response:** The proposed 32 memory care units are considered a nursing or convalescent home use and are therefore a community service use. As such, the provisions of Section 19.904 apply.

#### 19.904.4 Approval Criteria

An application for a community service use may be allowed if the following criteria are met:

A. *The building setback, height limitation, and off-street parking and similar requirements governing the size and location of development in the underlying zone are met. Where a specific standard is not proposed in the CSU, the standards of the underlying zone are met;*

**Response:** Except where superseded by the specific standards for nursing and convalescent homes in Section 19.904.8, the standards and requirements of the underlying zone will be met.

B. *Specific standards for the proposed uses as found in Subsections 19.904.7-11 are met;*

**Response:** The specific standards for a nursing and convalescent home in Section 19.904.8 will be met. Those standards are addressed later in this narrative.

C. *The hours and levels of operation of the proposed use are reasonably compatible with surrounding uses;*

**Response:** The proposed 32 memory care units will have full-time residents. Employees will also be on-site at all times and will work in shifts throughout the day and night. Visitors will be allowed during the hours of 7:00 AM to 7:00 PM. Memory care residents do not drive cars and do not leave the site unsupervised. Because of the special circumstances of memory care residents, the impact of those units on the surrounding neighborhood will be minimal.

Uses around the site include the Turning Point Church to the east, North Clackamas Park to the west, and some residential homes to the north. To the south of the site, across Kellogg Creek Drive, there are single-family homes and the Deerfield Village Assisted Living Center. No off-site noise impacts will result from the memory care units. There will be an outdoor courtyard for the memory care patients that will be located internally (enclosed by the building on all sides) for security reasons. Noise from the outdoor area will not be noticeable from adjacent properties. There are no light or odor impacts associated with the memory care units. The only noticeable outdoor activity from the memory care units will be the occasional traffic associated with employees and visitors to and from the site. The amount of traffic generated by the memory care units (and by the development as a whole) will not have significant impacts to the local street system (see the traffic study in Exhibit D).

*D. The public benefits of the proposed use are greater than the negative impacts, if any, on the neighborhood; and*

**Response:** As discussed above, negative impacts to the neighborhood are not anticipated from the proposed memory care units. The memory care units provide full-time care and supervision for patients with advanced Alzheimer’s disease and other significant memory-related conditions. Patients live on site and are cared for by professional staff educated in memory care treatment techniques. Supervision of the memory care units is provided 24 hours a day to ensure safety and security of the patients. Educational programs and support groups are also provided on-site for families of the memory care patients. Making this type of care available to communities in Milwaukie provides a significant public benefit.

*E. The location is appropriate for the type of use proposed.*

**Response:** The proposed site for the memory care units is appropriate because it is large enough to accommodate the senior living center as a whole. The site provides enough space to thoughtfully plan for memory care residents’ needs in terms of security, location within the overall building and dedicated outdoor spaces. The proximity to North Clackamas Park provides opportunity for additional outdoor activity beyond what will be offered on the site. There is also a community center (the Milwaukie Center) located in the park that provides indoor programs throughout the year. The site is relatively close to downtown Milwaukie and central to the Portland Metro region, providing convenience for employees and visitors/family of the memory care residents. The site is also located directly adjacent to the Turning Point Church, which provides religious services and community programs.

#### **19.904.5 Procedures for Reviewing a Community Service Use**

*C. The Planning Director may approve minor modifications to an approved community service per Section 19.1004 Type I Review, provided that such modification:*

**Response:** The proposed project will include some minor changes to the existing church property to reconfigure the church access point from Rusk Road. Due to site distance limitations, exit from that location is not allowed. The reconfiguration will help to enforce that access point as entrance-only and prohibit drivers from exiting onto Rusk Road.

*1. Does not increase the intensity of any use;*

**Response:** The proposed modifications to the church property will not add square footage to the church use or otherwise result in an increase in activity or use of the site. The modifications will be limited to reconfiguration of the existing access from Rusk Road.

*2. Meets all requirements of the underlying zone relating to building size and location and off-street parking and the standards of Title 19;*

**Response:** Applicable standards from Title 19 include those related to access and parking lot perimeter buffers. No other elements regulated by Title 19 (such as building size and location) will be impacted by the proposed modifications.

- The Public Facility Improvements standards in Chapter 19.703 require that all development has safe access to a public street. The proposed modifications to the church site will facilitate safe access to the

site by improving the entry-only access point on Rusk Road. These improvements will help ensure that the entry-only access point is not used as an exit.

- Per MMC 19.606.2.C, perimeter landscape buffers are required where the parking area abuts another property. As shown on Sheet C201, a 6-foot buffer will be provided along the northern and western edges of the church parking lot where it abuts the adjacent property.

3. *Does not result in deterioration or loss of any protected natural feature or open space, and does not negatively affect nearby properties;*

**Response:** The proposed access modifications will not have any impact on natural resources or open spaces in the vicinity of the site. All proposed modifications to the church site will occur within the boundaries of the existing parking lot and will not negatively affect nearby properties.

4. *Does not alter or contravene any conditions specifically placed on the development by the Planning Commission or City Council; and*

**Response:** The most recent review of the church property was conducted in September 2014 when the Turning Point Church requested a CSU Minor Modification and Natural Resource Review in order to remove a section of off-street parking spaces from the church parking lot and replace them with landscaping (grass and ground cover). That decision (File Nos. CSU-14-06 and NR-14-06) did not include any conditions of approval. In the findings for that decision, prior conditions of approval for the church site were listed as follows:

*The property was annexed into the city limits in 1981 (land use file #A-80-07). In 1983, use of the site for pasture land and grazing for horses was approved as a conditional use (file #C-83-08); however, the conditional use application was subsequently withdrawn.*

*The site was approved as a CSU for church use by the Milwaukie Assembly of God in 1984 (file #CS-84-02). Conditions of approval included requirements to provide plans for landscaping, public facilities, and exterior lighting, as well as a traffic study and right-of-way dedication along Rusk Rd and Kellogg Creek Dr.*

*In 1987, the City Council approved a zone change for the western portion of the property, from R-10 to R3, along with a conditional use approval for senior housing and an amendment to the Comprehensive Plan map (file #CPA-87-01, ZC-87-05, CU87-05, with Ordinance #1639). The senior housing project (called Parkside Village) was never developed.*

*In 1992, the City approved a 5,500-sq-ft addition to the church building (file #CSO-92-03, NR-92-01). Conditions of approval included requirements to install the approved landscaping and to direct lighting away from the designated natural resource area.*

*In 1997, the Planning Commission denied a sign permit request to locate an electronic reader board sign on the property near the intersection of Highway 224 and Rusk Rd (file #SP-97-01).*

The proposed modifications to the church access will not contravene or alter any of the conditions of approval from the above-listed decisions.

5. *Does not cause any public facility, including transportation, water, sewer and storm drainage, to fail to meet any applicable standards relating to adequacy of the public facility.*

**Response:** No public facility will fail to meet adequacy standards as a result of the proposed modifications to the church property. The only public facility that will be impacted by the proposed modifications is public

transportation. The proposed modifications at the entry-only access point on Rusk Road will provide an overall improvement to safe access for the church property. The “no exit” requirement onto Rusk Road will be reinforced and a safe and convenient exit onto Kellogg Creek Drive will be provided through the proposed new development. The new access point on Kellogg Creek Drive will be designed consistent with applicable standards.

#### **19.904.6 Application Requirements**

*An application for approval of a community service use shall include the following:*

- A. Name, address and telephone number of applicant and/or property owner;*
- B. Map number and/or subdivision block and lot;*
- C. Narrative concerning the proposed request;*
- D. Copy of deed, or other document showing ownership or interest in property. If applicant is not the owner, the written authorization from the owner for the application shall be submitted;*
- E. Vicinity map;*
- F. Comprehensive plan and zoning designations;*
- G. A map showing existing uses, structures, easements, and public utilities and showing proposed development, placement of lot lines, etc.;*
- H. Detailed plans for the specific project;*
- I. Any information required by other applicable provisions of local, state or federal law;*
- J. Proof of payment of the applicable fees;*
- K. Additional drawings, surveys or other material necessary to understand the proposed use may be required.*

**Response:** All required submittal items for the Community Service Use application have been provided with this application package.

#### **19.904.8 Specific Standards for Nursing or Convalescent Homes**

- A. Public services must be adequate to serve the facility.*

**Response:** Per the notes provided by the Public Works Department in the pre-application notes (Exhibit C), there is an existing Clackamas River Water main in Kellogg Creek Drive that is available to provide public water service to the proposed development. There is also a Clackamas County Water Environment Services (WES) wastewater main in Kellogg Creek Drive that is available to provide sanitary sewer service to the proposed development. The site has frontage on, and access from, Kellogg Creek Drive, which is a designated local street. As part of this development, additional right-of-way along the frontage will be dedicated and half-street improvements will be constructed to bring the street up to the local street standard.

- B. Facilities will access on arterial or collector streets.*

**Response:** The proposed senior housing development will take access from SE Kellogg Creek Drive, which has a local street designation per City of Milwaukie. SE Rusk Road is a collector street; however, access from Rusk Road is not possible due to the presence of the existing church property. Furthermore, while the 32 memory

care units are considered a community service use, the remainder of the proposed senior housing facility (assisted and independent living units) is considered a conditional use and not subject to this standard. A traffic impact analysis has been conducted for this project and demonstrates that safe access from Kellogg Creek Drive is possible and all potential traffic impacts to the surrounding road network can be mitigated (see Exhibit D).

*C. Setbacks must be the greater of 25 ft or the setback of an adjacent residential zone or of the underlying zone.*

**Response:** The subject site is zoned R-10 (20-foot setbacks), and R-3 (15-foot setbacks). The adjacent properties are zoned R-10. Therefore, the setbacks must be 25 feet per this standard. As shown on the Site Plan Sheet C201, the building is located more than 25 feet from any property line and therefore meets this standard.

*D. Maximum height shall not exceed 45 ft.*

**Response:** The portion of the building that contains the memory care units will be one story, or 10.6 feet in height, which is below the maximum standard for this use.

*E. Buffering of noise and light from adjacent streets and between adjacent properties may be required.*

**Response:** Buffering of noise and light has not been required.

*F. Sites which could cause hazard to disoriented patients through proximity to heavily traveled streets, water hazards, or ravines or steep slopes shall not be approved unless the applicant can satisfy the commission that safety measures will be used to prevent injury to patients.*

**Response:** The proposed memory care units will be in a secured portion of the building and will have 24-hour surveillance. The internal and external doors to the memory care facility will be locked at all times; access through the doors will only be possible with an access card; only employees of the facility will have access cards. Visitors to the memory care facility will be escorted through the doors by employees. The outdoor memory care courtyard is entirely enclosed by the building and will not be accessible from outside the building. Landscape plants in the memory care courtyard have been specifically selected to ensure no toxic plant materials will be planted in that area. Bonaventure has owned and operated many memory care facilities and is experienced in providing quality care for their residents; safety and security for those residents is always a top priority.

*G. On parcels surrounded by existing dwellings, additional conditions may be necessary to:*

- 1. Mitigate the effects of traffic caused by shift changes, particularly regarding noise at night and safety of school children in transit; and/or*
- 2. Maintain neighborhood scale, particularly regarding size of structure, width of driveway, signs, exterior lighting, and placement of parking facilities.*

**Response:** The subject site is not surrounded by existing dwellings. There are existing dwellings south of the site, across Kellogg Creek Drive, and north of the site on the north side of Mount Scott Creek. As demonstrated in the traffic study provided in Exhibit D, traffic impacts from the proposed development will not be significant and can be mitigated. The overall site for the project is large (14+ acres) and the building will be buffered from nearby residences by the large amount of natural open space and proposed landscaping on the site. In addition,

there is a large church and associated parking lot directly to the east of the site, a large community center directly west of the site, and an existing assisted living center across Kellogg Creek Drive from the site. As such, the proposed use is consistent with the surrounding neighborhood in terms of scale and structure size. Exterior signage for the senior living center will be minimal. Exterior lighting will be designed to avoid trespass onto adjacent properties and onto the HCA and WRQ areas. On-site parking has been distributed around the site to avoid large surface parking areas and to ensure direct connections between parking and building entrances for residents and visitors.

*H. Conversion of existing dwellings may be allowed if state codes and rules can be met and the conditions of this subsection are satisfied.*

**Response:** Not applicable. The project does not propose conversion of existing dwellings.

*I. Off-street parking must be provided as per Chapter 19.600.*

**Response:** Off-street parking will be provided consistent with Chapter 19.600. Off-street parking provisions are addressed under that section of this narrative.

*J. 15% of the total site is to be landscaped.*

**Response:** As shown on the landscape plan Sheet L100 approximately 72 percent of the site will be landscaped or be preserved as natural open space, which exceeds this standard.

## **Section 19.905 Conditional Uses**

### **19.905.4 Approval Criteria**

*A. Establishment of a new conditional use, or major modification of an existing conditional use, shall be approved if the following criteria are met:*

- 1. The characteristics of the lot are suitable for the proposed use considering size, shape, location, topography, existing improvements, and natural features.*

**Response:** The subject site is large (14+ acres) and relatively flat with a few sloped areas. There is a large wetland on the western edge of the site, Mount Scott Creek along north end of the site, and a stand of mature White Oak trees in the southwest corner. In addition, there is mapped WQR and HCA associated with the creek, floodplain and wetland on the site. The site is large enough to accommodate the proposed senior living development and associated parking and drive aisle while still allowing preservation of most of the identified natural resources on the site. The large designated wetland located in the middle of the western half of the site will not be impacted by the proposed development, nor will the large stand of White Oaks. There will also be no impacts to the 100-year floodplain. There will be some impacts to WQR and HCA areas; however, those impacts will be mitigated to satisfy city requirements; impacts and mitigation details will be provided in a Natural Resources Review report prepared by Pacific Habitat Services. The presence of natural resources on the site will provide a benefit to residents and visitors of the senior center, allowing opportunities for scenic viewing and nature walks. The location of the site is suitable for a senior living center because it has proximity to North Clackamas Park, the Milwaukie Center and Turning Point Church, all of which offer recreational and other programs and services for residents of the center. The site is located within a couple miles of downtown



Milwaukie and various other shopping and service centers. The site is centrally located within the Portland region, providing convenience for families and visitors as well as employees.

- 2. The operating and physical characteristics of the proposed use will be reasonably compatible with, and have minimal impact on, nearby uses.*

**Response:** Uses around the site include the Turning Point Church to the east, North Clackamas Park and the Milwaukie Center to the west, and some residential homes to the north across Mount Scott Creek. To the south of the site, across Kellogg Creek Drive, there are single-family homes and the Deerfield Village Assisted Living Center.

The proposed senior living center will be in operation at all times; residents will live on-site full time and employees will also be on-site full time. As demonstrated in the traffic study provided in Exhibit D, traffic impacts from the proposed development will not be significant and can be mitigated. Generally, traffic generated by the use will be distributed throughout the day and will not have the same peak hours that are typical of residential or employment uses. The overall site for the project is large and the building will be buffered from nearby residences by the large amount of natural open space and proposed landscaping. In addition, there is a large church and associated parking lot directly to the east of the site, a large community center directly west of the site, and an existing assisted living center across Kellogg Creek Drive from the site. As such, the proposed use is consistent with the surrounding neighborhood in terms of scale and use. Exterior lighting will be designed to avoid trespass onto adjacent properties and onto the HCA and WRQ areas. On-site parking has been distributed around the site to avoid large surface parking areas. The building has been designed with ample articulation, varied heights, and quality building materials (see the exterior building elevations on Sheet A3.1) to minimize massing and create a visually attractive building. No off-site noise impacts will result from the proposed use. There will be several outdoor areas for residents of the senior center. However, noise from those areas will be minimal and not be noticeable from adjacent properties.

- 3. All identified impacts will be mitigated to the extent practicable.*

**Response:** Identified impacts from the proposed use are impacts to the WQR and HCA areas on the site and minor traffic impacts. A Natural Resources Review Report will be provided to demonstrate that the WQR and HCA impacts can be mitigated and will satisfy city requirements per Chapter 19.402. As demonstrated in the traffic study provided in Exhibit D, traffic impacts can be mitigated through provision of a northbound right-turn lane on Rusk Road at OR-224, improvements to the existing church driveway, and provision of safe intersection sight distance at the site driveway on Kellogg Creek Drive. In addition, half-street improvements including a bike lane will be provided along the site's frontage with Kellogg Creek Drive.

- 4. The proposed use will not have unmitigated nuisance impacts, such as from noise, odor, and/or vibrations, greater than usually generated by uses allowed outright at the proposed location.*

**Response:** The proposed senior center will not result in noise, odor or vibration impacts that would be greater than those that would be generated by a residential development on the site.

- 5. The proposed use will comply with all applicable development standards and requirements of the base zone, any overlay zones or special areas, and the standards in Section 19.905.*

**Response:** The proposed senior center will comply with applicable standards and requirements of the base zone and overlay zone, with the exception of building height. A variance has been requested as part of this proposal to allow a building height greater than the maximum. Variance criteria are addressed later in this narrative.

*6. The proposed use is consistent with applicable Comprehensive Plan policies related to the proposed use.*

**Response:** Applicable Comprehensive Plan policies include:

- Chapter 3, Objective 2 - Natural Resources: Policies in this section are intended to protect designated natural resources such as wetlands and habitat areas. To implement these policies, the city has developed a review process to regulate development within natural resources. The proposed senior living development will have some impacts to designated natural resources on the site. The applicant has provided a natural resources report and wetland delineation, consistent with the city's natural resources review requirements and in support of these policies. Most of the natural resources on the site will be preserved; impacts have been minimized to the extent practicable and will be mitigated.
- Chapter 3, Objective 1 – Floodplain: Policies in this section are established to manage the 100-year floodplain and protect lives and property located along and within the floodplain. There is mapped FEMA 100-year floodplain on the senior living site; however, the current FEMA mapping does not accurately reflect the actual location of the 100-year floodplain. The applicant is requesting a conditional letter of map revision (CLOMR) from FEMA to revise the floodplain boundary on the site based on actual elevations and detailed topographic survey of the site. The request to FEMA must include a Community Acknowledgement Form signed by the City's engineer stating they agree with the revision. The City engineer has indicated that the form will be signed after preliminary land use approval at the public hearing. Once that occurs, the CLOMR request will be submitted to FEMA. The proposed development does not impact the 100-year floodplain as mapped per the map revision.
- Chapter 4, Objective 6 – Housing Assistance: Policies in this section encourage provision of housing for senior citizens. Special characteristics and needs of senior citizens should be considered in reviewing senior housing development proposals. The proposed senior living development supports these policies by providing a high-quality senior living center with a range of options and amenities.

*7. Adequate public transportation facilities and public utilities will be available to serve the proposed use prior to occupancy pursuant to Chapter 19.700.*

**Response:** Per the notes provided by the Public Works Department in the pre-application notes (Exhibit C), there is an existing Clackamas River Water main in Kellogg Creek Drive that is available to provide public water service to the proposed development. There is also a Clackamas County Water Environment Services (WES) wastewater main in Kellogg Creek Drive that is available to provide sanitary sewer service to the proposed development. The site has frontage on, and access from, Kellogg Creek Drive, which is a designated local street. As part of this development, additional right-of-way along the frontage will be dedicated and half-street improvements will be constructed to bring the street up to the local street standard. The applicable standards and requirements of Chapter 19.700 were addressed previously in this narrative.

### **19.905.9 Standards Governing Conditional Uses**

*A conditional use shall comply with the standards of the base zone, and any overlay zones or special areas, in which it is located, except as these standards have been modified by the Planning Commission when authorizing the conditional use and as otherwise modified by the standards in this subsection.*

*A. Yards*

*Additional yard width requirements may be imposed as a condition of approval to address impacts related to building height, mass, and proximity to residential land uses.*

**Response:** Additional yard widths are not anticipated to be imposed due to the significant yard widths already being proposed for the senior housing facility. As shown on the Site Plan Sheet C201, the proposed building will have the following approximate setbacks:

- Front: 75 feet
- Side: 90 feet
- Rear: 130 feet

*B. Access to Property and Building Openings*

*The City may limit or prohibit vehicle access from a conditional use to a residential street, and it may limit or prohibit building openings within 50 ft of residential property in a residential zone if the openings will cause glare or excessive noise or will otherwise adversely affect adjacent residential property.*

**Response:** The proposed senior living facility will have access from SE Kellogg Creek Drive, which is a local street. The city has not limited or prohibited access from that street; access from other streets is not available. The building will be oriented to avoid openings within 50 feet of a residential property.

*C. Surface Mining*

*D. Junk or Wrecking Yard*

*E. High-Impact Commercial Use*

*F. Multifamily Dwellings*

**Response:** The standards in C through F are not applicable to the proposed use.

*G. Senior and Retirement Housing*

*In considering a conditional use application for senior and retirement housing, the Planning Commission shall consider the following:*

- 1. Pedestrian access to transit.*

**Response:** Pedestrian access to transit from the site is not realistic for residents of the proposed senior center. The closest TriMet bus stop is approximately one-half mile away at the intersection of Rusk and Lake Roads. Although the project will provide a new public pathway from the site up to the intersection of Rusk Road and OR-224, senior center residents are typically not expected to walk that distance, and cross OR-224, in order to access transit.

2. *Pedestrian access to convenience facilities such as grocery store, pharmacy, laundromat, park and open space, and senior activity center.*

**Response:** Pedestrian access to some facilities will be available for the senior living development. North Clackamas Park and the Milwaukie Center are located directly adjacent to the site. The Milwaukie Center entrance is less than one-quarter mile from the senior center driveway. The park offers a variety of outdoor recreation opportunities, and the Milwaukie Center offers year-round programs, workshops and volunteer opportunities, some of which are designed to serve the elderly population.

3. *Pedestrian access to banking, churches, hospitals, and restaurants.*

**Response:** Turning Point Church is directly adjacent to the site to the east and provides convenient access to religious and other community programs for residents of the proposed senior living center. Pedestrian access to banking, hospitals and restaurants is not realistic due to distance and the proximity of the site to OR-224.

4. *Quality of project as a living environment for residents.*

**Response:** The proposed senior living development is intended to provide a quality living environment that allows residents to “age in place” and transition and their need for assistance changes. The development will include:

- 78 Independent Living Suites: One and two-bedroom suites ranging from 570 to 1,150 sf. While these residents do receive some meals and services such as housekeeping and social programs, these units have complete kitchens and balconies.
- 60 Assisted Living Suites: One and two-bedroom suites ranging from 500 to 1,130 sf. These residents are served all meals in a restaurant-style communal dining room; therefore, these suites are equipped with a microwave and refrigerator only for snacks. These residents are not anticipated to drive and tend to receive additional services to assist with activities of daily living.
- 32 Memory Care Suites: This is a secured section of the building, with its own separate and enhanced administrative and care staff. It has a separate serving kitchen, dining room, outdoor area, and common amenities.

Interior amenities include a large and gracious lobby and reception area, café, formal living room/parlor with public computers for resident use, garden/hobby/workshop, fitness center, piano lounge, beauty salon, large theater for movies and special events, activity space for cooking/baking programs, and a hospitality bar for meals and social functions.

With a generous site and large setbacks, the site will provide ample yards and open spaces for residents to enjoy. Outside activity areas include a combination of open and covered patios where staff can engage residents in various scheduled activities and occasional meals in fair weather. Outdoor planting areas are provided for resident use, as well as horseshoe pits and other exterior amenity areas. The memory care units have a dedicated, secure outdoor courtyard designed and landscaped specifically for memory care patients.

5. *Minimizing impact on the surrounding area.*

**Response:** As demonstrated in the traffic study provided in Exhibit D, traffic impacts from the proposed development will not be significant and can be mitigated. Generally, traffic generated by the use will be distributed throughout the day and will not have the same peak hours that are typical of residential or

employment uses. The overall site for the project is large and the building will be buffered from nearby residences by the large amount of natural open space and proposed landscaping on the site. Exterior lighting will be designed to avoid trespass onto adjacent properties and onto the HCA and WRQ areas. On-site parking has been distributed around the site to avoid large surface parking areas. The building has been designed with ample articulation, varied heights, and quality building materials (see the exterior building elevations on Sheet A3.1) to minimize building mass and create a visually attractive building. No off-site noise impacts will result from the proposed use. There will be several outdoor areas for residents of the senior center. However, noise from those areas will be minimal and not be noticeable from adjacent properties. Impacts to the HCA and WQR areas on-site have been minimized to the extent practicable and can be mitigated in accordance with the Natural Resources provisions in Chapter 19.402.

*An applicant shall submit materials and the Planning Commission shall attach conditions that will ensure that the special nature of the housing, and the groups to be served, are clearly defined and maintained in perpetuity. A project is required to meet the definition for this type of housing in Section 19.201.*

**Response:** Per Section 19.201, the definition for senior and retirement housing is:

*“...a multiunit dwelling where persons who are of retirement age reside. Activity levels, including traffic generation and parking of cars, are generally lower than for other types of housing. Common facilities for eating and activities may be provided; nursing care, medical supplies, and personal services may be provided on a limited basis. One person may own the entire complex, or each dwelling unit may be owned separately as in a condominium.”*

The proposed senior living development will be a multiunit building intended to serve a variety of users, including those of retirement age, those who need special assistance, and those who have significant memory care needs. Common facilities for eating and activities will be provided, in addition to nursing care and other personal services. The entire complex will be under one ownership.

## **Section 19.911 Variances**

### **19.911.2 Applicability**

#### *A. Eligible Variances*

*Except for situations described in Subsection 19.911.2.B, a variance may be requested to any standard or regulation in Titles 17 or 19 of the Milwaukie Municipal Code, or any other portion of the Milwaukie Municipal Code that constitutes a land use regulation per ORS 197.015.*

**Response:** The applicant is requesting three variances to standards in Title 19 of the MMC, as described below.

### **19.911.3 Review Process**

#### *A. General Provisions*

- 1. Variance applications shall be evaluated through either a Type II or III review, depending on the nature and scope of the variance request and the discretion involved in the decision-making process.*
- 2. Variance applications may be combined with, and reviewed concurrently with, other land use applications.*

3. *One variance application may include up to three variance requests. Each variance request must be addressed separately in the application. If all of the variance requests are Type II, the application will be processed through a Type II review. If one or more of the variance requests is Type III, the application will be processed through a Type III review. Additional variance requests must be made on a separate variance application.*

**Response:** The applicant is requesting three variances:

1. A variance to the building height standard of 2.5 stories or 35 feet, whichever is greater, for those portions of the building that are not memory care (which has a separate height limit that will be met). As shown on Sheet A3.1, the three-story portions of the building will be 37 feet, 1 inch as measured per the average height of the highest gable. The four-story portions of the building will be, at highest, 47 feet, 9 inches as measured per average height of the highest gable. Therefore, the applicant requests a variance to allow greater building height for the three- and four-story portions of the building.
2. MMC 19.504.9 requires a walkway connection into the site for every 300 feet of street frontage. The site has approximately 64 feet of frontage along SE Rusk Road, which requires one walkway connection into the site. However, a connection at this location is not appropriate for the proposed use and a variance is requested to reduce the requirement to zero connections from SE Rusk Road.
3. MMC 19.904.8 requires that nursing or convalescent homes have access from an arterial or collector street. Although the site will have access to a collector street (SE Rusk Road) via the church property, that access is intended as an emergency-only access and not a full access. Therefore, a variance is requested to allow primary access from SE Kellogg Creek Drive, which is a local street.

### C. *Type III Variances*

*Type III variances allow for larger or more complex variations to standards that require additional discretion and warrant a public hearing consistent with the Type III review process. Any variance request that is not specifically listed as a Type II variance per Subsection 19.911.3.B shall be evaluated through a Type III review per Section 19.1006.*

**Response:** The requested variances are not listed as Type II variances per Subsection 19.911.3.B. Therefore, Type III variances are requested and have been included as part of this application package.

### **19.911.4 Approval Criteria**

#### B. *Type III Variances*

*An application for a Type III variance shall be approved when all of the criteria in either Subsection 19.911.4.B.1 or 2 have been met. An applicant may choose which set of criteria to meet based upon the nature of the variance request, the nature of the development proposal, and the existing site conditions.*

**Response:** The applicant is requesting variances using the discretionary relief criteria in subsection B.1 below.

#### 1. *Discretionary Relief Criteria*

- a. *The applicant's alternatives analysis provides, at a minimum, an analysis of the impacts and benefits of the variance proposal as compared to the baseline code requirements.*

**Response:**

- 1. Building height variance.** In order to provide a building of the same size that meets the height limits for the base zone, the building would have a significantly larger footprint than the one proposed. A larger footprint for this development is not practical or appropriate for two reasons:
  - The site has a significant amount of designated natural resources, including wetlands and habitat conservation area, located on the western half of the site. The proposed building and associated site improvements have been designed to minimize impacts to those natural resources as much as possible. A building that meets the applicable height requirements would have a larger footprint and would therefore have greater impacts to natural resources, particularly the large wetland located in the middle of the western half of the site. The height variance will allow a more compact building footprint and facilitate preservation of natural resources on the site.
  - This proposal is for a senior living facility; the average age of residents is anticipated to be 82 years. More than half of the residents will be either in assisted living or memory care units. For these reasons, the building must be designed to minimize walking distances (corridor lengths) between the residential units and the communal areas such as dining, cafes and other amenities and services. A mix of three and four stories provides the appropriate corridor lengths and ensures that residents are not required to walk long distances to access services. A building of the same size that complied with the height limits of the base zone would be more spread out and would result in corridor lengths that are not practical for its residents.
- 2. Walkway from SE Rusk Road variance.** A walkway connection into the site from SE Rusk Road is not appropriate for several reasons. First, the only feasible location for a walkway would be north of the church property, connecting to Rusk Road near its intersection with OR-224. The walkway would be approximately 300 feet (to connect to the nearest developed portion of the senior living facility) and would travel in an undeveloped area behind the church parking lot. There would very limited visibility into this area because both the church and the proposed senior living building are not in close proximity and could not provide surveillance for the walkway. Thus, it would not be a secure or particularly comfortable place for pedestrians to walk. In addition, the senior living facility must provide a safe and secure home for its residents; doing so requires that the facility have more limited access than a typical residential or commercial use. Ensuring that access (for visitors, employees, and other users) occurs in a more centralized location that is more visible is important to maintaining a safe environment for the senior living residents.
- 3. Access variance.** The proposed primary access from Kellogg Creek Drive provides safe access for the senior living facility and allows efficient and convenient site circulation. Access to an arterial or collector, as required per the standard, would not be safe and would not be consistent with established access spacing standards, as follows:
  - Access to an arterial is not possible because the site does not have frontage on an arterial street. OR-224 is designated as a Regional Route per Milwaukie's Transportation System Plan (Figure 8-1). It is also a state highway with limited access. Even if access were permitted to OR-224, the required spacing standard (1,100 feet for a state highway with posted speeds of 50 MPH) could not be met from the site because it would be too close to the OR-224/Rusk Road intersection.
  - Although the site does have access to Rusk Road (a designated Collector per Clackamas County's Transportation System Plan, Map 5-4a), that access is through the church property and is intended for emergency-only access. A full access to Rusk Road is not feasible. The only site frontage on Rusk Road is approximately 64 feet and located at the intersection of Rusk Road with OR-224. Access from that location would not meet intersection spacing standards (300 feet for Collectors). Any other access to Rusk Road would require impacting the church property. The

existing emergency-only access through the church property cannot be converted into a full access because exit onto Rusk Road is not permitted at that location due to sight distance limitations and north-bound queuing issues on Rusk Road. The proposed driveway access from Kellogg Creek Drive meets (and exceeds) the applicable spacing standard (100 feet) and will provide safe access to the site.

*b. The proposed variance is determined by the Planning Commission to be both reasonable and appropriate, and it meets one or more of the following criteria:*

*(1) The proposed variance avoids or minimizes impacts to surrounding properties.*

*(2) The proposed variance has desirable public benefits.*

*(3) The proposed variance responds to the existing built or natural environment in a creative and sensitive manner.*

**Response:**

- 1. Building height variance.** The proposed height variance will facilitate development of a senior living facility that is appropriately designed for its residents and that minimizes impacts to the significant area of natural resources on the site. Development of a senior living facility that allows residents to age in place and transition to higher levels of care as needed provides a public benefit. The site is centrally located within the region, providing a convenient option for families who are considering this type of senior living arrangement. This type of development is specifically encouraged in Comprehensive Plan policies and addresses the significant demographic trend of the aging “baby boomer” generation. The proposed variance will also allow a more compact development footprint, thereby minimizing impacts to natural resources on the site and facilitating preservation of those areas.
- 2. Walkway from SE Rusk Road variance.** The requested variance to not build a walkway connection to SE Rusk Road will not have any impacts on surrounding properties. It is a reasonable and appropriate variance because a walkway in this location will not achieve the intent of the standard, which includes the following language:

*On-site walkways shall link the site with the public street sidewalk system. Walkways are required between parts of a site where the public is invited to walk. Walkways are not required between buildings or portions of a site that are not intended or likely to be used by pedestrians.*

The undeveloped area north of the church parking lot is not an area where the public should be invited to walk and is not likely to be used by pedestrians because the surrounding sidewalk system is inadequate. Transit service in the area is limited; there are no sidewalks on OR-224 and the only sidewalk along Rusk Road is south of the Rusk Road/OR-224 intersection.

- 3. Access variance.** The proposed access variance responds to the built environment by putting access along a local street (Kellogg Creek Drive) where it can meet spacing standards and avoid impacts to the church property. This driveway location will result in some additional traffic on Kellogg Creek Drive; however, per the traffic study, traffic resulting from the project will not cause deficiencies in the surrounding street network. In addition, this project includes improvements to Rusk Road to provide a north-bound right-turn lane onto OR-224 which will help alleviate existing traffic congestion at that intersection.

*c. Impacts from the proposed variance will be mitigated to the extent practicable.*



**Response:**

- 1. Building height variance.** Potential impacts from the proposed height variance have to do with compatibility with the surrounding neighborhood in terms of building size and scale. These impacts have been minimized through significant building setbacks, extensive landscaping on the site, preservation of a large natural resource area, and a high-quality and articulated building exterior.
- 2. Walkway from SE Rusk Road variance.** The lack of a walkway connection into the site from Rusk Road will be mitigated by the proposed new bike-pedestrian path extending from the Rusk Road/OR-224 intersection south and west to connect with the bike lane and sidewalk on Kellogg Creek Drive. While this connection is not as direct as a connection from the north end of Rusk Road, it will be more visible and will facilitate security and safety for the senior living center.
- 3. Access variance.** Taking access from a local street instead of an arterial or collector will result in additional traffic on Kellogg Creek Drive, as noted above. However, the traffic study provided in Exhibit D concludes that traffic resulting from the project will not cause deficiencies in the surrounding street network. This project also includes improvements to Rusk Road to provide a northbound right-turn lane onto OR-224 which will help alleviate existing traffic congestion in the area. In addition, the driveway on Kellogg Creek Drive is located between two landscaped storm swales and the internal perimeter loop road is setback from Kellogg Creek Drive by more than 40 feet. This will help to reduce visual and noise impacts that may result from the site driveway. Furthermore, as shown on Figure 8 in the traffic study, the trips resulting from the proposed senior center will account for only a small percentage of the traffic occurring on Kellogg Creek Drive, meaning that any noise resulting from the site access will be negligible considering background conditions.

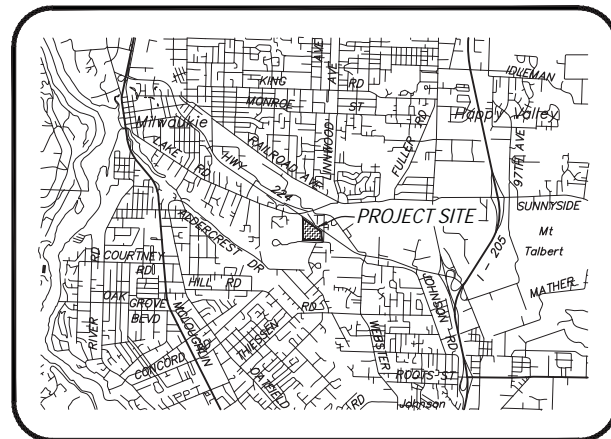
## **IV. CONCLUSIONS**

As established in the discussion and responses provided in this narrative, the proposed senior living development is consistent with City standards and criteria. The applicant therefore requests that the City approve the applications contained in this submittal.

# BONAVENTURE SENIOR HOUSING

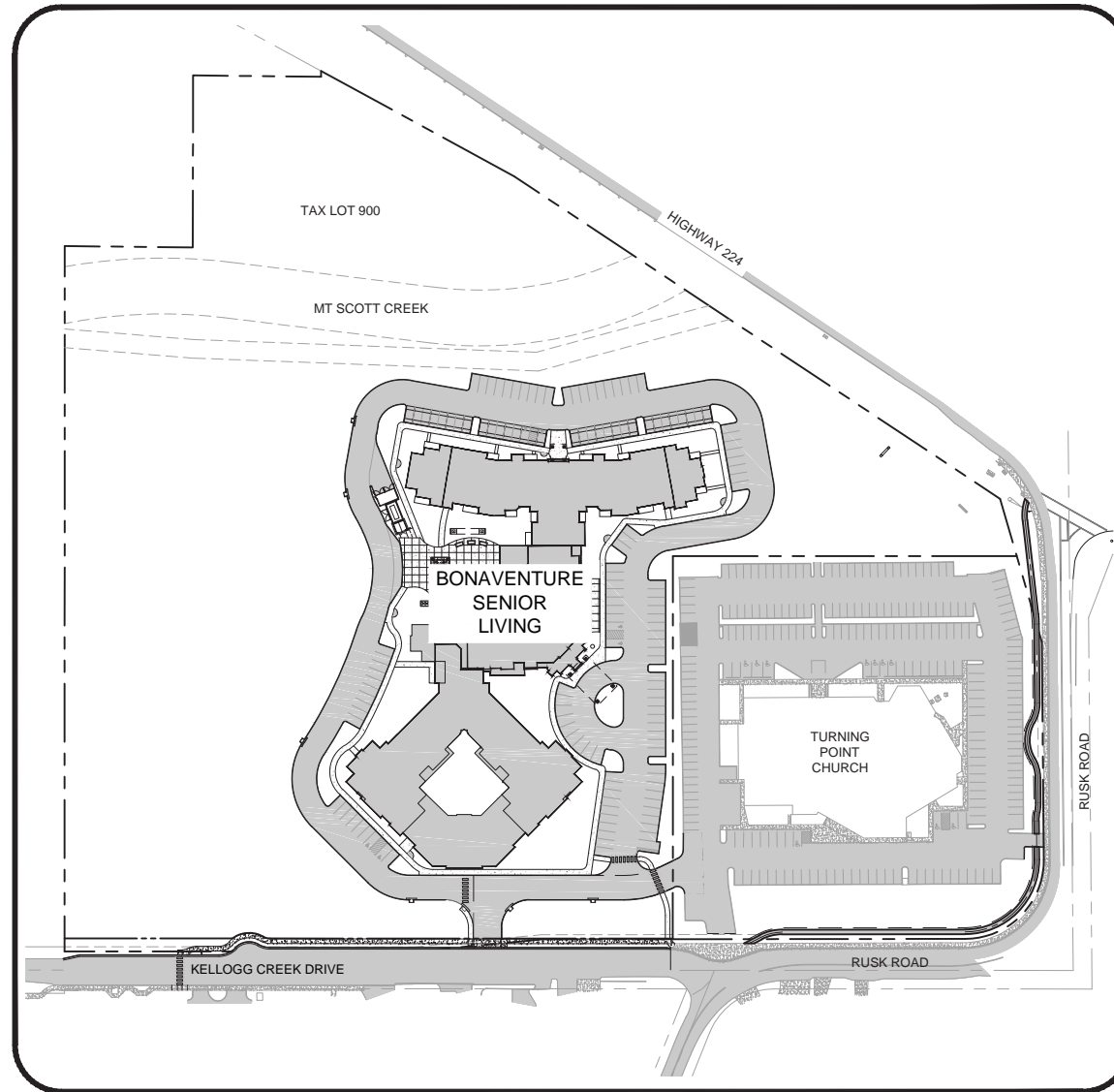
Milwaukie, Oregon

JANUARY, 2019



VICINITY MAP

SCALE: NTS



SITE MAP

SCALE: NTS



## SHEET INDEX

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C201	PRELIMINARY SITE PLAN
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L100	LANDSCAPE PLANTING PLAN - OVERALL
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L120	LANDSCAPE DETAILS AND NOTES
L121	LANDSCAPE NOTES AND SUBMITTAL ITEMS
A100	EXISTING BONAVENTURE BUILDINGS
A3.1	EXTERIOR ELEVATIONS



## PROJECT TEAM

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BONAVENTURE SENIOR HOUSING  
COVER SHEET

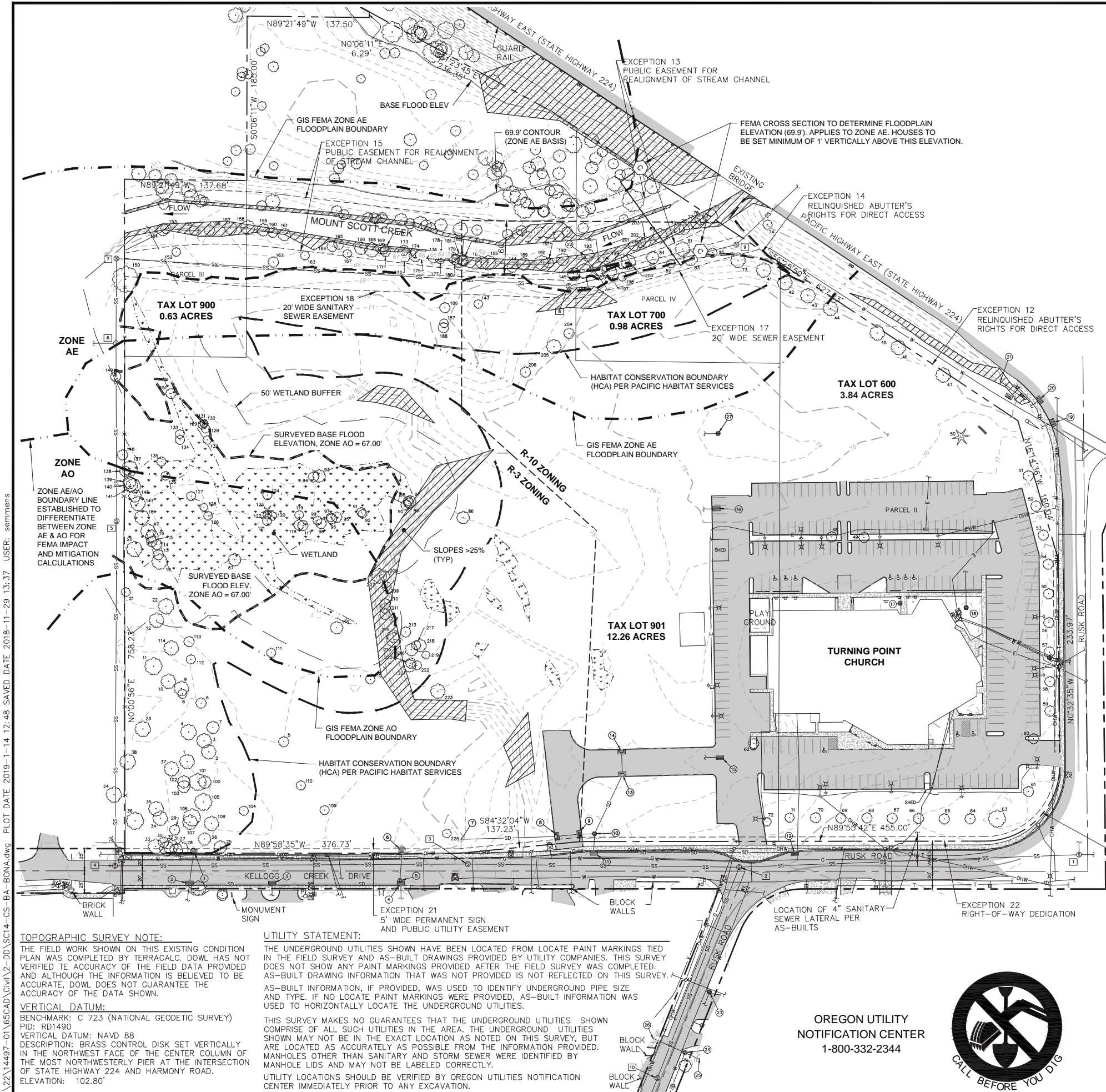
BONAVENTURE SENIOR HOUSING  
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PROJECT 14497-01  
DATE 01/11/2019

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SHEET

C000



**LEGEND:**

- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING GRAVEL
- EXISTING SLOPES GREATER THAN 25%
- EXISTING WETLAND
- STORM DRAINAGE LINE
- SANITARY SEWER LINE
- UNDERGROUND TELECOMMUNICATION LINE
- UNDERGROUND ELECTRIC LINE
- UNDERGROUND WATER LINE
- FENCE
- OVERHEAD POWER LINE
- GAS LINE
- DECIDUOUS TREE
- CONIFEROUS TREE
- SIGN
- TRAFFIC SIGNAL POLE
- SANITARY SEWER MANHOLE
- STORM DRAINAGE MANHOLE
- CATCH BASIN
- AREA DRAIN
- DITCH INLET
- ELECTRICAL VAULT
- COMMUNICATIONS VAULT
- WATER VAULT
- ELECTRICAL METER
- ELECTRICAL RISER
- WATER VALVE
- WATER METER
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- SPRINKLER VALVE
- GAS VALVE
- COMMUNICATIONS RISER
- ELECTRIC JUNCTION BOX
- SIGNAL JUNCTION BOX
- BOLLARD
- LIGHT POLE
- SIGNAL POLE
- PEDESTRIAN SIGNAL POLE
- UTILITY POLE
- GUY ANCHOR
- HANDICAPPED PARKING SPACE
- EXTG MAJOR CONTOUR
- EXTG MINOR CONTOUR
- FLOOD PLAIN (100 YEAR)
- LOT LINE
- BOUNDARY LINE
- RIGHT OF WAY LINE
- CENTERLINE
- ZONING DELINEATION
- 100 YEAR FLOOD ELEVATION AS SURVEYED
- HABITAT CONSERVATION AREA (HCA)
- GIS 100 YEAR FLOOD (FEMA)

**SANITARY SEWER TABLE:**

1	SANITARY SEWER MANHOLE RIM=82.78' IE 8" CONC (N)=68.77' IE 12" CONC (E)=68.54' IE 12" CONC (W)=68.50'
2	SANITARY SEWER MANHOLE RIM=79.05' IE 8" CONC (S)=68.12' IE 12" CONC (E)=67.60' IE 12" CONC (W)=67.55'
3	SANITARY SEWER MANHOLE RIM=71.50' IE 12" CONC (E)=63.83' IE 12" CONC (W)=63.83'
4	SANITARY SEWER MANHOLE RIM=68.97' IE 12" CONC (E)=62.99' IE 12" CONC (N)=62.54'
5	SANITARY SEWER MANHOLE RIM=66.79' IE 12" CONC (S)=60.82' IE 12" CONC (N)=60.78'
6	SANITARY SEWER MANHOLE RIM=66.57' IE 12" CONC (S)=53.59' IE 42" CONC (N)=51.77' IE 42" CONC (W)=51.68'
7	SANITARY SEWER MANHOLE RIM=65.51' IE 42" CONC (E)= IE 42" CONC (S)=
8	SANITARY SEWER MANHOLE RIM=69.73' IE 42" CONC (E)=52.94' IE 42" CONC (W)=52.94'
9	SANITARY SEWER MANHOLE RIM=70.91' IE 42" CONC (NE)=53.40' IE 42" CONC (W)=53.21'

**STORM DRAINAGE TABLE:**

1	DITCH INLET GRATE=
2	CATCH BASIN GRATE=67.40' IE 6" PVC (S)=65.95' IE 12" CPP (N)=65.93' IE 12" CONC (E)=65.88'
3	CATCH BASIN GRATE=67.79' IE 8" PVC (S)=65.72' IE 12" CONC (W)=65.62' IE 12" CONC (E)=65.62'
4	CATCH BASIN GRATE=68.47' IE 12" CONC (W)=65.22' IE 12" CONC (NW)=65.42' IE 12" CONC (S)=65.17'
5	STORM DRAINAGE MANHOLE RIM=68.65' IE 12" CONC (N)=65.29' IE 12" CONC (SE)=65.58'
6	DITCH INLET GRATE=67.83' IE 12" CONC (S)=65.69'
7	IE 12" CPP (E)=69.69'
8	CATCH BASIN GRATE=75.17' IE 12" CPP (E)=70.89' IE 12" CPP (W)=70.89'
9	CATCH BASIN GRATE=75.11' IE 12" CPP (E)=71.41' IE 12" CPP (W)=71.41'
10	AREA DRAIN GRATE=75.57' IE 12" CPP (N)=72.36' IE 12" CONC (S)=72.23' IE 12" CPP (W)=71.86'
11	CATCH BASIN GRATE=76.05' IE 12" CONC (E)=74.27' IE 12" CONC (N)=73.25'
12	CATCH BASIN GRATE=79.51' IE 12" CONC (W)=76.32'
13	CATCH BASIN GRATE=75.01' IE 12" CPP (N)=72.42' IE 12" CPP (S)=72.59'
14	CATCH BASIN GRATE=75.03' IE 12" CPP (S)=72.70'
15	CATCH BASIN/OIL TRAP GRATE=76.12' WATER LEVEL=75.00' COULD NOT OPEN TRAP
16	CATCH BASIN/OIL TRAP GRATE=73.86' WATER LEVEL=73.16' COULD NOT OPEN TRAP
17	AREA DRAIN GRATE=77.52'
18	AREA DRAIN/OIL TRAP GRATE=77.60' WATER LEVEL=76.89' COULD NOT OPEN TRAP
19	CATCH BASIN GRATE=76.41' IE 12" CONC (SW)=74.65'
20	CATCH BASIN GRATE=76.14' IE 12" CONC (SW)=74.09'
21	IE 16" CPP (E)=72.59'
22	IE 12" PVC (SE)=64.71'
23	AREA DRAIN GRATE=77.39' IE 3" PVC (S)=76.74'
24	AREA DRAIN GRATE=76.08' IE 24" CONC (E&W)=71.42'
25	IE 24" CONC (W)=71.63'
26	IE 24" CONC (E)=70.95'
27	AREA DRAIN GRATE=72.78' WATER LEVEL=72.03' COULD NOT OPEN TRAP

**TOPOGRAPHIC SURVEY NOTE:**  
THE FIELD WORK SHOWN ON THIS EXISTING CONDITION PLAN WAS COMPLETED BY TERRACALC. DOWL HAS NOT VERIFIED THE ACCURACY OF THE FIELD DATA PROVIDED AND ALTHOUGH THE INFORMATION IS BELIEVED TO BE ACCURATE, DOWL DOES NOT GUARANTEE THE ACCURACY OF THE DATA SHOWN.

**VERTICAL DATUM:**  
BENCHMARK: C 723 (NATIONAL GEODETIC SURVEY)  
PID: RD1490  
VERTICAL DATUM: NAVD 88  
DESCRIPTION: BRASS CONTROL DISK SET VERTICALLY IN THE NORTHWEST FACE OF THE CENTER COLUMN OF THE MOST NORTHWESTERLY PIER AT THE INTERSECTION OF STATE HIGHWAY 224 AND HARMONY ROAD.  
ELEVATION: 102.80'

**UTILITY STATEMENT:**  
THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM LOCATE PAINT MARKINGS TIED IN THE FIELD SURVEY AND AS-BUILT DRAWINGS PROVIDED BY UTILITY COMPANIES. THIS SURVEY DOES NOT SHOW ANY PAINT MARKINGS PROVIDED AFTER THE FIELD SURVEY WAS COMPLETED. AS-BUILT DRAWING INFORMATION THAT WAS NOT PROVIDED IS NOT REFLECTED ON THIS SURVEY. AS-BUILT INFORMATION, IF PROVIDED, WAS USED TO IDENTIFY UNDERGROUND PIPE SIZE AND TYPE. IF NO LOCATE PAINT MARKINGS WERE PROVIDED, AS-BUILT INFORMATION WAS USED TO HORIZONTALLY LOCATE THE UNDERGROUND UTILITIES.

THIS SURVEY MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE OF ALL SUCH UTILITIES IN THE AREA. THE UNDERGROUND UTILITIES SHOWN MAY NOT BE IN THE EXACT LOCATION AS NOTED ON THIS SURVEY, BUT ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION PROVIDED. MANHOLES OTHER THAN SANITARY AND STORM SEWER WERE IDENTIFIED BY MANHOLE LIDS AND MAY NOT BE LABELED CORRECTLY.

UTILITY LOCATIONS SHOULD BE VERIFIED BY OREGON UTILITIES NOTIFICATION CENTER IMMEDIATELY PRIOR TO ANY EXCAVATION.

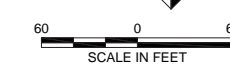
OREGON UTILITY  
NOTIFICATION CENTER  
1-800-332-2344



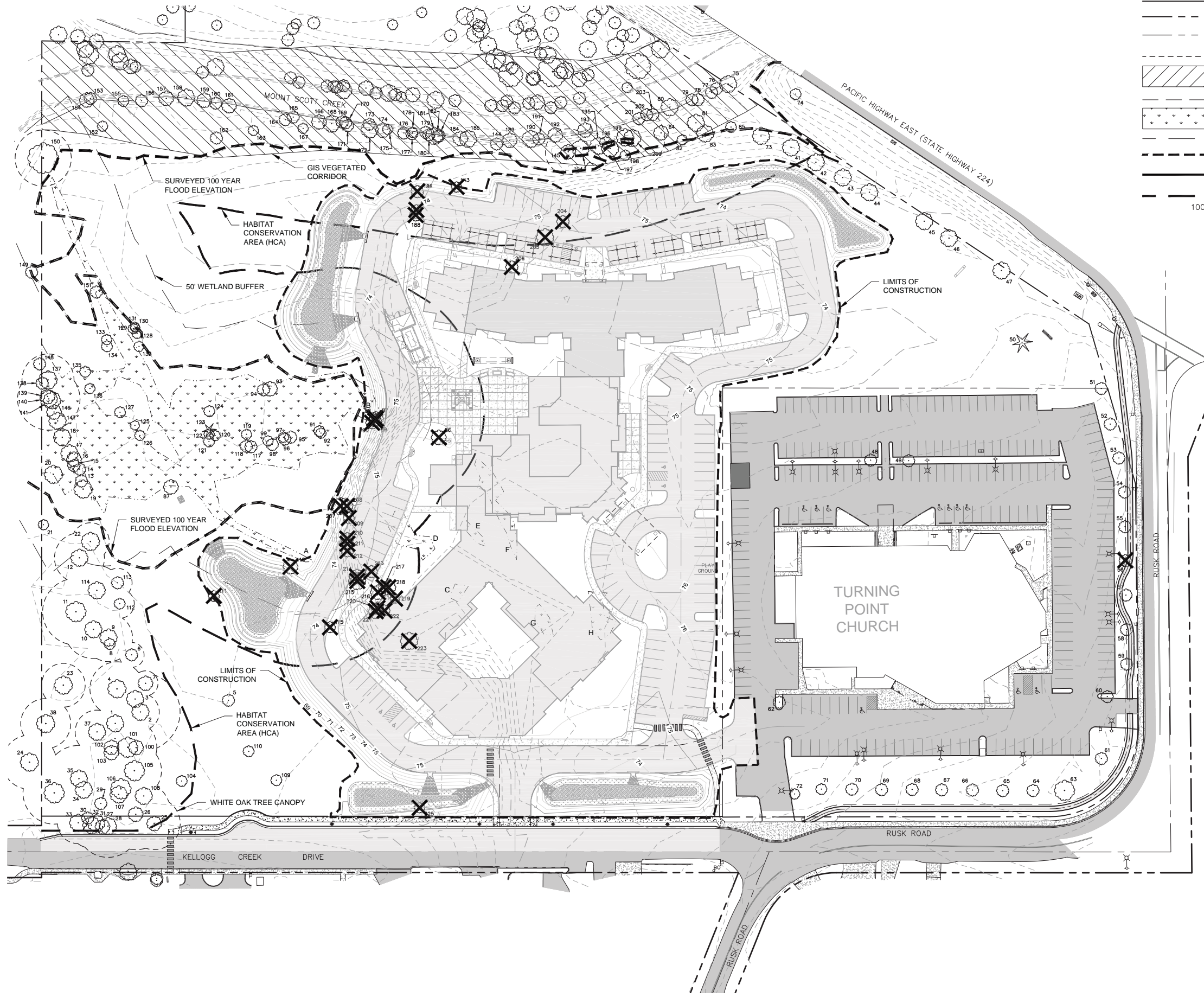
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**BONAVENTURE SENIOR HOUSING**  
EXISTING CONDITIONS  
BONAVENTURE SENIOR HOUSING  
MILWAUKIE, OREGON  
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**LEGEND**

- EXISTING BOUNDARY LINE
- PROPOSED LOT LINE
- TREE PROTECTION FENCING
- GIS VEGETATED CORRIDOR
- FLOOD PLAIN BOUNDARY
- WETLAND
- WETLAND BUFFER
- LIMIT OF CONSTRUCTION
- 100 YEAR FLOOD ELEVATION AS SURVEYED
- HABITAT CONSERVATION AREA (HCA)
- EXISTING TREE TO BE REMOVED
- TOTAL TREES TO BE REMOVED = 35
- TREES THAT ARE NOT NUMBERED HAVE NOT BEEN EVALUATED BEEN BY THE TREE ARBORIST

100

**WETLAND IMPACTS**

<b>LOWER WETLAND</b>	
A	46 SF
B	300 SF
<b>SUBTOTAL</b>	<b>346 SF</b>
<b>UPPER WETLANDS (SMALL AREAS)</b>	
C	172 SF
D	905 SF
E	176 SF
F	998 SF
G	301 SF
H	666 SF
<b>SUBTOTAL</b>	<b>3,218 SF</b>

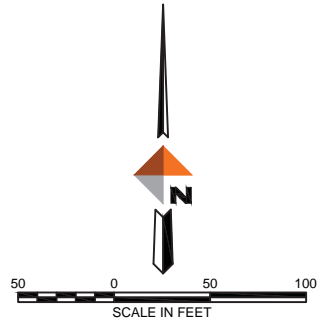


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**BONAVENTURE SENIOR HOUSING**  
**TREE PROTECTION & REMOVAL PLAN**  
 BONAVENTURE SENIOR HOUSING  
 MILWAUKIE, OREGON  
 13333 RUSK ROAD MILWAUKIE, OR 97222

PROJECT 14497-01  
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Number	Dia (in)	White Oak (Y/N)	Remove (Y/N)
1	18	Y	N
2	18	Y	N
3	18	Y	N
4	20	Y	N
5	12	N	N
6	12	Y	N
7	14	Y	N
8	10	Y	N
9	16	Y	N
10	16	Y	N
11	24	Y	N
12	18	Y	N
13	12	N	N
14	12	N	N
15	12	N	N
16	14x2	N	N
17	16	N	N
18	18	N	N
19	20	N	N
20	20	N	N
21	8	N	N
22	20	Y	N
23	20	Y	N
24	20	Y	N
25	14	Y	N
26	14x2	Y	N
27	14	Y	N
28	16	Y	N
29	12	N	N
30	12	Y	N
31	16	Y	N
32	16	Y	N
33	16	Y	N
34	16	Y	N
35	16x2	Y	N
36	24	Y	N
37	18	Y	N
38	20	Y	N
41	18	N	N
42	16	N	N
43	16	N	N
44	16	N	N
45	16	N	N
46	16	N	N
47	16	N	N
48	12	N	N
49	12	N	N
50	12x2	N	N
51	12	N	N
52	12	N	N
53	12	N	N
54	12	N	N
55	14	N	N
56	12	N	Y
57	12	N	N
58	12	N	N
59	12	N	N
60	12	N	N
61	12	N	N
62	10	N	N
63	24	N	N
64	12	N	N
65	12	N	N
66	12	N	N
67	12	N	N
68	12	N	N
69	12	N	N
70	12	N	N
71	12	N	N
72	8	N	N
73	16	N	N
74	10	N	N
75	16	N	N
76	12x3	N	N

77	12	N	N
78	12	N	N
79	12	N	N
80	18	N	N
81	18	N	N
82	8	N	N
83	16	N	N
84	14	N	N
85	10	N	N
86	14	N	Y
87	14x2	N	Y
88	10	N	Y
89	12	N	Y
90	12	N	Y
91	10	N	N
92	8	N	N
93	14	N	N
94	12	N	N
95	12	N	N
96	12	N	N
97	8	N	N
98	12	N	N
99	8	N	N
100	14	Y	N
101	24	Y	N
102	8x6	N	N
103	14	Y	N
104	10	N	N
105	24	Y	N
106	24	Y	N
107	18	N	N
108	16x2	N	N
109	10	N	N
110	10	N	N
111	10x5	N	Y
112	10	Y	N
113	12	Y	N
114	18	Y	N
115	10x8	N	Y
116	14	N	Y
117	12	N	N
118	12	N	N
119	8x2	N	N
120	8	N	N
121	10	N	N
122	8	N	N
123	6	N	N
124	10x2	N	N
125	6	N	N
126	8	N	N
127	10	N	N
128	8	N	N
129	8	N	N
130	6	N	N
131	6	N	N
132	8	N	N
133	8	N	N
134	10	N	N
135	10	N	N
136	8x2	N	N
137	20	Y	N
138	12	N	N
139	14	N	N
140	16	N	N
141	16	Y	N
143	8	N	Y
144	12	N	N
145	14x2	Y	N
146	14	N	N
147	16x2	N	N
148	12x3	N	N
149	12	N	N
150	48	Y	N
151	12	N	N
152	8	N	Y
153	12	N	N

154	14	N	N
155	10x4	N	N
156	12x2	N	N
157	14	N	N
158	16	N	N
159	14	N	N
160	10x3	N	N
161	14	N	N
162	10	N	N
163	8x2	N	N
164	12	N	N
165	12	N	N
166	14	N	N
167	8	N	N
168	18	N	N
169	12	N	N
170	12	N	N
171	12	N	N
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173	12	N	N
174	14	N	N
175	8	N	N
176	12	N	N
177	10	N	N
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183	12	N	N
184	14x2	N	N
185	18x2	N	N
186	12x3	N	Y
187	8x2	N	Y
188	10x2	N	Y
189	14x2	N	N
190	16	N	N
191	12	N	N
192	14x2	N	N
193	14	N	N
194	16	Y	N
195	16	Y	N
196	12	Y	N
197	16	Y	N
198	8	Y	N
199	19	Y	N
200	18	Y	N
201	12	N	N
202	12	N	N
203	10x2	N	N
204	12	N	Y
205	18x2	N	Y
206	12x4	N	Y
207	16	N	Y
208	12x2	N	Y
209	10x9	N	Y
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211	12	N	Y
212	12	N	Y
213	12	N	Y
214	14	N	Y
215	16	N	Y
216	14	N	Y
217	10	N	Y
218	14	N	Y
219	6x3	N	Y
220	12	N	Y
221	14	N	Y
222	10	N	Y
223	16x2	N	Y
225	8x3	N	Y

TOTAL TREES TO BE REMOVED = 35

TREES THAT ARE NOT NUMBERED HAVE NOT BEEN EVALUATED BEEN BY THE TREE ARBORIST



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**BONAVENTURE SENIOR HOUSING  
 TREE PROTECTION & REMOVAL PLAN**

**BONAVENTURE SENIOR HOUSING**  
 MILWAUKIE, OREGON  
 13333 RUSK ROAD MILWAUKIE, OR 97222

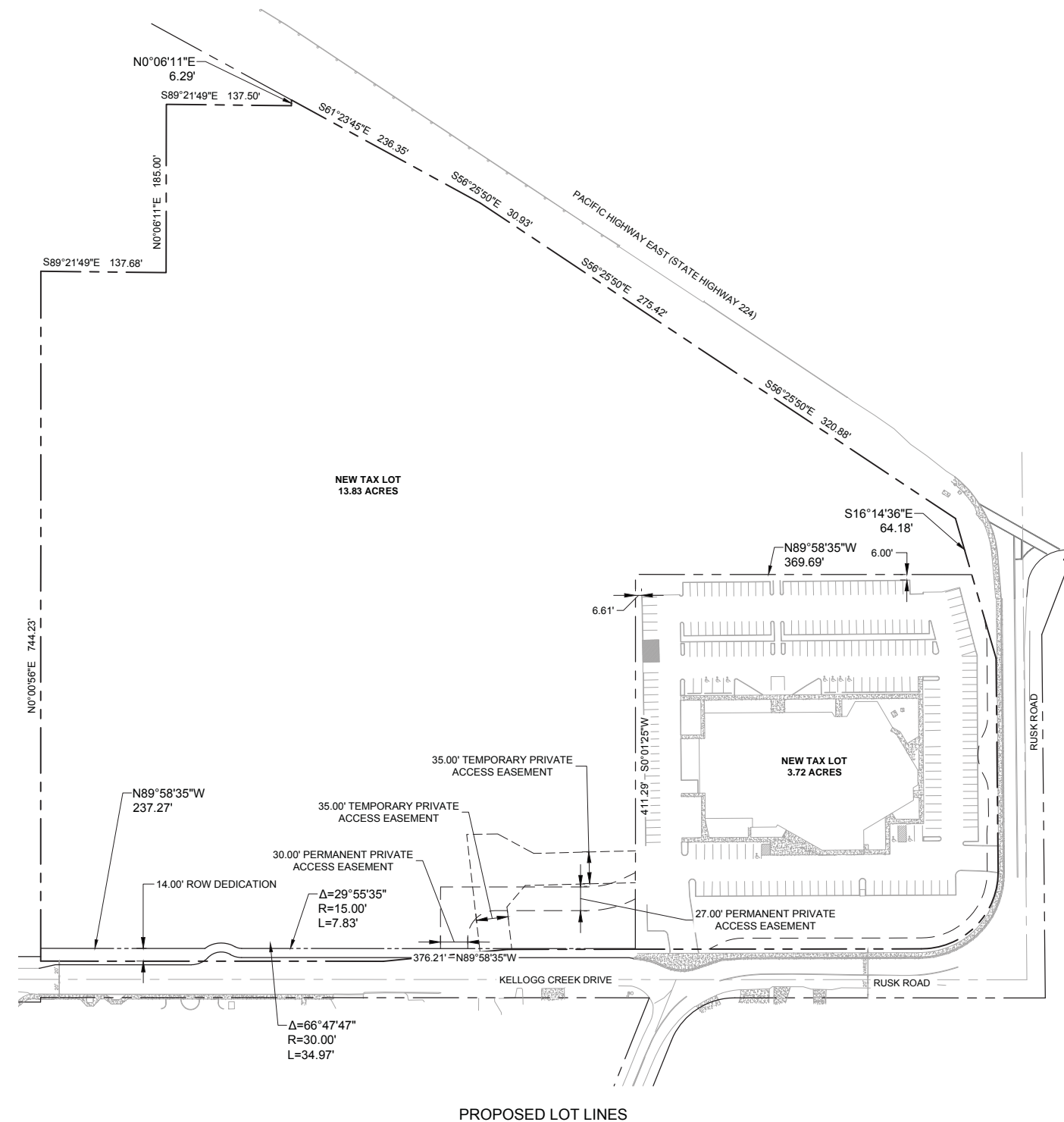
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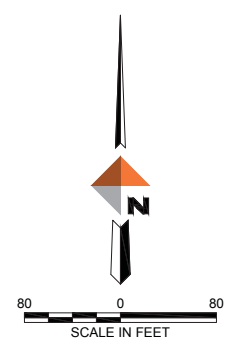


EXISTING LOT LINES



PROPOSED LOT LINES

**LOT CONSOLIDATION AND PROPERTY LOT LINE ADJUSTMENT**



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**BONAVENTURE SENIOR HOUSING**  
 PRELIMINARY LOT LINE ADJUSTMENT  
 BONAVENTURE SENIOR HOUSING  
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**SITE INFORMATION**

TOTAL SITE AREA	605,385 SF	13.89 ACRES	100.00%
LOT COVERAGE (BUILDING ONLY)	68,304 SF	1.57 ACRES	11.28%
LANDSCAPE/OPEN SPACE AREA	537,081 SF	12.33 ACRES	88.72%

<b>PARKING</b>	
132	STANDARD PARKING STALLS
6	ADA PARKING STALLS
1	ADA WHEELCHAIR USER ONLY PARKING STALL
139	TOTAL PARKING STALLS

**LEGEND:**

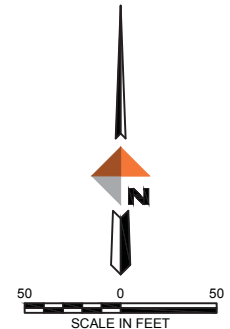
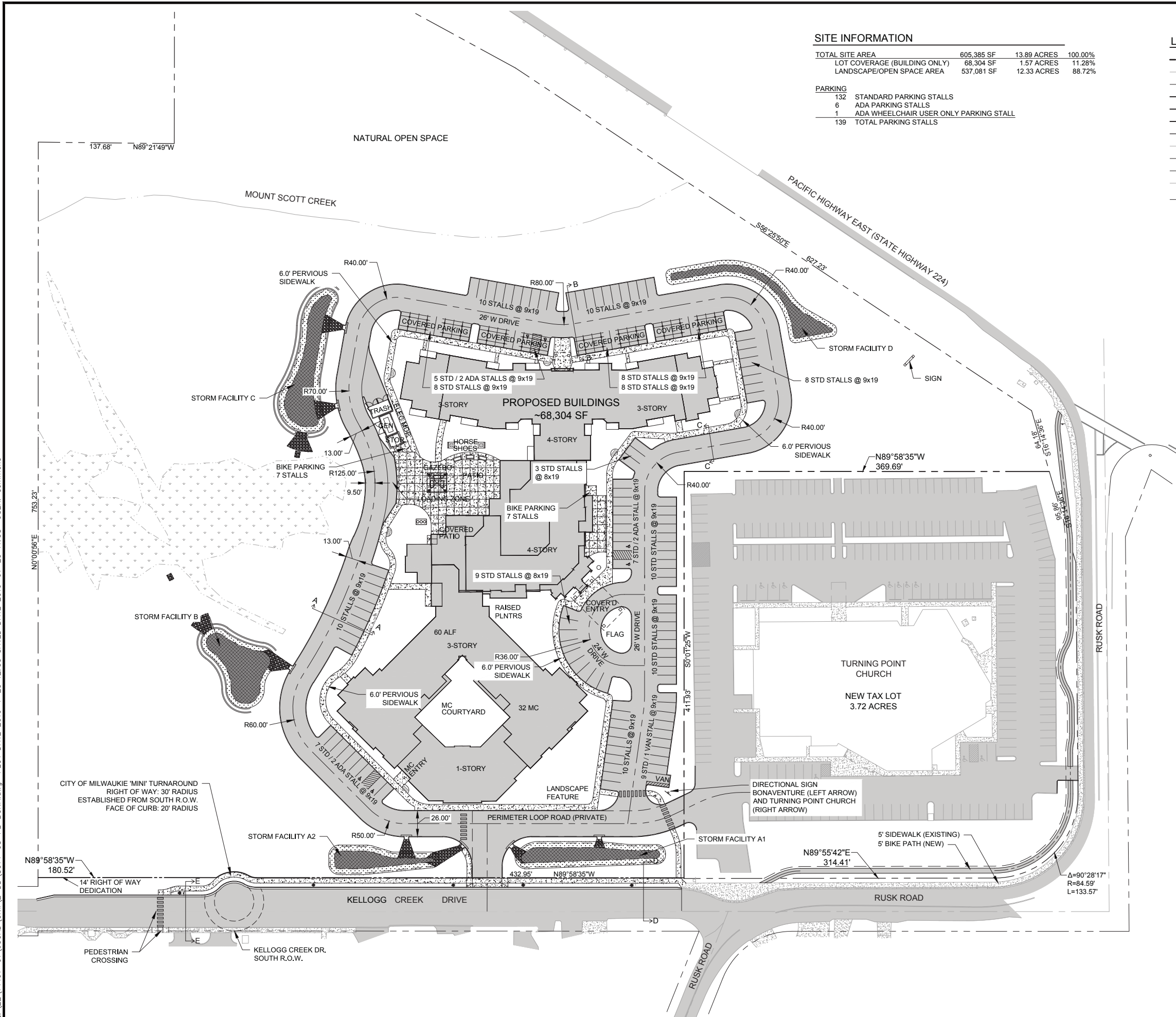
- ZONING BOUNDARY
  - EXISTING CENTERLINE
  - PROPOSED CENTERLINE
  - PROPOSED LOT LINE
  - PROPOSED RIGHT OF WAY LINE
  - EXISTING RIGHT OF WAY LINE
  - EXISTING PROPERTY LINE TO REMAIN
  - EXISTING PROPERTY LINE TO REMOVE
  - PROPOSED SETBACK LINE
  - PROPOSED CURB AND GUTTER
  - EXISTING EASEMENT
  - PROPOSED 6' PUE
- SEE SHEET C202 FOR STREET SECTIONS  
PROPOSED STREETLIGHT



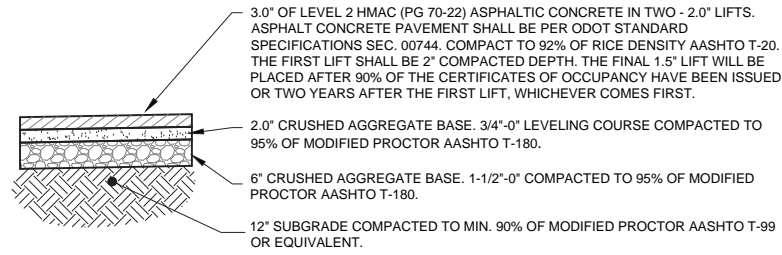
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**BONAVENTURE SENIOR HOUSING**  
PRELIMINARY SITE PLAN  
BONAVENTURE SENIOR HOUSING  
MILWAUKIE, OREGON  
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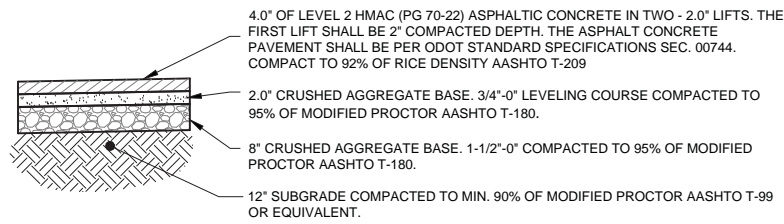
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**C201**



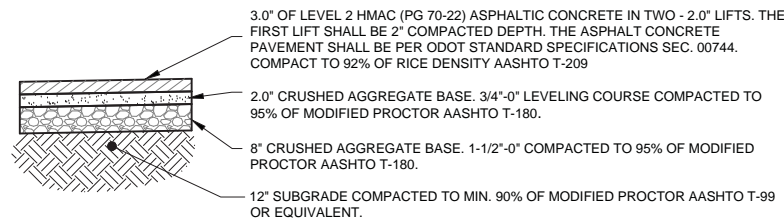
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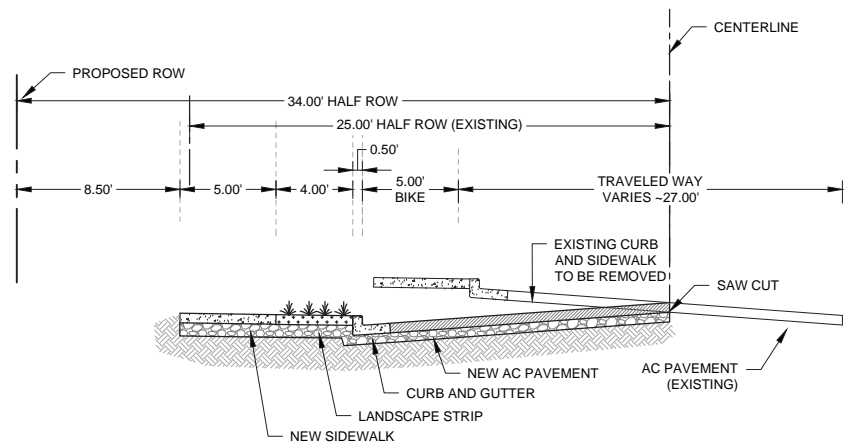
**PRIVATE PARKING - PAVEMENT SECTION**  
NTS



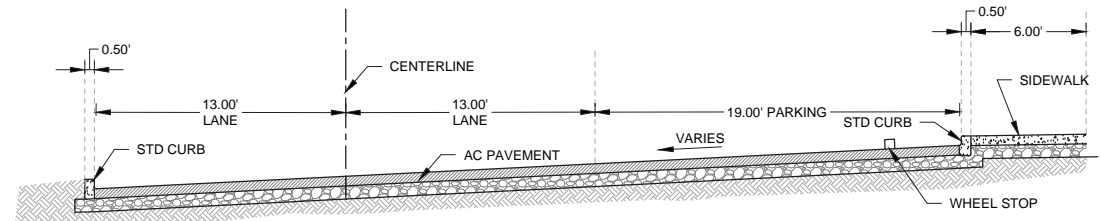
**PRIVATE PERIMETER ACCESS ROAD - PAVEMENT SECTION**  
NTS



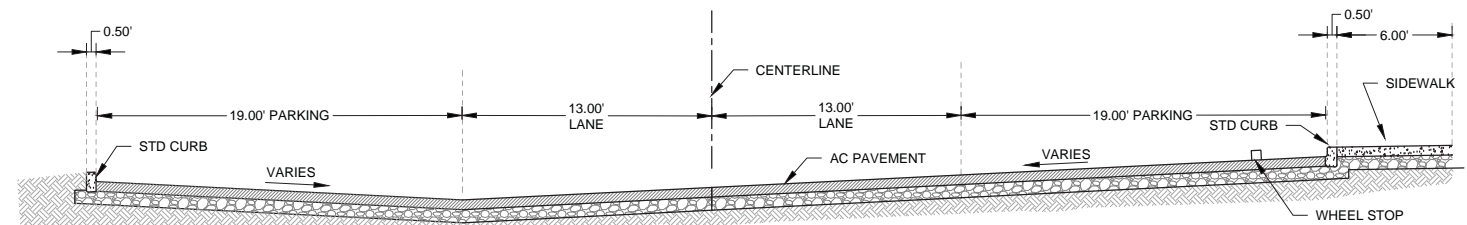
**KELLOGG CREEK DRIVE - HALF STREET PAVEMENT SECTION**  
NTS



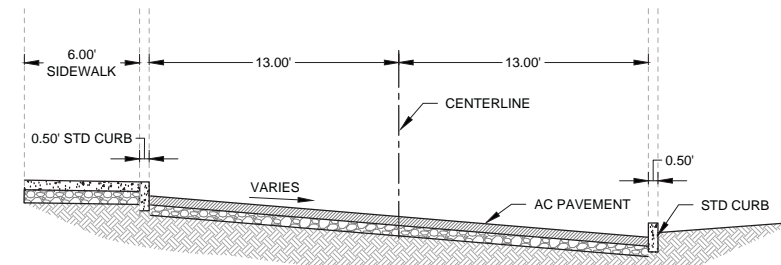
**KELLOGG CREEK DRIVE - TYPICAL SECTION E-E**  
HORIZONTAL SCALE: 1" = 5'



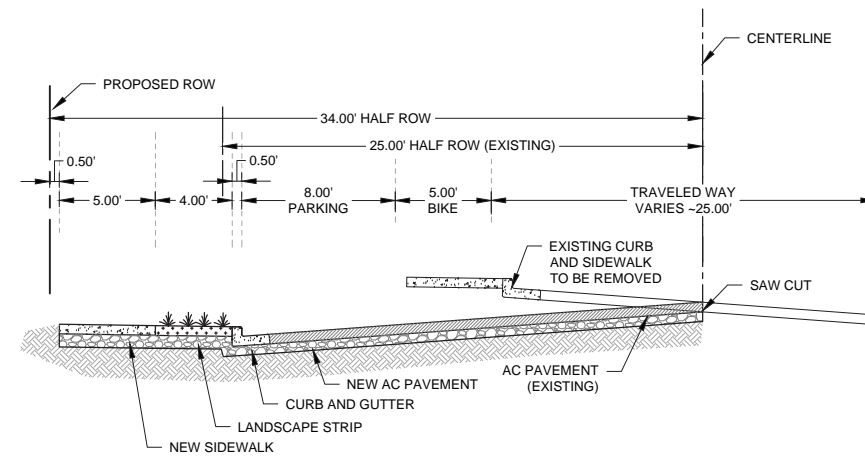
**PERIMETER ROAD - TYPICAL SECTION A-A**  
HORIZONTAL SCALE: 1" = 5'



**PERIMETER ROAD - TYPICAL SECTION B-B**  
HORIZONTAL SCALE: 1" = 5'



**PERIMETER ROAD - TYPICAL SECTION C-C**  
HORIZONTAL SCALE: 1" = 5'



**KELLOGG CREEK DRIVE - TYPICAL SECTION D-D**  
HORIZONTAL SCALE: 1" = 5'

**NOTES:**

1. SEE PLAN FOR WIDENED ROW FOR STORM FACILITY.
2. SEE PLAN FOR SECTION OF KELLOGG CREEK DRIVE TO HAVE CURB TIGHT AND DETACHED VARYING OFFSET SIDEWALK.



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**BONAVENTURE SENIOR HOUSING**  
TYPICAL STREET SECTIONS  
BONAVENTURE SENIOR HOUSING  
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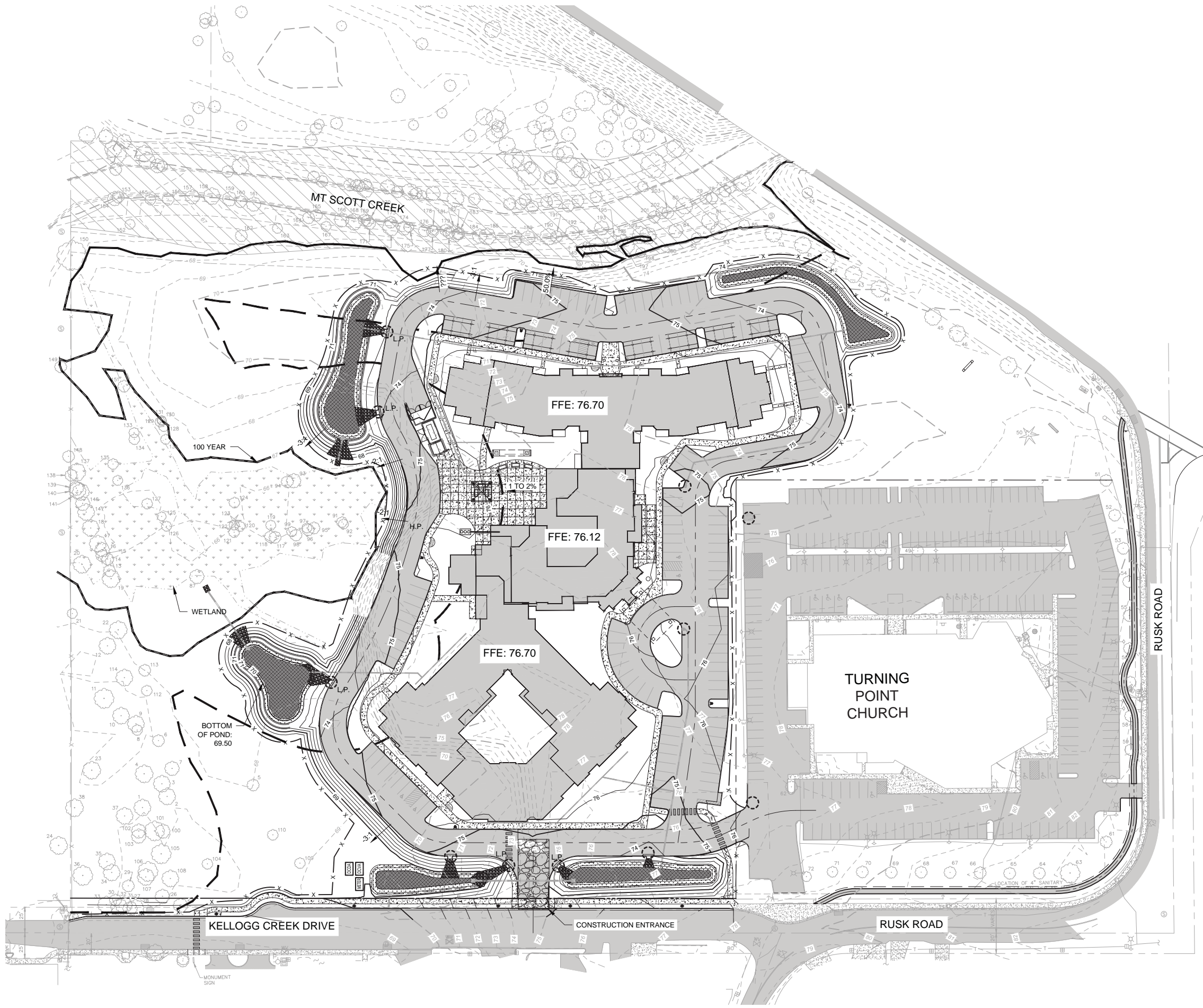
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- LEGEND:**
- - - - - EXISTING MINOR CONTOUR
  - - - - - EXISTING MAJOR CONTOUR
  - - - - - EXISTING PROPERTY LINE
  - - - - - PROPOSED MINOR CONTOUR
  - - - - - PROPOSED MAJOR CONTOUR
  - - - - - PROPOSED RIGHT OF WAY
  - - - - - TOE OF SLOPE
  - x - x - SEDIMENT FENCE
  - - INLET PROTECTION
  - - - - - PROPOSED FLOODPLAIN BOUNDARY
  - ▨ - GRAVEL CONSTRUCTION ENTRANCE



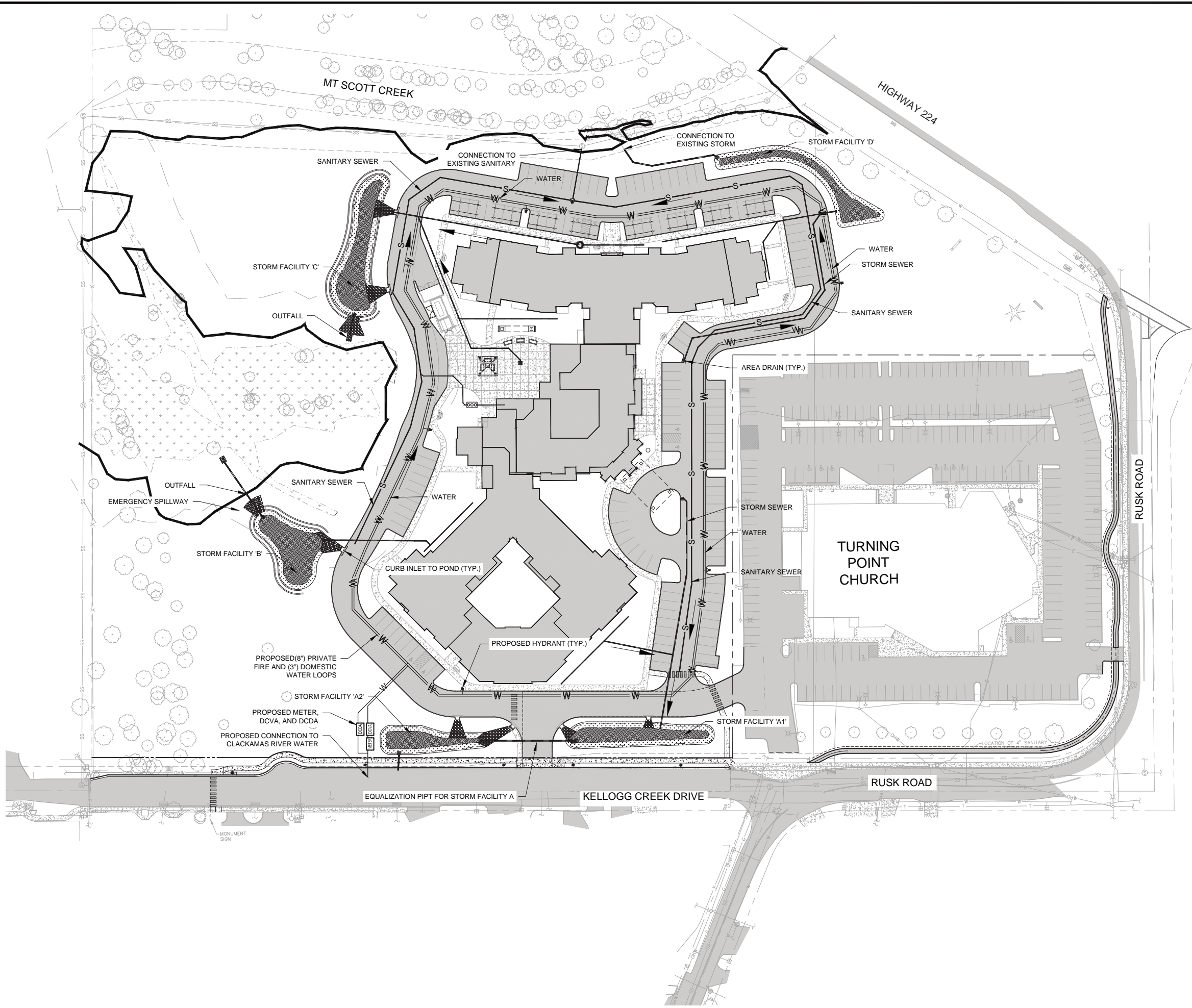
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**GRADING PLAN**  
 BONAVENTURE SENIOR HOUSING  
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- LEGEND:**
- S ——— - EXISTING SANITARY SEWER LINE
  - SD ——— - EXISTING STORM LINE
  - W ——— - EXISTING WATER LINE
  - ——— - EXISTING STORM MAN HOLE
  - ——— - EXISTING SANITARY MAN HOLE
  - ——— - EXISTING CATCH BASIN
  - ——— - EXISTING WATER VALVE
  - S ——— - PROPOSED SANITARY SEWER LINE
  - SD ——— - PROPOSED STORM LINE
  - W ——— - PROPOSED WATER LINE
  - ——— - PROPOSED SANITARY MAN HOLE
  - ——— - PROPOSED STORM MAN HOLE
  - ——— - PROPOSED CATCH BASIN

**NOTES:**  
BUILDING UTILITY CONNECTIONS TO BE DETERMINED.

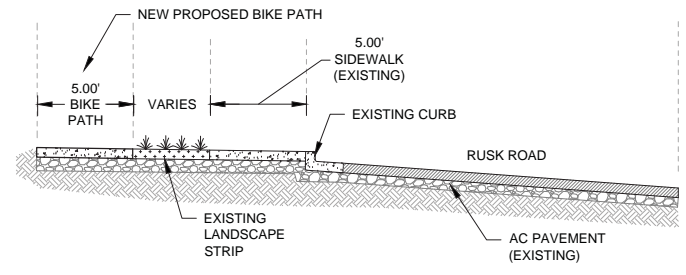
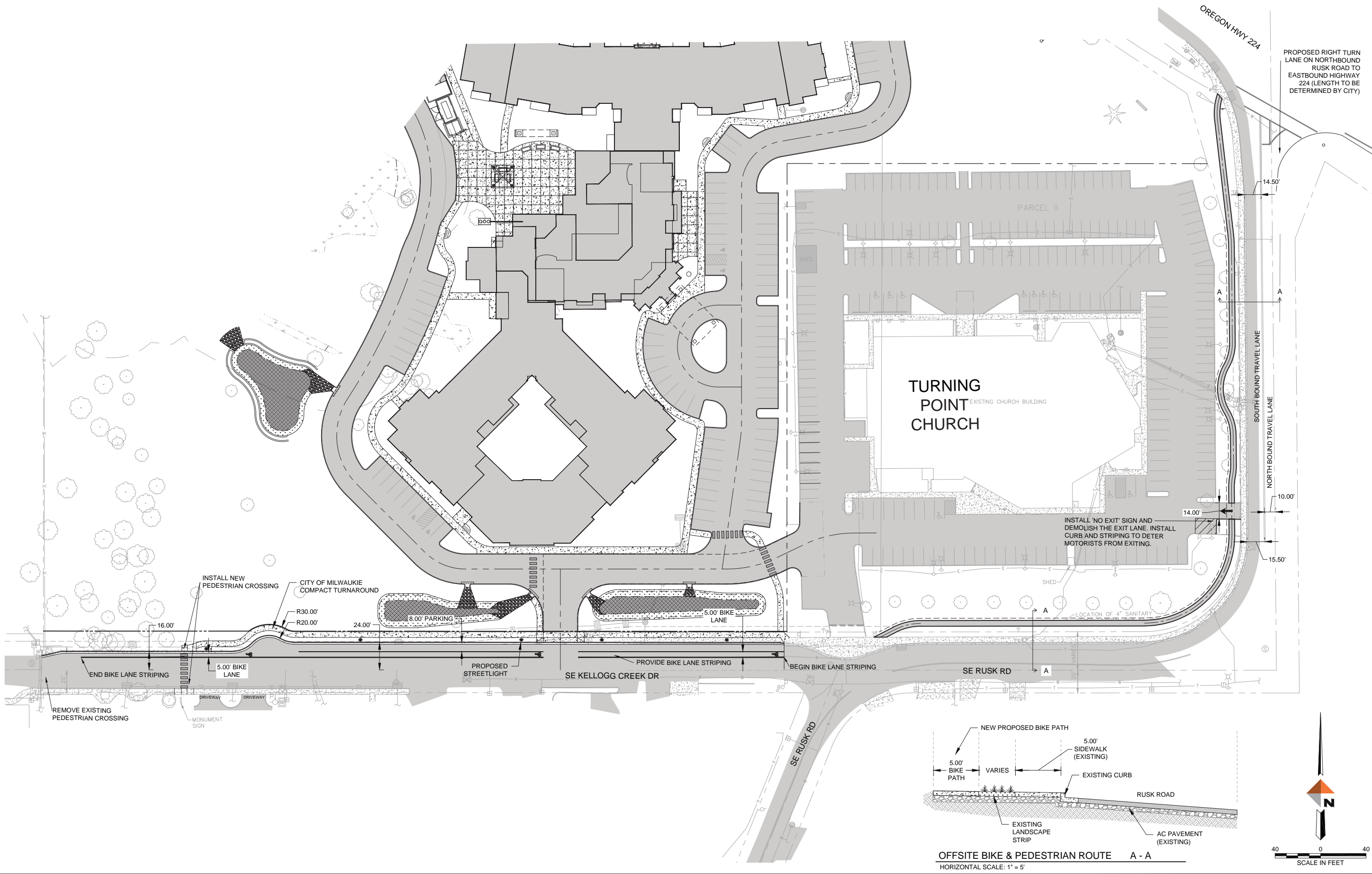


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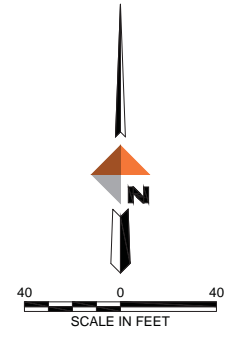
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COMPOSITE UTILITY PLAN  
BONAVENTURE SENIOR HOUSING  
MILWAUKIE, OREGON  
13333 RUSK ROAD MILWAUKIE, OR 97222

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OFFSITE BIKE & PEDESTRIAN ROUTE A - A  
HORIZONTAL SCALE: 1" = 5'



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### LANDSCAPE AREA SUMMARY

SITE AREA: 605,385.03 SF  
SITE LANDSCAPE / OPEN SPACE AREA: 437,414.64 SF = 72.3%

INTERIOR PARKING LOT LANDSCAPE  
PROPOSED PARKING STALLS: 139  
REQUIRED AREA: 25 SF / STALL: 3,475 SF  
PROPOSED AREA: 5,347 SF



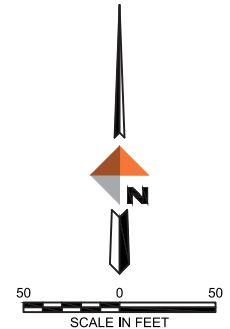
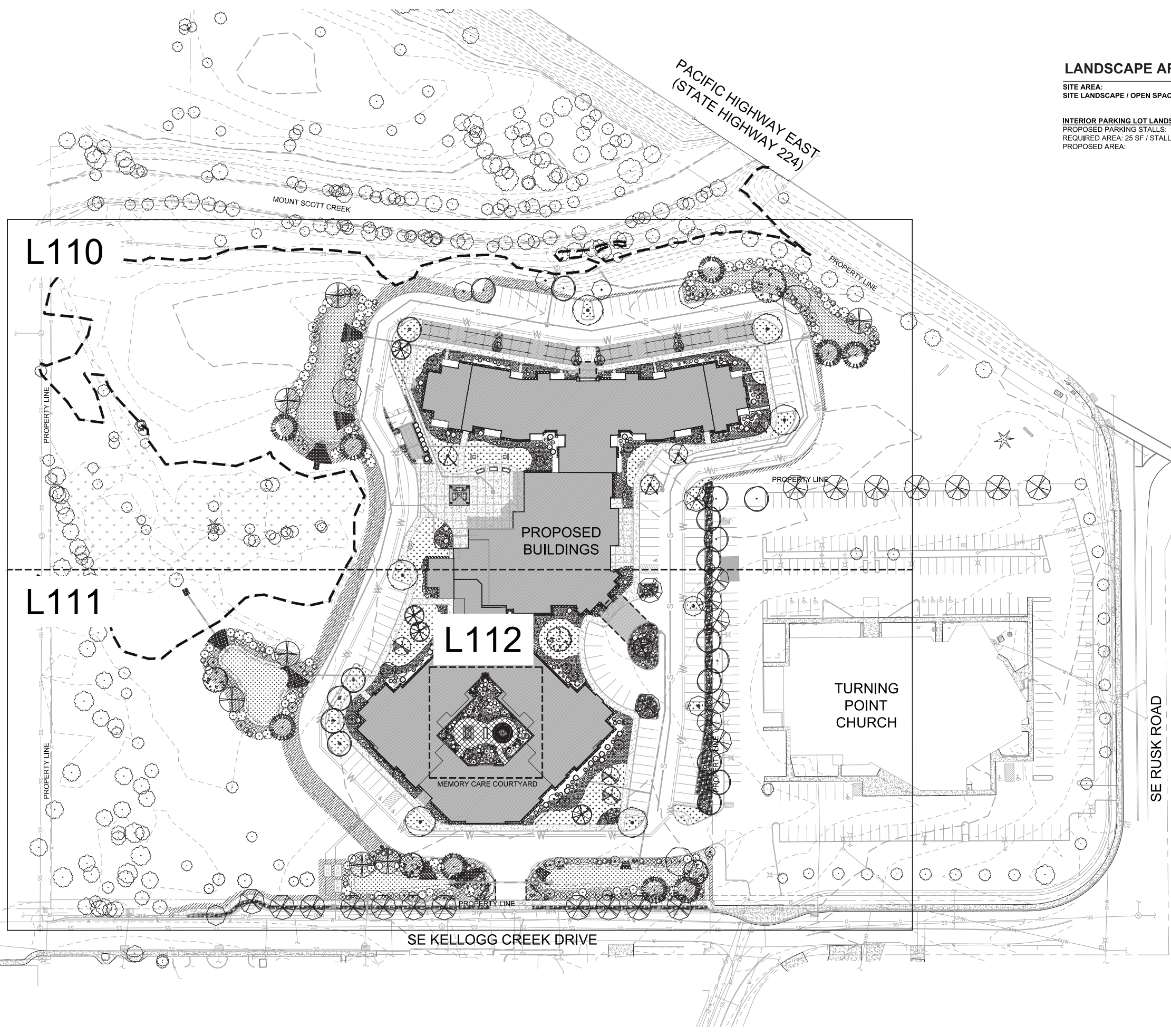
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LANDSCAPE PLANTING PLAN - OVERALL  
BONAVENTURE SENIOR HOUSING  
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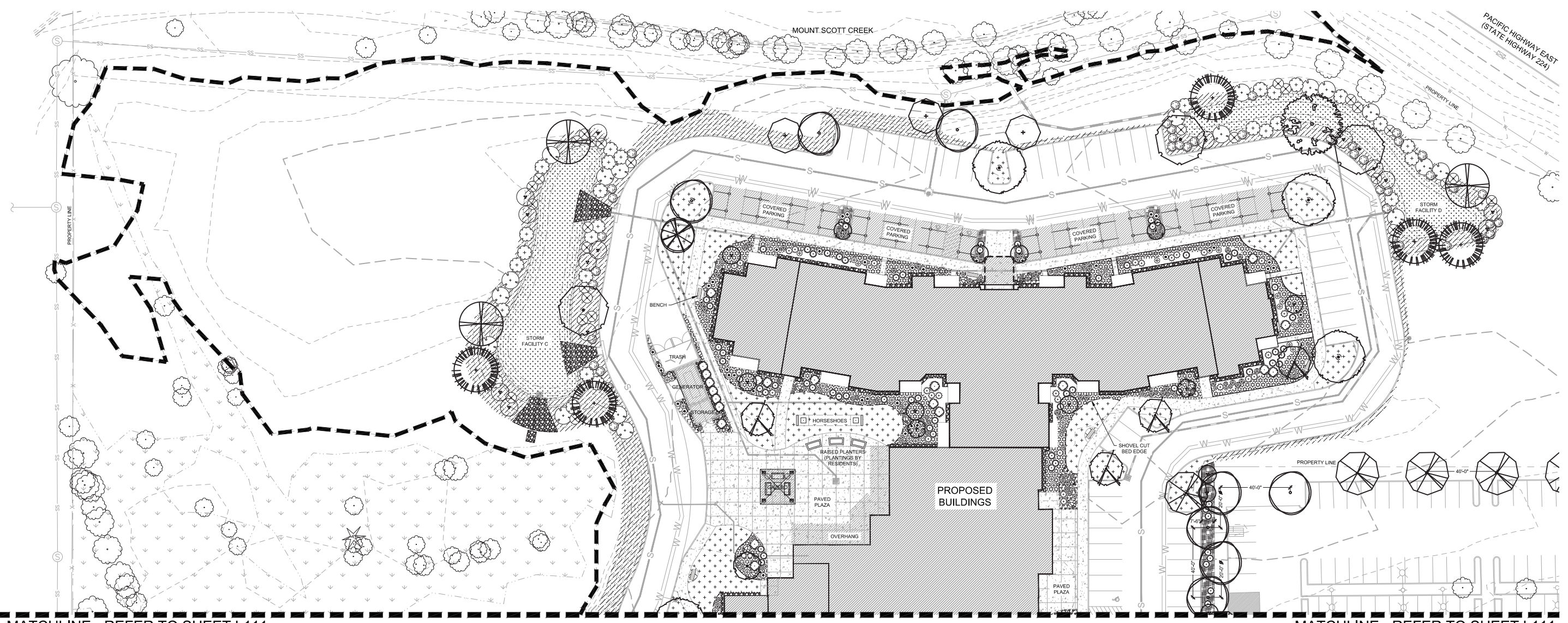
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MATCHLINE - REFER TO SHEET L111

MATCHLINE - REFER TO SHEET L111

**SITE LANDSCAPE PLANTINGS & FURNISHINGS LEGEND**

TREES ITEM	SIZE	QTY.	CANOPY (H x W) / COMMENTS
ACER TRUN x A. PLAT. WARRENRED PACIFIC SUNSET MAPLE	1.5" CAL. / B&B AS SHOWN	16	30' H x 25' W / DECIDUOUS RED FALL COLOR
ACER GRISEUM PAPERBARK MAPLE	1.5" CAL. / B&B AS SHOWN	5	25' H x 20' W / DECIDUOUS EXFOLIATED CINNAMON BARK
GWINKO BIL.OBA 'AUTUMN GOLD' AUTUMN GOLD GINKGO	1.5" CAL. / B&B AS SHOWN	4	40' H x 25' W / DECIDUOUS YELLOW FALL COLOR
HYSSA SYLVATICA BLACK TUPELO	1.5" CAL. / B&B AS SHOWN	18	50' H x 40' W / DECIDUOUS RED FALL COLOR
STEWARTIA PSEUDOCAMELLIA JAPANESE STEWARTIA	1.5" CAL. / B&B AS SHOWN	4	30' H x 20' W / DECIDUOUS EXFOLIATED BARK / WHITE FLOWER
ZELKOVA SERRATA 'GREEN VASE' GREEN VASE ZELKOVA	1.5" CAL. / B&B AS SHOWN	6	60' H x 40' W / DECIDUOUS
LIRODENDRON TULIPIFERA FASTIGIATUM COLUMNAR TULIP TREE	1.5" CAL. / B&B AS SHOWN	4	40' H x 15' W / DECIDUOUS YELLOW FALL COLOR
QUERCUS GARRYANA OREGON WHITE OAK	1.5" CAL. / B&B AS SHOWN	1	75' H x 50' W / DECIDUOUS PNW NATIVE
PNUS NIGRA AUSTRALIAN PINE	6" HT. / B&B AS SHOWN	3	60' H x 35' W / EVERGREEN
PNUS CONTORTA var. CONTORTA SHORE PINE	6" HT. / B&B AS SHOWN	5	40' H x 30' W / EVERGREEN
EXISTING TREE TO REMAIN	AS NOTED		CONTRACTOR TO PROTECT IN PLACE
SHRUBS & ACCENTS ITEM	SIZE	QTY.	FORM (H x W) / COMMENTS
MAGNOLIA STELLATA STAR MAGNOLIA	4" MIN. HT. / B&B MULTI-STEM	6	12' H x 10' W / DECIDUOUS WHITE FLOWER / SPRING BLOOM
ACER CIRCINATUM VINE MAPLE	4" MIN. HT. / B&B MULTI-STEM	20	15' H x 10' W / DECIDUOUS PNW NATIVE
CALAMAGROSTIS x A. 'KARL FOERSTER' KARL FOERSTER REED GRASS	1 GAL. 18" O.C.	52	5' H x 18" W / ORNAMENTAL GRASS
MARHONIA AQUIFOLIUM TALL OREGON GRABERHOLLY	3 GAL. 4" O.C.	173	4' H x 3' W / EVERGREEN
MISCANTHUS SINENSIS 'LITTLE KITTEN' LITTLE KITTEN MAIDEN GRASS	1 GAL. 3" O.C.	64	3' H x 3' W / ORNAMENTAL GRASS
ROSMARINUS OFFICINALIS 'ARP' ARP ROSEMARY	3 GAL. 3" O.C.	79	3' H x 3' W / EVERGREEN PURPLE FLOWER / EDIBLE FOLIAGE
VACCINIUM OVATUM EVERGREEN HUCKLEBERRY	3 GAL. 4" O.C.	44	6' H x 5' W / EVERGREEN
RUDBECKIA FULGIDA 'EARLY BIRD GOLD' EARLY BIRD GOLD BLACK EYED SUSAN	1 GAL. 2" O.C.	94	2' H x 2' W / PERENNIAL YELLOW FLOWER / SPRING-FALL BLOOM
CORNUS STOLONIFERA 'FARROW' ARCTIC FIRE RED TWIG DOGWOOD	1 GAL. 4" O.C.	83	TO 3' H x 3' W - DECIDUOUS RED TWIGS / WINTER-SPRING INTEREST

**PRIVATE STORM FACILITY PLANTINGS**

TREES ITEM	SIZE	QTY.	FORM (H x W) / COMMENTS
ALNUS RUBRA RED ALDER	1.5" CAL. / B&B AS SHOWN	5	50' H x 35' W / DECIDUOUS PNW NATIVE
QUERCUS GARRYANA OREGON WHITE OAK	1.5" CAL. / B&B AS SHOWN	4	75' H x 50' W / DECIDUOUS PNW NATIVE
PSEUDOTSUGA MENZIESII DOUGLAS FIR	4" HT. / B&B AS SHOWN	9	85' H x 45' W / EVERGREEN PNW NATIVE
THUJA PLICATA WESTERN RED CEDAR	4" HT. / B&B AS SHOWN	7	75' H x 40' W / EVERGREEN PNW NATIVE
SHRUBS ITEM	SIZE	QTY.	FORM (H x W) / COMMENTS
ACER CIRCINATUM VINE MAPLE	4" MIN. HT. / B&B MULTI-STEM	29	15' H x 10' W / DECIDUOUS PNW NATIVE
AMELANCHIER ALNIFOLIA WESTERN SERVICEBERRY	4" MIN. HT. / B&B AS SHOWN	29	20' H x 10' W / DECIDUOUS PNW NATIVE
RIBES SANGUINEUM RED-FLOWERING CURRANT	3 GAL. AS SHOWN	93	5' H x 4' W / DECIDUOUS PNW NATIVE
CEANOETHUS THYRSIFLORUS BLUEBLOSSOM CEANOETHUS	3 GAL. AS SHOWN	84	6' H x 6' W / EVERGREEN PNW NATIVE
MYRICA CALIFORNICA PACIFIC WAX MYRTLE	3 GAL. AS SHOWN	58	6' H x 5' W / EVERGREEN MUST BE OREGON GROWN
GROUNDCOVERS ITEM	SIZE	QTY.	FORM (H x W) / COMMENTS
PROTIME 303 SUN MIX HOPPS & HOPKINS - PORTLAND, OR	SEED @ 8 LBS / 1,000 SF	10,180 SF	THREE-WAY PERENNIAL RYEGRASS RYEGRASS / RED & CHEWINGS FESCUE
SOD LAWN FROM A LOCAL SUPPLIER	SOD ROLL PALLET	16,880 SF	
SITE FURNISHINGS ITEM	SIZE	QTY.	COMMENTS
GRAY RIVER ROCK BORDER 2" DIAMETER WASHED	24" WIDTH 6" DEPTH	3,698 SF 68 CY	REFER TO DETAIL 8 ON SHEET L120
LANDSCAPE BOULDER QUARRIED BASALT FROM A LOCAL SUPPLIER	S = 24" H x 24" W M = 30" H x 36" W L = 36" H x 48" W	S = 30 M = 50 L = 39	REFER TO DETAIL 9 ON SHEET L120

**PRIVATE STORM FACILITY SUMMARY:**

REQUIRED PLANTINGS FOR POND BOTTOM:	REQUIRED PLANTINGS FOR POND SIDE SLOPES:
• EVERGREEN TREES 112 / 100 SF	• EVERGREEN TREES - (1) 6" HT. PER 300 SF
	• DECIDUOUS TREES - (1) 1.5" CAL. PER 300 SF
	• LARGE SHRUBS - (4) 3 GAL. PER 100 SF

STORM FACILITY A1:	STORM FACILITY A2:
FACILITY AREA: POND BOTTOM: 1,665 SF SIDE SLOPES: 1,303 SF	FACILITY AREA: POND BOTTOM: 1,154 SF SIDE SLOPES: 1,419 SF
REQUIRED PLANTINGS: TREES: 4.34 (5) LARGE SHRUBS: 52 WETLAND PLANTS: 1,914	REQUIRED PLANTINGS: TREES: 4.73 (5) LARGE SHRUBS: 56.7 (57) WETLAND PLANTS: 1,327
PROPOSED PLANTINGS: EVERGREEN TREES: 2 DECIDUOUS TREES: 3 LARGE SHRUBS: 52 WETLAND PLANTS: 1,920	PROPOSED PLANTINGS: EVERGREEN TREES: 3 DECIDUOUS TREES: 2 LARGE SHRUBS: 58 WETLAND PLANTS: 1,330
STORM FACILITY B:	STORM FACILITY C:
FACILITY AREA: POND BOTTOM: 2,383 SF SIDE SLOPES: 1,021 SF	FACILITY AREA: POND BOTTOM: 2,585 SF SIDE SLOPES: 1,446 SF
REQUIRED PLANTINGS: TREES: 3.4 (4) LARGE SHRUBS: 40.8 (41) WETLAND PLANTS: 2,752	REQUIRED PLANTINGS: TREES: 4.82 (5) LARGE SHRUBS: 57.8 (58) WETLAND PLANTS: 2,973
PROPOSED PLANTINGS: EVERGREEN TREES: 3 DECIDUOUS TREES: 1 LARGE SHRUBS: 42 WETLAND PLANTS: 2,756	PROPOSED PLANTINGS: EVERGREEN TREES: 4 DECIDUOUS TREES: 3 LARGE SHRUBS: 60 WETLAND PLANTS: 2,976
STORM FACILITY D:	
FACILITY AREA: POND BOTTOM: 1,750 SF SIDE SLOPES: 1,850 SF	
REQUIRED PLANTINGS: TREES: 6.16 (7) LARGE SHRUBS: 74 WETLAND PLANTS: 2,913	
PROPOSED PLANTINGS: EVERGREEN TREES: 4 DECIDUOUS TREES: 3 LARGE SHRUBS: 75 WETLAND PLANTS: 2,916	

QUANTITIES SHOWN ARE FOR ALL SHEETS

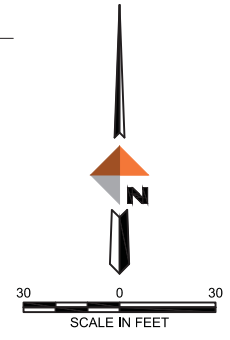
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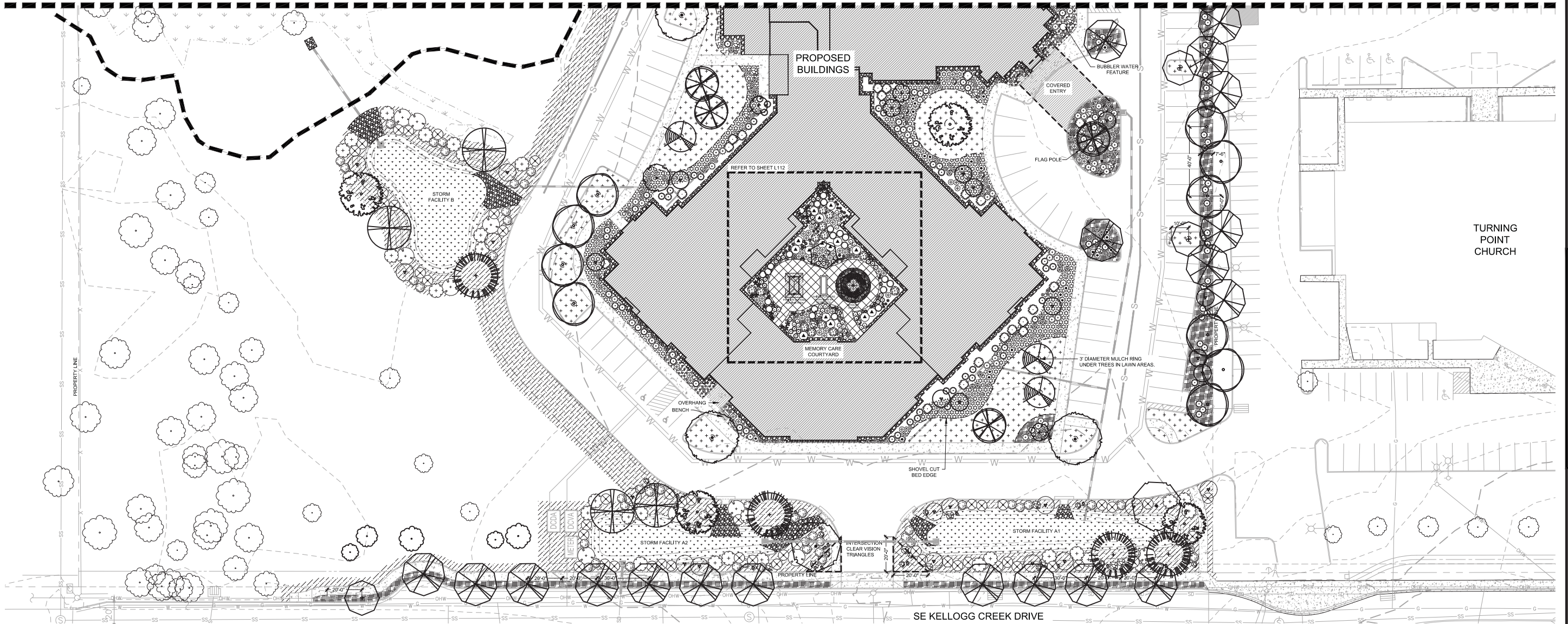
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SITE LANDSCAPE PLANTINGS & FURNISHINGS LEGEND

TREES ITEM	SIZE	QTY.	CANOPY (H x W) / COMMENTS
ACER TRUN, x A. PLAT. WARRENRED PACIFIC SUNSET MAPLE	1.5" CAL. / B&B AS SHOWN	16	30' H x 25' W / DECIDUOUS RED FALL COLOR
ACER GRISEUM PAPERBARK MAPLE	1.5" CAL. / B&B AS SHOWN	5	25' H x 20' W / DECIDUOUS EXFOLIATED CINNAMON BARK
GINKGO BILOBA 'AUTUMN GOLD' AUTUMN GOLD GINKGO	1.5" CAL. / B&B AS SHOWN	4	40' H x 25' W / DECIDUOUS YELLOW FALL COLOR
NYSSA SYLVATICA BLACK TUPELO	1.5" CAL. / B&B AS SHOWN	18	50' H x 40' W / DECIDUOUS RED FALL COLOR
STEWARTIA PSEUDOCAMELLIA JAPANESE STEWARTIA	1.5" CAL. / B&B AS SHOWN	4	30' H x 20' W / DECIDUOUS EXFOLIATED BARK / WHITE FLOWER
ZELKOVA SERRATA 'GREEN VASE' GREEN VASE ZELKOVA	1.5" CAL. / B&B AS SHOWN	6	60' H x 40' W / DECIDUOUS
LIRIODENDRON TULIPIFERA FASTIGIATUM COLUMNAR TULIP TREE	1.5" CAL. / B&B AS SHOWN	4	40' H x 15' W / DECIDUOUS YELLOW FALL COLOR
QUERCUS GARRYANA OREGON WHITE OAK	1.5" CAL. / B&B AS SHOWN	1	75' H x 50' W / DECIDUOUS PNW NATIVE
PNUS NIGRA AUSTRALIAN PINE	6" HT. / B&B AS SHOWN	3	65' H x 35' W / EVERGREEN
PNUS CONTORTA var. CONTORTA SHORE PINE	6" HT. / B&B AS SHOWN	5	40' H x 30' W / EVERGREEN
EXISTING TREE TO REMAIN	AS NOTED		CONTRACTOR TO PROTECT IN PLACE

SHRUBS & ACCENTS ITEM	SIZE	QTY.	FORM (H x W) / COMMENTS
LAVENDULA STOECHAS SPANISH LAVENDER	1 GAL. 3'-0" O.C.	73	3' H x 4' W / EVERGREEN PURPLE FLOWER / SUMMER BLOOM
LEUCANTHEMUM x SUPERBUM 'SNOWCAP' POT 'SNOWCAP DWARF' SHASTA DAISY	4" POT 2'-0" O.C.	48	12" H x 12" W / HERBACEOUS PERENNIAL WHITE FLOWERS / SPRING-SUMMER BLOOM
HEMEROCALLIS 'HAPPY RETURNS' 'HAPPY RETURNS' DAYLILY	1 GAL.	50 PLANTS	18" H x 18" W / DROUGHT TOLERANT
NARCISSUS 'DUTCH MASTER' 'DUTCH MASTER' TRUMPET DAFFODIL	BULB 9" O.C.	350 BULBS	20" H x 6" W / BULB YELLOW FLOWERS - SPRING
COLCHICUM GIGANTEUM 'THE GIANT' GIANT AUTUMN CROCUS	BULB 9" O.C.	350 BULBS	8" H x 8" W / BULB PURPLE FLOWERS - FALL
WINTER ANNUALS	4" POT 9" O.C.		COVER ALL BARE SOIL AREAS

GROUNDCOVERS ITEM	SIZE	QTY.	FORM (H x W) / COMMENTS
ARCTOSTAPHYLOS UVA-URSI 'MASS' KINNICKINICK	1 GAL. 3'-0" O.C.	5,200 SF	9" H x 4" W / EVERGREEN WHITE FLOWERS / WINTER BERRIES
TRACHYLOSPERMUM JASMINOIDES STAR JASMINE	1 GAL. 4'-0" O.C.	11,440 SF	TO 18" H x 4" W / EVERGREEN WHITE FLOWER / SPRING-SUMMER BLOOM
COTONEASTER DAMERI 'LOWFAST' BEARBERRY COTONEASTER	1 GAL. 3'-0" O.C.	1,940 SF	10" H x 3" W / EVERGREEN WHITE FLOWER / YEAR ROUND INTEREST
PROTIME 303 SUN MIX HOPPS & HOPKINS - PORTLAND, OR	SEED @ 8 LBS / 1,000 SF	10,180 SF	THREE-WAY PERENNIAL RYEGRASS RYEGRASS / RED & CHEWINGS FESCUE
SOD LAWN FROM A LOCAL SUPPLIER	SOD ROLL PALLET	16,890 SF	

PRIVATE STORM FACILITY PLANTINGS

TREES ITEM	SIZE	QTY.	CANOPY (H x W) / COMMENTS
ALNUS RUBRA RED ALDER	1.5" CAL. / B&B AS SHOWN	5	30' H x 35' W / DECIDUOUS PNW NATIVE
QUERCUS GARRYANA OREGON WHITE OAK	1.5" CAL. / B&B AS SHOWN	4	75' H x 50' W / DECIDUOUS PNW NATIVE
PSEUDOTSUGA MENZIESII DOUGLAS FIR	4" HT. / B&B AS SHOWN	9	85' H x 45' W / EVERGREEN PNW NATIVE
THUJA PLICATA WESTERN RED CEDAR	4" HT. / B&B AS SHOWN	7	75' H x 40' W / EVERGREEN PNW NATIVE

SHRUBS ITEM	SIZE	QTY.	FORM (H x W) / COMMENTS
ACER CIRCINATUM VINE MAPLE	4" MIN. HT. / B&B MULTI-STEM	29	15' H x 10' W / DECIDUOUS PNW NATIVE
AMELANCHIER ALNIFOLIA WESTERN SERVICEBERRY	4" MIN. HT. / B&B AS SHOWN	29	20' H x 10' W / DECIDUOUS PNW NATIVE
RIBES SANGUINEUM RED-FLOWERING CURRANT	3 GAL. AS SHOWN	83	8" H x 4" W / DECIDUOUS PNW NATIVE
CEANOTHUS THYRSIFLORUS BLUEBLOSSOM CEANOTHUS	3 GAL. AS SHOWN	94	6" H x 6" W / EVERGREEN PNW NATIVE
MYRTICA CALIFORNICA PACIFIC WAX MYRTLE	3 GAL. AS SHOWN	58	6" H x 5" W / EVERGREEN MUST BE OREGON GROWN.

PRIVATE STORM FACILITY SUMMARY:

REQUIRED PLANTINGS FOR POND BOTTOM:	WETLAND PLANTS 115 / 100 SF
REQUIRED PLANTINGS FOR POND SIDE SLOPES: <td>EVERGREEN TREES - (1) 6" HT. PER 300 SF</td>	EVERGREEN TREES - (1) 6" HT. PER 300 SF
DECIDUOUS TREES - (1) 1.5" CAL. PER 300 SF	LARGE SHRUBS - (4) 3 GAL. PER 100 SF

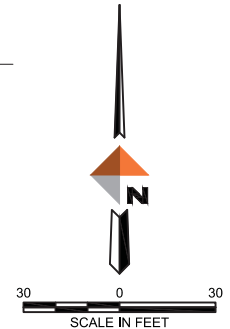


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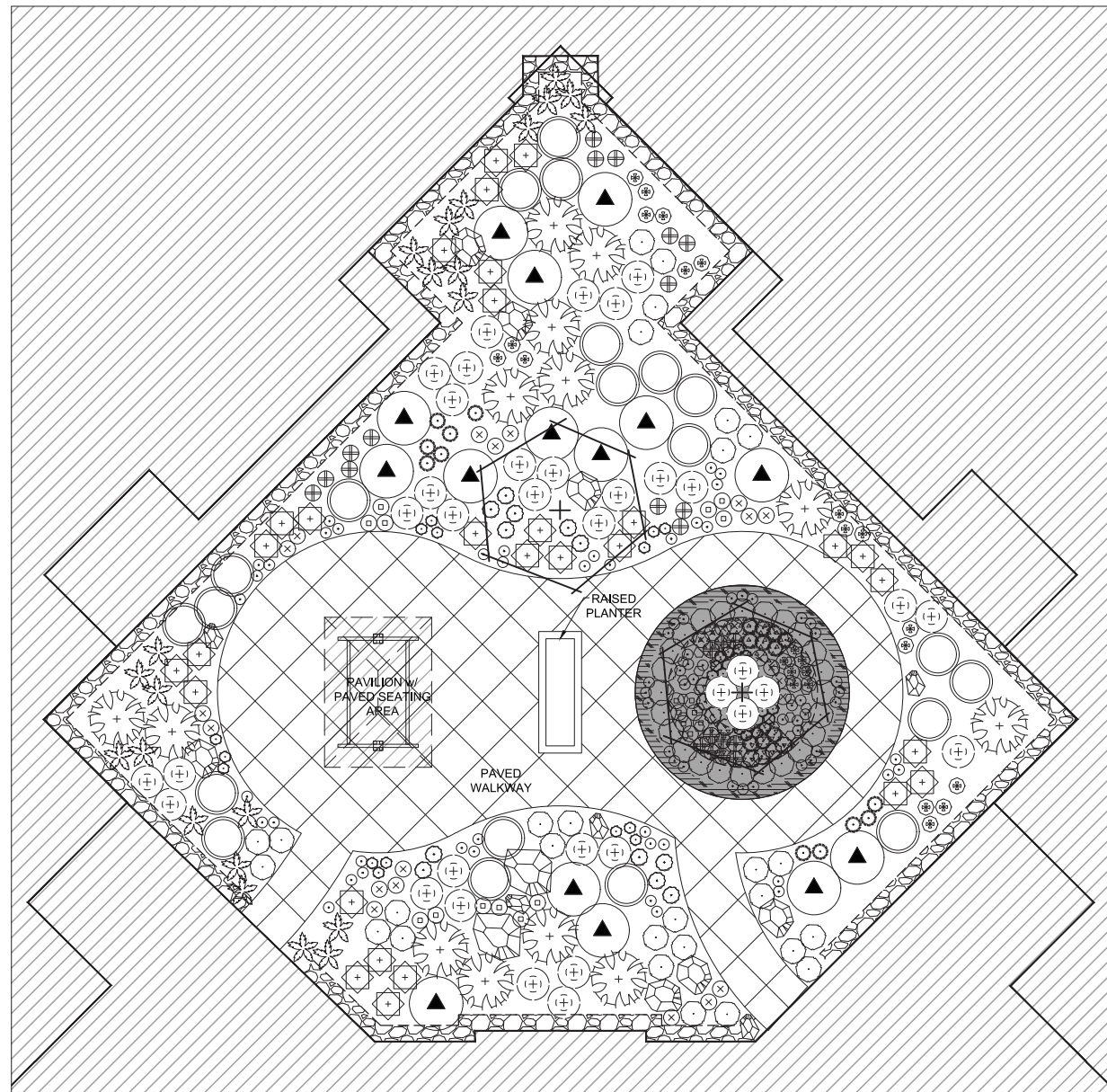
**BONAVENTURE SENIOR HOUSING**  
 LANDSCAPE PLANTING PLAN  
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MEMORY CARE COURTYARD

MEMORY CARE COURTYARD LEGEND



TREES ITEM	SIZE	QTY.	CANOPY (H x W) / COMMENTS
<i>ULMUS PARVIFOLIA</i> 'BSNUFF'	1.5" CAL. / B&B	2	30" H x 15' W - COLUMNAR
EVERCLEAR LACEBARK ELM	AS SHOWN		DECIDUOUS



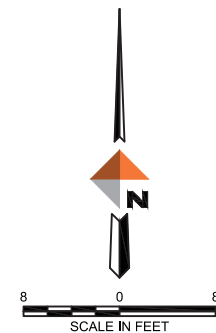
SHRUBS ITEM	SIZE	QTY.	FORM (H x W) / COMMENTS
<i>ABELIA</i> 'EDWARD GOUCHER'	3 GAL	21	4' H x 4' W - SEMI-EVERGREEN
EDWARD GOUCHER ABELIA	4'-0" O.C.		PINK FLOWER / SPRING-SUMMER BLOOM
<i>CISTUS</i> x <i>PULVERULENTUS</i>	3 GAL	29	18" H x 3'+ W - EVERGREEN
MAGENTA ROCK ROSE	3'-0" O.C.		PINK FLOWER / SPRING-SUMMER BLOOM
<i>CAMELLIA JAPONICA</i> 'NUCCIO'S GEM'	5 GAL	15	6'+ H x 5' W - EVERGREEN
NUCCIO'S GEM CAMELLIA	6'-0" O.C.		WHITE FLOWER / WINTER BLOOM
<i>RIBES ALPINUM</i>	5 GAL	13	6' H x 5' W - DECIDUOUS
APLPINE CURRANT	6'-0" O.C.		WHITE FLOWER / SPRING BLOOM
<i>POLYSTICHUM MUNITUM</i>	4" POT	23	3' H x 3' W - EVERGREEN
SWORD FERN	AS SHOWN		GREEN FOLIAGE
<i>SPIRAEA JAPONICA</i> 'MAGIC CARPET'	2 GAL	52	2' H x 2'+ W - DECIDUOUS
MAGIC CARPET SPIRAEA	2'-6" O.C.		PINK FLOWER / SUMMER-FALL BLOOM
<i>CORNUS STOLONIFERA</i> 'FARROW'	3 GAL	35	TO 3' H x 3'+ W - DECIDUOUS
ARCTIC FIRE RED TWIG DOGWOOD	4'-0" O.C.		RED TWIGS / WINTER-SPRING INTEREST



FLOWERS ITEM	SIZE	QTY.	FORM (H x W) / COMMENTS
<i>CENTAUREA CYANUS</i>	4" POT	25	TO 36" H x 12" W - PERENNIAL
BACHELOR BUTTON / CORNFLOWER	AS SHOWN		BLUE FLOWER / SUMMER BLOOM
<i>COREOPSIS GRANDIFLORA</i> 'DAYBREAK'	4" POT	25	TO 36" H x 18" W - PERENNIAL
LARGE FLOWER TICKSEED	AS SHOWN		YELLOW-RED FLOWER / SUMMER BLOOM
<i>ANTIRRHINUM MAJUS</i>	4" POT	33	36" H x 18" W - PERENNIAL
COMMON SNAPDRAGON	AS SHOWN		MIXED PASTEL FLOWER / SPRING BLOOM
<i>SEDUM</i> x 'AUTUMN JOY'	4" POT	24	18"-24" H x 18" W - PERENNIAL
AUTUMN JOY SEDUM	AS SHOWN		PINK FLOWER / SUMMER-FALL BLOOM
<i>MONARDA</i> ssp.	4" POT	19	12"-36" H x 12" W - PERENNIAL
BEEBALM	AS SHOWN		RED FLOWER / SUMMER BLOOM
<i>COSMOS BIPINNATUS</i>	4" POT	20	18"-36" x 24" W - PERENNIAL
COSMOS	AS SHOWN		PINK-PURPLE FLOWER / SUMMER BLOOM
<i>ECHINACEA PURPUREA</i>	4" POT	21	36" x 18" W - PERENNIAL
PURPLE CONEFLOWER	AS SHOWN		PINK-PURPLE FLOWER / SUMMER-FALL BLOOM
<i>CROCUS VERNUS</i>	BULBS	20	6" x 6" W - PERENNIAL
SPRING CROCUS	IN GROUPS		PINK-PURPLE FLOWER / SPRING BLOOM



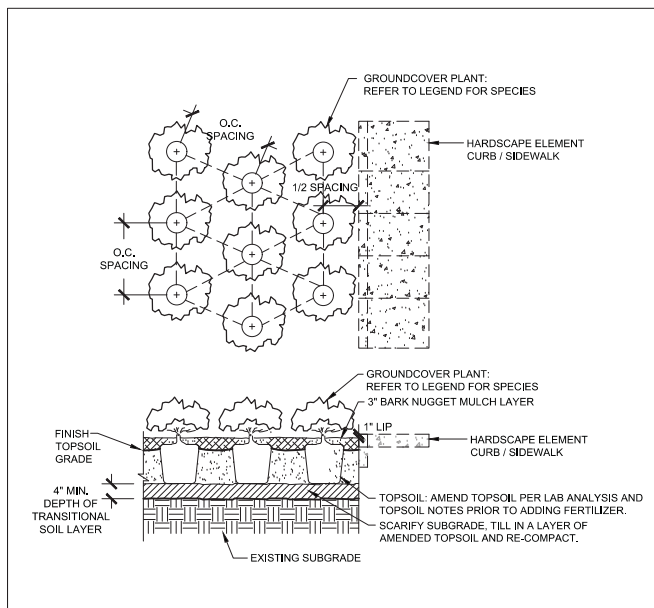
GROUNDCOVERS ITEM	SIZE	QTY.	FORM (H x W) / COMMENTS
<i>LAMPRANTHUS PIQUET</i>	4" POT	68 SF	6" x H x 2' W - EVERGREEN HERBACEOUS
ICE PLANT	18" O.C.	35 PLANTS	PURPLE FLOWER / SPREADING
<i>LYSIMACHIA NUMMULARIA</i>	4" POT	65 SF	6" x H x 2' W - EVERGREEN HERBACEOUS
CREeping JENNY	18" O.C.	34 PLANTS	GREEN FOLIAGE / SPREADING
<i>SEMPERVIRENS TECTORUM</i>	4" POT	68 SF	6" x H x 2' W - EVERGREEN HERBACEOUS
HENS AND CHICKENS	18" O.C.	35 PLANTS	GREEN-RED FOLIAGE / SPREADING



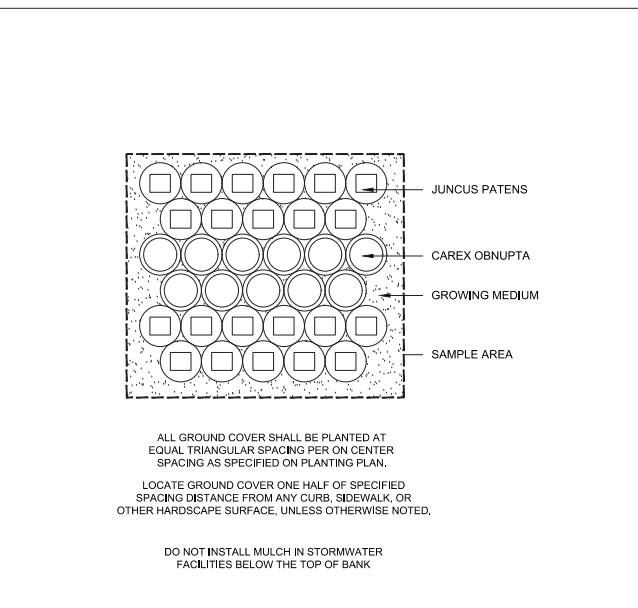
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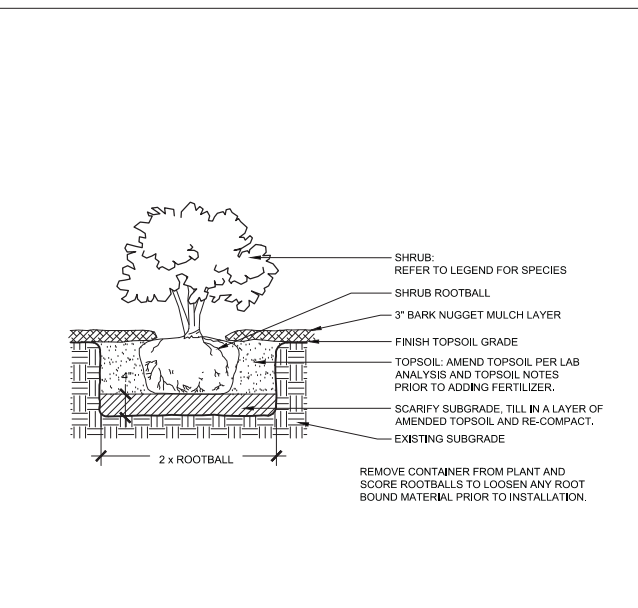
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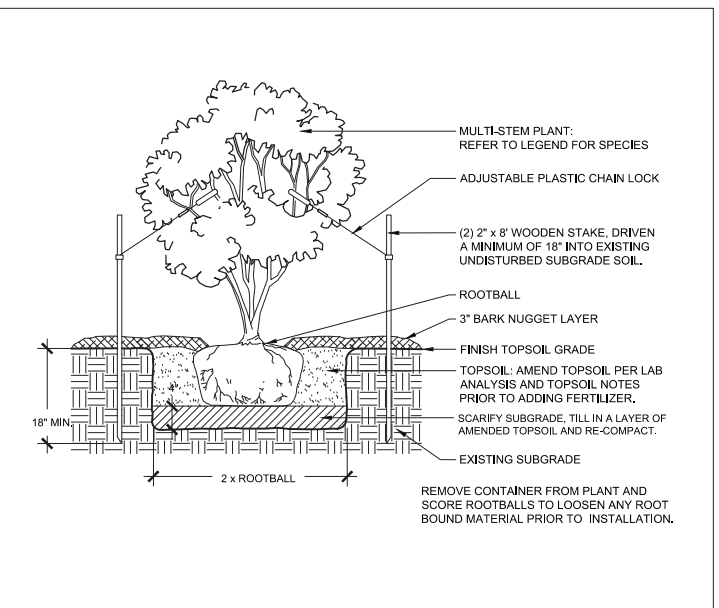
**1 GROUND COVER SPACING / PLANTING** NOT TO SCALE



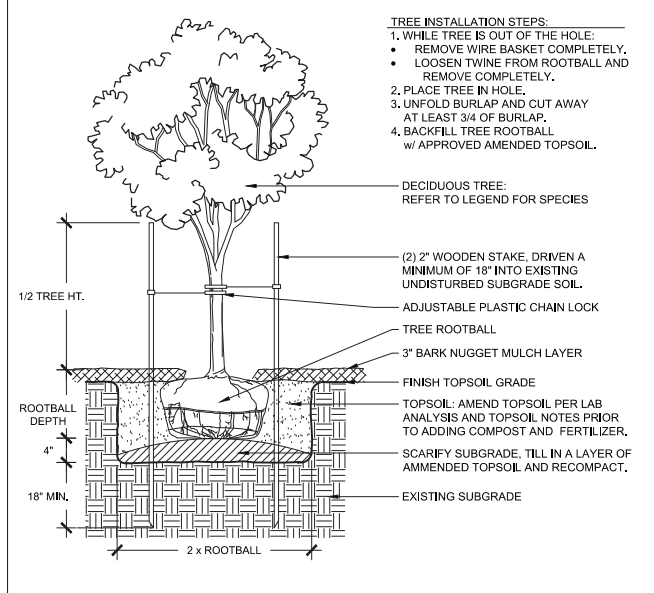
**2 STORMWATER FACILITY PLANTING** NOT TO SCALE



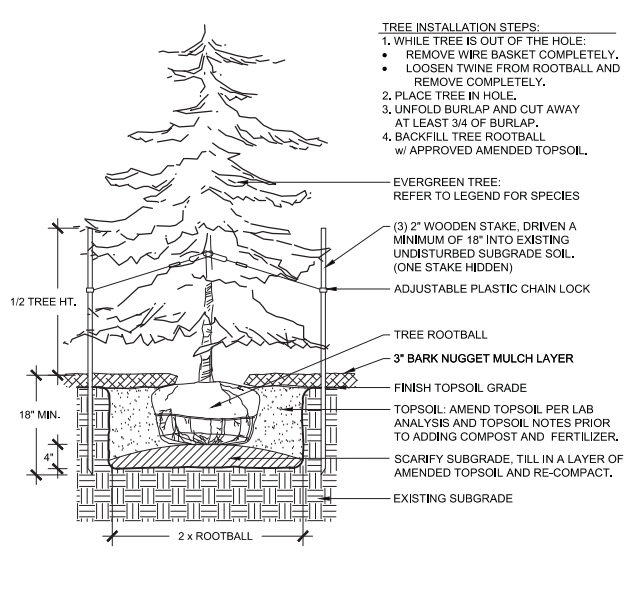
**3 SHRUB PLANTING** NOT TO SCALE



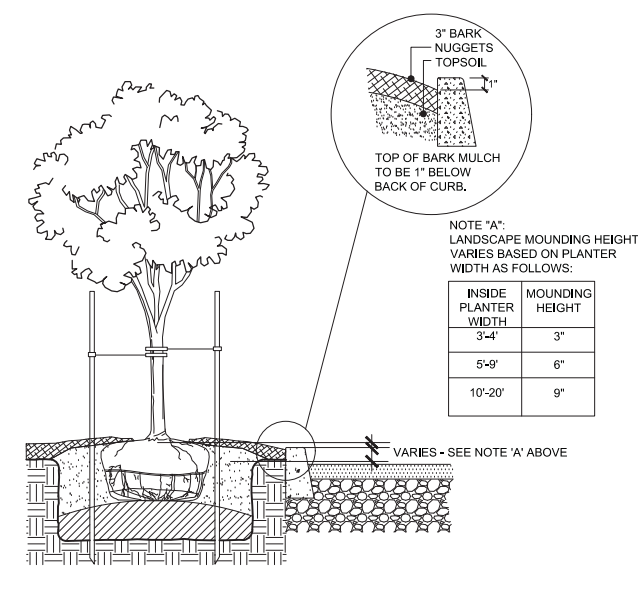
**4 MULTI-STEM PLANTING** NOT TO SCALE



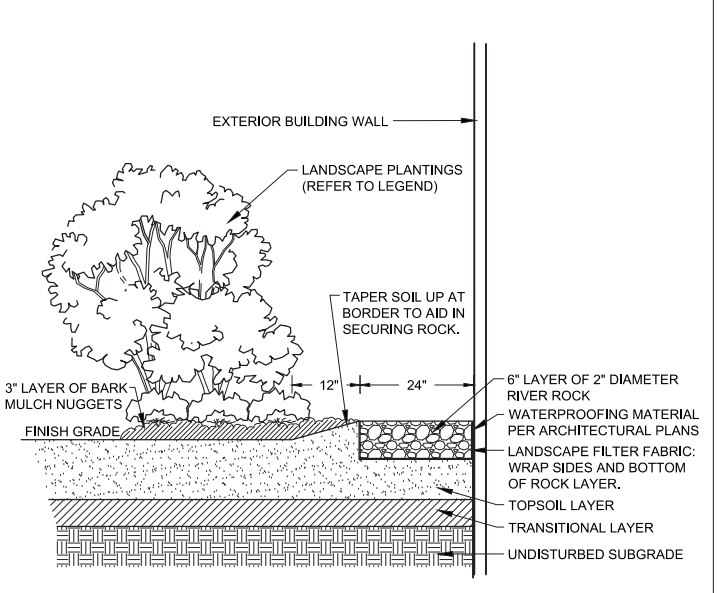
**5 DECIDUOUS TREE PLANTING** NOT TO SCALE



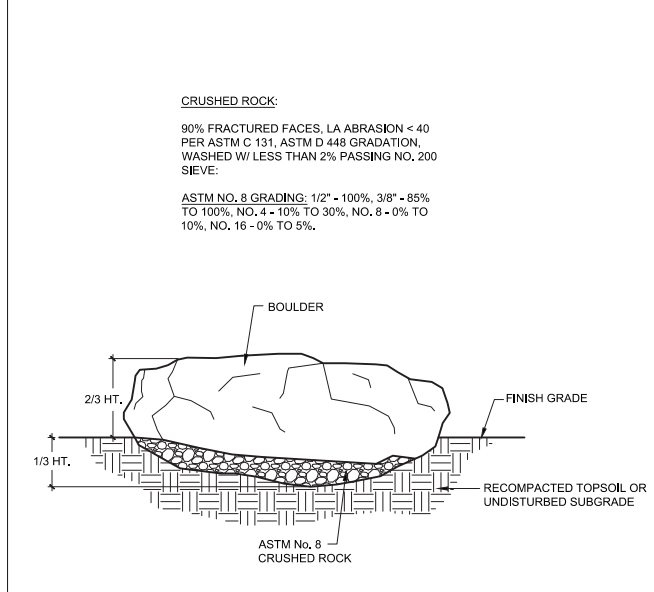
**6 EVERGREEN TREE PLANTING** NOT TO SCALE



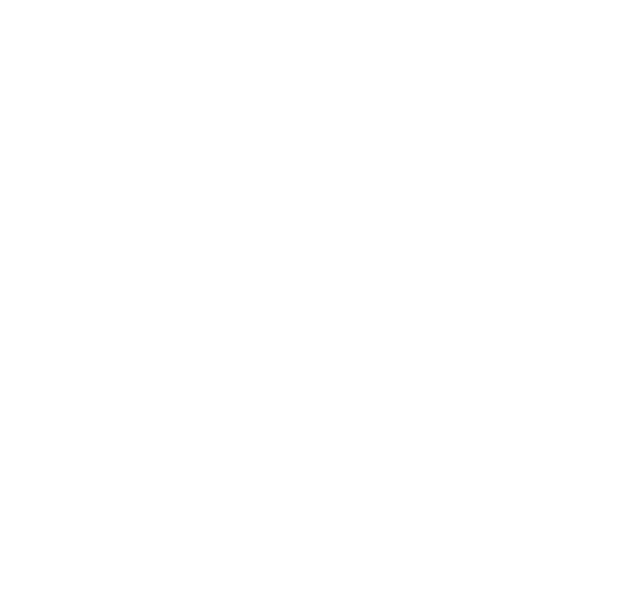
**7 SOIL MOUNDING: ISLANDS AND PERIMETER** NOT TO SCALE



**8 GRAY RIVER ROCK BORDER** NOT TO SCALE



**9 LANDSCAPE BOULDER** NOT TO SCALE



**10 BLANK** NOT TO SCALE



**11 BLANK** NOT TO SCALE



**12 BLANK** NOT TO SCALE

G:\22\14497-01\65CAD\Landscape\_DD\SC14-LS-FC-BONA.dwg PLOT DATE 2019-11-23 15:40 SAVED DATE 2019-01-21 11:47 USER: pggaynor



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**BONAVENTURE SENIOR HOUSING**  
 LANDSCAPE DETAILS AND NOTES  
 BONAVENTURE SENIOR HOUSING  
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	<p>1. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A NUMBER IN THE BASE BID TO FURNISH AND INSTALL AMENDED TOPSOIL IN ALL LANDSCAPE BEDS AND SEEDED AREAS AS SPECIFIED BELOW UNLESS OTHERWISE NOTED, AMENDED TOPSOIL SHALL INCLUDE ALL NECESSARY FERTILIZERS, ORGANIC AND INORGANIC AMENDMENTS, BASED ON INDUSTRY STANDARDS AND SOILS LAB RECOMMENDATION.</p> <ul style="list-style-type: none"> <li>• SCARIFY ALL PLANTING AREA SUBGRADE TO A DEPTH OF 6". TILL IN A LAYER OF AMENDED TOPSOIL INTO SCARIFIED SUBGRADE AND RE-COMPACT TO CREATE A MINIMUM 4" THICK TRANSITIONAL LAYER.</li> <li>• INSTALL A MINIMUM 6" LAYER OF AMENDED TOPSOIL IN ALL SEEDED LAWN AREAS.</li> <li>• INSTALL A MINIMUM 12" LAYER OF AMENDED TOPSOIL IN ALL SOD LAWN AREAS.</li> <li>• INSTALL A MINIMUM 18" LAYER OF AMENDED TOPSOIL IN ALL PARKING LOT ISLANDS, PERIMETER LANDSCAPE AREAS, RAISED PLANTERS AND THE MEMORY CARE COURTYARD PLANTERS.</li> <li>• INSTALL GROWING MEDIUM IN STORMWATER FACILITIES TO THE DEPTHS INDICATED ON THE CIVIL PLANS AND JURISDICTIONAL STANDARD DETAILS.</li> </ul> <p>2. UPON BEING AWARDED THE CONTRACT, THE GENERAL CONTRACTOR SHALL COORDINATE WITH A STATE LICENSED SOIL LABORATORY AND THE LANDSCAPE ARCHITECT, TO DETERMINE THE SUITABILITY AND AVAILABILITY OF THE EXISTING SITE TOPSOIL. THE CONTRACTOR SHALL SEND THE TOPSOIL TO A SOIL LABORATORY FOR ANALYSIS STATING THAT THE TOPSOIL BE ANALYZED FOR A LANDSCAPE CROP. AFTER RECEIVING RECOMMENDATIONS FROM THE SOILS EXPERT FORWARD A COPY TO THE OWNERS REPRESENTATIVE AT WHICH TIME A DECISION WILL BE MADE BY THE OWNER AS TO WHETHER OR NOT THE EXISTING ON-SITE STOCKPILE WILL BE USED FOR THE PROJECT.</p> <p>3. IF THE EXISTING TOPSOIL IS TO BE USED THE CONTRACTOR SHALL ADD THE RECOMMENDED AMENDMENTS AND FERTILIZERS AS STATED IN THE SOILS ANALYSIS ALONG WITH ADDITIONAL AMENDMENTS AND FERTILIZERS LISTED IN NOTE #6 AND #7.</p> <p>4. IN THE EVENT THE EXISTING ON-SITE TOPSOIL IS OF POOR QUALITY (AS DETERMINED BY THE SOIL ANALYSIS) OR IS UNAVAILABLE FOR USE, THE OWNER'S REPRESENTATIVE WILL MAKE A DECISION AS TO WHETHER OR NOT THE NUMBER FOR IMPORTING 9" OF AMENDED IMPORTED TOPSOIL WILL BE ADDED TO THE SIGNED CONTRACT AGREEMENT.</p> <p>5. IF AMENDED IMPORTED TOPSOIL IS TO BE USED, THE GENERAL CONTRACTOR WILL BE NOTIFIED IN WRITING BY THE OWNER'S REPRESENTATIVE AND THE CONTRACT MODIFIED ACCORDINGLY. TOPSOIL SHALL BE OBTAINED FROM NATURALLY WELL-DRAINED SITES WHERE TOPSOIL OCCURS AT LEAST 4 INCHES DEEP, DO NOT OBTAIN FROM BOGS OR MARSHES. IMPORTED TOPSOIL TO COMPLY WITH ASTM D 5268, WITH A PH RANGE OF 5.5 TO 7.0, FREE OF STONES 1 INCH OR LARGER IN ANY DIMENSION, AND ANY OTHER EXTRANEOUS MATERIALS (ROCKS, STICKS, RUBBISH, SOD) HARMFUL TO PLANT GROWTH. AN ADDITIONAL SOILS ANALYSIS WILL BE REQUIRED FOR THE IMPORTED TOPSOIL.</p> <p>6. AMENDED IMPORTED TOPSOIL SHALL INCLUDE ALL NECESSARY FERTILIZER AND AMENDMENTS PER THE SOIL ANALYSIS RECOMMENDATIONS. TOPSOIL ANALYSIS SHALL STATE ORGANIC MATTER, INORGANIC MATTER (SILT, CLAY AND SAND), DELETERIOUS MATERIAL, PH, MINERAL AND PLANT-NUTRIENT CONTENT. IN ADDITION THE REPORT SHALL ALSO STATE RECOMMENDED QUANTITIES (BY PERCENTAGE OF WEIGHT *L.E. 2 LBS OF 15-15-15 PER 1000SF) OF NITROGEN, PHOSPHORUS AND POTASH, NUTRIENTS AND ANY LIMESTONE, ALUMINUM SULFATE, OR OTHER SOIL AMENDMENTS TO BE ADDED TO PRODUCE A SATISFACTORY AMENDED TOPSOIL. FURNISH REPORT AND RECOMMENDATIONS TO LANDSCAPE ARCHITECT FOR REVIEW AND WRITTEN APPROVAL 30 DAYS PRIOR TO MOBILIZATION.</p> <p>7. IN ADDITION TO THE SOILS ANALYSIS RECOMMENDATIONS THE LANDSCAPE CONTRACTOR SHALL ADD 1 PART (2" LAYER) OF APPROVED HUMUS MATERIAL TO 2 PARTS AMENDED TOPSOIL. SUBMIT CUT SHEET OF HUMUS MATERIAL (CERTIFIED FINE COMPOSTED YARD DEBRIS) TO LANDSCAPE ARCHITECT FOR REVIEW AND WRITTEN APPROVAL PRIOR TO MIXING.</p> <p>8. PRIOR TO PLACEMENT OF TOPSOIL SCARIFY AND LOOSEN SUBGRADE OF PLANTING BED AREA TO A MINIMUM DEPTH OF 6 INCHES. REMOVE STONES LARGER THAN 1" IN ANY DIMENSION AND STICKS, ROOTS, RUBBISH AND OTHER EXTRANEOUS MATERIALS. REMOVE WEEDS FROM EXISTING SUBGRADE AND TREAT WITH NECESSARY HERBICIDE TO PREVENT WEED GROWTH. SPREAD HALF OF THE AMENDED TOPSOIL MIXTURE AND WORK INTO TOP OF LOOSEN SUBGRADE TO CREATE A TRANSITION LAYER, PLACE REMAINING HALF OF THE PLANTING SOIL MIXTURE TO THE DEPTH REQUIRED TO MEET THICKNESS, GRADES AND ELEVATIONS SHOWN, AFTER LIGHT ROLLING AND NATURAL SETTLEMENT.</p> <p>9. WITHIN TREE WELLS &amp; PLANTER ISLANDS, REMOVE EXISTING SOIL AND OTHER DEBRIS, TO A MINIMUM DEPTH OF 18" AND REPLACE WITH AMENDED TOPSOIL. ADD ADDITIONAL SOIL AS REQUIRED PER DETAILS AND NOTES.</p> <p>10. THE CONTRACTOR SHALL SUBMIT TO THE LANDSCAPE ARCHITECT, SHIPPING TICKETS FOR IMPORTED TOP SOIL AND HUMUS MATERIAL, 60 DAYS PRIOR TO INSTALLATION FOR REVIEW AND WRITTEN APPROVAL.</p>
	<p><b>TOPSOIL NOTES</b></p> <p>1. ANY CEMENT TREATED LANDSCAPE AREAS SHALL BE EXCAVATED A MINIMUM OF 6" BELOW BOTTOM OF TREAT AREA DEPTH AND REMOVED FROM THE SITE. BACKFILL WITH TOPSOIL TO ORIGINAL GRADE PRIOR TO ADDING THE SPECIFIED AMENDED SOIL PER THE PLANS.</p> <p>2. CONTRACTOR TO VERIFY WITH OWNER AND UTILITY COMPANIES THE LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION, TO DETERMINE IN THE FIELD THE ACTUAL LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL CALL UTILITY PROTECTION SERVICE 72 HOURS PRIOR TO CONSTRUCTION.</p> <p>3. CONTRACTOR SHALL EXAMINE FINISH SURFACE, GRADES, TOPSOIL QUALITY AND DEPTH. DO NOT START ANY WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. VERIFY LIMITS OF WORK BEFORE STARTING.</p> <p>4. CONTRACTOR TO REPORT ALL DAMAGES TO EXISTING CONDITIONS AND INCONSISTENCIES WITH PLANS TO THE LANDSCAPE ARCHITECT.</p> <p>5. ALL TREE / SHRUB PLANT MASSES TO BE CONTAINED WITHIN A 3" LAYER OF BARK NUGGETS. DO NOT INSTALL BARK NUGGETS IN STORMWATER FACILITY.</p> <p>6. BED EDGE TO BE NO LESS THAN 12" AND NO MORE THAN 18" FROM OUTER EDGE OF PLANT MATERIAL BRANCHING, WHERE GROUND-COVER OCCURS. PLANT TO LIMITS OF AREA AS SHOWN.</p> <p>7. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE IN ALL LANDSCAPE BEDS.</p> <p>8. CONTRACTOR TO FINE GRADE AND ROCK-HOUND ALL PLANTING AREAS PRIOR TO PLANTING, TO PROVIDE A SMOOTH AND CONTINUAL SURFACE, FREE OF IRREGULARITIES (BUMPS OR DEPRESSIONS) &amp; EXTRANEOUS MATERIAL OR DEBRIS.</p> <p>9. QUANTITIES ARE INTENDED TO ASSIST CONTRACTOR IN EVALUATING THEIR OWN TAKE OFFS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR BID QUANTITIES AS INDICATED ON THE PLANS. IF THERE IS A DISCREPANCY BETWEEN THE NUMBER IN THE PLANT LEGEND AND THE QUANTITY OF GRAPHIC SYMBOLS SHOWN, THE GRAPHIC SYMBOL SHALL GOVERN.</p> <p>10. COORDINATE PLANTING INSTALLATION WITH INSTALLATION OF UNDERGROUND SPRINKLER AND DRAINAGE SYSTEMS.</p> <p>11. CONTRACTOR SHALL NOT REMOVE ANY TREES DURING CONSTRUCTION WITHOUT THE EXPRESS WRITTEN CONSENT OF THE LANDSCAPE ARCHITECT. EXISTING VEGETATION TO REMAIN SHALL BE PROTECTED AS DIRECTED BY THE LANDSCAPE ARCHITECT.</p> <p>12. WHERE PROPOSED TREE LOCATIONS OCCUR UNDER EXISTING OVERHEAD UTILITIES OR CROWD EXISTING TREES, NOTIFY LANDSCAPE ARCHITECT TO ADJUST TREE LOCATIONS.</p> <p>13. LANDSCAPE MAINTENANCE PERIOD BEGINS IMMEDIATELY AFTER THE COMPLETION OF ALL PLANTING OPERATIONS AND ACKNOWLEDGEMENT THAT ALL PUNCH LIST ITEMS HAVE BEEN COMPLETED BY THE CONTRACTOR. MAINTAIN TREES, SHRUBS, LAWNS AND OTHER PLANTS UNTIL FINAL ACCEPTANCE OR 90 DAYS AFTER NOTIFICATION AND ACCEPTANCE, WHICHEVER IS LONGER. WARRANTY ALL PLANTING FOR A PERIOD OF TWO (2) YEARS FROM THE DATE OF ACCEPTANCE.</p> <p>14. REMOVE EXISTING WEEDS FROM PROJECT SITE PRIOR TO THE ADDITION OF ORGANIC AMENDMENTS AND FERTILIZER.</p> <p>15. BACKFILL MATERIAL FOR TREE AND SHRUB PLANTING SHALL CONTAIN: ONE PART FINE GRADE COMPOST TO FOUR PARTS TOPSOIL BY VOLUME. INCORPORATE ANY SLOW RELEASE FERTILIZERS AND AMENDMENTS PER SOIL LAB ANALYSIS RECOMMENDATIONS.</p> <p>16. CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ALL PLANT MATERIAL SUBSTITUTIONS FROM THE LANDSCAPE ARCHITECT 90 DAYS PRIOR TO INSTALLATION. PLANT SUBSTITUTIONS WITHOUT PRIOR WRITTEN APPROVAL THAT DO NOT COMPLY WITH THE DRAWINGS AND SPECIFICATIONS MAY BE REJECTED BY THE LANDSCAPE ARCHITECT AT NO COST TO THE OWNER, THESE ITEMS MAY BE REQUIRED TO BE REPLACED WITH PLANT MATERIALS THAT ARE IN COMPLIANCE WITH THE DRAWINGS.</p> <p>17. CONTRACTOR SHALL BE RESPONSIBLE TO SECURE ALL PLANT MATERIAL IN THE SIZE SPECIFIED ON PLAN PRIOR TO INSTALLATION. IN THE EVENT THE PLANT MATERIAL IS NOT AVAILABLE IN THE SIZE SPECIFIED, THE CONTRACTOR SHALL SUBMIT TO THE OWNERS REPRESENTATIVE, AND THE LANDSCAPE ARCHITECT, A WRITTEN ESTIMATE TO INCREASE PLANT MATERIAL, (AND INSTALL) THE NEXT AVAILABLE CONTAINER SIZE PLANT (I.E. 4" POT TO ONE GALLON CONTAINER, 2" CALIPER TREE TO 2.5" CALIPER).</p> <p>18. CONTRACTOR SHALL BE RESPONSIBLE TO IMPLEMENT BEST MANAGEMENT PRACTICES TO STABILIZE ALL SLOPES 3:1 OR GREATER AND PREVENT EROSION OR MOVEMENT OF SOIL FROM SLOPES. THIS COULD INCLUDE, BUT NOT LIMITED TO, EROSION CONTROL FABRIC, STAKING, NETTING, AND STRAW WATTLES. SUBMIT METHOD OF SLOPE STABILIZATION TO LANDSCAPE ARCHITECT FOR REVIEW AND WRITTEN APPROVAL 30 DAYS PRIOR TO IMPLEMENTATION.</p> <p>19. PRIOR TO MOBILIZATION THE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT, IN WRITING, IF THEY BELIEVE ANY OF THE PLANT MATERIAL IDENTIFIED ON THE PLAN MAY NOT BE SUITABLE FOR THE SITE OR MAY DIE. SUBSTITUTION REQUESTS MAY BE GRANTED BY THE LANDSCAPE ARCHITECT PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. IF NOTIFICATION IS NOT GIVEN TO THE LANDSCAPE ARCHITECT ALL PLANTING WHICH FAILS TO GROW (EXCEPT FOR DEFECTS RESULTING FROM LACK OF ADEQUATE MAINTENANCE AS DETERMINED BY THE OWNER. NEGLIGENCE OR VANDALISM) SHALL BE REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.</p> <p>20. NOTIFY THE LANDSCAPE ARCHITECT IN WRITING, WHEN CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, POOR PLANTING SOIL, ADVERSE DRAINAGE CONDITIONS, OR OBSTRUCTIONS, PRIOR TO PLANTING.</p> <p>21. PLANTING RESTRICTIONS - PLANTING IS NOT PERMITTED DURING THE FOLLOWING CONDITIONS, UNLESS OTHERWISE APPROVED IN WRITING BY THE LANDSCAPE ARCHITECT:      A. COLD WEATHER: LESS THAN 32 DEGREES FAHRENHEIT      B. HOT WEATHER: GREATER THAN 90 DEGREES FAHRENHEIT      C. WET WEATHER: SATURATED SOIL OR STANDING WATER      D. WINDY WEATHER: WIND VELOCITIES GREATER THAN 20 M.P.H.</p> <p>22. ALL PLANTING AREAS EXCEPT FOR MITIGATION AREAS SHALL BE WATERED WITH AN AUTOMATIC UNDERGROUND IRRIGATION SYSTEM. MITIGATION AREAS SHALL BE IRRIGATED PER CWS REQUIREMENTS.</p> <p>23. DO NOT LOCATE TREES IN EASEMENTS.</p> <p>24. SEE CIVIL PLANS FOR EXISTING TREES TO REMAIN ON SITE.</p> <p>25. ALL PLANTS MUST COMPLY TO THE AMERICAN STANDARD FOR NURSERY STOCK, THOSE THAT DO NOT WILL BE REJECTED. CALIPER TREES MUST BRANCH AT 5' MIN. HT.</p> <p>26. LANDSCAPE CONTRACTOR TO READ AND UNDERSTAND THE LANDSCAPE SPECIFICATIONS (SHEET L120) PRIOR TO FINALIZING BIDS. THE LANDSCAPE SPECIFICATIONS SHALL BE ADHERED TO THROUGHOUT THE CONSTRUCTION PROCESS.</p> <p>27. CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING TREES FROM DAMAGE DURING CONSTRUCTION, ALL TREE PROTECTION DEVICES TO BE INSTALLED PRIOR TO THE START OF LAND DISTURBANCE, AND MAINTAINED UNTIL FINAL LANDSCAPING. ALL TREE PROTECTION AREAS TO BE PROTECTED FROM SEDIMENTATION. ALL TREE PROTECTION FENCING TO BE INSPECTED DAILY, AND REPAIRED OR REPLACED AS NEEDED. NO PARKING, STORAGE OR OTHER CONSTRUCTION ACTIVITIES ARE TO OCCUR WITHIN TREE PROTECTION AREAS.</p> <p>28. ALL PLANTING AREAS SHALL BE CLEARED OF CONSTRUCTION DEBRIS (IE. CONCRETE, ROCK, RUBBLE, BUILDING MATERIALS, ETC) PRIOR TO ADDING AND SPREADING OF THE TOPSOIL.</p> <p>29. PLANTING AREA SUBGRADE TO BE EXCAVATED TO THE APPROPRIATE ELEVATION TO ACCOUNT FOR TOPSOIL DEPTH AND MOUNDING.</p> <p>30. PRIOR TO BEGINNING WORK, THE LANDSCAPE CONTRACTOR SHALL INSPECT THE SUBGRADE, GENERAL SITE CONDITIONS, VERIFY ELEVATIONS, UTILITY LOCATIONS, AND OBSERVE THE SITE CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. NOTIFY THE GENERAL CONTRACTOR OF ANY UNSATISFACTORY CONDITIONS. WORK SHALL NOT PROCEED UNTIL SUCH CONDITIONS HAVE BEEN CORRECTED AND ARE ACCEPTABLE TO THE LANDSCAPE CONTRACTOR.</p> <p>31. ANY DEVIATIONS FROM THE APPROVED SET OF PLANS ARE TO BE APPROVED BY THE LANDSCAPE ARCHITECT.</p> <p>32. LANDSCAPING SHALL BE INSTALLED IN CONFORMANCE WITH ANSI Z60.1 THE "AMERICAN STANDARD FOR NURSERY STOCK" AND THE ACCEPTED STANDARDS OF THE AMERICAN ASSOCIATION OF NURSERYMEN.</p> <p>33. EXISTING GRASS IN PROPOSED PLANTING AREAS SHALL BE KILLED AND REMOVED. HAND RAKE TO REMOVE ALL ROCKS AND DEBRIS LARGER THAN 1 INCH IN DIAMETER, PRIOR TO ADDING TOPSOIL AND PLANTING SHRUBS. SOIL TO BE TESTED TO DETERMINE FERTILIZER AND LIME REQUIREMENTS PRIOR TO LAYING SOD.</p> <p>34. SOD TO BE DELIVERED FRESH (CUT LESS THAN 24 HOURS PRIOR TO ARRIVING ON SITE), LAID IMMEDIATELY, ROLLED, AND WATERED THOROUGHLY IMMEDIATELY AFTER PLANTING. EDGE OF SOD AT PLANTING BEDS ARE TO BE "V" TRENCHED. SEE LANDSCAPE DETAILS.</p> <p>35. ANY EXISTING GRASS DISTURBED DURING CONSTRUCTION TO BE FULLY REMOVED, RE-GRADED AND REPLACED. ALL TIRE MARKS AND INDENTATIONS TO BE REPAIRED.</p> <p>36. WATER THOROUGHLY TWICE IN FIRST 24 HOURS AND APPLY BARK NUGGET MULCH IMMEDIATELY.</p> <p>37. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE ALL PLANTS INSTALLED FOR ONE FULL YEAR FROM DATE OF ACCEPTANCE BY THE OWNER. ALL PLANTS SHALL BE ALIVE AND AT A VIGOROUS RATE OF GROWTH AT THE END OF THE GUARANTEE PERIOD. SEE LANDSCAPE SPECIFICATIONS FOR WARRANTY REQUIREMENTS/EXPECTATIONS. ANY PLANT THAT IS DETERMINED DEAD, IN AN UNHEALTHY, UNSIGHTLY CONDITION, LOST ITS SHAPE DUE TO DEAD BRANCHES, OR OTHER SYMPTOMS OF POOR, NON-VIGOROUS GROWTH, SHALL BE REPLACED BY THE LANDSCAPE CONTRACTOR. SEE LANDSCAPE SPECIFICATIONS FOR WARRANTY REQUIREMENTS/EXPECTATIONS.</p> <p>38. IRRIGATION AS-BUILT SHALL BE PROVIDED TO THE LANDSCAPE ARCHITECT WITHIN 24 HOURS OF IRRIGATION INSTALL COMPLETION.</p> <p>39. STAKE ALL TREES AS SHOWN IN THE PLANTING DETAIL AND AS PER THE LANDSCAPE SPECIFICATIONS. REMOVE STAKES AND GUYING FROM ALL TREES AFTER ONE YEAR FROM PLANTING.</p>
<p><b>THE LANDSCAPE CONTRACTOR WILL SUPPLY DOWL WITH THE FOLLOWING SUBMITTAL ITEMS PRIOR TO PURCHASE AND THE START OF WORK:</b></p> <ol style="list-style-type: none"> <li>1. LIST OF PLANT SPECIES, QUANTITIES AND THE SUPPLYING NURSERY.</li> <li>2. NURSERY PHOTOS OF ACTUAL PLANTS INTENDED FOR USE, PRIOR TO PURCHASE.</li> <li>3. QUARRY PHOTOS OF ACTUAL BOULDERS INTENDED FOR USE, PRIOR TO PURCHASE.</li> <li>4. PLASTIC TREE TIE AND WOODEN STAKE MATERIAL DATA SHEETS.</li> <li>5. BARK NUGGET MULCH:             <ul style="list-style-type: none"> <li>• 1 QUART PHYSICAL MULCH SAMPLE FOR EACH MULCH SOURCE.</li> <li>• MATERIALS DATA SHEET FROM MULCH SUPPLIER.</li> </ul> </li> <li>6. COMPOST:             <ul style="list-style-type: none"> <li>• 1 QUART PHYSICAL SOIL SAMPLE FOR EACH COMPOST SOURCE.</li> <li>• LAB ANALYSIS FROM CERTIFIED SOIL TESTING LAB FOR (ALL) INTENDED STOCKPILE(S).</li> </ul> </li> <li>7. TOPSOIL:             <ul style="list-style-type: none"> <li>• 1 QUART PHYSICAL SOIL SAMPLE FOR EACH TOPSOIL SOURCE.</li> <li>• LAB ANALYSIS FROM CERTIFIED SOIL TESTING LAB FOR (ALL) INTENDED STOCKPILE(S), TEST SOIL(S) AS A LANDSCAPE CROP.</li> <li>• ANALYSIS MUST INCLUDE: MACRO AND MICRO-NUTRIENT LEVELS, PH, SOIL CLASSIFICATION: (% SAND, SILT, CLAY), AND SOILS LAB TECHNICIAN RECOMMENDATIONS FOR AMENDMENT.</li> </ul> </li> <li>8. GROWING MEDIUM:             <ul style="list-style-type: none"> <li>• 1 QUART PHYSICAL SOIL SAMPLE FOR EACH GROWING MEDIUM SOURCE.</li> <li>• LAB ANALYSIS FROM CERTIFIED SOIL TESTING LAB FOR (ALL) INTENDED STOCKPILE(S).</li> <li>• ANALYSIS MUST INCLUDE: MACRO AND MICRO-NUTRIENT LEVELS, PH, SOIL CLASSIFICATION: (% SAND, SILT, CLAY), AND SOILS LAB TECHNICIAN RECOMMENDATIONS FOR AMENDMENT.</li> </ul> </li> </ol> <p><b>ADDITIONAL SUBMITTAL ITEMS:</b></p> <ul style="list-style-type: none"> <li>• SHIPPING TICKETS FOR TOPSOIL: <i>PROVIDE TO DOWL AT THE COMPLETION OF TOPSOIL PLACEMENT.</i></li> <li>• AS-BUILT DRAWINGS. <i>PROVIDE TO DOWL AT THE COMPLETION OF INSTALLATION.</i></li> </ul>	<p><b>GENERAL NOTES - LANDSCAPE PLANTING PLAN</b></p>
<p><b>PLANTING SUBMITTAL ITEMS</b></p>	<p><b>GENERAL NOTES - LANDSCAPE PLANTING PLAN</b></p>



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**BONAVENTURE SENIOR HOUSING**  
 LANDSCAPE NOTES AND SUBMITTAL ITEMS  
 BONAVENTURE SENIOR HOUSING  
 MILWAUKIE, OREGON  
 13333 RUSK ROAD MILWAUKIE, OR 97222

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**BONAVENTURE SENIOR HOUSING**  
**EXISTING BONAVENTURE BUILDINGS**

BONAVENTURE SENIOR HOUSING  
 MILWAUKIE, OREGON  
 13333 RUSK ROAD MILWAUKIE, OR 97222

PROJECT 14497-01  
 DATE 01/11/2019

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1 EAST ELEVATION  
SCALE: 1/16" = 1'-0"



2 WEST ELEVATION  
SCALE: NTS



3 NORTH ELEVATION  
SCALE: NTS



4 SOUTH ELEVATION  
SCALE: NTS

MATERIAL	COLOR
LAMINATED ARCHITECTURAL COMPOSITION SHINGLES	OWENS CORNING OAKRIDGE ONYX BLACK
FIBER CEMENT PANEL	SW2842 ROYCROFT SUEDE
2 FLASH HORIZONTAL PANELS	SW7020 BLACK FOX (TRIM AS SHOWN)
FIBER CEMENT VERTICAL TRIM	
FIBER CEMENT BOARD AND BATTEN	SW7033 BRAINSTORM BRONZE
1x2 BATTENS 12" oc ON	
4x8 FIBER CEMENT PANEL	
HORIZONTAL FLOOR BAND, FASCIA, GUTTERS, SOFFIT AND DECK TRIM	SW7020 BLACK FOX
MAIN BODY	SW6120 BELIEVABLE BUFF
FIBER CEMENT LAP SIDING	8" x 4" REVEAL LAP PATTERN
FIBER CEMENT LAP SIDING	8" x 4" REVEAL LAP PATTERN
FIBER CEMENT LAP SIDING	8" x 4" REVEAL LAP PATTERN
FIBER CEMENT LAP SIDING	8" x 4" REVEAL LAP PATTERN
FIBER CEMENT LAP SIDING	8" x 4" REVEAL LAP PATTERN
CULTURED STONE	QUALITY STONE VENEER
ADHERED STONE	OHIO DRYSTACK POWDER RIDGE
EXTERIOR DOOR PAINT TO MATCH VINYL WINDOW COLOR	SW6149 RELAXED KHAKI

GENERAL COLOR NOTES:  
1. ALL WINDOWS TO BE VINYL - "ALMOND"  
2. ALL BUILDING TRIM AND DOWNSPOUTS TO MATCH ADJACENT CLADDING COLOR, UNLESS OTHERWISE NOTED.

5 EXTERIOR FINISH SCHEDULE  
SCALE: NTS



6 Typical Carport  
SCALE: 1/8" = 1'-0"



7 Refuse Enclosure  
SCALE: 1/8" = 1'-0"



KEY PLAN

REVISIONS:	
PROJECT TITLE:	Milwaukie, OR
SHEET TITLE:	Bonaventure of Milwaukie Milwaukie, OR
SHEET:	17xx
DATE:	11/26/20
A3.1	



**1 EAST ELEVATION**  
SCALE: 1/16" = 1'-0"



**2 WEST ELEVATION**  
SCALE: NTS



**3 NORTH ELEVATION**  
SCALE: NTS

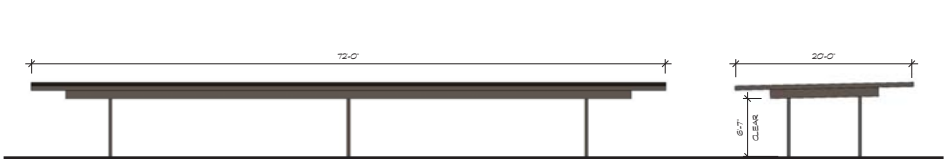


**4 SOUTH ELEVATION**  
SCALE: NTS

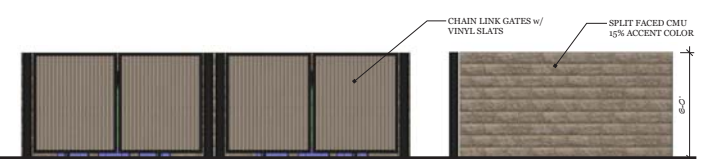
MATERIAL	COLOR
LAMINATED ARCHITECTURAL COMPOSITION SHINGLES	OWENS CORNING OAKRIDGE ONYX BLACK
FIBER CEMENT PANEL	SW6151 QUIVER TAN
2 FLASH HORIZONTAL PANELS	SW7033 BRAINSTORM BRONZE (POP-OUTS)
FIBER CEMENT VERTICAL TRIM	SW7020 BLACK FOX (TRIM AS SHOWN)
FIBER CEMENT BOARD AND BATTEN	SW7033 BRAINSTORM BRONZE
1/2 BATTENS 12" oc ON 4/8 FIBER CEMENT PANEL	
HORIZONTAL FLOOR BAND, FASCIA, GUTTERS, SOFFIT AND DECK TRIM	SW7020 BLACK FOX
MAIN BODY	SW2842 ROYCROFT SUEDE
FIBER CEMENT LAP SIDING	8" x 4" REVEAL LAP PATTERN
FIBER CEMENT LAP SIDING	8" x 4" REVEAL LAP PATTERN
FIBER CEMENT LAP SIDING	8" x 4" REVEAL LAP PATTERN
FIBER CEMENT LAP SIDING	8" x 4" REVEAL LAP PATTERN
FIBER CEMENT LAP SIDING	8" x 4" REVEAL LAP PATTERN
CULTURED STONE	QUALITY STONE VENEER
ADHERED STONE	OHIO DRYSTACK POWDER RIDGE
EXTERIOR DOOR AND WINDOW TRIM TO MATCH VINYL WINDOW COLOR	SW6149 RELAXED KHAKI

**GENERAL COLOR NOTES:**  
1. ALL WINDOWS TO BE VINYL - "ALMOND"  
2. ALL BUILDING TRIM AND DOWNSPOUTS TO MATCH ADJACENT CLADDING COLOR UNLESS OTHERWISE NOTED

**5 EXTERIOR FINISH SCHEDULE**  
SCALE: NTS



**6 Typical Carport**  
SCALE: 1/8" = 1'-0"



**7 Refuse Enclosure**  
SCALE: 1/4" = 1'-0"



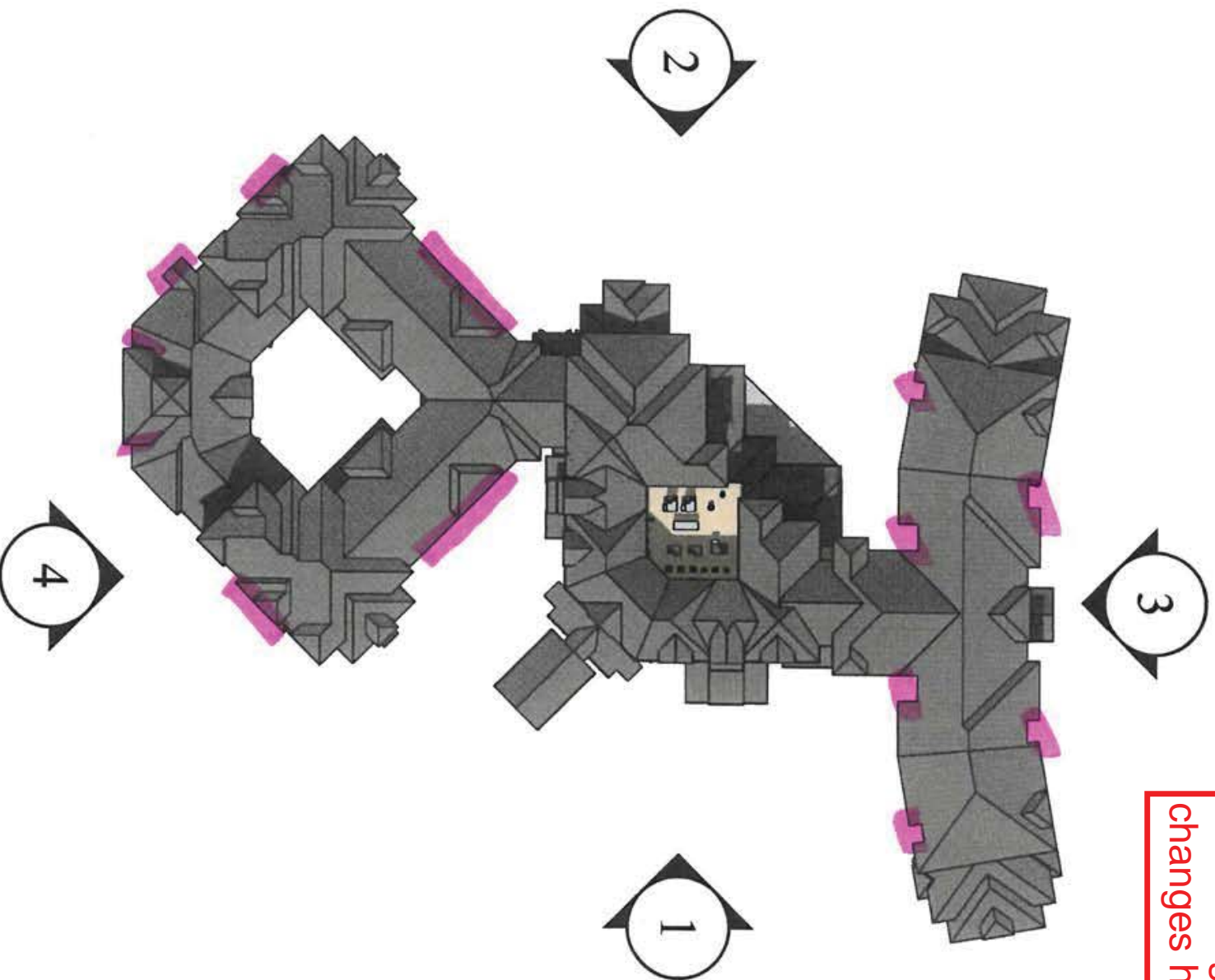
REVISIONS:	
PROJECT TITLE:	
Milwaukee, OR	
Bonaventure of Milwaukee Milwaukee, OR	
SHEET TITLE: EXTERIOR ELEVATIONS	
DESIGN BY: SHEET:	
17xx	A3.1
DATE: 11/26/2019	

8"/4" REVEAL LAP PATTERN	
FIBER CEMENT LAP SIDING	WING A ACCENT
8"/4" REVEAL LAP PATTERN	SW7645 THUNDER GRAY
FIBER CEMENT LAP SIDING	WING C ACCENT
8"/4" REVEAL LAP PATTERN	SW6096 JUTE BROWN
FIBER CEMENT LAP SIDING	BUILDING ACCENT
8"/4" REVEAL LAP PATTERN	SW2842 ROYCROFT SUEDE
CULTURED STONE	QUALITY STONE VENEER
ADHERED STONE	OHIO DRYSTACK
	POWDER RIDGE
EXTERIOR DOOR PAINT TO MATCH	SW6149 RELAXED KHAKI
VINYL WINDOW COLOR	

- GENERAL COLOR NOTES:**
1. ALL WINDOWS TO BE VINYL - "ALMOND"
  2. ALL BUILDING TRIM AND DOWNSPOUTS TO MATCH ADJACENT CLADDING COLOR UNLESS OTHERWISE NOTED.

## EXTERIOR FINISH SCHEDULE

SCALE: NTS



KEY PLAN

For comparison, the earlier roof plan as shown on Sheet A3.1, submitted Jan. 11, 2019---highlighted areas indicate where changes have been made.

PROJECT TITLE:

Milwaukee, OR

SHEET TITLE:  
EXTERIOR  
ELEVATIONS

Bonaventure of Milwaukee

Milwaukee, OR

DRAWN BY:

SHAWN

SHEET:

A3.1

OLD

PROJECT #:

17xx

DATE:

11/26/201

## **EXHIBIT B: PARKING ASSESSMENT MEMO**



## MEMORANDUM

Date: December 13, 2016

To: Jim Swan  
Bonaventure Senior Housing  
3425 Boone Road SE  
Salem OR 97317

From: Frank Charbonneau, PE, PTOE

Subject: Parking Assessment Report FL16126  
**Bonaventure Senior Living of Vancouver**  
NE 94<sup>th</sup> Avenue, Clark County

As requested a parking assessment has been prepared for the Bonaventure Senior Living facility being planned in Clark County at the southwest intersection corner of NE 94<sup>th</sup> Avenue and 86<sup>th</sup> Street.

The proposed development will consist of a senior residential building providing 160 units for memory care (28 units), assisted living (60 units), and independent living (72 units). A total of 125 on-site parking spaces will be provided for the residents, employees, and visitors. The property will have vehicular access at one main driveway location on 86<sup>th</sup> Street plus at a secondary driveway also on 86<sup>th</sup> Street. Figure `a` in the appendix is a vicinity map showing the site location. Figure `b` is the project site plan.

The following items are addressed in the study.

- Clark County building code parking requirements in terms of unit type and number of units.
- Analysis that documents applicable parking rates and numbers successfully adopted for other Bonaventure sites. Include justifiable parking data.
- Demonstrate that the parking demand established from proven data at numerous other Bonaventure sites will not exceed the on-site parking capacity of 125 on-site spaces.

The Bonaventure Senior Living of Vancouver facility will provide on-site parking for staff, residents, visitors, and a company owned 15-seat passenger van. Six spaces for handicap parking and an 8 feet by 20 feet drop-off zone will be included for a total parking capacity of 125 spaces. One space measuring 15 feet by 21 feet will be reserved for the passenger van.

The residents typically average 82 years of age. Data derived from 40 existing Bonaventure facilities has established that no more than 50% of the independent living residents drive and maintain a vehicle on site. At the Clark County site this would equate to 36 spaces (50% of 72 independent units). A total of 39 spaces are being provided according to the parking utilization plan (see Exhibit 1 - Parking Utilization chart in appendix) and is 55% of the independent living units.

No parking spaces are necessary for the assisted living or memory care residents since they do not drive.



At full occupancy there will be approximately 50 staff members employed over three shifts. The maximum number of employees will equate to 20 staff members during the normal operating hours so 20 spaces are needed for staff use. The number could be lower if any of the employees elect to commute using C-Tran. The parking utilization plan identifies 24 spaces will be available for employees.

Visitors accessing site average a one hour stay with the number of vehicles ranging from five to 10 cars per hour throughout the day between 6:00AM and 8:00PM. The maximum number visitor cars parked (10 vehicles) occurs during the mid-day period between 11:00-1:00PM and again between 5:00-8:00PM. The parking demand by time of day is supported by the parking utilization data contained in the appendix.

Clark County building code parking standards for senior residential facilities include 1.50 spaces per unit for independent living and one space per three beds for assisted living and memory care uses. Applying these rates for the new building equates to a total of 138 spaces.

The Clark County parking requirement for independent living is 1.5 spaces per unit and is applicable to all multi-family developments regardless of type and bedroom count (CCC Table 40.340.010-4). The County code does not have a parking standard for senior housing aka independent living. The independent living section of the new Bonaventure facility will have far less resident parking but more employee parking than for typical apartment use. The industry standard for independent living in a suburban setting is close to one parking space per unit and therefore is much lower than the County requirement.

Bonaventure has developed a range of parking ratios that are specific for their facilities. While many jurisdictions use a parking standard close to 0.50 spaces per residential unit Bonaventure's own experience has determined the ratio must be higher to adequately handle the parking needs. Over the years they have established that an average parking ratio of 0.65 to 0.70 per unit is ideal for a mixed-use facility and is more than adequate for their residents, guests, employees, and service needs without impacting the surrounding properties or nearby streets. Parking assessments of previously developed Bonaventure sites that included input from residents and visitors and observations by staff have been helpful in solidifying the optimum parking standard for Bonaventure. In support of the parking ratio standard adopted by Bonaventure Table 1 is included (following page) and contains a listing of 30 existing senior living facilities operated by Bonaventure (last site listed in table is the proposed development in Clark County) . The data identifies the site location, number of units by type, number of parking spaces, and the parking ratio for each site. It should be noted that six sites on the list were identified as having parking shortage issues (parking ratios lower than 0.56). If these sites are excluded the average parking rate increases to 0.70 spaces/unit.

The new Bonaventure of Vancouver site will incorporate a parking ratio of 0.78 spaces/unit with 125 stalls for the 160 unit facility. This parking ratio is more than adequate for the use, location, and total size of 160 units. Furthermore, a parking ratio of 0.78 spaces per unit is supported by the other comparable Bonaventure locations provided on the next page.

Table 1 Parking Ratios for Bonaventure Senior Communities & Proposed Site							
FACILITY	Year Opened	No. Units			Total Units	Total Spaces	Spaces Per Unit
		AL	IL	MC			
<b>Bridgewood*</b> Vancouver, WA	2003	72	52		124	61	0.49
<b>Cascadia Village</b> Sandy, OR	2000	50	34		84	48	0.57
<b>Five Rivers*</b> Tillamook, OR	2002	64	24		88	33	0.38
<b>Monticello Park</b> Longview, WA	2001	84	60		144	101	0.70
<b>Woodland*</b> Lacey, WA	2004	78	72		150	84	0.56
<b>Olympic Place</b> Arlington, WA	2004	62	46		108	67	0.62
<b>Rosemont</b> Yelm, WA	2004	62	24		86	48	0.56
<b>Columbia Heights</b> Wenatchee, WA	2004	72	64		136	92	0.68
<b>Cedar Ridge</b> Bonney Lake, WA	2007	66	42		108	68	0.63
<b>Silver Creek</b> Puallup, WA	2005	66	42		108	79	0.73
<b>Seaport</b> Port Townsend, WA	2005	66	42		108	73	0.68
<b>Park Vista</b> Port Orchard, WA	2006	66	42		108	78	0.72
<b>Spring Creek*</b> Bellingham, WA	2006	81	81		162	83	0.51
<b>North Creek*</b> Bothell, WA	2008	76	62		138	69	0.50
<b>Bonaventure Place</b> Boise, ID	2007	131	75		206	100	0.49
<b>Riverton*</b> Richland, WA	2008	88	76		164	77	0.47
<b>East Wenatchee</b> East Wenatchee, WA	2009	78	96	19	193	103	0.53
<b>Lacey</b> Lacey, WA	2009	60	116	24	200	120	0.60
<b>Sparks</b> Sparks, NV	2009	80	128	16	224	148	0.66
<b>Idaho Falls</b> Idaho Falls, ID	2009	66	99	16	181	172	0.95
<b>Billings</b> Billings, MT	2009	70	104	16	190	128	0.67
<b>Salem</b> Salem, OR	2012	52	66	24	142	143	1.01
<b>Castle Rock</b> Castle Rock, CO	2012	55	89	18	162	101	0.62
<b>Bonaventure of Salem</b> Salem, OR	2012	52	66	24	142	143	1.01
<b>Bonaventure of Co. Springs</b> Colorado Springs, CO	2014	52	80	17	149	124	0.83
<b>Bonaventure of Pueblo</b> Pueblo, CO	2015	55	65	24	144	118	0.82
<b>Bonaventure of Salmon Creek</b> Salmon Creek, WA	2015	53	63	24	140	91	0.65
<b>Bonaventure of Albany</b> Albany, OR	2015	54	67	22	143	93	0.65
<b>Bonaventure of Tigard</b> Tigard, OR	2016	54	70	23	147	118	0.80
<b>Bonaventure of Gresham</b> Gresham, OR	2016	57	74	24	155	104	0.67
Parking Ratio All Exist Sites					4334	2867	0.66
Park Ratio Exist Sites - Shortage Sites					3508	2460	0.70
<b>PROPOSED</b>							
<b>Bonaventure at Vancouver</b>	2018	60	72	28	160	125	0.78

\*Communities that have experienced issues due to parking shortages

Shown in Table 2 is the projected parking demand by use (staff, resident, & visitor), available parking, capacity, and occupancy percentages by time of day for the proposed Bonaventure site.

**Table 2 BONAVENTURE OF CLARK COUNTY PARKING DEMAND & CAPACITY SUMMARY**

Time	Employee Parking Demand	Resident Parking Demand	Visitor Parking Demand	Total Parking Demand	Available Parking	Open Spaces	% Occupied Spaces
4:00 AM	4	39	0	43	125	82	34%
5:00 AM	5	39	2	46	125	79	37%
6:00 AM	9	39	5	53	125	72	42%
7:00 AM	11	39	5	55	125	70	44%
8:00 AM	17	39	5	61	125	64	49%
9:00 AM	19	39	5	63	125	62	50%
10:00 AM	21	39	5	65	125	60	52%
11:00 AM	23	39	10	72	125	53	58%
12:00 PM	24	39	10	73	125	52	58%
1:00 PM	24	39	8	71	125	54	57%
2:00 PM	24	39	5	68	125	57	54%
3:00 PM	24	39	5	68	125	57	54%
4:00 PM	24	39	5	68	125	57	54%
5:00 PM	22	39	10	71	125	54	57%
6:00 PM	15	39	10	64	125	61	51%
7:00 PM	13	39	10	62	125	63	40%
8:00 PM	8	39	6	53	125	72	42%
9:00 PM	7	39	2	48	125	77	38%
10:00 PM	4	39	0	43	125	82	34%

The peak demand will total 73 spaces during the noon hour and remain above 60 spaces between the hours of 8:00AM to 8:00PM. The highest percent occupancy is 58% based on 125 spaces, leaving 52 stalls available for additional parking. Considering the in-depth historical parking data documented by Bonaventure the number of available spaces is considered more than adequate to accommodate the facility at all times and not result in a parking impact to the neighborhood.

Based on the results of the parking analysis it is recommended that Clark County support the proposed site plan containing a total of 125 on-site parking spaces.

If you should have any questions, please contact Frank Charbonneau, PE, PTOE at 503.293.1118.

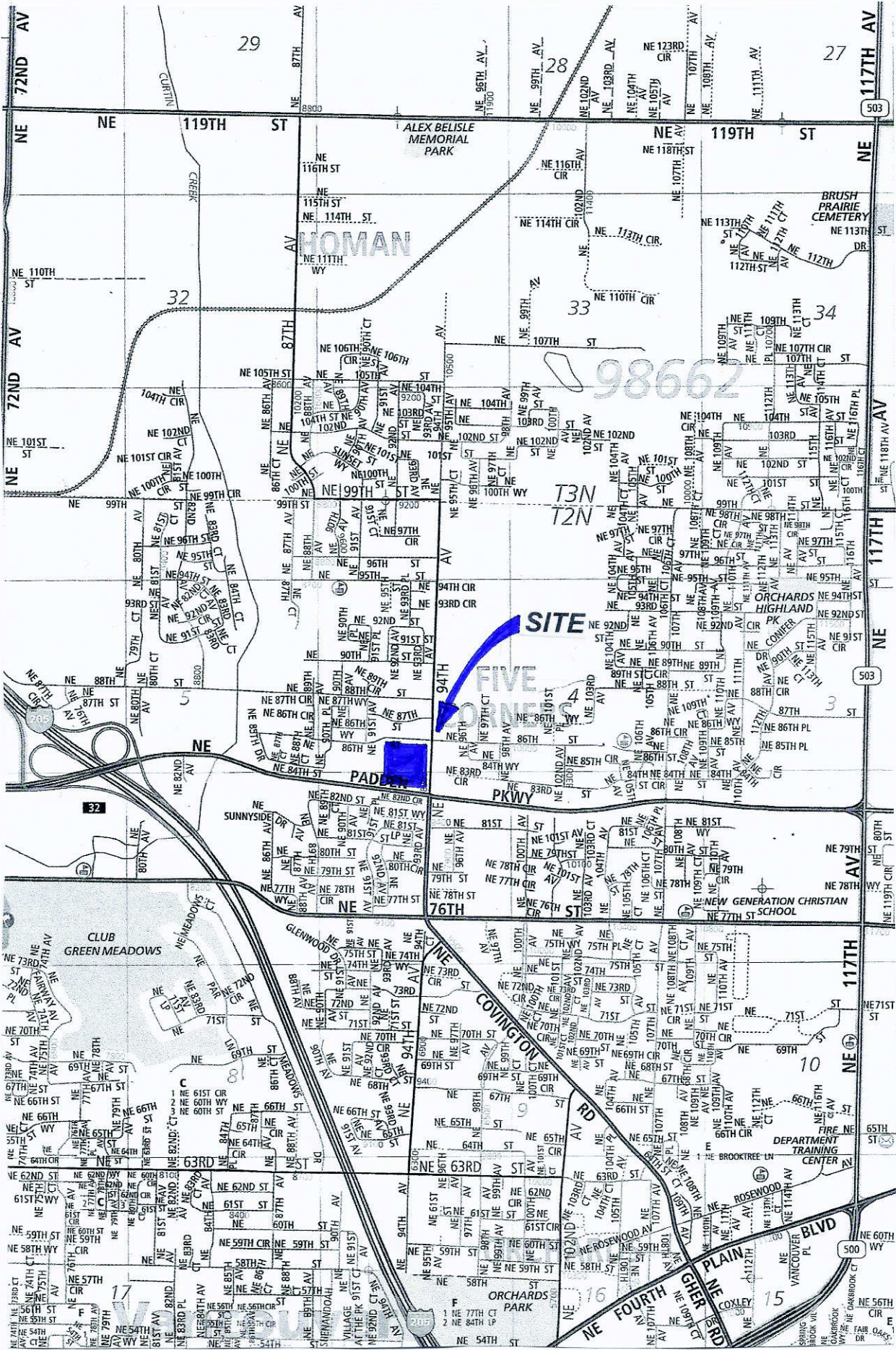
#### **Appendix**

Figure 'a' Vicinity Map  
 Figure 'b' Site Plan  
 Exhibit 1 Parking Demand by Time of Day



FILE NAME: 1639flow.dwg

PLOT DATE: 10.25.16



**CHARBONNEAU ENGINEERING LLC**  
 PROJECT: 16-39

NOTES:  
 NO SCALE

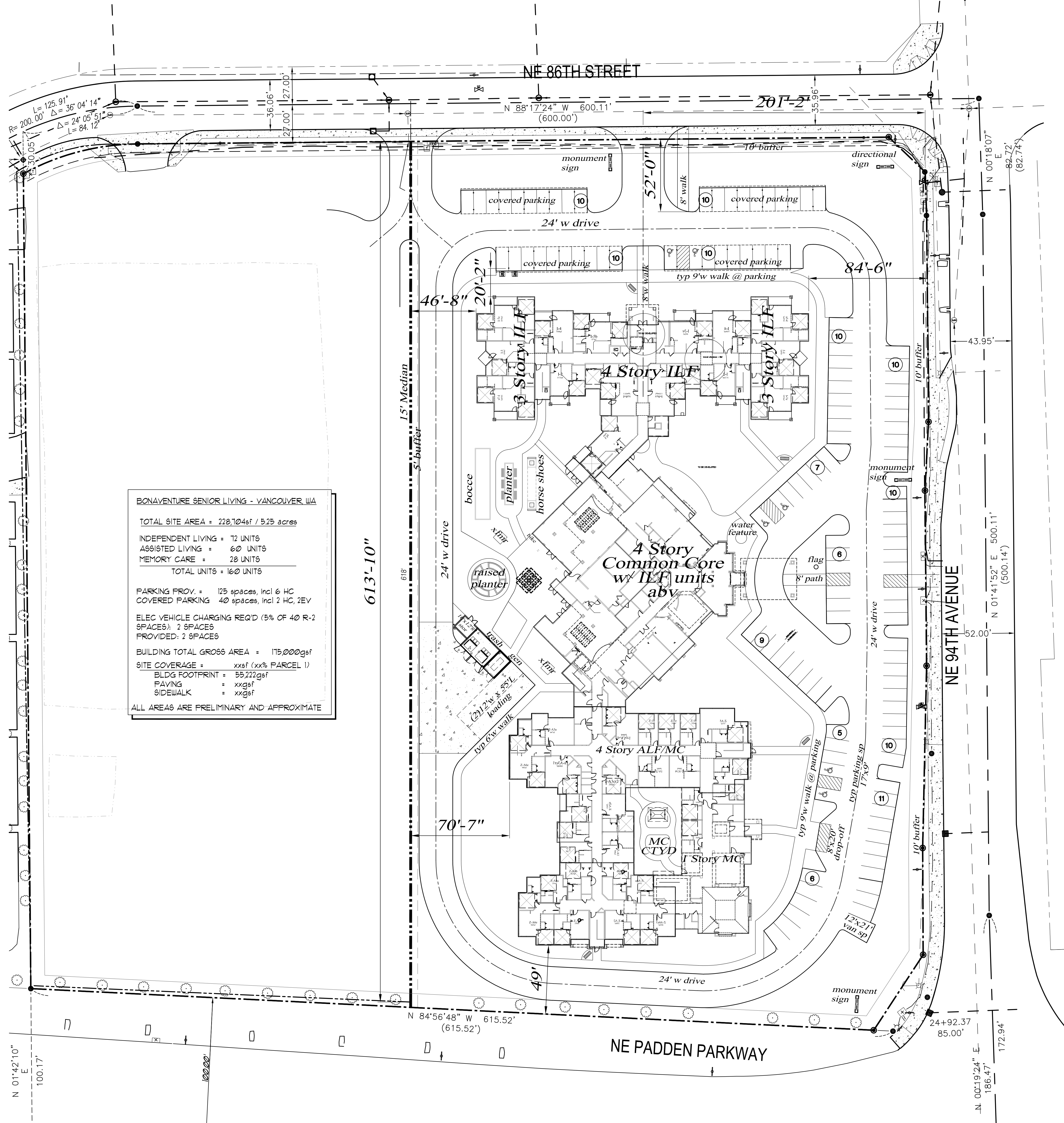


VICINITY MAP  
 BONAVENTURE SENIOR LIVING

FIGURE  
 a

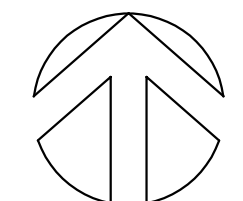
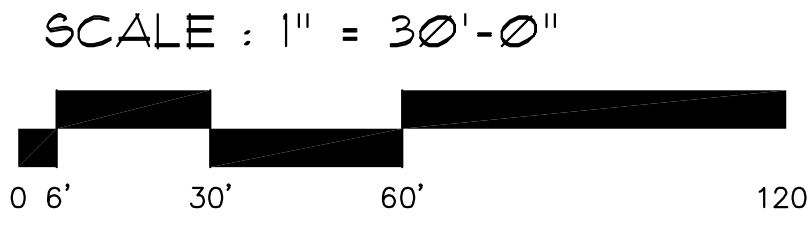
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LAST SAVED: Thu, 01 Dec 2016 - 03:19 pm LOCATION: M:\Drafting\Projects\16xx Vancouver 86th st\BND-Prelim stephan8 Vancouver 86th st 12-1-16 12-01.dwg, Site Plan-Vncvr  
 PRINTED: Thu, 01 Dec 2016 - 03:23 pm PRINTED BY: JClarkson



BONAVENTURE SENIOR LIVING - VANCOUVER, WA	
TOTAL SITE AREA	= 228,104sf / 5.25 acres
INDEPENDENT LIVING	= 12 UNITS
ASSISTED LIVING	= 60 UNITS
MEMORY CARE	= 28 UNITS
TOTAL UNITS	= 100 UNITS
PARKING PROV.	= 125 spaces, incl 6 HC
COVERED PARKING	= 40 spaces, incl 2 HC, 2EV
ELEC VEHICLE CHARGING REQ'D (5% OF 40 R-2 SPACES)	= 2 SPACES
PROVIDED	= 2 SPACES
BUILDING TOTAL GROSS AREA	= 175,000gsf
SITE COVERAGE	= xxsf (xx% PARCEL 1)
BLDG FOOTPRINT	= 55,222gsf
PAVING	= xxgsf
SIDEWALK	= xxgsf
ALL AREAS ARE PRELIMINARY AND APPROXIMATE	

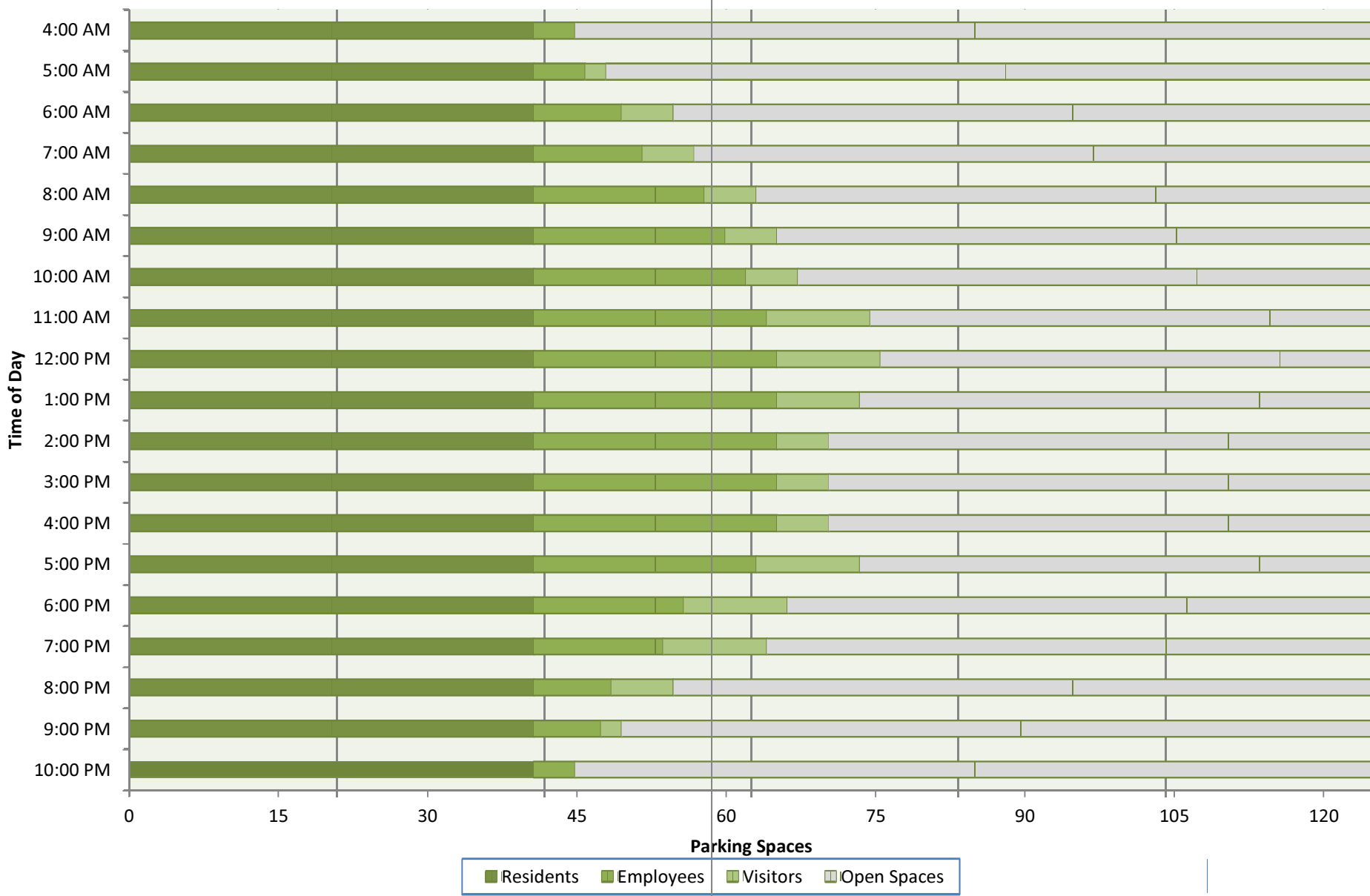
**SITE PLAN Figure `b`**



REVISIONS:	
PROJECT TITLE:	Vancouver, Wa
SHEET TITLE:	Bonaventure of Vancouver
DRAWN BY:	
PROJECT:	XX
DATE:	XX

**PRELIMINARY  
NOT FOR  
CONSTRUCTION  
Dec 01 2016**

# Exhibit 1 - Parking Utilization by Time of Day





## **EXHIBIT C: PRE-APPLICATION SUMMARY NOTES**







# CITY OF MILWAUKIE

September 26, 2018

Serah Breakstone  
DOWL  
720 SW Washington St, Ste.750  
Portland OR 97205

**Re: Preapplication Report**

Dear Serah:

Enclosed is the Preapplication Report Summary from your meeting with the City on September 6, 2018, concerning your proposal for action on property located at 13333 SE Rusk Rd.

A preapplication conference is required prior to submittal of certain types of land use applications in the City of Milwaukie. Where a preapplication conference is required, please be advised of the following:

- Preapplication conferences are valid for a period of 2 years from the date of the conference. If a land use application or development permit has not been submitted within 2 years of the conference date, the Planning Director may require a new preapplication conference.
- If a development proposal is significantly modified after a preapplication conference occurs, the Planning Director may require a new preapplication conference.

If you have any questions concerning the content of this report, please contact the appropriate City staff.

Sincerely,

Alicia Martin  
Administrative Specialist II

Enclosure

cc: Bonaventure - Jim Clarkson, Daniel Dobson, John Eld  
Scott Emmens, DOWL  
Chris Brehmer, Kittleson & Associates, Inc.

**PRE-APPLICATION CONFERENCE REPORT**

---

**This report is provided as a follow-up to a meeting that was held on 9/6/2018 at 10:00am**

**Applicant Name:** Serah Breakstone

**Company:** DOWL

**Applicant 'Role':** Other

**Address Line 1:** 720 SW Washington St, Ste. 750

**Address Line 2:**

**City, State Zip:** Portland OR 97205

**Project Name:** Bonadventure Senior Housing

**Description:** New senior living facility

**ProjectAddress:** 13333 SE Rusk Rd

**Zone:** Residential R-3 and R-10

**Occupancy Group:**

**ConstructionType:**

**Use:** Medium Density (MD) and Low Density (LD)

**Occupant Load:**

**AppsPresent:** Jim Clarkson, Serah Breakstone, Scott Emmens, Chris Bremmer, Daniel Dobson, John Eld

**Staff Attendance:** Dennis Egner, Brett Kelper, Alex Roller, Matt Amos

**BUILDING ISSUES**

**ADA:** Building will need to be Fully ADA compliant.

**Structural:** Building will need to meet all of the provisions of the Oregon Structural Specialty Code (OSSC).

**Mechanical:** Building will need to meet all the provisions of the Oregon Mechanical Specialty Code (OMSC).

**Plumbing:** Building will need to meet all the provisions of the Oregon Plumbing Specialty Code (OPSC).

**Plumb Site Utilities:** On site plumbing requires plumbing plan review. Two sets of plans will need to be submitted to the building office separate from any grading, utility, or erosion plans submitted to Engineering for review.

**Electrical:** Building will need to meet all of the povisions of the National Electrical Code.

**Notes:**

**Please note all drawings must be individually rolled. If the drawings are small enough to fold they must be individually folded.**

### **FIRE MARSHAL ISSUES**

- Fire Sprinklers:** Will need to be provided for as per the Oregon Structural Specialty Code (OSSC).
- Fire Alarms:** Will need to be provided for as per the Oregon Structural Specialty Code (OSSC).
- Fire Hydrants:**
- Turn Arounds:**
- Addressing:**
- Fire Protection:**
- Fire Access:**
- Hazardous Mat.:**
- Fire Marshal Notes:** See attached.

### **PUBLIC WORKS ISSUES**

- Water:** An unknown size Clackamas River water main in SE Kellogg Creek Dr is available to provide connection to serve the proposed development. The applicant shall construct adequately sized domestic line and all required fire components (hydrants and/or sprinklers) per Clackamas Fire District (CFD) #1 and building requirements. Water construction will conform to Clackamas River Water (CRW) standards. Betty Johnson (503-723-2571) at CRW will be your contact for construction and System Development Charges (SDC) requirements. Construction of improvements within the public right-of-way shall be completed prior to final building approval. During construction plan review, the Fire Chief and City Engineer may determine that existing fire hydrants are adequate to serve the development. Please refer to CFD #1 memorandum for additional requirements.
- Sewer:** An unknown size Clackamas County Water Environment Services (WES) wastewater main located in Kellogg Creek Dr is available for connection to serve the proposed development. There are no City of Milwaukie utilities being constructed, so development will not pay any Milwaukie SDCs. WES (503-742-4567) will be your contact for sewer requirement. Clackamas County's SDCs are collected with the building permit and forwarded to the County. The wastewater SDC will be assessed and collected at the time the building permits are issued.
- Storm:** Submission of a stormwater management plan by a qualified professional engineer is required as part of the proposed development. The plan shall conform to Section 2 - Stormwater Design Standards of the City of Milwaukie Pubic Works Standards. As referenced in Section 2.0013.B, the City of Milwaukie has adopted City of Portland standards for design of water quality facilities. The stormwater management plan shall demonstrate that the post-development runoff does not exceed the pre-development runoff, including any existing stormwater management facilities serving the development property. Also, the plan shall demonstrate compliance with water quality standards. The presence of the wetland on the west side of the property will add additional stormwater release requirements.

All new impervious surfaces, including replacement of impervious surface with new impervious surfaces, are subject to the water quality standards. See Milwaukie Public Works Standards for design and construction standards and detailed drawings.

The storm SDC is based on the amount of new impervious surface constructed at the site. One storm SDC unit is the equivalent of 2,706 sq ft of impervious surface. The storm SDC is currently \$930 per unit. The storm SDC will be assessed and collected at the time the building permits are issued.

**Street:**

The proposed development fronts the north side of Kellogg Creek Dr. The portion of Kellogg Creek Dr fronting the proposed development has a right-of-way width of 40 to 50 ft, has a 5-ft wide curb tight sidewalk on the north side, and is unimproved on the south side.

The transportation SDC will be based on the increase in trips generated by the new use per the Trip Generation Handbook from the Institute of Transportation Engineers. The SDC for transportation is \$2,114 per trip generated. Credits will be given for any demolished structures, which shall be based upon the existing use of the structures.

**Frontage:**

Chapter 19.700 of the Milwaukie Municipal Code, herein referred to as the "Code", applies to partitions, subdivisions, new construction, and modification and or expansions of existing structures or uses that produce a projected increase in vehicle trips.

Transportation Facility Requirements, Code Section 19.708, states that all rights-of-way, streets, sidewalks, necessary public improvements, and other public transportation facilities located in the public right-of-way and abutting the development site shall be adequate at the time of development or shall be made adequate in a timely manner.

Kellogg Creek Dr

According to Code Table 19.708.2 the local street cross section includes the following:

- 10-ft travel lanes
- 8-ft parking lane with curb & gutter
- 5-ft bike lanes
- 5-ft landscape strips
- 5-ft setback sidewalks

Kellogg Creek Dr right-of-way terminates at the entrance to the park property to the west. Per MMC 19.708.1.E.4 permanent turnarounds are only permitted when no opportunity exists for creating a through street connection. There is no foreseeable potential for the street to be extended into the park. The proposed development's frontage includes the entire length of Kellogg Creek Dr. The development will be responsible for constructing a turnaround at the west end as part of the required improvements. The turnaround can be located east of the existing habitat conservation area located in the southwest corner of the property. Right-of-way dedication will be required to accommodate the above frontage improvements.

The required bike lane is identified in the 2013 Transportation System Plan as connecting the southwest corner of the development to the northeast corner of the development at the intersection of Rusk Rd and Highway 224. There are two available options for this bike lane:

1. Construct 5-ft bike lane along entire Kellogg Creek Dr and Rusk Rd frontage.
2. Construct 10-ft bike lane through site with clear signage. Bike lane will connect southwest corner to the northeast corner. Final design will be determined in plan review.

Applicant will be responsible for constructing the above improvements prior to occupancy. In addition,

additional improvements may be required at the conclusion of the Traffic Impact Study (TIS). These may include turning lanes on Rusk Rd at Kellogg Creed Dr or Hwy 224, turning lanes on Kellogg Creek Dr, or restricted access requirements.

**Right of Way:** The right-of-way width varies between 40 and 50 ft. Right-of-way dedication will be required to accommodate the above frontage improvements.

**Driveways:** Code Section 12.16.040.A states that access to private property shall be permitted with the use of driveway curb cuts and driveways shall meet all applicable guidelines of the Americans with Disabilities Act (ADA). Driveway approaches shall be improved to meet the requirements of Milwaukie's Public Works Standards, Section 5.0085, at the time of development. Per Code Section 12.16.F.6, the driveway width will be between 12 and 36 ft wide. Per Code Section 12.16.040.C.4.c spacing requirements between driveways and intersections on a local is 100 ft.

**Erosion Control:** Per Code Section 16.28.020(C), an erosion control permit is required prior to placement of fill, site clearing, or land disturbances, including but not limited to grubbing, clearing or removal of ground vegetation, grading, excavation, or other activities, any of which results in the disturbance or exposure of soils exceeding 500 sq ft. The proposed development exceeds the threshold; therefore, an erosion control permit is required.

Code Section 16.28.020(E) states that an erosion control permit is required prior to issuance of building permits or approval of construction plans. Also, Code Section 16.28.020(B) states that an erosion control plan that meets the requirements of Code Section 16.28.030 is required prior to any approval of an erosion control permit.

**Traffic Impact Study:** Code Section 19.704.1(A) states that the City will determine whether a TIS is required. In the event the proposed development will significantly increase the intensity of use, a TIS will be required. The City Engineering Director will make the determination based on the availability of sufficient information to determine the impact of the proposed development.

If required, the TIS triggers a Transportation Facilities Review (TFR) Land Use Application to be filed concurrent with the land use application. Once the scope of the proposed development is determined and a deposit of \$1500 is paid, the City will provide a detailed TIS scope for the traffic study. When the TIS is completed in accordance with the scope, the applicant shall schedule a second preapplication meeting with Milwaukie Engineering staff. The second preapplication meeting will allow Engineering staff to review and comment on the applicant's TIS prior to submission of any land use applications. The fee for the second preapplication meeting is \$100 and a deposit of \$2500. Upon completion of the second preapplication meeting, the applicant may submit their land use applications.

The Engineering Director has determined that there is not sufficient information available and a TIS will be required.

**PW Notes:** APPLICABILITY OF PREAPPLICATION REVIEW  
The comments provided are preliminary and intended to address the original application materials submitted unless otherwise specifically called out in the notes. The information contained within these notes may change over time due to changes or additional information presented for the development. This preapplication review is for the following:

The construction of a 165-unit adult care facility with three different levels of care.

#### SYSTEM DEVELOPMENT CHARGES (SDCS)

There was insufficient information to estimate SDCs with the pre-application submitted. All SDCs are calculated, assessed, and collected at the time of building permit is issued. Any changes in the proposed use may result in a change in the SDCs that are assessed. If the applicant needs an estimate of

SDCs then staff can provide the specific information to be submitted by the applicant required to calculate SDCs for a given proposal.

In addition to the SDCs mentioned earlier, there is a parks and recreation SDC that is triggered when application for a building permit on a new dwelling is received. The City is in communication with North Clackamas Parks and Recreation District about the SDC methodology for adult care facilities. The parks and recreation SDC will be assessed and collected at the time the building permits are issued.

#### OVERHEAD UTILITIES

No new overhead utilities will be allowed. The development will be required to underground all utilities required due to the development, including all utilities that serve the development.

#### REQUIREMENTS PRIOR TO OCCUPANCY

- Engineered plans for public improvements (street, sidewalk, and utility) are to be submitted and approved prior to start of construction. Full-engineered design is required along the frontage of the proposed development. Plans shall be prepared by a Professional Engineer licensed in the State of Oregon.

- The applicant shall pay an application, plan review, and inspection fee in accordance with the City Master Fee Schedule prior to the issuance of building permits.

- The applicant shall provide a payment and performance bond for 100% of the cost of the public improvements prior to the start of construction.

- The applicant shall provide a final approved set of Mylar "As Constructed" drawings to the City of Milwaukie prior to the final inspection.

- The applicant shall provide a maintenance bond for 100% of the cost of the public improvements prior to the final inspection

#### ADDITIONAL NOTES

- All fees mentioned are subject to change in accordance with the City of Milwaukie Master Fee Schedule.

### PLANNING ISSUES

#### Setbacks:

The independent and assisted living portions of the project are a Conditional Use (CU). Conditional uses are subject to the setback requirements of the underlying zone, and additional setbacks can be imposed as conditions of approval (MMC Subsection 19.905.5). In the R-10 zone, front and rear yard setbacks are 20 ft, side yard setbacks are 10 ft, and street-side yard setbacks are 20 ft. In the R-3 zone, front and rear yard setbacks are 15 ft, side yard setbacks are 5 ft, and street-side yard setbacks are 15 ft.

The memory care portion of the project is a Community Service Use (CSU); setbacks for "nursing or convalescent homes" as CSUs are the greater of 25 ft or the setback of an adjacent residential zone or the underlying zone. The 25-ft standard is greater than maximum 20-ft setbacks required for the underlying R-10 and R-3 zones as well as for the adjacent County R-10 zone.

#### Landscape:

A minimum of 35% of the site must be landscaped (the standards for the R-10 and R-3 zones are the same). Vegetated areas may be planted in trees, grass, shrubs, or bark dust for planting beds, with no

more than 20% of the landscaped area finished in bark dust (as per MMC Subsection 19.504.7). Required landscaping for off-street parking areas may be counted toward the minimum vegetation requirement.

A maximum of 30% of the R-10 portion of the site may be covered by structures; the maximum lot coverage allowed for the R-3 portion of the site is 40%. Additional limitations on lot coverage or building size and location can be imposed as conditions of the CU and/or CSU approval.

**Parking:**

The off-street parking standards outlined in MMC Table 19.605.1 provide two standards that are relevant: (1) as multifamily dwellings for the independent living suites and assisted living suites; and (2) as nursing, convalescent, and extended-care facilities for the memory care suites.

For multifamily dwellings, the minimum requirement depends on the size of the unit: 1 space for each unit that is 800 sq ft or less, and 1.25 spaces for each unit over 800 sq ft. The maximum parking allowance is 2 spaces per unit regardless of size. For nursing, convalescent, and extended-care facilities, the minimum number required is 1 space per 4 beds and the maximum allowed is 1 space per 3 beds.

Alternately, the applicant can request a parking determination (Type II review) to assert that a different quantity of spaces should be required or allowed. MMC Subsection 19.605.2 establishes the process for parking determinations, including providing data and analysis to support the request.

The design standards for off-street parking areas (including landscaping and lighting) are established in MMC Section 19.606. Note that pedestrian access must be provided through parking areas so that no parking space is more than 100 ft from a building entrance or a walkway. Required walkways must meet the standards of MMC Subsection 19.504.9.E, including for permeability and minimum lighting levels.

The requirements for perimeter landscaping (MMC Subsection 19.606.2.C) are relevant where adjacent to the church site. Adjusting the property boundaries to establish the church on its own single lot will require the applicant to demonstrate that the church parking lot provides a minimum perimeter landscaping buffer of 6 ft. Similarly, the proposed development must provide at least a 6-ft perimeter landscaping buffer on the senior living facility site. If this standard cannot be met, a variance may be requested, subject to the Type III review process and the approval criteria of MMC Subsection 19.911.4.B.

**Transportation Review:**

As new construction, the project triggers the applicability of MMC Chapter 19.700 Public Facility Improvements. The City's Engineering Department has indicated that a Traffic Impact Study (TIS) will be required, with the scope provided by the City. See the Public Works notes or contact the Engineering Department for more information about the requirements of MMC 19.700, including potential right-of-way dedication, street improvements, or access spacing.

**Application Procedures:**

The independent and assisted living units will be reviewed as senior and retirement housing, which requires Conditional Use (CU) approval in the R-10 and R-3 zones. The memory care aspect is similar to a nursing or convalescent home and will be reviewed as a Community Service Use (CSU). Both of these applications require Type III review, with a decision by the Planning Commission at a public hearing.

The proposed building exceeds the maximum height allowance of both the R-10 and R-3 zones (the lesser of 2.5 stories or 35 ft). A Type III Variance Request will be required.

As noted below under "Natural Resource Review," some form of Natural Resource (NR) application will be required. The applicant is proposing to amend the City's NR Administrative Map to verify the



natural resource boundaries, which requires Type II review. Additional NR review (either Type I or III) may be required for any non-exempt disturbance of the natural resource.

In addition, since a TIS is required, a Type II Transportation Facilities Review (TFR) application is necessary to address the relevant requirements of MMC Chapter 19.700.

To put the church and proposed senior living facility on their own separate lots, an application for Lot Consolidation (LC) and Property Line Adjustment (PLA) will be required, processed with Type I review. The resulting changes to the church site (playground & parking area landscaping) constitute a minor modification to the church CSU, which will be processed concurrently with the LC/PLA.

Current application fees relevant to the proposal:

Type III review = \$2,000 per application (CSU & CU, NR review for major disturbance if needed, Variance(s))

Type II review = \$1,000 per application (TFR, NR review for map revision, Parking determination if requested)

Type I review = \$200 per application (LC, NR review for limited disturbance if needed)

PLA = specific application fee of \$650

Additional fees or deposits:

TIS = Actual cost for scope of work preparation, with \$1,500 reserve deposit; actual cost for review of TIS, with \$2,500 reserve deposit

Natural Resources = \$3,000 reserve deposit, with actual cost charged for peer review of applicant's natural resource report

For concurrent applications, the most expensive application is charged full price and the fees for all other applications are discounted 25%.

For the City's initial review of the application package, the applicant should submit 5 complete copies of the submittal materials, including all required forms, checklists, narrative, and plans. (Note: Disregard the call for 12 copies noted in the code and on several checklists.) A determination of the application's completeness will be issued within 30 days. If deemed incomplete, additional information will be requested. If deemed complete, additional copies of the application may be required for referral to other departments, the Lake Road Neighborhood District Association (NDA), and other relevant parties and agencies. City staff will inform the applicant of the total number of copies needed.

Once the application is deemed complete, a public hearing with the Planning Commission will be scheduled. Public notice will be provided to property owners and residents within 300 ft of the subject property at least 20 days prior to the public hearing. A sign giving notice of the application must be posted on the subject property at least 14 days prior to the hearing.

Following a determination that the application is complete (estimate at least 1 month for completeness review process, as noted above), processing time to a final decision for Type III review is approximately 2 months. Issuance of a final decision starts a 15-day appeal period for the applicant and any party who establishes standing.

Prior to submitting the application, the applicant is encouraged (but not required) to present the project at a regular meeting of the Lake Road NDA (6:30 p.m. on the second Wednesday of most months, usually at Rowe Middle School, 3606 SE Lake Rd).

Following the Type III review process, a Type I Development Review application (\$200 fee) will be required in conjunction with the development permits for construction of the project.

**Natural Resource Review:** The site includes Kellogg Creek, a delineated wetland, and floodplain areas. These natural resource features generate Water Quality Resource (WQR) and Habitat Conservation Area (HCA) designations on the site. A stand of old-growth Oregon white oak trees in the southwest corner of the site is not currently designated as an HCA on the City's Natural Resource (NR) Administrative Map, while a sparsely canopied area extending almost 200 ft south of Mt Scott Creek is shown as HCA. The applicant has proposed a detailed boundary verification of the HCA in accordance with the procedures outlined in MMC Subsection 19.402.15.A.2.b. That verification process requires Type II NR review.

Taking the updated HCA boundary into account, the applicant can determine whether any WQR or HCA will be disturbed by the proposed development. Depending on the level of any WQR or HCA disturbance, Type I or III NR review may be required.

**Lot Geography:** The subject property is comprised of four tax lots that mirror what appear to be underlying lots of record, established by deed in the 1970s or earlier. With the exception of tax lot 900, none of the lots are strictly rectilinear, though they would be if not for their various frontages along Highway 224 (which runs at an angle northwest to southeast) and/or Rusk Rd (which has a curved radius where it turns from a north-south alignment to an east-west alignment at the southeast corner of tax lot 600).

**Planning Notes:** General Note = These notes represent staff's best evaluation of the applicant's proposal(s) in advance of any official submittal of a land use application. They do not represent approval or denial of the proposed action, only an assessment of the issues and likely requirements.

Church access = A shared access easement will be required as part of the Lot Consolidation and Property Line Adjustment process, to ensure that the church retains access to Kellogg Creek Dr. The boundary adjustment itself will not trigger a review of the church driveway onto Rusk Rd, but the proposed development of the senior living facility will require driveway modifications to eliminate egress to Rusk Rd and to allow right-in-only movements (since the shared access would allow new trips from the senior living facility onto the church site).

Multifamily design = Although the proposed development is not technically a multifamily project, the applicant should expect to address the multifamily design standards of MMC 19.505.3 to demonstrate the project's compatibility as part of the CSU and CU reviews.

Site design suggestions = Consider shifting some parking to the northeast corner of site, to allow the overall development footprint to be moved away from the wetland and WQR area. This may also provide room for the required bicycle connection to be provided on site as well as for the necessary perimeter landscaping (6-ft width) adjacent to the church site.

### **ADDITIONAL NOTES AND ISSUES**

**County Health Notes:**

**Other Notes:**

**This is only preliminary preapplication conference information based on the applicant's proposal and does not cover all possible development scenarios. Other requirements may be added after an applicant submits land use applications or building permits. City policies and code requirements are subject to change. If you have any questions, please contact the City staff that attended the conference (listed on Page 1). Contact numbers for these staff are City staff listed at the end of the report.**

**Sincerely,**

**City of Milwaukie Development Review Team**

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**BUILDING DEPARTMENT**

**Samantha Vandagriff - Building Official - 503-786-7611**

**Stephanie Marcinkiewicz**

**- Inspector/Plans Examiner - 503-786-7613**

**ENGINEERING DEPARTMENT**

**Chuck Eaton - Engineering Director - 503-786-7605**

**Alex Roller - Engineering Tech II - 503-786-7695**

**COMMUNITY DEVELOPMENT DEPARTMENT**

**Alma Flores - Comm. Dev. Director - 503-786-7652**

**Leila Aman - Development Manager - 503-786-7616**

**Alicia Martin - Admin Specialist - 503-786-7600**

**PLANNING DEPARTMENT**

**Dennis Egner - Planning Director - 503-786-7654**

**David Levitan - Senior Planner - 503-786-7627**

**Brett Kelter - Associate Planner - 503-786-7657**

**Vera Kolas - Associate Planner - 503-786-7653**

**Mary Heberling - Assistant Planner - 503-786-7658**

**CLACKAMAS FIRE DISTRICT**

**Mike Boumann - Lieutenant Deputy Fire Marshal - 503-742-2673**

**Matt Amos - Fire Inspector - 503-742-2661**

# Clackamas County Fire District #1

## Fire Prevention Office



### E-mail Memorandum

To: City of Milwaukie Planning Department  
From: Matt Amos, Fire Inspector, Clackamas Fire District #1  
Date: 9/26/2018  
Re: 13333 Rusk Rd. 18-011PA

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This review is based upon the current version of the Oregon Fire Code (OFC), as adopted by the Oregon State Fire Marshal's Office. The scope of review is typically limited to fire apparatus access and water supply, although the applicant must comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the fire code official. The following items should be addressed by the applicant:

#### COMMENTS:

**A Fire Access and Water Supply plan is required for subdivisions and commercial buildings over 1000 square feet in size or when required by Clackamas Fire District #1. The plan shall show fire apparatus access, fire lanes, fire hydrants, fire lines, available fire flow, FDC location (if applicable), building square footage, and type of construction. The applicant shall provide fire flow tests per NFPA 291, and shall be no older than 12 months. Work to be completed by experienced and responsible persons and coordinated with the local water authority.**

#### Access:

- 1) Provide address numbering that is clearly visible from the street.
- 2) The inside turning radius and outside turning radius for a 20' wide road shall not be less than 28 feet and 48 feet respectively, measured from the same center point.
- 3) Buildings exceeding 30 feet in height shall require extra width and proximity provisions for aerial apparatus.

## **Water Supply**

- 1) **Fire Hydrants, Commercial Buildings:** Where a portion of the building is more than 400 feet from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the building, on-site fire hydrants and mains shall be provided. Note: This distance may be increased to 600 feet for buildings equipped throughout with an approved automatic sprinkler system.
- 2) All new buildings shall have a firefighting water supply that meets the fire flow requirements of the Fire Code. Maximum spacing between hydrants on street frontage shall not exceed 500 feet. Additional private on-site fire hydrants may be required for larger buildings. Fire sprinklers may reduce the water supply requirements.
- 3) Prior to the start of combustible construction required fire hydrants shall be operational and accessible.
- 4) The fire department connection (FDC) for any fire sprinkler system shall be placed as near as possible to the street, and within 100 feet of a fire hydrant.

### **Note:**

**Emergency responder radio coverage must be tested or provided due to the following**

- 1. Any building with one or more basement or below-grade building levels.**
- 2. Any underground building.**
- 3. Any building more than five stories in height.**
- 4. Any building 50,000 square feet in size or larger.**
- 5. Any building that, through performance testing, does not meet the requirement of section 510.**

## **EXHIBIT D: TRAFFIC IMPACT STUDY**



## MEMORANDUM

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Date: November 8, 2018 Project #: 23248

To: Alex Roller – City of Milwaukie  
Christian Snuffin, PE, PTOE – Clackamas County  
Avi Tayar, PE – Oregon Department of Transportation  
Reah Flisakowski, PE – DKS Associates

CC: Serah Breakstone and Scott Emmons, PE – DOWL  
Daniel Dobson – Bonaventure

From: Kristine Connolly, PE, and Chris Brehmer, PE – Kittelson & Associates, Inc.

Project: Rusk Road Senior Housing

Subject: Transportation Impact Study

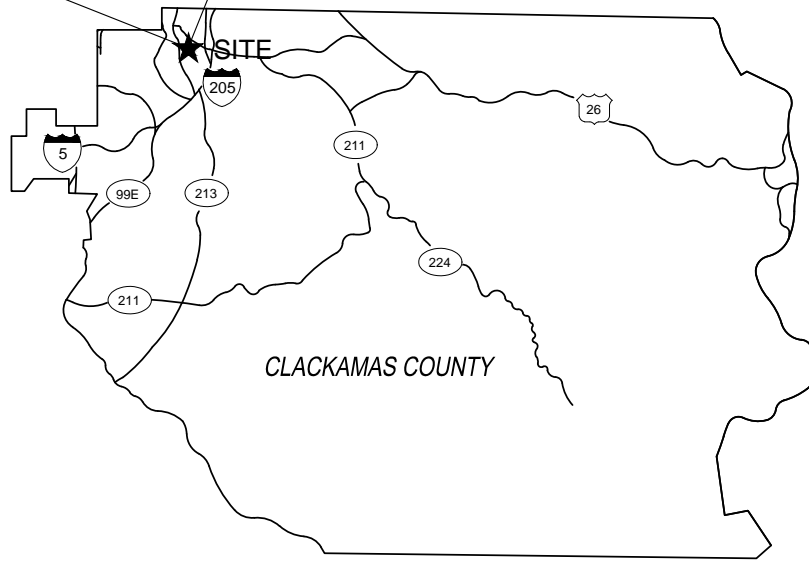
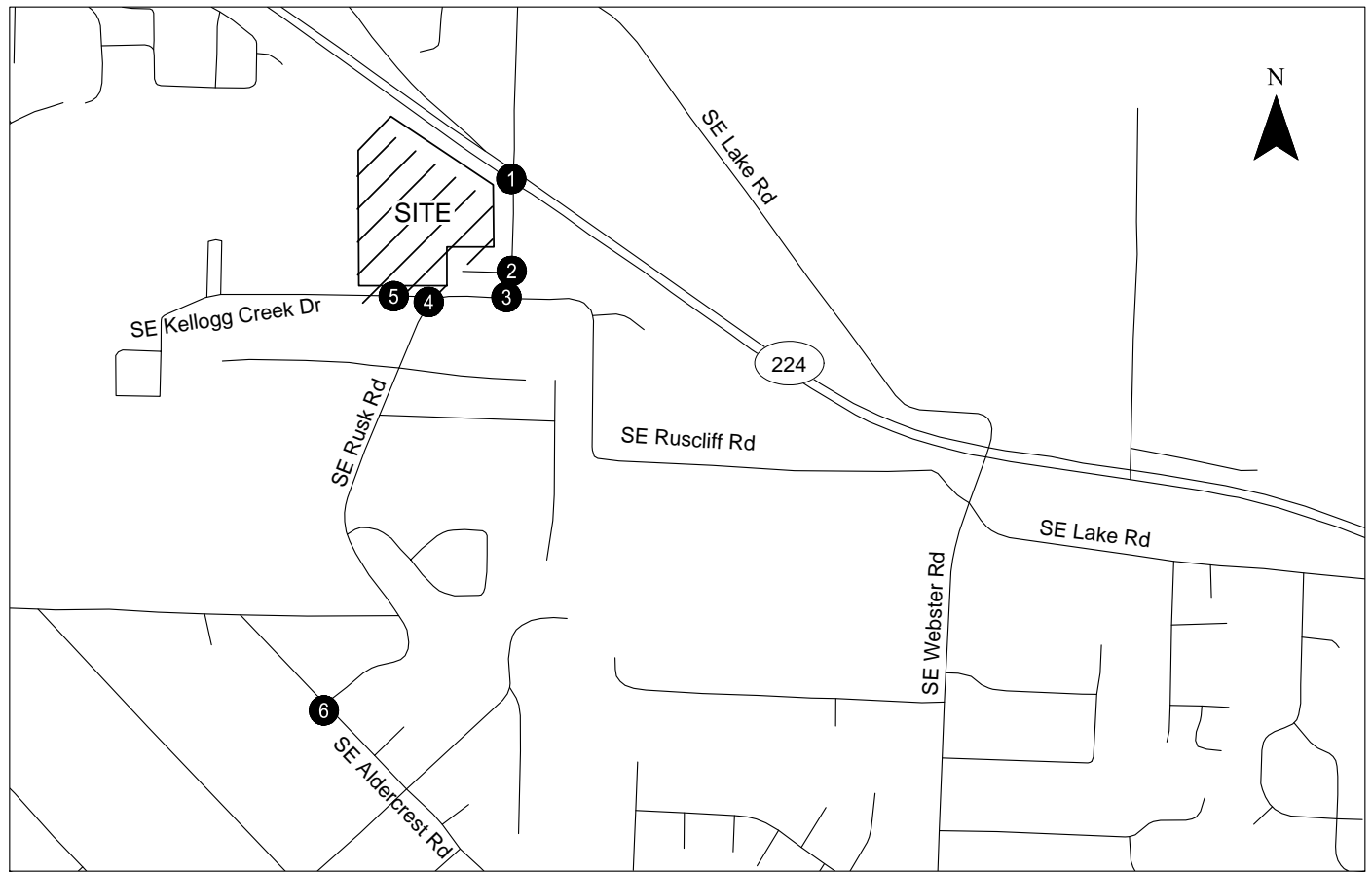
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Bonaventure is proposing to develop vacant property located at 13333 SE Rusk Road. The proposed development site is bordered by Turning Point Church to the east. As proposed, the development will include 170 senior housing units accessible via a SE Kellogg Creek Drive driveway shared with the church. The site location and overall site vicinity are shown in **Figure 1**, and a conceptual site plan is shown in **Figure 2**. This transportation impact study report documents the transportation impacts associated with site development. Key findings and recommendations are summarized below.

### SUMMARY OF FINDINGS

- All study intersections are forecast to operate within the applicable review agency volume-to-capacity ratio and delay standards under existing and site opening year 2019 conditions during the weekday AM, midday, and PM peak hours.
- Some vehicles were observed making wrong-way egress movements at the existing church driveway on SE Rusk Road.
- Existing weekday AM peak hour northbound queuing on SE Rusk Road at OR-224 extends past SE Ruscliff Road and west towards SE Kellogg Creek Drive.
- With the provision of a northbound right-turn lane on SE Rusk Road at OR-224, projected 95<sup>th</sup> percentile AM, midday and PM peak hour queues can be accommodated within the existing storage areas at the study intersections and queuing on SE Rusk Road after site development will be less than the amount experienced today.
- Historical crash data for the study area intersections indicate no patterns or trends that require mitigation associated with the proposed development.





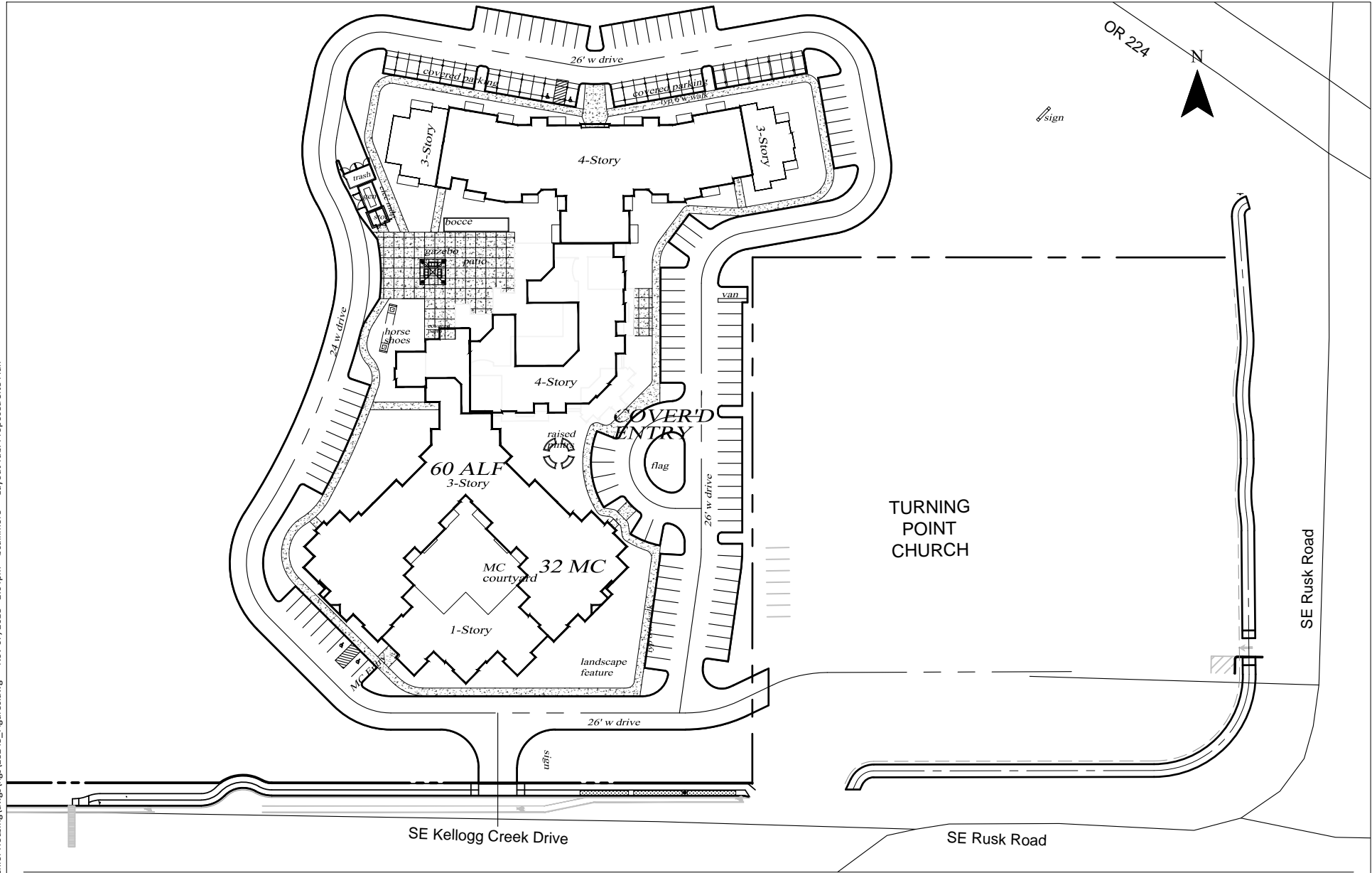
## - Study Intersections

Site Vicinity Map  
Milwaukie, Oregon

Figure  
1

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H:\23\23248 - Rusk Road Senior Housing\dwgs\figs\23248\_Figures.dwg Nov 07, 2018 - 2:04pm - bcullimore - Layout Tab: Proposed Site Plan



Site Plan Provided By DOWL 2018-11-05

Proposed Site Plan  
Milwaukie, Oregon

Figure  
2

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## RECOMMENDATIONS

- Subject to City approval and regardless of the proposed development, “DO NOT ENTER” and/or “ONE WAY” signs should be installed at the SE Rusk Road/Church driveway in accordance with the *Manual on Uniform Traffic Control Devices* (MUTCD) to restrict vehicles from exiting the church driveway onto SE Rusk Road.
- The Applicant should collaborate with the City of Milwaukie to construct a northbound right-turn lane on SE Rusk Road at OR-224 in conjunction with site development subject to available right-of-way and Transportation System Development Charges (TSDC) credits. The turn lane design and construction will be creditable towards the project TSDC.
- Intersection sight distance should be provided at the proposed site access per applicable City of Milwaukie and Clackamas County design requirements. Landscaping, above ground utilities, and signing should be located and maintained in a manner that provides adequate intersection sight distance.

## REPORT SCOPE

This report identifies the transportation-related impacts associated with the proposed development and was prepared in accordance with the City of Milwaukie, Clackamas County, and Oregon Department of Transportation (ODOT) requirements. Per City, County, and ODOT staff direction, operational analyses were performed at the following study intersections during the weekday AM, midday, and PM peak periods:

1. SE Rusk Road/OR-224
2. SE Rusk Road/Church Driveway
3. SE Rusk Road/SE Ruscliff Road
4. SE Rusk Road/SE Kellogg Creek Drive
5. SE Kellogg Creek Drive/Church Driveway
6. SE Rusk Road/SE Aldercrest Road

This report evaluates the following transportation issues:

- Existing land use and transportation system conditions within the site vicinity during the weekday AM, midday, and PM peak periods;
- Forecast year 2019 background traffic conditions during the weekday AM, midday, and PM peak periods, considering other development and transportation improvements planned in the study area;
- Trip generation and distribution estimates for the proposed development;
- Forecast year 2019 total traffic conditions during the weekday AM, midday and PM peak periods with build-out of the site;
- Review of applicable City of Milwaukie requirements, including sight distance, access standards, and turn-lane warrants; and
- Findings and recommendations.

## Analysis Methodology

All level-of-service (LOS) analyses described in this report were performed in accordance with the procedures stated in the *2010 Highway Capacity Manual* (HCM 2010 – Reference 1) or the *2000 Highway Capacity Manual* (HCM 2000 – Reference 2) using Synchro 10 software. The signalized intersection of SE Rusk Road/OR-224 was analyzed using HCM 2000 to obtain overall intersection volume-to-capacity (v/c) ratios for comparison to ODOT-maintained intersection operating standards. All unsignalized intersections were analyzed using HCM 2010 methodology. The peak 15-minute flow rates were used in the evaluation of all intersection LOS and v/c ratios to provide analyses based on a reasonable worst-case scenario. For this reason, the analyses reflect conditions that are only likely to occur for 15 minutes out of each average peak hour (*refer to Attachment A for additional details*).

## Applicable Operating Standards

Chapter 3 of the *City of Milwaukie Transportation System Plan* (Reference 3) defines the minimum acceptable measure of effectiveness for intersections during the peak hour as LOS “D” for both signalized and stop-controlled intersections.

Chapter 5 of the *Clackamas County Comprehensive Plan* (Reference 4) sets performance evaluation standards for the urban area (Table 5-2a). Per these standards, a maximum v/c ratio of 0.90 must be maintained during the midday peak hour and a maximum of 0.99 during the weekday PM peak hour.

The *Oregon Highway Plan* (OHP) (Reference 5) requires a maximum v/c ratio of 0.99 at ODOT-maintained intersections.

**Table 1** lists the study intersections, the responsible jurisdiction, and the corresponding operating standard.

**Table 1. Study Intersection Operating Standards**

Study Intersection	Jurisdiction	Intersection Operating Standard
SE Rusk Road/OR-224	ODOT	Intersection V/C $\leq$ 0.99
SE Rusk Road/Church Driveway	City of Milwaukie & Clackamas County	LOS "D" & Midday V/C $\leq$ 0.90, PM V/C $\leq$ 0.99
SE Rusk Road/SE Ruscliff Road	City of Milwaukie & Clackamas County	LOS "D" & Midday V/C $\leq$ 0.90, PM V/C $\leq$ 0.99
SE Rusk Road/SE Kellogg Creek Drive	City of Milwaukie & Clackamas County	LOS "D" & Midday V/C $\leq$ 0.90, PM V/C $\leq$ 0.99
SE Kellogg Creek Drive/Church Driveway	City of Milwaukie	LOS "D"
SE Rusk Road/SE Aldercrest Road	City of Milwaukie & Clackamas County	LOS "D" & Midday V/C $\leq$ 0.90, PM V/C $\leq$ 0.99

## EXISTING CONDITIONS

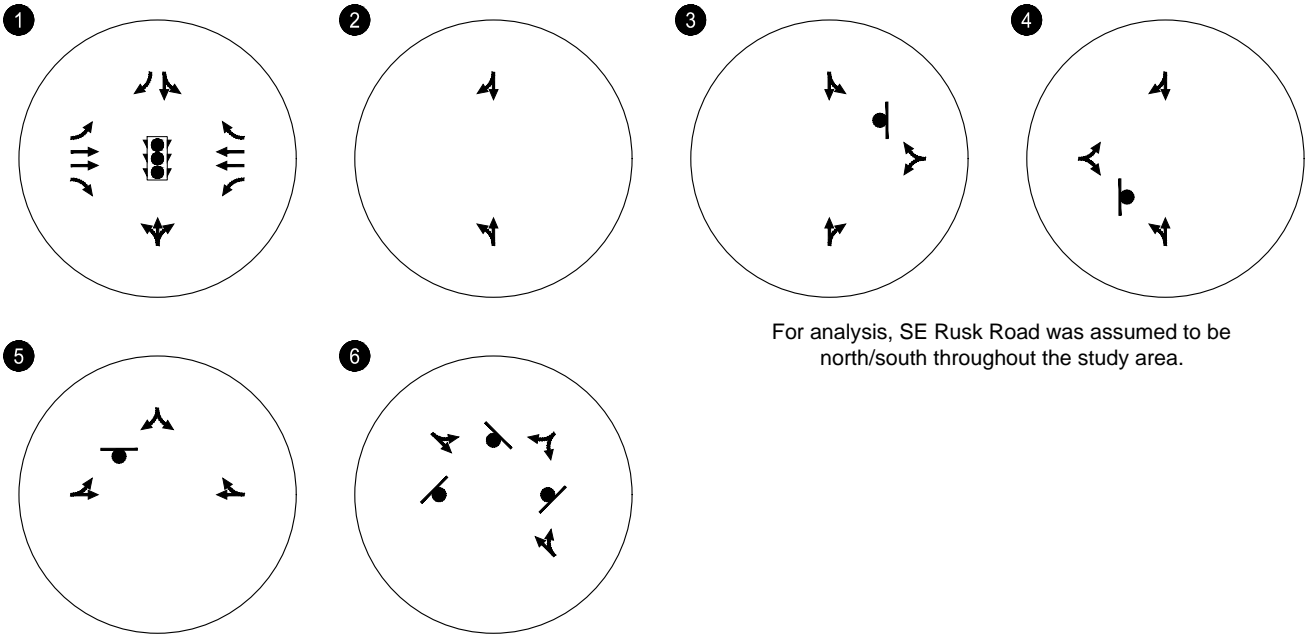
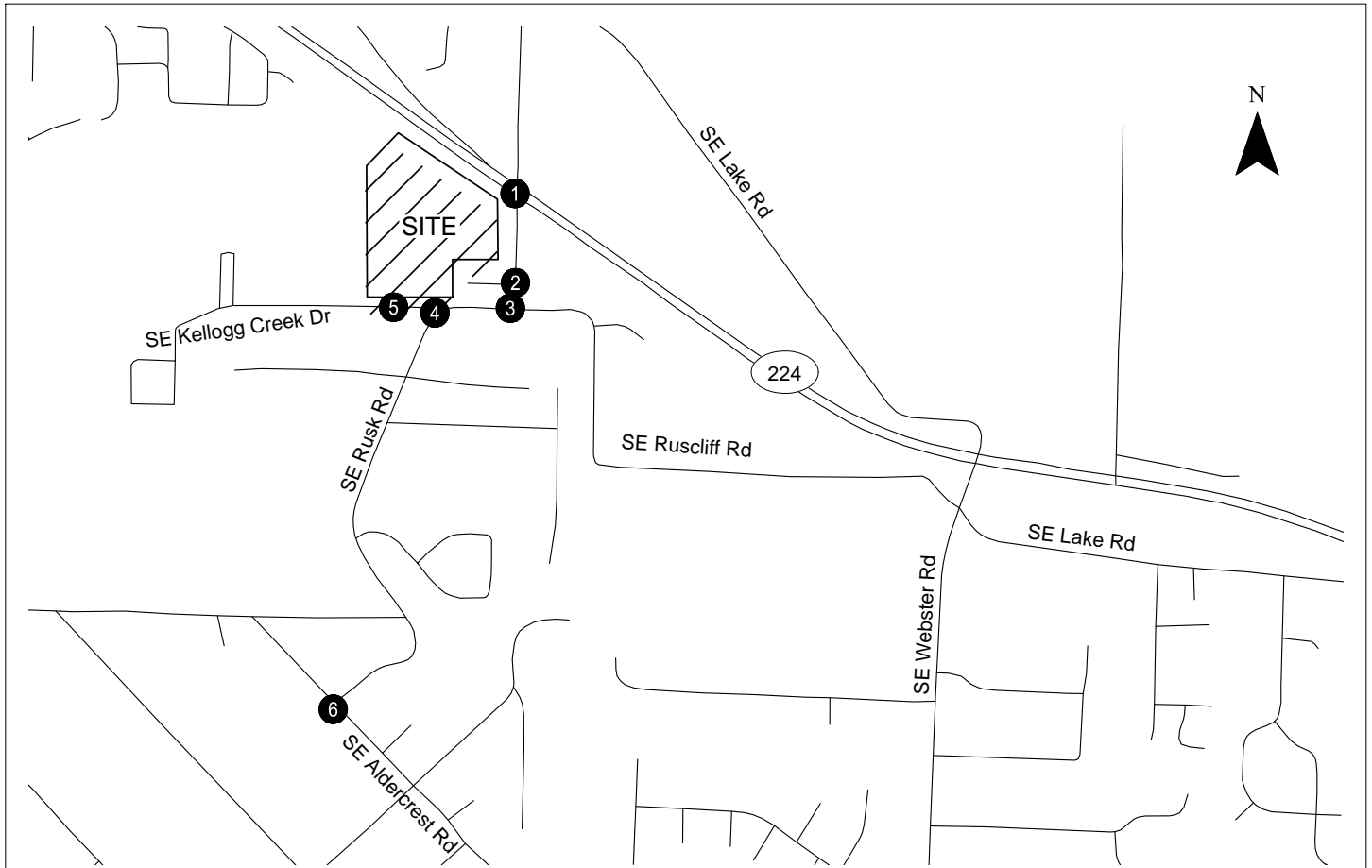
This section summarizes the existing characteristics of the transportation system and adjacent land uses in the vicinity of the proposed development, including an inventory of the existing multimodal transportation facilities and options, an evaluation of existing intersection operations for motor vehicles at the study intersections, and a summary of recent study intersection crash history.

### Site Conditions and Adjacent Land Uses



The proposed development site is located within the City of Milwaukie, south of the Milwaukie Expressway (referred to as OR-224 in the remainder of this report), west of SE Rusk Road, and north of SE Kellogg Creek Drive. While the site is within the City of Milwaukie, SE Rusk Road is one of the dividing lines between the City and unincorporated Clackamas County to the east. The development site is mostly open space and interfaces with Turning Point Church and its surface parking lot. Today, there are two access points that serve the church: one located at the east end of the property on SE Rusk Road and one located on the south side of the property on SE Kellogg Creek Drive.

### Transportation Facilities

**Figure 3** illustrates the existing lane configurations and traffic control devices at the study intersections. **Table 2** summarizes the attributes of key roadways in the vicinity.



For analysis, SE Rusk Road was assumed to be north/south throughout the study area.

-  - STOP SIGN
-  - TRAFFIC SIGNAL

Existing Lane Configurations  
& Traffic Control Devices  
Milwaukie, Oregon

Figure  
3

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**Table 2. Street Characteristics in Site Vicinity**

Street	Classification <sup>1</sup>	Motor Vehicle Travel Lanes	Posted Speed (mph)	Sidewalks	Striped Bicycle Lanes	On-Street Parking
OR-224	Freeway/Regional Route (Milwaukie) Freeway/Expressway (Clackamas County) Urban Principal Arterial (ODOT)	4-5	50	No	No	No
SE Rusk Road	Collector	2	30	Partial <sup>2</sup>	No	Yes <sup>3</sup>
SE Kellogg Creek Drive	Local Street	2	25	Yes <sup>4</sup>	No	South side
SE Ruscliff Road	Local Street	2	25	No	No	Yes
SE Aldercrest Road	Local Street	2	30	No	No	Yes <sup>3</sup>

<sup>1</sup>Per *City of Milwaukie Transportation System Plan*, Table 3-4 (Reference 3)

<sup>2</sup>There is a sidewalk on the east side of SE Rusk Road between SE Eastbrook Drive and SE Robhil Drive. There is a sidewalk on the west side of SE Rusk Road from SE Eric Street north approximately 250'. There is a sidewalk on the north and west sides of SE Rusk Road from SE Kellogg Creek Drive to OR-224.

<sup>3</sup>Some on-street parking is available in front of homes and/or sections of sidewalk.

<sup>4</sup>There is no sidewalk on the south side of SE Kellogg Creek Drive between Deerfield Village Assisted Living and SE Rusk Road.

### **Roadway Cross Section Standards**

The City of Milwaukie maintains typical cross-sections for roadways based on functional classification, as detailed in the City's *Transportation System Plan* (Reference 3). Milwaukie Municipal Code (MMC) Section 19.708 requires that all rights-of-way, streets, sidewalks, necessary public improvements, and other public transportation facilities located in the public right-of-way and abutting the development site shall be adequate at the time of development or shall be made adequate in a timely manner.

Per MMC Table 19.708.2, the SE Kellogg Creek Drive local street cross section fronting the proposed development site should include 10-foot wide travel lanes, 8-foot wide parking with curb and gutter, 5-foot wide bike lanes, 5-foot landscape strips and 5-foot detached sidewalks.

### **Pedestrian Facilities**

The entire site frontages on both SE Rusk Road and SE Kellogg Creek Drive have sidewalks along their lengths. There are marked crosswalks on three approaches (none on the eastern approach) of the SE Rusk Road/OR-224 intersection. The north side of SE Rusk Road at the three-leg intersection with SE Kellogg Creek Drive has a curb bulb-out. The North Clackamas Park and the Milwaukie Community Center can be reached via sidewalk from the site, and there is a marked crosswalk at the entrance to the park. The closest pedestrian crossing of Mt. Scott Creek is via a trail through the park, which provides access to SE Casa Del Rey Drive and then a completed sidewalk access route to SE Lake Road west of OR-224.

### Bicycle Facilities

No striped on-street bicycle facilities are provided within the project vicinity today. The 2013 *City of Milwaukie Transportation System Plan* (Reference 3) identifies the need for a bicycle facility connecting the SE Rusk Road/OR-224 intersection with the southwest corner of the proposed development site.

### Transit Facilities

Per TriMet’s online schedule, (Reference 6) weekday bus service is provided by TriMet Route 152 (Milwaukie) along SE Harmony Road and SE International Way between downtown Milwaukie and Clackamas Town Center from 6:30 AM to 6:30 PM. Headways change throughout the day and range from approximately 30 to 40 minutes. The stop closest to the site is at the intersection of SE Lake Road/SE Harmony Road on the north side of OR-224, approximately ½-mile from the site.

TriMet Route 29 (Lake/Webster Road) operates along SE Lake Road between downtown Milwaukie and Clackamas Town Center approximately every 75 minutes on weekdays from 5:30 AM to 8:00 PM. The closest stop to the site is at the intersection of SE Rusk Road/SE Lake Road on the north side of OR-224, slightly less than ½-mile away.

TriMet Route 30 (Estacada) operates along OR-224 between Estacada and downtown Portland via Clackamas Town Center once per weekday in each direction. The closest stop to the site is at the intersection of SE Webster Road/SE Lake Road to the east.

### Crash History Analysis

Reported crash history for each study intersection was reviewed in an effort to identify potential intersection safety issues. Reported crash data for the study intersections were obtained from ODOT for the five-year period from January 1, 2014 through December 31, 2016. **Table 3** summarizes the crashes reported at the study intersections. *Attachment B contains the ODOT crash data.*

**Table 3. Intersection Crash History (January 1, 2012 through December 31, 2016)**

Intersection	Collision Type			Severity			Total Crashes
	Rear End	Turning	Angle	PDO <sup>1</sup>	Injury	Fatality	
SE Rusk Road/OR-224	8	2	3	5	8	0	13
SE Rusk Road/SE Ruscliff Road	0	1	0	1	0	0	1
SE Rusk Road/SE Kellogg Creek Drive	0	3	0	2	1	0	3
SE Rusk Road/SE Aldercrest Road	1	2	0	1	2	0	3

<sup>1</sup>PDO – Property damage only



Critical crash rates were calculated for each of the study intersections following the analysis methodology presented in ODOT’s *SPR 667 Assessment of Statewide Intersection Safety Performance* (Reference 7). SPR 667 provided average crash rates at a variety of intersection configurations in Oregon based on number of approaches and traffic control types. The average crash rate represents the approximate number of crashes that are “expected” at a study intersection. Additionally, this average crash rate was used to calculate the critical crash rate for each study intersection, based on the *Highway Safety Manual* methodology (Reference 8). The critical crash rate is calculated for each intersection based on the average crash rate for each facility and serves as a threshold for further analysis.

**Table 4** summarizes the critical crash rate for each intersection and compares those values to the observed crash rate. Per ODOT, if the observed crash rate at the study location exceeds the critical rate, it is a possible indication that the location is exceeding average crash rates. As shown in **Table 4**, the observed crash rate at all intersections is less than the critical crash rates.

**Table 4. Intersection Crash Rate Assessment**

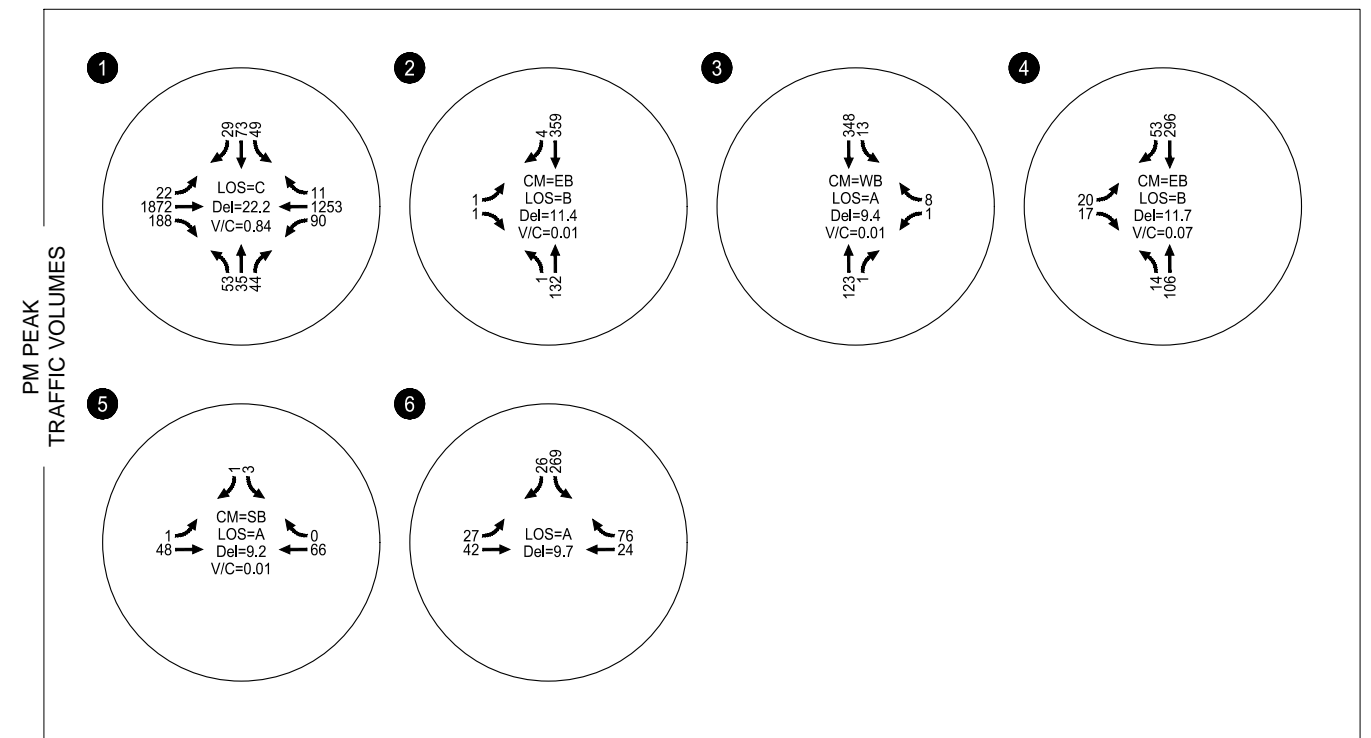
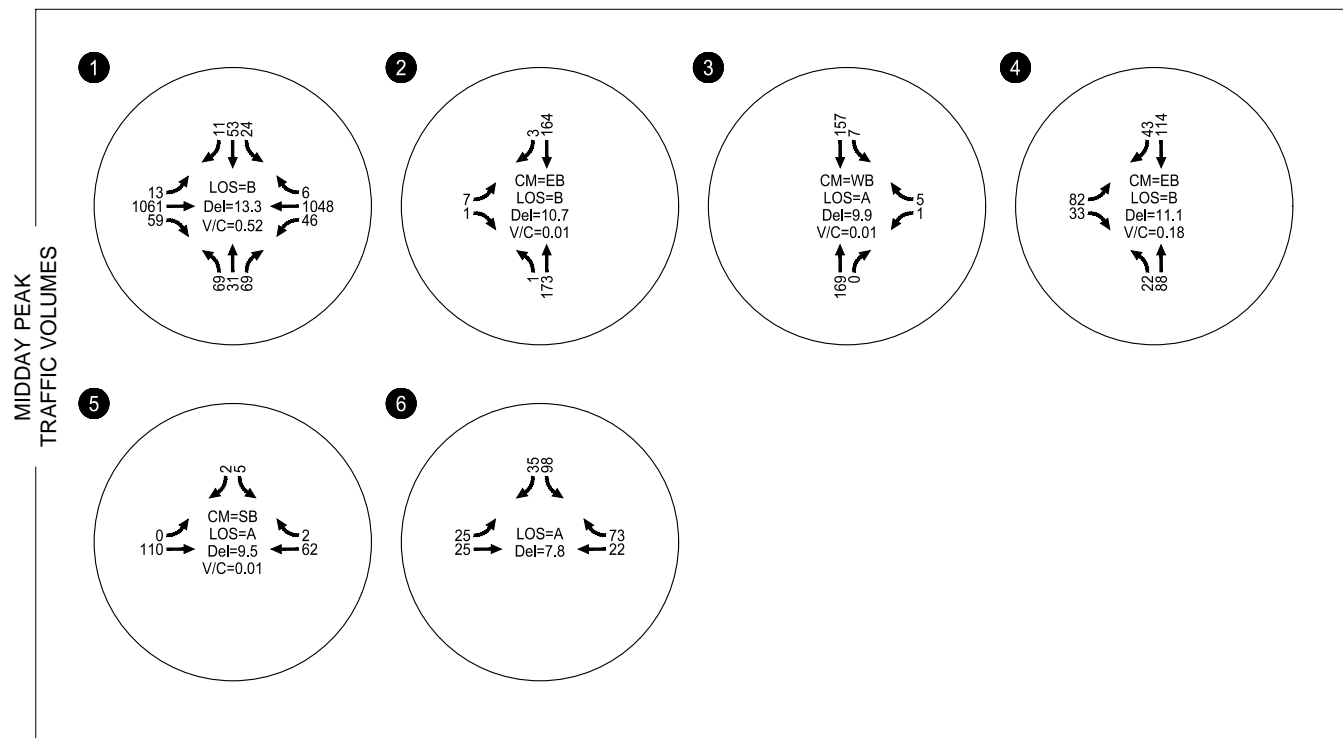
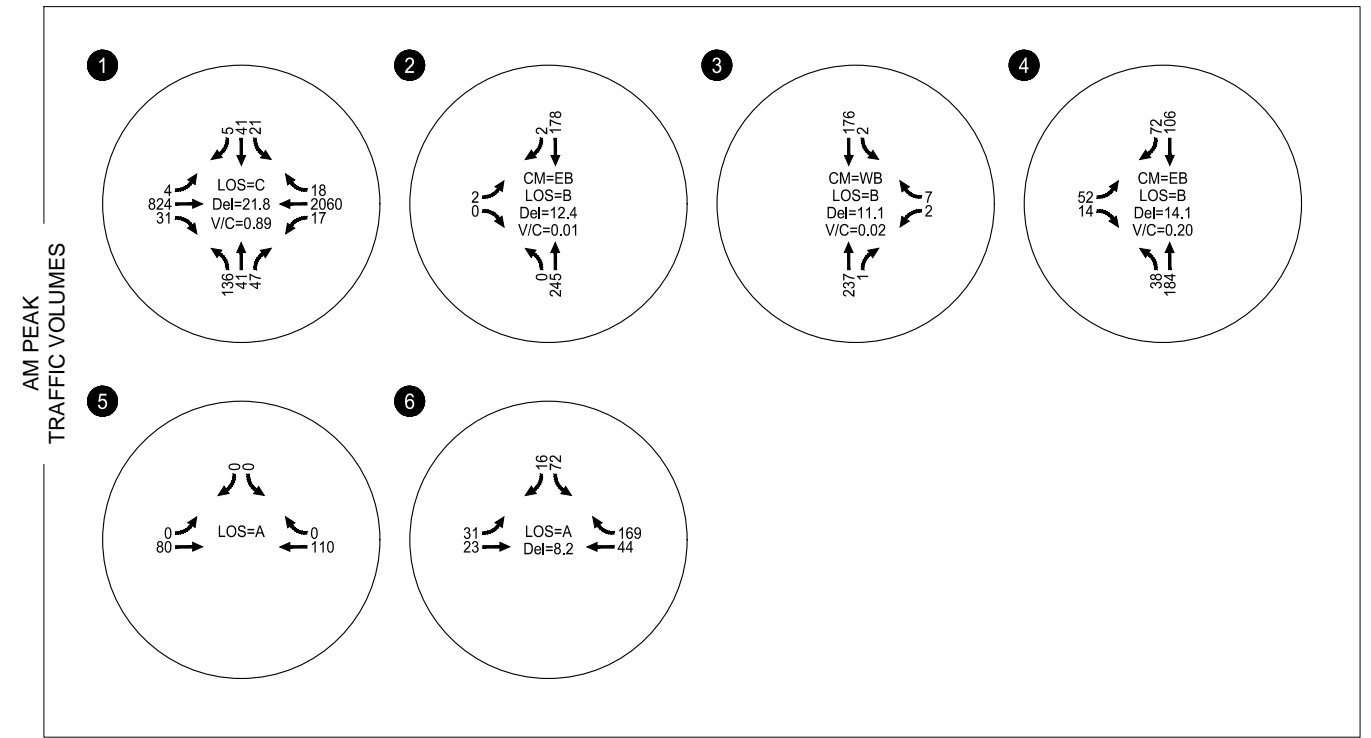
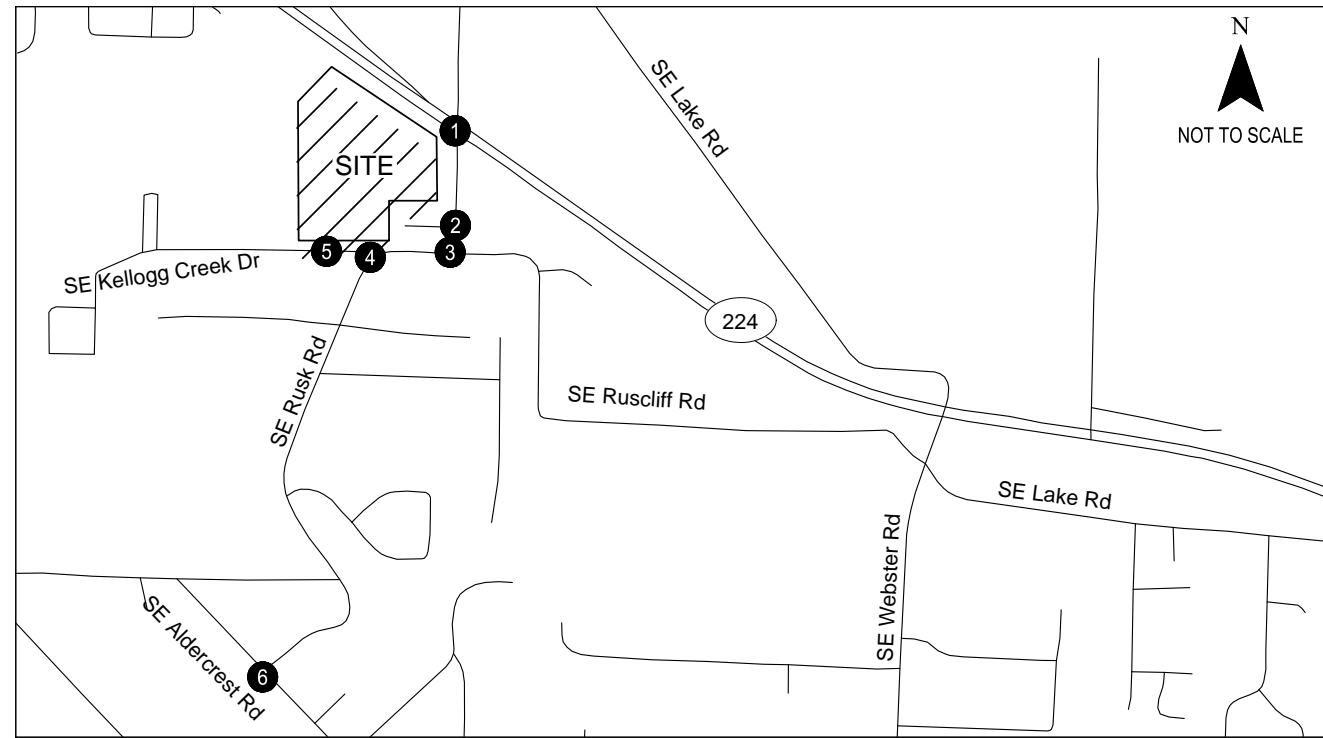
Location	Total Crashes	Critical Crash Rate by Intersection	Critical Crash Rate by Volume	Observed Crash Rate at Intersection	Observed Crash Rate > Critical Crash Rate?
SE Rusk Road/OR-224	13	0.62	0.53	0.19	No
SE Rusk Road /SE Ruscliff Road	1	0.38	0.40	0.11	No
SE Rusk Road/SE Kellogg Creek Drive	3	0.38	0.40	0.32	No
SE Rusk Road/SE Aldercrest Road	3	0.38	0.41	0.35	No

No safety-based mitigations were identified for implementation in conjunction with the proposed development based on review of the historic crash data alone.

### Existing Conditions Operational Analysis

Manual turning movement counts were collected at the study intersections in October 2018. Traffic counts were collected during the weekday morning (7:00 AM to 9:00 AM), midday (11:00 AM to 1:00 PM), and evening (4:00 PM to 6:00 PM) peak periods during typical weekday conditions while school was in session. ODOT provided traffic signal phasing and timing for the SE Rusk Road/OR-224 intersection. *Attachment C contains the traffic count worksheets.*

**Figure 4** summarizes the existing traffic conditions at the study intersections during the weekday AM, midday, and PM peak hours. As shown in **Figure 4**, all intersections operate within applicable City, County, and ODOT standards during all three peak hours. *Attachment D includes the existing operations analysis worksheets.*



CM = CRITICAL MOVEMENT (TWSC)  
 LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED/AWSC) / CRITICAL MOVEMENT LEVEL OF SERVICE (TWSC)  
 Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED/AWSC) / CRITICAL MOVEMENT CONTROL DELAY (TWSC)  
 V/C = CRITICAL VOLUME-TO-CAPACITY RATIO  
 TWSC = TWO-WAY STOP CONTROL  
 AWSC = ALL-WAY STOP CONTROL

Existing Traffic Conditions  
 Weekday AM, Midday & PM Peak Hours  
 Milwaukie, Oregon

Figure  
 4

While the respective operating standards are satisfied, field observations documented existing weekday AM peak hour northbound queuing on SE Rusk Road at OR-224 that extends past SE Ruscliff Road and west towards SE Kellogg Creek Drive. The queuing reflects the signal timing in place at the SE Rusk Road/OR-224 intersection that facilitates east-west progression along OR-224 and the relatively narrow (single lane) northbound intersection approach.

## TRANSPORTATION IMPACT ANALYSIS

The transportation impact analysis identifies how the study area's transportation system would operate in the year 2019 upon development of the site. This section of the report includes analysis of 2019 background traffic volumes and operations, an estimate of site-generated trips, and analysis of 2019 total traffic volumes and operations with the proposed development.

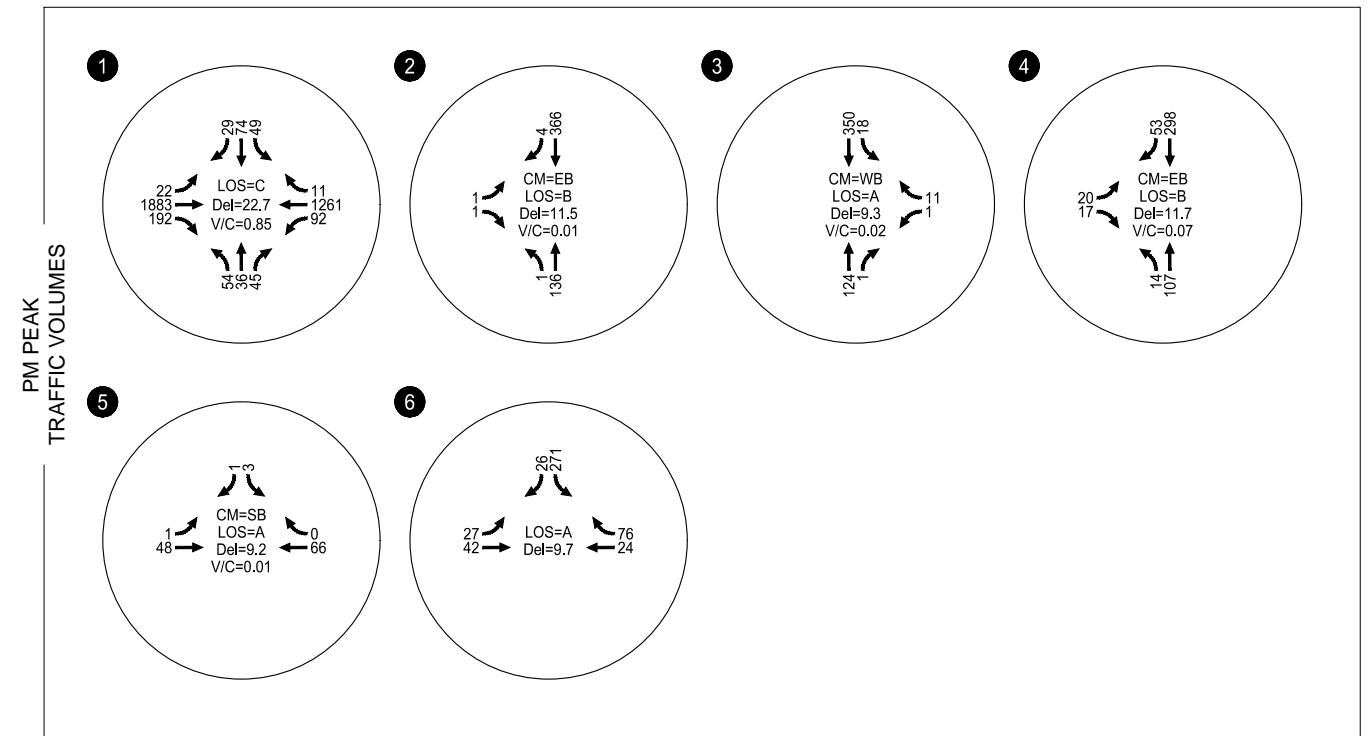
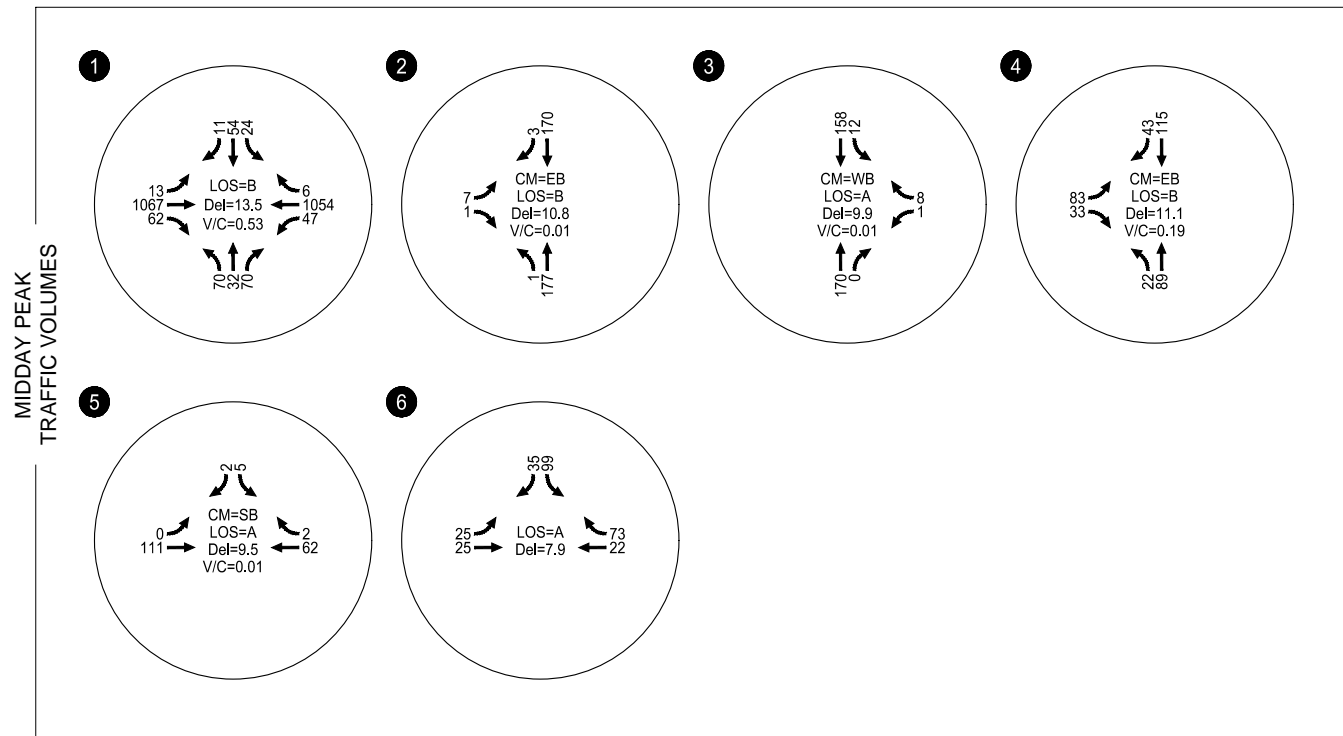
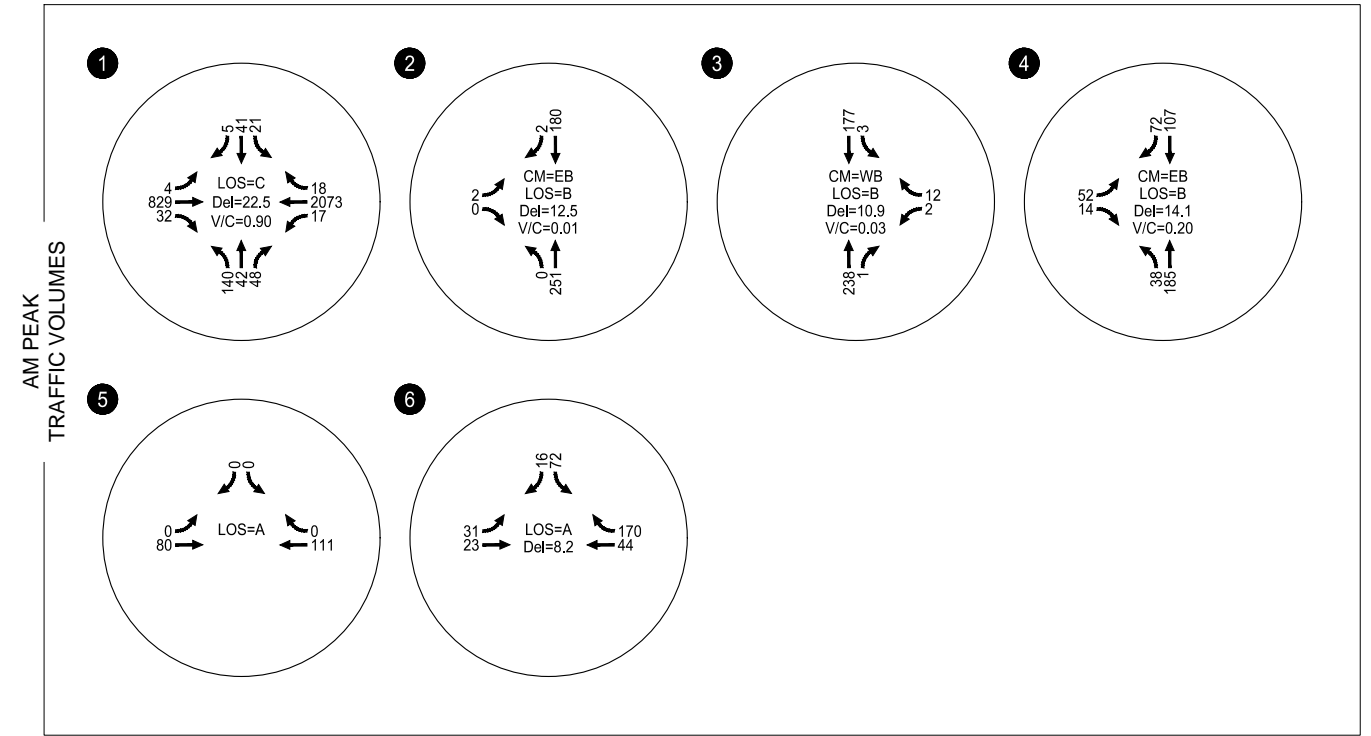
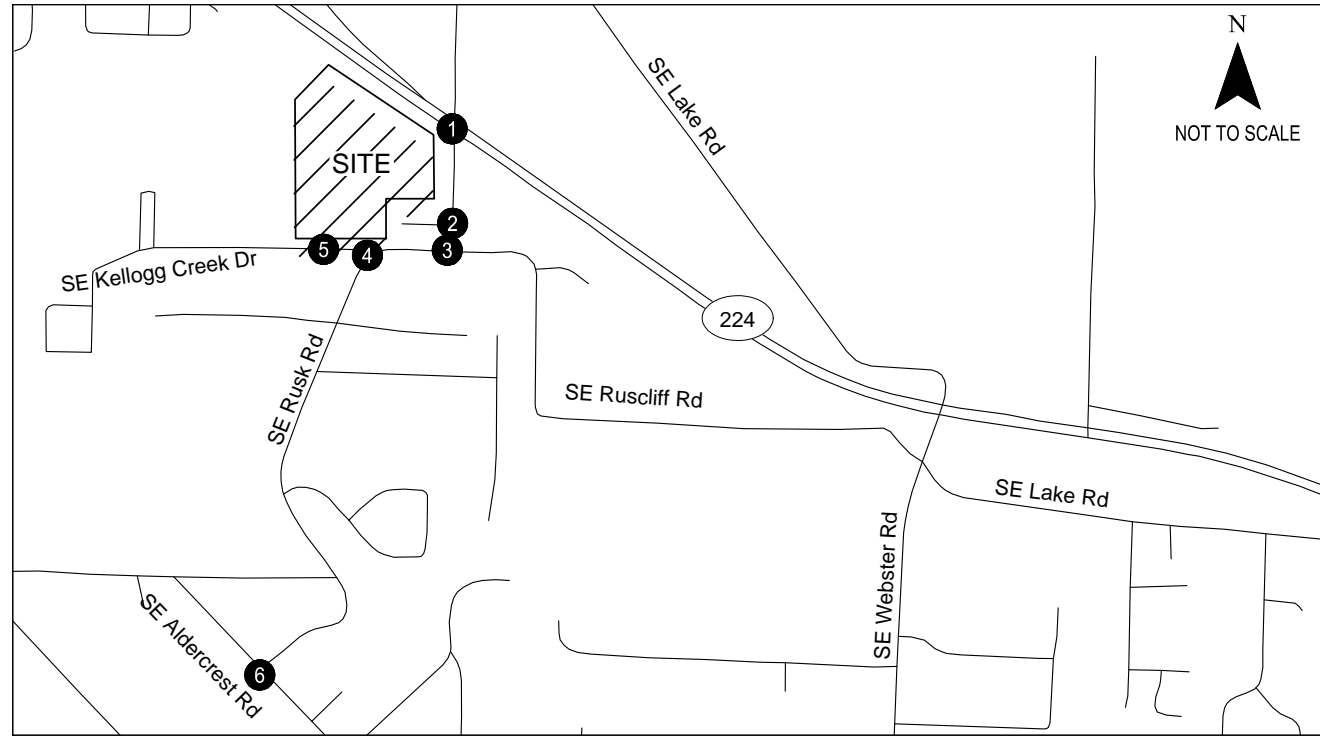
### 2019 Background Operational Analysis

Background traffic volumes include changes in volumes due to added trips from in-process developments in the vicinity of the site as well as general regional growth. Per direction from City of Milwaukie staff, no planned transportation improvements are included in the background traffic analysis. A 0.61 percent growth rate<sup>1</sup> was applied to the existing traffic volumes to reflect near-term growth. Additionally, in-process trips were included for a proposed residential development on SE Ruscliff Road with up to eight single-family homes. These trips were all conservatively assigned to the SE Rusk Road/OR-224 intersection, rather than assigning a portion of trips to SE Aldercrest Road. *Attachment E includes the in-process traffic volumes.*

**Figure 5** illustrates the 2019 background traffic volumes and corresponding operational analysis for the weekday AM, midday, and PM peak hours. As shown, all of the intersections are expected to continue to satisfy applicable City, County, and ODOT standards under background conditions, though northbound queuing on NE Rusk Road approaching Highway 224 will lengthen. *Attachment E includes the 2019 background operations analysis worksheets.*

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<sup>1</sup> Annual traffic growth rate calculated from 2006 count data at the SE Rusk Road/OR-224 intersection in the City of Milwaukie's *Transportation System Plan* and 2018 count data collected at the same intersection for this analysis.



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2019 Background Traffic Conditions  
 Weekday AM, Midday & PM Peak Hours  
 Milwaukie, Oregon

Figure  
 5

## Trip Generation Estimate

Trips for the proposed senior housing development were estimated using trip rates obtained from *Trip Generation Manual, 10<sup>th</sup> Edition* (Reference 9), as shown in **Table 5**. Note that the weekday AM and PM peak hour trip rates were conservatively calculated using the fitted curve equation in the *Trip Generation Manual*. Based on direction from Clackamas County, the weekday PM peak hour trip generation rates were used for the weekday midday peak hour estimates as shown in **Table 5**. Midday trip rate data is not available through the *Trip Generation Manual*.

**Table 5. Trip Generation with Development**

Land Use	ITE Code	Size	Total Daily Trips	Weekday AM Peak Hour			Weekday Midday Peak Hour			Weekday PM Peak Hour		
				Total Trips	In	Out	Total Trips	In	Out	Total Trips	In	Out
Continuing Care Retirement Community	255	170 units	408	35	23	12	35	14	21	36	14	22

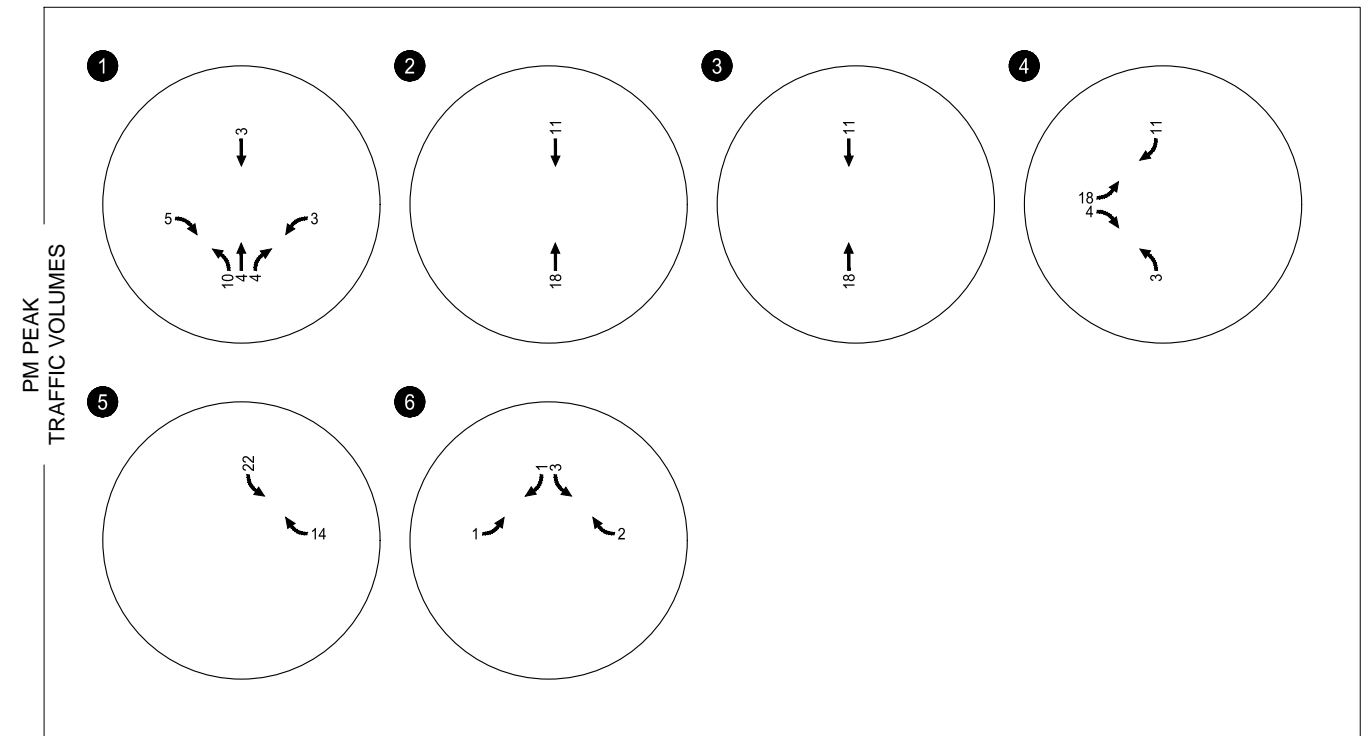
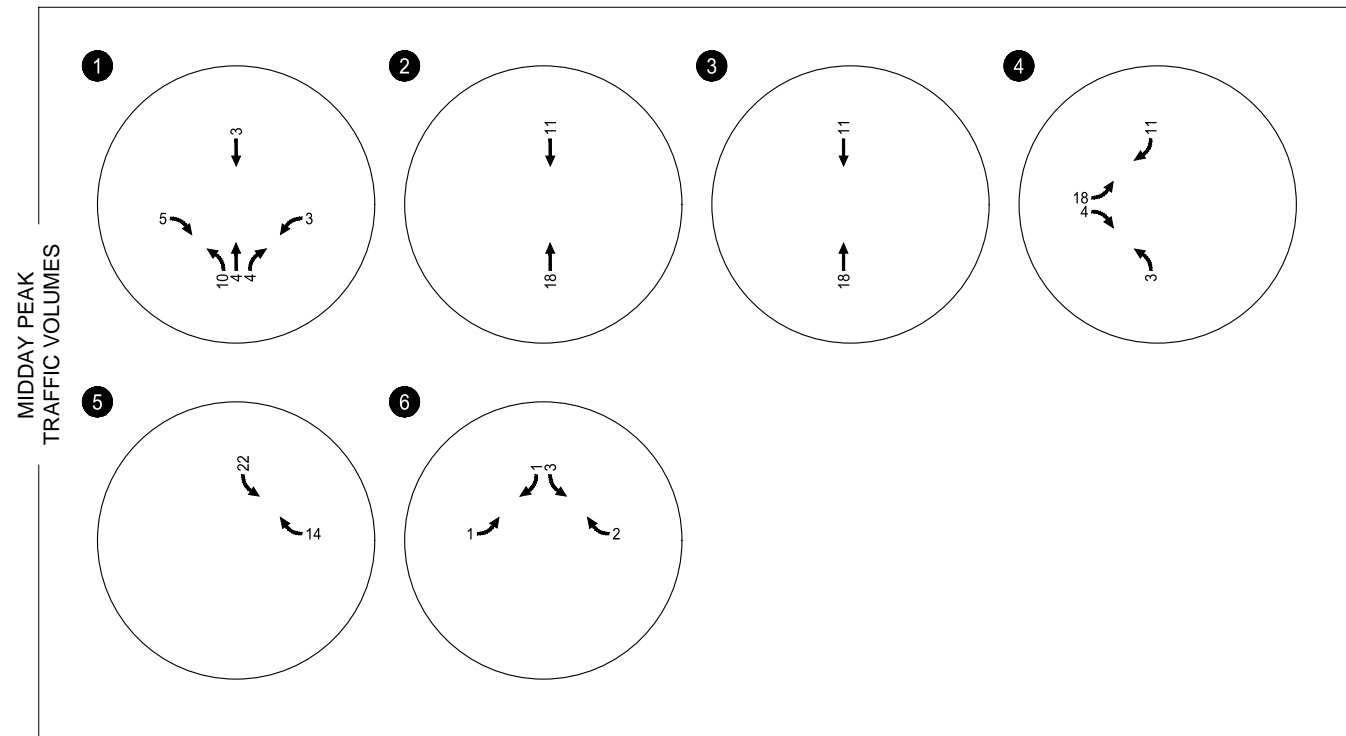
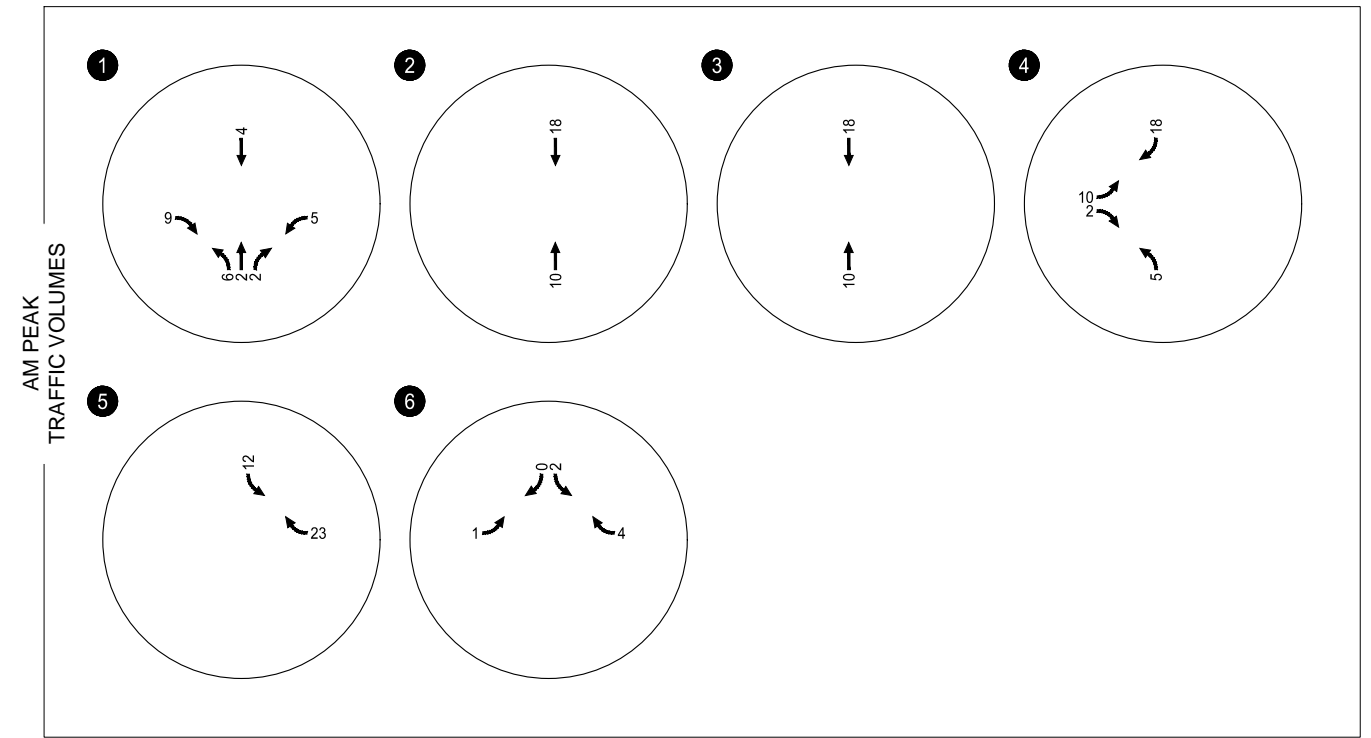
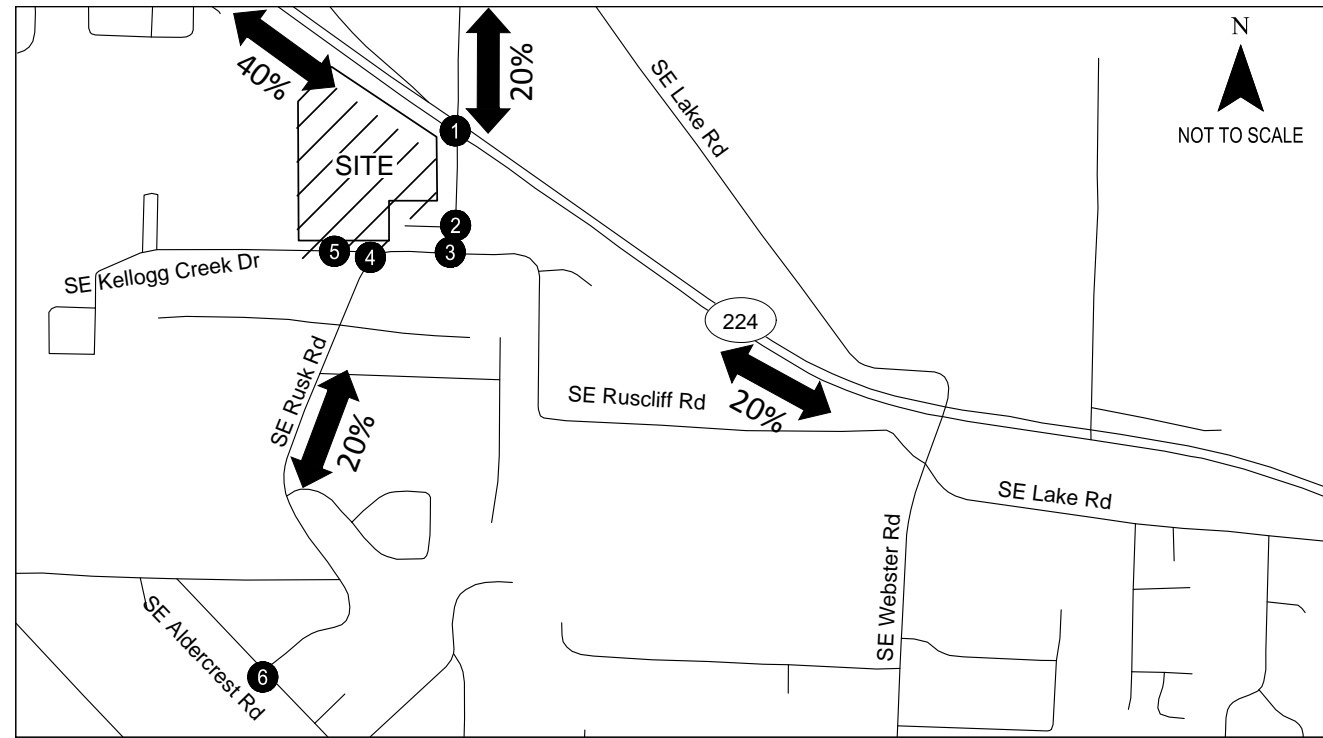
## Trip Distribution/Assignment

A trip distribution pattern was identified for the site considering existing traffic patterns at the study intersections as well as the anticipated travel patterns of site residents, visitors, and employees. Site-generated traffic was assigned to the study intersections based on the estimated distribution pattern. **Figure 6** shows the proposed trip distribution and the site-generated trips at each study intersection for the weekday AM, midday, and PM peak hours.

## Year 2019 Total Traffic Conditions

The total traffic conditions analysis forecasts the operation of the study area’s transportation system with the inclusion of traffic generated by the proposed site development<sup>2</sup>. Regardless of the proposed development, there is an existing need for a northbound right-turn lane on SE Rusk Road approaching OR-224. Recognizing the existing northbound queuing, the Applicant is collaborating with the City of Milwaukie to construct a northbound right-turn lane with at least 100 feet of storage at the SE Rusk Road/OR-224 intersection (final design parameters to be confirmed in coordination with the City based on available right-of-way and subject to available Transportation System Development Charge credits). **Figure 7** illustrates the study intersection proposed lane configurations and traffic control.

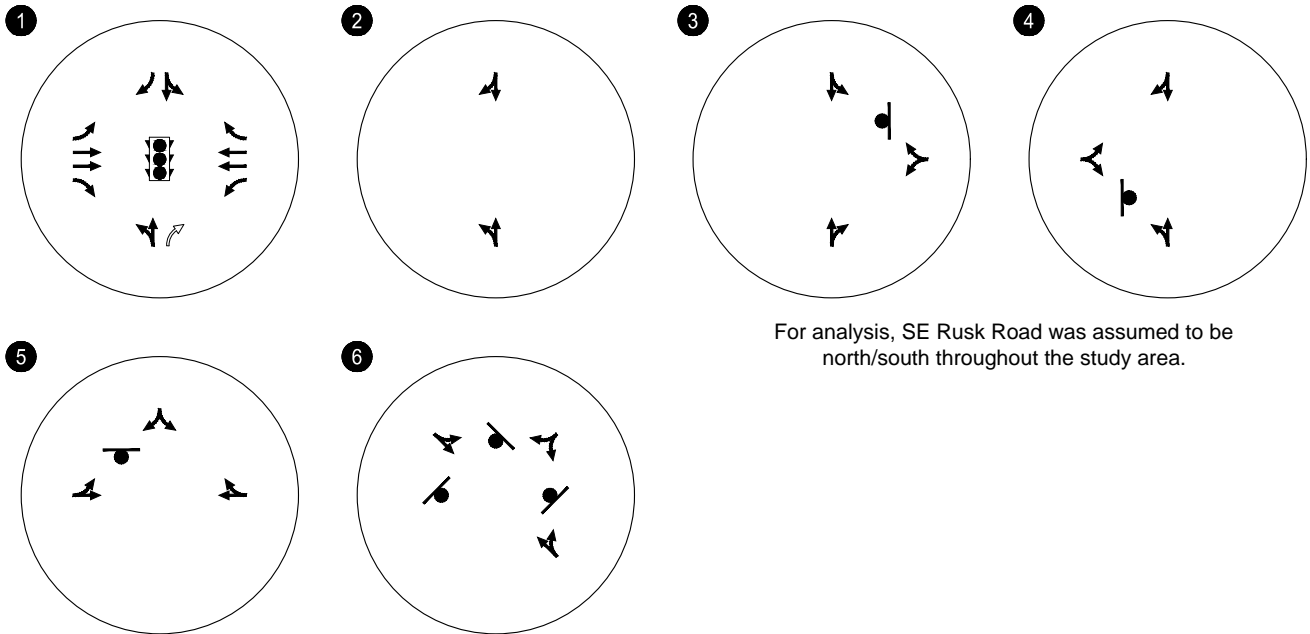
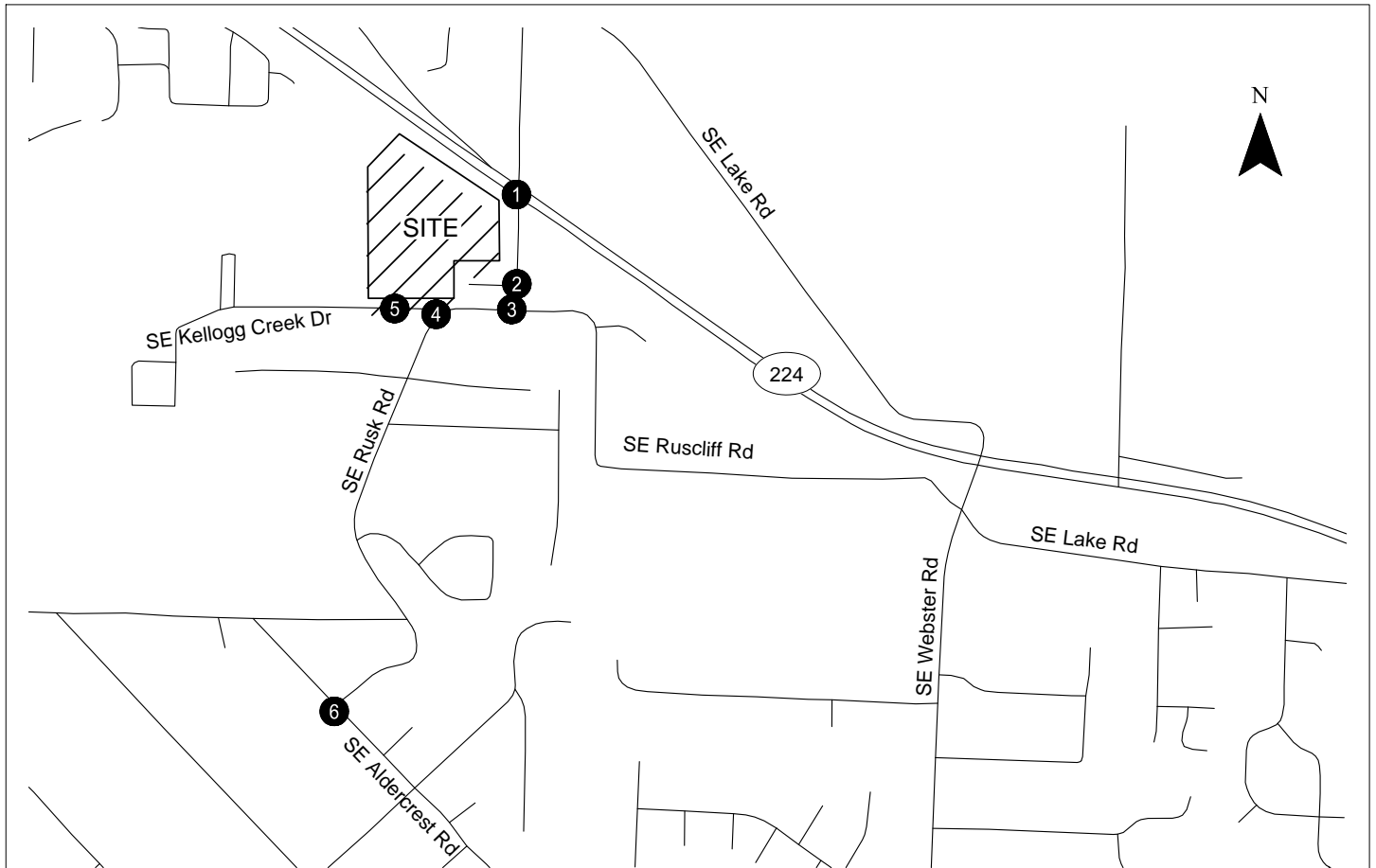
<sup>2</sup> Note that existing trips exiting the Church driveway to SE Rusk Road were redistributed to the site access under total traffic conditions. *Attachment F includes the redistributed traffic volumes.*






Site-Generated Trip Assignment  
 Weekday AM, Midday & PM Peak Hours  
 Milwaukie, Oregon

Figure  
 6

H:\23\23248 - Rusk Road Senior Housing\dwg\figs\23248\_Figures.dwg Nov 07, 2018 - 2:04pm - bcullimore Layout Tab: Prop Dist and Site Traff 11x17



For analysis, SE Rusk Road was assumed to be north/south throughout the study area.

-  - STOP SIGN
-  - TRAFFIC SIGNAL
-  - PROPOSED LANE ADDITION

Proposed Lane Configurations  
& Traffic Control Devices  
Milwaukie, Oregon

Figure  
7

Total traffic conditions were determined by adding the estimated site-generated and redistributed traffic to the year 2019 background volumes for the weekday AM, midday, and PM peak hours. **Figure 8** illustrates the 2019 total traffic conditions and corresponding operational analysis for the weekday AM, midday, and PM peak hours.

As shown in **Figure 8**, all of the intersections are expected to continue to satisfy applicable City, County, and ODOT standards under total traffic conditions. *Attachment F includes the 2019 total traffic operations analysis worksheets.*

**Year 2019 Queuing Analysis**

Per Section 19.704.3 and Section 295.16 of the *City of Milwaukie Municipal Code* (Reference 10) and the *Clackamas County Roadway Design Standards*, respectively, 95<sup>th</sup> percentile queuing at the study intersections site were assessed during the weekday AM, midday, and PM peak hours. The results of this 95<sup>th</sup> percentile queue length analysis are included in **Table 6**.

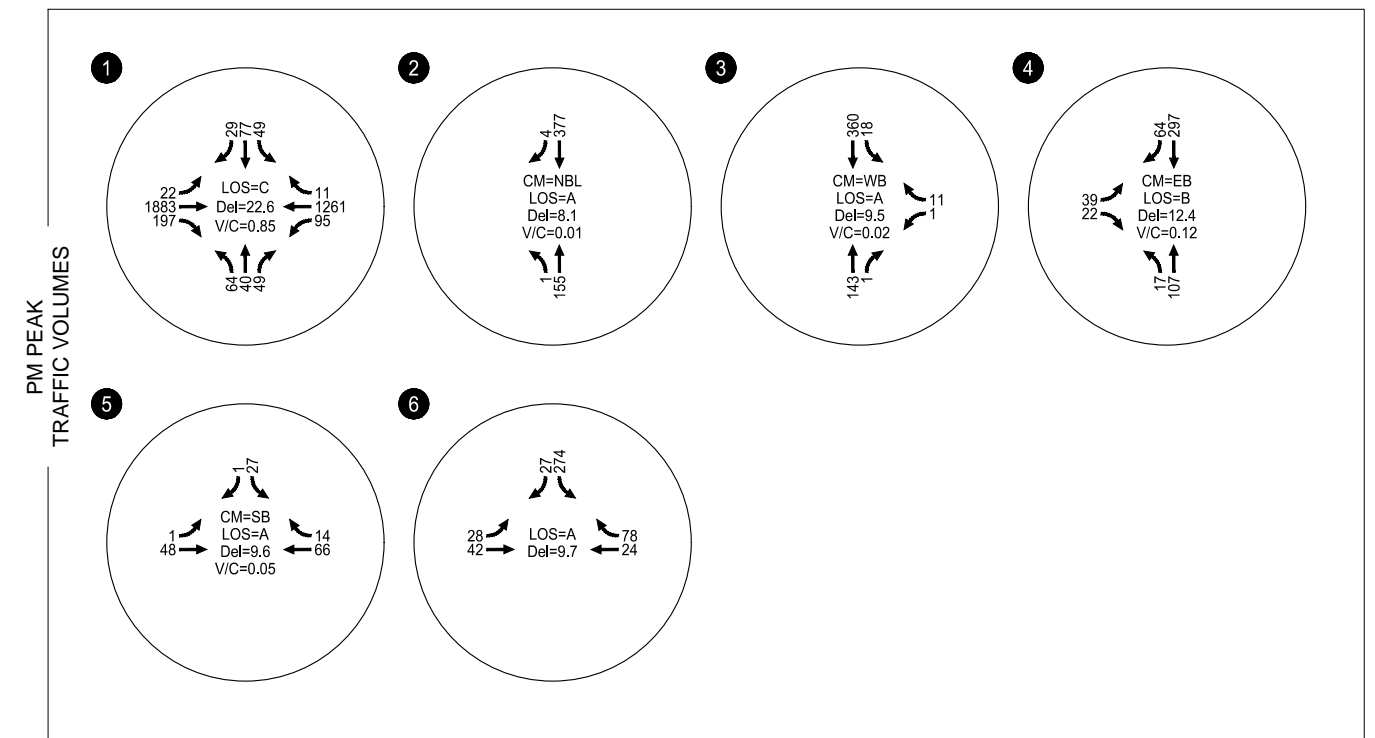
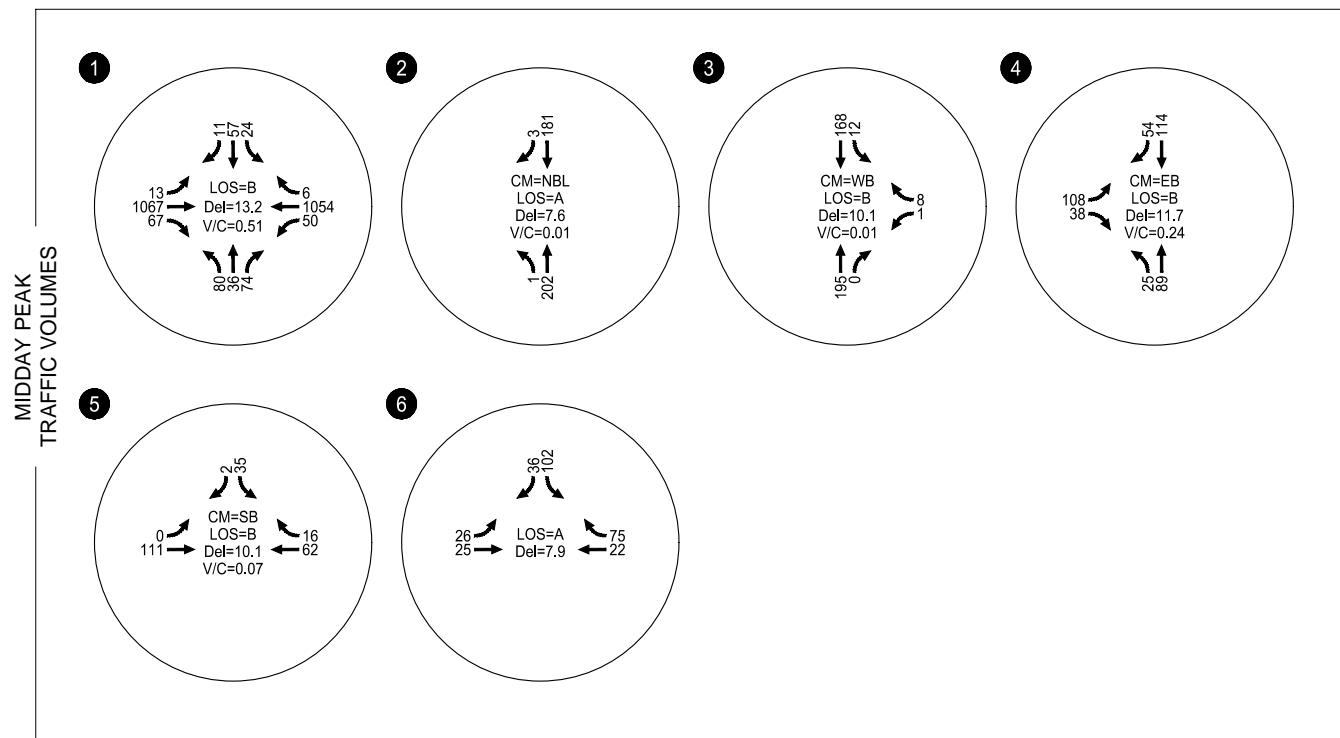
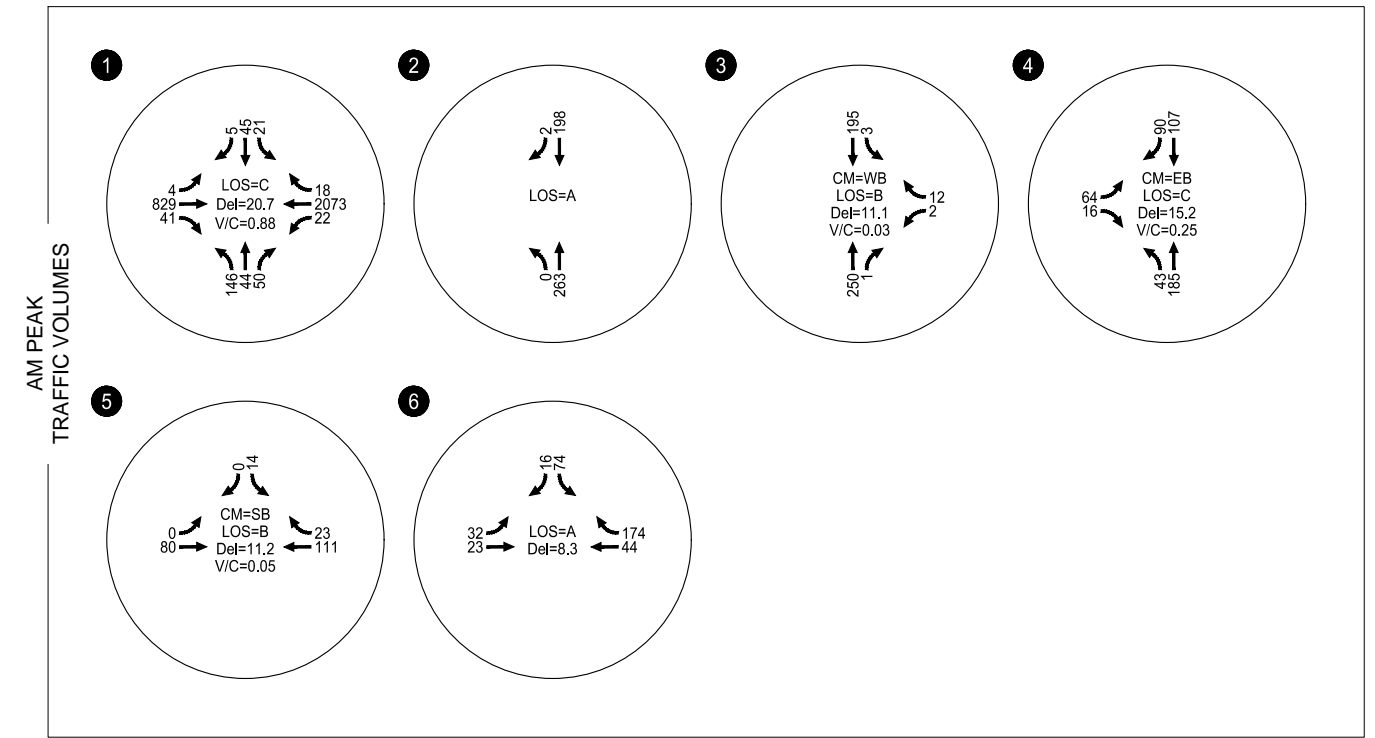
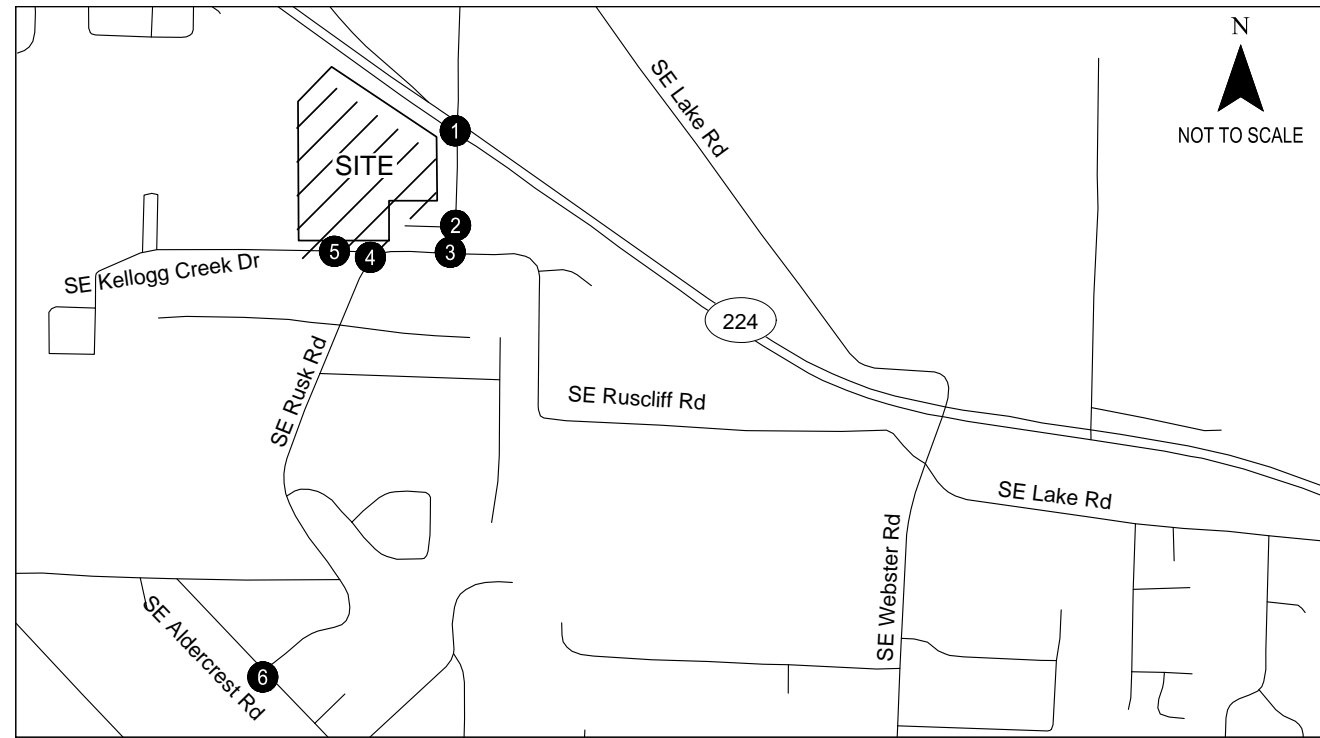
**Table 6. Summary of 95<sup>th</sup> Percentile Queues, 2019 Total Traffic Conditions**

Intersection	Movement	Available Queue Storage (feet)	95 <sup>th</sup> Percentile Queue (feet)			Queue Storage Adequate?
			Weekday AM Peak Hour	Weekday Midday Peak Hour	Weekday PM Peak Hour	
SE Rusk Road/OR-224	EBL	470	25	50	50	Yes
	EBR	110	25	25	100	Yes
	WBL	455	50	75	175	Yes
	WBR	100	25	0	0	Yes
	NBLT	>400	275	125	200	Yes
	NBR	50	25	50	50	Yes
	SBLT	745	100	100	200	Yes
	SBR	75	0	0	25	Yes
SE Rusk Road/SE Ruscliff Road	WBLR	360	25	0	0	Yes
SE Rusk Road/SE Kellogg Creek Drive	EBLR	>100	25	25	25	Yes
SE Kellogg Creek Drive/Church Access	SBLR	75	25	25	25	Yes
SE Rusk Road/SE Aldercrest Road	EBLT	Continuous	-	-	-	Yes
	WBTR	Continuous	-	-	-	Yes
	SBLR	Continuous	-	-	-	Yes

Where: EB = eastbound, WB = westbound, NB = northbound, SB = southbound, L = left-turn, T= through, R = right-turn  
Queues rounded up to the nearest vehicle length, assumed to be 25 feet

As shown in **Table 6**, all 95<sup>th</sup> percentile queues during year 2019 total traffic conditions would be accommodated by the available storage. As previously noted, there is an existing need for a northbound right-turn lane at the SE Rusk Road/OR-224 intersection regardless of the proposed development. Provision of the northbound right-turn lane on SE Rusk Road approaching OR-224 reduces northbound queues relative to existing conditions.





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2019 Total Traffic Conditions  
 Weekday AM, Midday & PM Peak Hours  
 Milwaukie, Oregon

Figure  
 8

## Intersection Sight Distance

Section 240 of the *Clackamas County Roadway Design Standards* (Reference 11) establishes the intersection sight distance requirements associated with the existing driveway along SE Kellogg Creek Drive. Per Table 2-6 of Section 240 of the *Clackamas County Roadway Design Standards*, an intersection sight distance of 335 feet shall be provided for a left turn from a stop on a road with a 30 mile per hour design speed (posted 25 mph speed)<sup>3</sup>. Intersection sight distance was observed at the existing site driveway on SE Kellogg Creek Drive and was found to be at least 400 feet to the west, and at least 400 feet to the east for vehicles traveling west on SE Rusk Road<sup>4</sup>.

However, sight distance for a southbound left-turn at the driveway would be approximately 300 feet facing east towards a vehicle northbound on SE Rusk Road turning left onto SE Kellogg Creek Drive. The northbound left-turning vehicles on SE Rusk Road are required to yield to southbound vehicles on SE Rusk Road. Based on a field review of traffic and vehicular speeds entering SE Kellogg Creek Drive from SE Rusk Road, 300 feet is sufficient intersection sight distance for the southbound left-turn at the driveway because vehicles negotiating a left turn onto SE Kellogg Creek Drive would be operating at less than 20 miles per hour. The 25-foot radius of the curve corresponds to a design speed of approximately 11 miles per hour (NCHRP Report 672, Reference 12). Furthermore, the required minimum stopping sight distance for a northbound left-turn vehicle traveling at 20 miles per hour is 115 feet per Table 2-10 of Section 240 of the *Clackamas County Roadway Design Standards*, which will be satisfied. Subject to agency approval, the Applicant proposes to relocate the existing access 45 feet to the west of its existing location, increasing the sight lines and travel distance to SE Rusk Road.

Landscaping, above ground utilities, and signing should be located and maintained in a manner that provides adequate intersection sight distance.

## Analysis of Access Standards

Per Section 12.16.040 of the *City of Milwaukie Municipal Code* (Reference 10) driveway access to the nearest intersecting street face shall be a minimum of 100 feet. The existing driveway on SE Kellogg Creek Drive is located approximately 200 feet from SE Rusk Road, which satisfies the City standard. The Applicant proposes to relocate this access 45 feet to the west of its existing location, increasing access spacing with respect to SE Rusk Road.

The existing SE Rusk Road church driveway is signed for one-way inbound movement. Egress movements were recorded at the driveway despite the one-way signing. Regardless of the proposed

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<sup>3</sup> Clackamas County Roadway Design Standards Section 250.1.2.c.2 defines the design speed of roadways as the existing regulatory speed plus five mph.

<sup>4</sup> Per Clackamas County Roadway Design Standards Section 240.4, intersection sight distance shall typically be measured from a driver's eye height of 3.5 feet and 14.5 feet from the edge of the nearest travel lane to an object height of 3.5 feet above the roadway surface.

development, "DO NOT ENTER" and/or "ONE WAY" signs should be installed at the SE Rusk Road/Church driveway in accordance with the *Manual on Uniform Traffic Control Devices (MUTCD)* (Reference 13) to restrict vehicles from exiting the church driveway onto SE Rusk Road.

### ***Emergency Access***

Emergency access to the proposed senior housing site will be provided via this existing driveway, which will remain ungated for Church use.

### **Parking Supply Analysis**

The Applicant proposes a total of 136 parking spaces, plus one additional dedicated space for an activities van. A minimum of 162 parking spaces are required by City Code:

- Once space per unit for 75 independent and assisted living units under 800 square feet.
- 1.25 spaces per unit for 63 independent and assisted living units over 800 square feet.
- 0.25 spaces per bed for 32 memory care beds.

The Applicant will be requesting a Parking Modification and will supply evidence in support of the request under separate cover.

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## FINDINGS AND RECOMMENDATIONS

Based on the results of the transportation impact analysis, the proposed development can be constructed while maintaining acceptable operations at the study intersections. The analysis developed the following findings and recommendations.

### Findings

- All study intersections are forecast to operate within the applicable review agency volume-to-capacity ratio and delay standards under existing and site opening year 2019 conditions during the weekday AM, midday, and PM peak hours.
- Some vehicles were observed making wrong-way egress movements at the existing church driveway on SE Rusk Road.
- Existing weekday AM peak hour northbound queuing on SE Rusk Road at OR-224 extends past SE Ruscliff Road and west towards SE Kellogg Creek Drive.
- With the provision of a northbound right-turn lane on SE Rusk Road at OR-224, projected 95<sup>th</sup> percentile AM, midday and PM peak hour queues can be accommodated within the existing storage areas at the study intersections and queuing on SE Rusk Road after site development will be less than the amount experienced today.
- Historical crash data for the study area intersections indicate no patterns or trends that require mitigation associated with the proposed development.

### RECOMMENDATIONS

- Subject to City approval and regardless of the proposed development, “DO NOT ENTER” and/or “ONE WAY” signs should be installed at the SE Rusk Road/Church driveway in accordance with the *Manual on Uniform Traffic Control Devices* (MUTCD) to restrict vehicles from exiting the church driveway onto SE Rusk Road.
- The Applicant should collaborate with the City of Milwaukie to construct a northbound right-turn lane on SE Rusk Road at OR-224 in conjunction with site development subject to available right-of-way and Transportation System Development Charges (TSDC) credits. The turn lane design and construction will be creditable towards the project TSDC.
- Intersection sight distance should be provided at the proposed site access per applicable City of Milwaukie and Clackamas County design requirements. Landscaping, above ground utilities, and signing should be located and maintained in a manner that provides adequate intersection sight distance.

Please contact us if you need any additional information regarding our analyses.

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## REFERENCES

1. Transportation Research Board. *2010 Highway Capacity Manual*. 2010.
2. Transportation Research Board. *2000 Highway Capacity Manual*. 2000.
3. *City of Milwaukie Transportation System Plan*. Revised October 2018.
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5. Oregon Department of Transportation. *1999 Oregon Highway Plan*. Amended May 2015.
6. TriMet. "Bus Services." Accessed on-line at [www.trimet.org](http://www.trimet.org). November 2018.
7. Oregon Department of Transportation Research Section. *SPR 667 Assessment of Statewide Intersection Safety Performance*. June 2011.
8. American Association of State Highway and Transportation Officials. *Highway Safety Manual*. 2010.
9. Institute of Transportation Engineers. *Trip Generation, 10<sup>th</sup> Edition*. 2017.
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11. *Clackamas County Roadway Design Standards*. Updated April 2018.
12. Transportation Research Board of the National Academies. *National Cooperative Highway Research Program (NCHRP) Report 672 Roundabouts: An Informational Guide*. Exhibit 6-52, Speed-Radius Relationship. Page 6-57.
13. *Manual on Uniform Traffic Control Devices*. USDOT, Federal Highway Administration. 2009, Revision 2, May 2012.

## ATTACHMENTS

Attachment A – Description of Level-of-Service and Volume-to-Capacity Methods and Criteria

Attachment B – Crash Data

Attachment C – Traffic Count Data

Attachment D – Existing Traffic Level-of-Service Worksheets

Attachment E – 2019 Background Traffic Level-of-Service Worksheets

Attachment F – 2019 Total Traffic Level-of-Service Worksheets

**Attachment A - Description of  
Level-of-Service and Volume-  
to-Capacity Methods and  
Criteria**

## LEVEL-OF-SERVICE CONCEPT

Level of service (LOS) is a concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. Six grades are used to denote the various level of service from “A” to “F.”<sup>5</sup>

### Signalized Intersections

The six level-of-service grades are described qualitatively for signalized intersections in Table A1. Additionally, Table A2 identifies the relationship between level of service and average control delay per vehicle. Control delay is defined to include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Using this definition, Level of Service “D” is generally considered to represent the minimum acceptable design standard.

Table A1 Level-of-Service Definitions (Signalized Intersections)

Level of Service	Average Delay per Vehicle
A	Very low average control delay, less than 10 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Average control delay is greater than 10 seconds per vehicle and less than or equal to 20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for a level of service A, causing higher levels of average delay.
C	Average control delay is greater than 20 seconds per vehicle and less than or equal to 35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Average control delay is greater than 35 seconds per vehicle and less than or equal to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high volume/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Average control delay is greater than 55 seconds per vehicle and less than or equal to 80 seconds per vehicle. This is usually considered to be the limit of acceptable delay. These high delay values generally (but not always) indicate poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.
F	Average control delay is in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation. It may also occur at high volume/capacity ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such high delay values.

<sup>5</sup>Most of the material in this appendix is adapted from the Transportation Research Board, *Highway Capacity Manual*, 2000.

Table A2 Level-of-Service Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

### Unsignalized Intersections

Unsignalized intersections include two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections. The *2000 Highway Capacity Manual (HCM)* provides models for estimating control delay at both TWSC and AWSC intersections. A qualitative description of the various service levels associated with an unsignalized intersection is presented in Table A3. A quantitative definition of level of service for unsignalized intersections is presented in Table A4. Using this definition, Level of Service “E” is generally considered to represent the minimum acceptable design standard.

Table A3 Level-of-Service Definitions (Unsignalized Intersections)

Level of Service	Average Delay per Vehicle to Minor Street
A	<ul style="list-style-type: none"> <li>Nearly all drivers find freedom of operation.</li> <li>Very seldom is there more than one vehicle in queue.</li> </ul>
B	<ul style="list-style-type: none"> <li>Some drivers begin to consider the delay an inconvenience.</li> <li>Occasionally there is more than one vehicle in queue.</li> </ul>
C	<ul style="list-style-type: none"> <li>Many times, there is more than one vehicle in queue.</li> <li>Most drivers feel restricted, but not objectionably so.</li> </ul>
D	<ul style="list-style-type: none"> <li>Often there is more than one vehicle in queue.</li> <li>Drivers feel quite restricted.</li> </ul>
E	<ul style="list-style-type: none"> <li>Represents a condition in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement.</li> <li>There is almost always more than one vehicle in queue.</li> <li>Drivers find the delays approaching intolerable levels.</li> </ul>
F	<ul style="list-style-type: none"> <li>Forced flow.</li> <li>Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection.</li> </ul>



Table A4 Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10.0 and ≤ 15.0
C	>15.0 and ≤ 25.0
D	>25.0 and ≤ 35.0
E	>35.0 and ≤ 50.0
F	>50.0

It should be noted that the level-of-service criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less galling than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to TWSC intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the control delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. While overall intersection level of service is calculated for AWSC intersections, level of service is only calculated for the minor approaches and the major street left turn movements at TWSC intersections. No delay is assumed to the major street through movements. For TWSC intersections, the overall intersection level of service remains undefined: level of service is only calculated for each minor street lane.

In the performance evaluation of TWSC intersections, it is important to consider other measures of effectiveness (MOEs) in addition to delay, such as v/c ratios for individual movements, average queue lengths, and 95<sup>th</sup>-percentile queue lengths. By focusing on a single MOE for the worst movement only, such as delay for the minor-street left turn, users may make inappropriate traffic control decisions. The potential for making such inappropriate decisions is likely to be particularly pronounced when the HCM level-of-service thresholds are adopted as legal standards, as is the case in many public agencies.

## **Attachment B - Crash Data**

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 224 Clackamas Highway (171) & Rusk Road  
 January 1, 2010 through December 31, 2014

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2014														
ANGLE	0	0	1	1	0	0	0	0	1	1	0	1	0	0
REAR-END	0	2	0	2	0	2	0	1	1	2	0	2	0	0
2014 TOTAL	0	2	1	3	0	2	0	1	2	3	0	3	0	0
YEAR: 2011														
REAR-END	0	2	0	2	0	2	0	1	1	2	0	2	0	0
TURNING MOVEMENTS	0	2	0	2	0	2	0	0	2	0	2	2	0	0
2011 TOTAL	0	4	0	4	0	4	0	1	3	2	2	4	0	0
YEAR: 2010														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2010 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	6	2	8	0	6	0	3	5	6	2	8	0	0

*Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.*



OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CONTINUOUS SYSTEM CRASH LISTING

171 CLACKAMAS

OR 224 Clackamas Highway (171) & Rusk Road  
January 1, 2010 through December 31, 2014

SER#	E A U C O	DATE	COUNTY	RD#	FC	CONN #	INT-TYP	RD CHAR	(MEDIAN)	INT-REL	OFFRD	WTHR	CRASH TYP	SPCL USE	TRLR QTY	MOVE	PRTC	INJ	A S	G E	LICNS	PED	ACTN	EVENT	CAUSE		
INVEST	E L G H R	DAY/TIME	CITY	MILEPNT	FIRST	STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL TYP	OWNER	FROM													
UNLOC?	D C S L K	LAT/LONG	URBAN AREA	LRS	INTERSECTION	SEQ#	LOCTN	(#LANES)	CNTL	DRVWY	LIGHT	SVRTY	V#	VEH TYPE	TO	P#	TYPE	SVRTY	E X	RES	LOC	ERROR					
00765	N N N N N	02/21/2014	CLACKAMAS	1	12		INTER	CROSS	N		N	CLD	ANGL-OTH	01	NONE	0	STRGHT								04		
CITY		Fri 7A		MN	0		CN		TRF	SIGNAL	N	WET	ANGL		PRVTE	S	N							000	00		
			PORTLAND UA		2.72		02	0			N	DAY	PDO		PSNGR	CAR		01	DRVR	NONE	53	F	OR-Y	000	000	00	
No	45 25	40.02 -122 36 4.56			017100100S00																					OR<25	
															02	NONE	0	STRGHT								00	00
															PRVTE	E	W								000	00	
															PSNGR	CAR		01	DRVR	NONE	27	M	OTH-Y	020	000	04	N-RES

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
COUNTY ROAD CRASH LISTING

CLACKAMAS COUNTY

OR 224 Clackamas Highway (171) & Rusk Road

January 1, 2010 through December 31, 2014

Table with columns: SER#, INVEST, UNLOC, DATE, MILEPNT, COUNTY ROADS, RD CHAR, INT-TYP, INT-REL, OFF-RD, WTHR, CRASH TYP, SPCL USE, MOVE, FROM, PRTC, INJ, SVRTY, A, S, G, E, LICNS, PED, ACTN, EVENT, CAUSE. Includes data for incidents 01538 and 01893.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SE Rusk Rd & Hwy 224 (Milwaukie Expressway)  
 January 1, 2015 through December 31, 2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2016														
ANGLE	0	1	0	1	0	5	0	1	0	1	0	1	0	0
REAR-END	0	1	1	2	0	1	1	1	1	1	1	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	0	1	1	0	0
2016 TOTAL	0	3	1	4	0	8	1	3	1	2	2	4	0	0
YEAR: 2015														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
REAR-END	0	2	2	4	0	2	0	3	0	2	2	4	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2015 TOTAL	0	3	3	6	0	3	0	5	0	3	3	6	0	0
FINAL TOTAL	0	6	4	10	0	11	1	8	1	5	5	10	0	0

**Disclaimers: Effective 2016, collection of "Property Damage Only" (PDO) crash data elements was reduced for vehicles and participants. Age, Gender, License, Error and other elements are no longer available for PDO crash reporting. Please keep this in mind when comparing 2016 PDO crash data to prior years.**

A higher number of crashes may be reported as of 2011 compared to prior years. This does not necessarily reflect an increase in annual crashes. The higher numbers may result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics. For all disclaimers, see [https://www.oregon.gov/ODOT/Data/documents/Crash\\_Data\\_Disclaimers.pdf](https://www.oregon.gov/ODOT/Data/documents/Crash_Data_Disclaimers.pdf).









OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Rusk Road & Ruscliffe Rd  
 January 1, 2010 through December 31, 2014

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2013														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2013 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0

*Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.*



OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SE Rusk Rd & SE Ruscliff Rd  
 January 1, 2015 through December 31, 2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

**Disclaimers:** Effective 2016, collection of "Property Damage Only" (PDO) crash data elements was reduced for vehicles and participants. Age, Gender, License, Error and other elements are no longer available for PDO crash reporting. Please keep this in mind when comparing 2016 PDO crash data to prior years.

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Rusk Road & Kellogg Creek Drive  
 January 1, 2010 through December 31, 2014

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2013														
TURNING MOVEMENTS	0	0	2	2	0	0	0	2	0	2	0	2	0	0
2013 TOTAL	0	0	2	2	0	0	0	2	0	2	0	2	0	0
FINAL TOTAL	0	0	2	2	0	0	0	2	0	2	0	2	0	0

*Disclaimer: A higher number of crashes may be reported as of 2011 compared to prior years. This does not reflect an increase in annual crashes. The higher numbers result from a change to an internal departmental process that allows the Crash Analysis and Reporting Unit to add previously unavailable, non-fatal crash reports to the annual data file. Please be aware of this change when comparing pre-2011 crash statistics.*



OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SE Rusk Rd & SE Kellogg Creek Dr  
 January 1, 2015 through December 31, 2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2016														
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2016 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
FINAL TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0

**Disclaimers:** Effective 2016, collection of “Property Damage Only” (PDO) crash data elements was reduced for vehicles and participants. Age, Gender, License, Error and other elements are no longer available for PDO crash reporting. Please keep this in mind when comparing 2016 PDO crash data to prior years.

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 COUNTY ROAD CRASH LISTING

CLACKAMAS COUNTY

SE Rusk Rd & SE Kellogg Creek Dr  
 January 1, 2015 through December 31, 2016

SER#	UNLOC?	D	C	S	L	K	LAT/LONG	DATE	MILEPNT	COUNTY ROADS	RD CHAR	INT-TYP	INT-REL	OFF-RD	WTHR	CRASH TYP	SPCL USE	MOVE	PRTC	INJ	A	S	ACTN	EVENT	CAUSE		
INVEST	E	L	G	H	R	DAY/TIME	DIST FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDBT	SURF	COLL TYP	OWNER	FROM	VEH TYPE	TO	SVR	TY	E	X	RES	LOC	ERROR		
NO	45	25	34.17	-122	36	9.48	INTERSECT	INTERSECTION SEQ #	LOCTN	(#LANES)	CONTL	DRVWY	LIGHT	SVRTY	V#	VEH TYPE	TO	P#	TYPE	SVRTY	E	X	RES	LOC	ERROR		
04144	N	N	N			9/9/2016	0.40	SE RUSK RD	INTER	3-LEG	N	N	CLR	BIKE	01	NONE	0	TURN-R							02		
NONE						Fri 1P			CN		UNKNOWN	N	DRY	TURN		PRVTE	E	NW							000	00	
No	45	25	34.17	-122	36	9.48			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	28	F	OR-Y	027	000	02	
																										000	00
																										046	00

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Rusk Road & Aldercrest Rd  
January 1, 2010 through December 31, 2014

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
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YEAR:

TOTAL

FINAL TOTAL

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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CRASH SUMMARIES BY YEAR BY COLLISION TYPE

SE Rusk Rd & SE Aldercrest Rd  
 January 1, 2015 through December 31, 2016

COLLISION TYPE	FATAL CRASHES	NON- FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER- SECTION	INTER- SECTION RELATED	OFF- ROAD
YEAR: 2016														
REAR-END	0	1	0	1	0	1	0	0	1	0	1	1	0	0
2016 TOTAL	0	1	0	1	0	1	0	0	1	0	1	1	0	0
YEAR: 2015														
TURNING MOVEMENTS	0	1	1	2	0	2	0	1	1	2	0	2	0	0
2015 TOTAL	0	1	1	2	0	2	0	1	1	2	0	2	0	0
FINAL TOTAL	0	2	1	3	0	3	0	1	2	2	1	3	0	0

**Disclaimers:** Effective 2016, collection of “Property Damage Only” (PDO) crash data elements was reduced for vehicles and participants. Age, Gender, License, Error and other elements are no longer available for PDO crash reporting. Please keep this in mind when comparing 2016 PDO crash data to prior years.

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ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARALLEL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
014	EMR V PKD	EMERGENCY VEHICLE LEGALLY PARKED IN THE ROADWAY
015	GO A/STOP	PROCEED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNED ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	PREV COL	STRUCK, OR WAS STRUCK BY, VEHICLE OR PEDESTRIAN IN PRIOR COLLISION BEFORE ACC. STABILIZED
023	STALLED	VEHICLE STALLED OR DISABLED
024	DRVR DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUING OR ATTEMPTING TO STOP A VEHICLE
031	PASSING	PASSING SITUATION
032	PRKOFFRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
046	W/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. WITH TRAFFIC
047	A/ TRAFIC	NON-MOTORIST WALKING, RUNNING, RIDING, ETC. FACING TRAFFIC
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF ROAD
052	MERGING	MERGING

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
055	SPRAY	BLINDED BY WATER SPRAY
088	OTHER	OTHER ACTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO-FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS SIG	DISREGARDED TRAFFIC SIGNAL
05	LEFT-CTR	DROVE LEFT OF CENTER ON TWO-WAY ROAD; STRADDLING
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROAD; WRONG SIDE DIVIDED RO
16	FATIGUE	DRIVER DROWSY/FATIGUED/SLEEPY
17	ILLNESS	PHYSICAL ILLNESS
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VISBL	NON-MOTORIST NOT VISIBLE; NON-REFLECTIVE CLOTHIN
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
28	NM INATT	NON-MOTORIST INATTENTION
29	F AVOID	FAILED TO AVOID VEHICLE AHEAD
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (PER PAR)
33	RECKLESS	RECKLESS DRIVING (PER PAR)
34	AGGRESV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)
40	VIEW OBS	VIEW OBSCURED
50	USED MDN	IMPROPER USE OF MEDIAN OR SHOULDER
51	FAIL LN	FAILED TO MAINTAIN LANE
52	OFF RD	RAN OFF ROAD

COLLISION TYPE CODE TRANSLATION LIST

COLL CODE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OTH	MISCELLANEOUS
-	BACK	BACKING
0	PED	PEDESTRIAN
1	ANGL	ANGLE
2	HEAD	HEAD-ON
3	REAR	REAR-END
4	SS-M	SIDESWIPE - MEETING
5	SS-O	SIDESWIPE - OVERTAKING
6	TURN	TURNING MOVEMENT
7	PARK	PARKING MANEUVER
8	NCOL	NON-COLLISION
9	FIX	FIXED OBJECT OR OTHER OBJECT

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BIKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	FIX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1 L-TURN	FROM OPPOSITE DIRECTION-ONE LEFT TURN, ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

DRIVER LICENSE CODE TRANSLATION LIST

LIC CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID OREGON LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED
4	EXP	EXPIRED
8	N-VAL	OTHER NON-VALID LICENSE
9	UNK	UNKNOWN IF DRIVER WAS LICENSED AT TIME OF CRASH

DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNUED FROM WRONG LANE
007	TO WRONG	TURNUED INTO WRONG LANE
008	ILLEG U	U-TURNUED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	INATTENTION (FAILURE TO DIM LIGHTS PRIOR TO 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING/EXITING PARKED POSITION W/ INSUFFICIENT CLEARANCE; OTHER IMPROPER PARKING MANEUVER
019	DIS DRIV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED SIREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDALCYCLIST
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNGSIDE	DRIVING ON WRONG SIDE OF THE ROAD (2-WAY UNDIVIDED ROADWAYS)



ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS
042	F/SLO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
043	TOO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
044	STRDL LN	STRADDLING OR DRIVING ON WRONG LANES
045	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
046	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY; WRONG SIDE DIVIDED ROAD
047	BASCRULE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
048	OPN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
049	IMPEDING TRAFFIC	IMPEDING TRAFFIC
050	SPEED	DRIVING IN EXCESS OF POSTED SPEED
051	RECKLESS	RECKLESS DRIVING (PER PAR)
052	CARELESS	CARELESS DRIVING (PER PAR)
053	RACING	SPEED RACING (PER PAR)
054	X N/SGNL	CROSSING AT INTERSECTION, NO TRAFFIC SIGNAL PRESENT
055	X W/SGNL	CROSSING AT INTERSECTION, TRAFFIC SIGNAL PRESENT
056	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
057	BTWN INT	CROSSING BETWEEN INTERSECTIONS
059	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
060	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
061	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
062	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
063	PLAYINRD	PLAYING IN STREET OR ROAD
064	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
065	WORK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
070	LAY ON RD	STANDING OR LYING IN ROADWAY
071	NM IMP USE	IMPROPER USE OF TRAFFIC LANE BY NON-MOTORIST
073	ELUDING	ELUDING / ATTEMPT TO ELUDE
079	F NEG CURV	FAILED TO NEGOTIATE A CURVE
080	FAIL LN	FAILED TO MAINTAIN LANE
081	OFF RD	RAN OFF ROAD
082	NO CLEAR	DRIVER MISJUDGED CLEARANCE
083	OVRSTEER	OVER-CORRECTING
084	NOT USED	CODE NOT IN USE
085	OVRLOAD	OVERLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
097	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

## EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	INDRCT PED	PEDESTRIAN INDIRECTLY INVOLVED (NOT STRUCK)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	INDRCT BIK	PEDALCYCLIST INDIRECTLY INVOLVED (NOT STRUCK)
007	HITCHIKR	HITCHHIKER (SOLICITING A RIDE)
008	PSNGR TOW	PASSENGER OR NON-MOTORIST BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON/OFF STOPPED/PARKED VEHICLE (OCCUPANTS ONLY; MUST HAVE PHYSICAL CONTACT W/ VEHICLE)
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSHD	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELOFF	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOST LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HORSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BAR OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LEADING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING OR PARAPET (ON BRIDGE OR APPROACH)
047	BR ABUTMNT	BRIDGE ABUTMENT (INCLUDED "APPROACH END" THRU 2013)
048	BR COLMN	BRIDGE PILLAR OR COLUMN
049	BR GIRDR	BRIDGE GIRDER (HORIZONTAL BRIDGE STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SGNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN

## EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT
060	MARKER	DELINEATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, FALLEN OR FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/DEBRIS IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	IRRGL PVMT	OTHER BUMP (NOT SPEED BUMP), POTHOLE OR PAVEMENT IRREGULARITY (PER PAR)
074	OVERHD OBJ	OTHER OVERHEAD OBJECT (HIGHWAY SIGN, SIGNAL HEAD, ETC.); NOT BRIDGE
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	HI WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	LO-HI EDGE	LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH EMBANKMENT
080	OBJ FRM MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY ROCK OR OTHER MOVING OR FLYING OBJECT (NOT SET IN MOTION BY VEHICLE)
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTHR CRASH	CRASH RELATED TO ANOTHER SEPARATE CRASH
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
091	BUILDING	BUILDING OR OTHER STRUCTURE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE
093	CELL PHONE	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	ABRUPT EDGE
099	CELL WTNSD	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	FIXED OBJECT, UNKNOWN TYPE.
101	OTHER OBJ	NON-FIXED OBJECT, OTHER OR UNKNOWN TYPE
102	TEXTING	TEXTING
103	WZ WORKER	WORK ZONE WORKER
104	ON VEHICLE	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
108	OFFICER	LAW ENFORCEMENT / POLICE OFFICER
109	SUB-BIKE	"SUB-BIKE": PEDALCYCLIST INJURED SUBSEQUENT TO COLLISION, ETC.
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR OR TROLLEY RIGHT-OF-WAY

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
115	DSTRCT GPS	DISTRACTED BY NAVIGATION SYSTEM OR GPS DEVICE
116	DSTRCT OTH	DISTRACTED BY OTHER ELECTRONIC DEVICE
117	RR GATE	RAIL CROSSING DROP-ARM GATE
118	EXPNSN JNT	EXPANSION JOINT
119	JERSEY BAR	JERSEY BARRIER
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
121	FENCE	FENCE
123	OBJ IN VEH	LOOSE OBJECT IN VEHICLE STRUCK OCCUPANT
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE (NOT GRAVEL)
125	SHLDR	SHOULDER GAVE WAY
126	BOULDER	ROCK(S), BOULDER (NOT GRAVEL; NOT ROCK SLIDE)
127	LAND SLIDE	ROCK SLIDE OR LAND SLIDE
128	CURVE INV	CURVE PRESENT AT CRASH LOCATION
129	HILL INV	VERTICAL GRADE / HILL PRESENT AT CRASH LOCATION
130	CURVE HID	VIEW OBSCURED BY CURVE
131	HILL HID	VIEW OBSCURED BY VERTICAL GRADE / HILL
132	WINDOW HID	VIEW OBSCURED BY VEHICLE WINDOW CONDITIONS
133	SPRAY HID	VIEW OBSCURED BY WATER SPRAY
134	TORRENTIAL	TORRENTIAL RAIN (EXCEPTIONALLY HEAVY RAIN)

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN MAJOR COLLECTOR
18	URBAN MINOR COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

HIGHWAY COMPONENT TRANSLATION LIST

CODE	DESCRIPTION
0	MAINLINE STATE HIGHWAY
1	COUPLET
3	FRONTAGE ROAD
6	CONNECTION
8	HIGHWAY - OTHER

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY
2	INJA	INCAPACITATING INJURY - BLEEDING, BROKEN BONES
3	INJB	NON-INCAPACITATING INJURY
4	INJC	POSSIBLE INJURY - COMPLAINT OF PAIN
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE
9	NONE	PARTICIPANT UNINJURED, OVER THE AGE OF 4

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DIVMD	EARTH, GRASS OR PAVED MEDIAN

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
Z	OVERLAPPING

**MOVEMENT TYPE CODE TRANSLATION LIST**

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY
9	PARKNG	PARKING MANEUVER

**NON-MOTORIST LOCATION CODE TRANSLATION LIST**

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH OR PARKING LANE
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
13	AT INTERSECTION - IN BIKE LANE
14	NOT AT INTERSECTION - IN BIKE LANE
15	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
16	NOT AT INTERSECTION - IN PARKING LANE
18	OTHER, NOT IN ROADWAY
99	UNKNOWN LOCATION

**ROAD CHARACTER CODE TRANSLATION LIST**

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	INTER	INTERSECTION
2	ALLEY	DRIVEWAY OR ALLEY
3	STRGHT	STRAIGHT ROADWAY
4	TRANS	TRANSITION
5	CURVE	CURVE (HORIZONTAL CURVE)
6	OPENAC	OPEN ACCESS OR TURNOUT
7	GRADE	GRADE (VERTICAL CURVE)
8	BRIDGE	BRIDGE STRUCTURE
9	TUNNEL	TUNNEL

**PARTICIPANT TYPE CODE TRANSLATION LIST**

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYANCE
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OBJECT
6	BIKE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN OBJECT
8	PRKD	OCCUPANT OF A PARKED MOTOR VEHICLE
9	UNK	UNKNOWN TYPE OF NON-MOTORIST

**TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST**

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OFCCR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG OR FLASHING LIGHTS W/O DROP-ARM GATE
025	X-BUCK WRN	CROSSBUCK AND ADVANCE WARNING
026	WW W/ GATE	FLASHING LIGHTS WITH DROP-ARM GATES
027	OVRHD SGNL	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
028	SP RR STOP	SPECIAL RR STOP SIGN
029	ILUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
090	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALL TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING
095	BUS STPSGN	BUS STOP SIGN AND RED LIGHTS

## VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
00	PDO	NOT COLLECTED FOR PDO CRASHES
01	PSNGR CAR	PASSENGER CAR, PICKUP, LIGHT DELIVERY, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, SEATED MOTOR SCOOTER, MOTOR BIKE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE, DIRT BIKE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER (STANDING)
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

## WEATHER CONDITION CODE TRANSLATION LIST

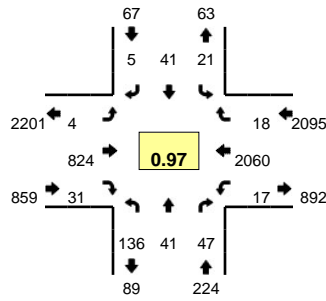
CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

**Attachment C - Traffic Count  
Data**

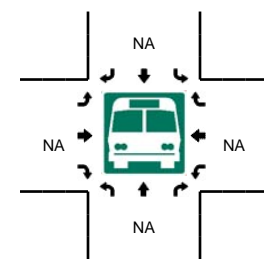
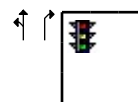
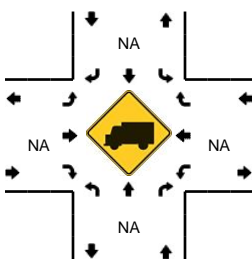
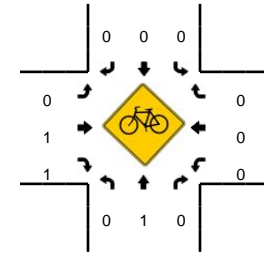
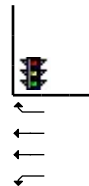
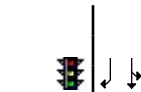
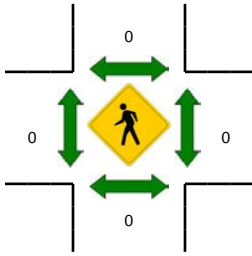
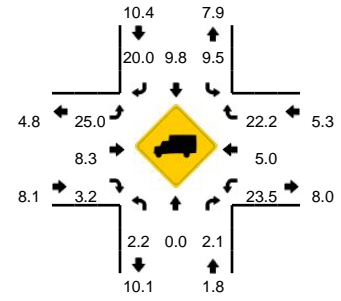


**LOCATION:** 1. SE Rusk Rd -- Milwaukie Expy (Hwy 224)  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793001  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 7:00 AM -- 8:00 AM**  
**Peak 15-Min: 7:40 AM -- 7:55 AM**

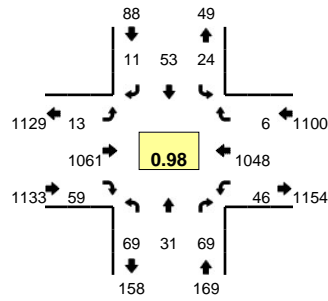


5-Min Count Period Beginning At	1. SE Rusk Rd (Northbound)				1. SE Rusk Rd (Southbound)				Milwaukie Expy (Hwy 224) (Eastbound)				Milwaukie Expy (Hwy 224) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	16	0	0	0	1	0	1	0	0	53	3	0	2	210	0	0	286	
7:05 AM	12	4	7	0	0	3	2	0	1	66	0	0	0	160	2	0	257	
7:10 AM	2	3	5	0	1	1	0	0	0	60	4	0	1	198	3	0	278	
7:15 AM	19	2	4	0	2	5	0	0	0	70	0	0	0	159	1	0	262	
7:20 AM	13	2	3	0	3	3	0	0	0	52	1	0	0	165	1	0	243	
7:25 AM	8	6	5	0	3	1	1	0	2	80	5	0	1	177	0	0	289	
7:30 AM	5	6	3	0	0	6	0	0	0	61	2	0	3	161	1	0	248	
7:35 AM	16	7	4	0	4	6	1	0	0	76	4	0	0	168	2	0	288	
7:40 AM	6	2	5	0	1	1	0	0	0	76	2	0	1	180	1	0	275	
7:45 AM	13	3	3	0	4	1	0	0	0	61	1	0	4	179	3	0	272	
7:50 AM	4	2	2	0	0	6	0	0	0	87	5	0	4	182	1	0	293	
7:55 AM	22	4	6	0	2	8	0	0	1	82	4	0	1	121	3	0	254	3245
8:00 AM	13	2	4	0	0	4	1	0	3	67	2	0	4	154	3	0	257	3216
8:05 AM	8	3	4	0	2	6	0	0	2	75	9	0	2	163	1	0	275	3234
8:10 AM	6	1	3	0	1	5	0	0	0	75	2	0	5	156	1	0	255	3211
8:15 AM	8	1	5	0	2	12	0	0	1	67	10	0	4	132	1	0	243	3192
8:20 AM	9	7	5	0	1	6	0	0	2	48	8	0	6	158	0	0	250	3199
8:25 AM	15	2	7	0	4	12	0	0	1	68	8	0	7	131	1	0	256	3166
8:30 AM	11	6	4	0	0	3	0	0	1	65	2	0	7	155	1	0	255	3173
8:35 AM	15	5	14	0	1	7	3	0	0	70	2	0	3	154	0	0	274	3159
8:40 AM	14	5	7	0	1	2	2	0	0	78	2	0	4	144	0	0	259	3143
8:45 AM	12	2	5	0	1	1	0	0	0	80	5	0	2	127	1	0	236	3107
8:50 AM	12	3	9	0	2	2	1	0	1	75	4	0	5	141	0	0	255	3069
8:55 AM	5	3	4	0	2	4	2	0	1	57	5	0	4	124	1	0	212	3027
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	92	28	40	0	20	32	0	0	0	896	32	0	36	2164	20	0	3360	
Heavy Trucks	4	0	0		4	4	0		0	72	0		8	92	4		188	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

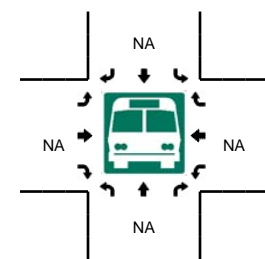
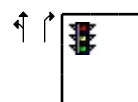
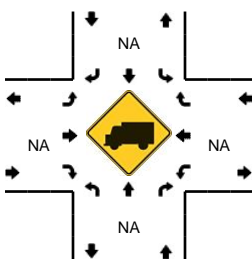
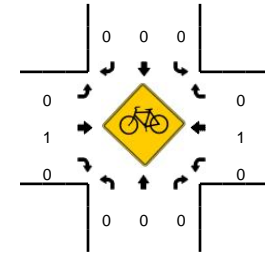
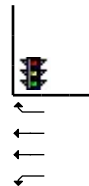
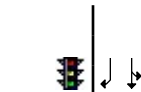
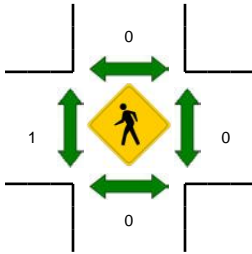
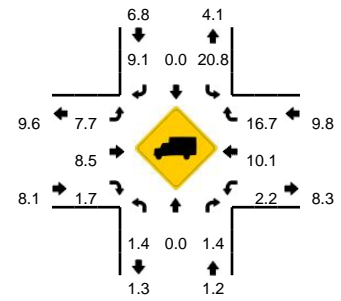
Comments:

**LOCATION:** 1. SE Rusk Rd -- Milwaukie Expy (Hwy 224)  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793002  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 11:40 AM -- 12:40 PM**  
**Peak 15-Min: 12:00 PM -- 12:15 PM**

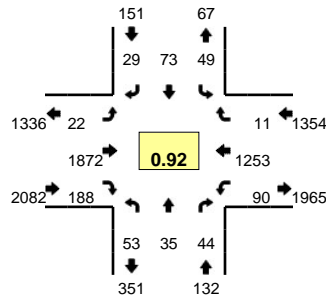


5-Min Count Period Beginning At	1. SE Rusk Rd (Northbound)				1. SE Rusk Rd (Southbound)				Milwaukie Expy (Hwy 224) (Eastbound)				Milwaukie Expy (Hwy 224) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	2	0	3	0	3	3	2	0	0	72	4	1	7	87	0	0	184	
11:05 AM	7	1	4	0	1	1	1	0	1	86	3	0	6	86	0	0	197	
11:10 AM	10	3	5	0	0	7	0	0	1	74	5	0	7	86	0	0	198	
11:15 AM	5	5	7	0	0	3	2	0	0	68	3	0	8	78	1	0	180	
11:20 AM	5	1	2	0	2	0	0	0	0	87	3	0	3	80	1	0	184	
11:25 AM	4	3	2	0	0	1	2	0	2	80	6	0	1	94	1	0	196	
11:30 AM	3	4	5	0	3	3	0	0	1	87	6	0	5	93	0	0	210	
11:35 AM	5	3	2	0	2	4	1	0	1	88	1	0	0	63	3	0	173	
11:40 AM	2	4	1	0	3	4	2	0	1	78	5	0	3	116	2	0	221	
11:45 AM	9	0	3	0	8	3	0	0	2	83	4	0	2	77	0	0	191	
11:50 AM	7	3	2	0	0	4	1	0	0	91	4	0	1	106	0	0	219	
11:55 AM	5	0	2	0	1	2	1	0	1	67	4	0	2	92	1	0	178	2331
12:00 PM	7	3	5	0	1	3	1	0	0	96	9	1	2	85	1	0	214	2361
12:05 PM	2	3	7	0	2	6	1	0	1	92	9	0	3	76	0	0	202	2366
12:10 PM	10	5	9	0	1	7	1	0	0	77	1	0	4	106	0	0	221	2389
12:15 PM	5	2	9	0	3	7	1	0	1	91	6	0	5	66	0	0	196	2405
12:20 PM	6	3	7	0	0	2	0	0	3	98	5	0	8	79	1	0	212	2433
12:25 PM	4	1	8	0	4	7	0	0	2	92	5	0	5	81	1	0	210	2447
12:30 PM	4	5	4	0	0	5	1	0	1	94	4	0	6	81	0	0	205	2442
12:35 PM	8	2	12	0	1	3	2	0	0	102	3	0	5	83	0	0	221	2490
12:40 PM	7	1	3	0	2	3	0	0	1	77	5	0	1	68	1	0	169	2438
12:45 PM	6	4	3	0	3	5	1	0	1	80	4	0	5	98	0	0	210	2457
12:50 PM	9	5	2	0	1	0	0	0	0	88	7	0	6	70	1	0	189	2427
12:55 PM	7	3	1	0	3	7	0	0	3	97	2	0	3	83	2	0	211	2460
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	76	44	84	0	16	64	12	0	4	1060	76	4	36	1068	4	0	2548	
Heavy Trucks	0	0	0		0	0	0		0	92	4		0	124	0		220	
Pedestrians		0				0				4				0			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

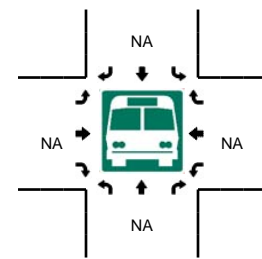
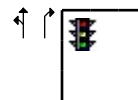
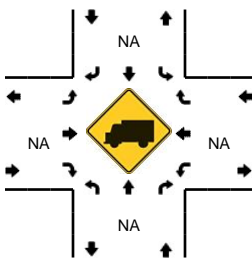
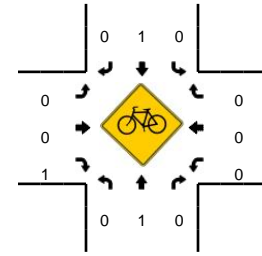
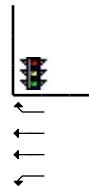
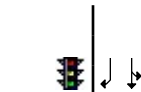
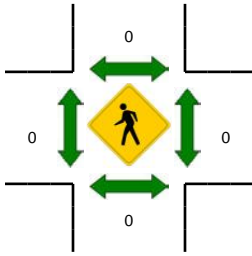
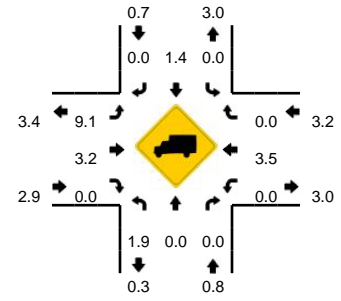
Comments:

**LOCATION:** 1. SE Rusk Rd -- Milwaukie Expy (Hwy 224)  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793003  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 4:35 PM -- 5:35 PM**  
**Peak 15-Min: 5:10 PM -- 5:25 PM**

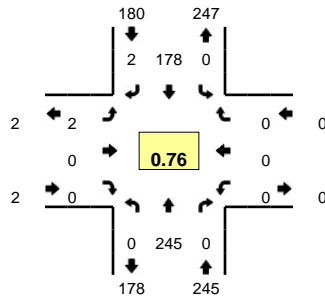


5-Min Count Period Beginning At	1. SE Rusk Rd (Northbound)				1. SE Rusk Rd (Southbound)				Milwaukie Expy (Hwy 224) (Eastbound)				Milwaukie Expy (Hwy 224) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	6	8	4	0	6	5	2	0	0	110	9	0	8	97	0	0	255	
4:05 PM	2	1	1	0	9	9	0	0	0	171	9	0	7	96	0	0	305	
4:10 PM	4	1	1	0	8	11	1	0	2	197	17	0	6	103	3	0	354	
4:15 PM	8	3	6	0	14	8	2	0	0	174	18	0	0	93	0	0	326	
4:20 PM	2	2	4	0	3	6	1	0	0	141	18	0	7	111	0	0	295	
4:25 PM	1	2	3	0	3	9	2	0	3	140	18	0	6	84	1	0	272	
4:30 PM	2	3	7	0	6	6	3	0	5	133	14	0	3	87	2	0	271	
4:35 PM	3	2	2	0	3	3	2	0	2	158	23	0	12	114	0	0	324	
4:40 PM	1	1	3	0	2	5	4	0	0	169	14	0	4	107	1	0	311	
4:45 PM	4	4	3	0	2	3	0	0	7	142	13	0	7	99	1	0	285	
4:50 PM	5	3	2	0	4	8	0	0	0	134	19	0	14	115	1	0	305	
4:55 PM	3	3	3	0	4	2	5	0	1	175	20	0	3	98	2	0	319	3622
5:00 PM	5	2	5	0	4	2	1	0	3	150	11	0	5	92	1	0	281	3648
5:05 PM	7	4	3	0	7	12	5	0	3	139	12	1	12	95	1	0	301	3644
5:10 PM	12	4	5	0	4	7	3	0	0	183	15	0	3	137	0	0	373	3663
5:15 PM	4	1	6	0	5	6	1	0	0	157	18	0	6	96	1	0	301	3638
5:20 PM	2	5	3	0	8	11	5	0	3	145	18	0	13	123	1	0	337	3680
5:25 PM	6	5	3	0	1	9	1	0	2	155	19	0	8	96	1	0	306	3714
5:30 PM	1	1	6	0	5	5	2	0	0	165	6	0	3	81	1	0	276	3719
5:35 PM	1	7	3	0	2	5	2	0	0	162	7	0	7	94	2	0	292	3687
5:40 PM	9	0	3	0	4	3	2	0	1	146	7	0	3	108	2	0	288	3664
5:45 PM	6	2	3	0	1	6	1	0	0	144	9	0	4	78	1	0	255	3634
5:50 PM	3	1	6	0	1	5	1	0	1	161	14	0	4	66	0	0	263	3592
5:55 PM	4	3	2	0	3	4	0	0	0	118	10	0	8	87	1	0	240	3513
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	72	40	56	0	68	96	36	0	12	1940	204	0	88	1424	8	0	4044	
Heavy Trucks	0	0	0		0	0	0		4	80	0		0	44	0		128	
Pedestrians		0				0				0				0			0	
Bicycles		1	0			0	0	0		0	0	1		0	0	0	2	
Railroad																		
Stopped Buses																		

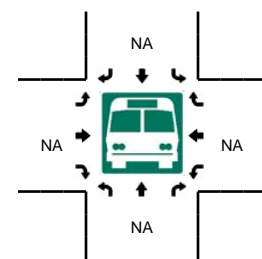
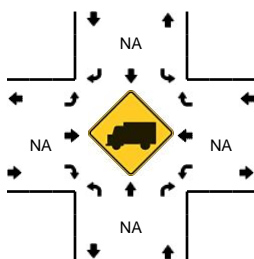
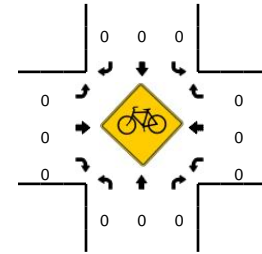
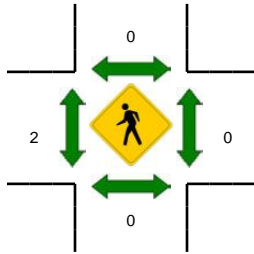
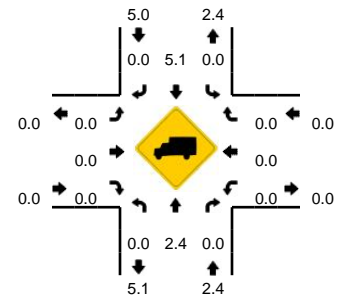
Comments:

**LOCATION:** 2. SE Rusk Rd -- Church Driveway  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793004  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 7:45 AM -- 8:45 AM**  
**Peak 15-Min: 8:15 AM -- 8:30 AM**

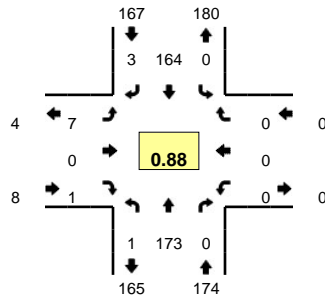


5-Min Count Period Beginning At	2. SE Rusk Rd (Northbound)				2. SE Rusk Rd (Southbound)				Church Driveway (Eastbound)				Church Driveway (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	14	0	0	0	4	0	0	0	0	0	0	0	0	0	0	18	
7:05 AM	0	22	0	0	0	4	0	0	0	0	0	0	0	0	0	0	26	
7:10 AM	0	12	0	0	0	6	0	0	0	0	0	0	0	0	0	0	18	
7:15 AM	0	21	0	0	0	5	0	0	0	0	0	0	0	0	0	0	26	
7:20 AM	0	18	0	0	0	4	0	0	0	0	0	0	0	0	0	0	22	
7:25 AM	0	20	0	0	0	7	0	0	0	0	0	0	0	0	0	0	27	
7:30 AM	0	18	0	0	0	9	0	0	0	0	0	0	0	0	0	0	27	
7:35 AM	0	21	0	0	0	12	0	0	0	0	0	0	0	0	0	0	33	
7:40 AM	0	20	0	0	0	4	0	0	0	0	0	0	0	0	0	0	24	
7:45 AM	0	19	0	0	0	8	0	0	0	0	0	0	0	0	0	0	27	
7:50 AM	0	18	0	0	0	15	0	0	0	0	0	0	0	0	0	0	33	
7:55 AM	0	23	0	0	0	13	1	0	0	0	0	0	0	0	0	0	37	318
8:00 AM	0	20	0	0	0	10	0	0	1	0	0	0	0	0	0	0	31	331
8:05 AM	0	11	0	0	0	16	0	0	0	0	0	0	0	0	0	0	27	332
8:10 AM	0	11	0	0	0	12	0	0	0	0	0	0	0	0	0	0	23	337
8:15 AM	0	17	0	0	0	27	0	0	0	0	0	0	0	0	0	0	44	355
8:20 AM	0	30	0	0	0	18	0	0	0	0	0	0	0	0	0	0	48	381
8:25 AM	0	21	0	0	0	28	0	0	0	0	0	0	0	0	0	0	49	403
8:30 AM	0	22	0	0	0	12	0	0	0	0	0	0	0	0	0	0	34	410
8:35 AM	0	32	0	0	0	12	0	0	0	0	0	0	0	0	0	0	44	421
8:40 AM	0	21	0	0	0	7	1	0	1	0	0	0	0	0	0	0	30	427
8:45 AM	0	18	0	0	0	8	0	0	0	0	0	0	0	0	0	0	26	426
8:50 AM	0	21	0	0	0	8	0	0	0	0	0	0	0	0	0	0	29	422
8:55 AM	0	12	0	0	0	16	0	0	0	0	0	0	0	0	0	0	28	413
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	272	0	0	0	292	0	0	0	0	0	0	0	0	0	0	564	
Heavy Trucks	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

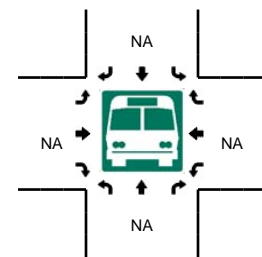
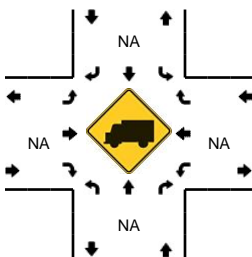
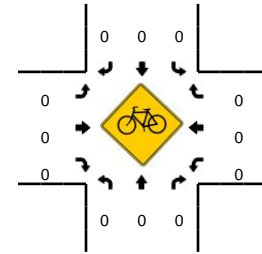
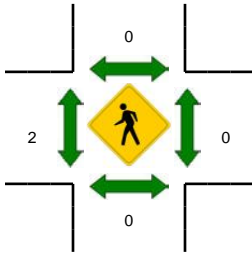
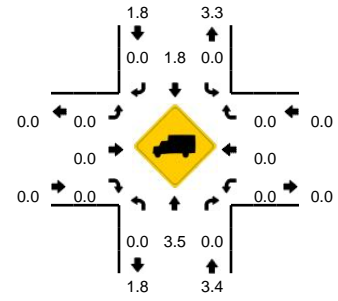
Comments:

**LOCATION:** 2. SE Rusk Rd -- Church Driveway  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793005  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 12:00 PM -- 1:00 PM**  
**Peak 15-Min: 12:15 PM -- 12:30 PM**

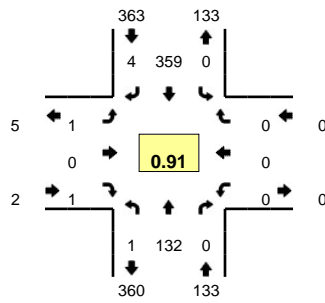


5-Min Count Period Beginning At	2. SE Rusk Rd (Northbound)				2. SE Rusk Rd (Southbound)				Church Driveway (Eastbound)				Church Driveway (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	11	0	0	0	13	0	0	0	0	0	0	0	0	0	0	24	
11:05 AM	0	13	0	0	0	8	0	0	0	0	0	0	0	0	0	0	21	
11:10 AM	0	18	0	0	0	20	0	0	0	0	0	0	0	0	0	0	38	
11:15 AM	0	14	0	0	0	15	0	0	0	0	0	0	0	0	0	0	29	
11:20 AM	0	10	0	0	0	6	0	0	0	0	0	0	0	0	0	0	16	
11:25 AM	0	8	0	0	0	9	0	0	0	0	0	0	0	0	0	0	17	
11:30 AM	0	9	0	0	0	14	0	0	0	0	0	0	0	0	0	0	23	
11:35 AM	0	10	0	0	0	6	0	0	0	0	0	0	0	0	0	0	16	
11:40 AM	0	10	0	0	0	11	0	0	0	0	0	0	0	0	0	0	21	
11:45 AM	0	9	0	0	0	9	0	0	0	0	0	0	0	0	0	0	18	
11:50 AM	0	12	0	0	0	8	0	0	0	0	0	0	0	0	0	0	20	
11:55 AM	0	10	0	0	0	8	0	0	0	0	0	0	0	0	0	0	18	261
12:00 PM	0	13	0	0	0	14	0	0	0	0	0	0	0	0	0	0	27	264
12:05 PM	0	16	0	0	0	16	0	0	1	0	0	0	0	0	0	0	33	276
12:10 PM	0	19	0	0	0	13	0	0	0	0	0	0	0	0	0	0	32	270
12:15 PM	0	12	0	0	0	15	1	0	0	0	0	0	0	0	0	0	28	269
12:20 PM	1	16	0	0	0	16	0	0	3	0	0	0	0	0	0	0	36	289
12:25 PM	0	17	0	0	0	16	0	0	1	0	1	0	0	0	0	0	35	307
12:30 PM	0	11	0	0	0	16	1	0	0	0	0	0	0	0	0	0	28	312
12:35 PM	0	21	0	0	0	9	0	0	0	0	0	0	0	0	0	0	30	326
12:40 PM	0	9	0	0	0	12	0	0	0	0	0	0	0	0	0	0	21	326
12:45 PM	0	14	0	0	0	12	0	0	1	0	0	0	0	0	0	0	27	335
12:50 PM	0	15	0	0	0	14	1	0	1	0	0	0	0	0	0	0	31	346
12:55 PM	0	10	0	0	0	11	0	0	0	0	0	0	0	0	0	0	21	349
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	4	180	0	0	0	188	4	0	16	0	4	0	0	0	0	0	396	
Heavy Trucks	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Railroad																		
Stopped Buses																		

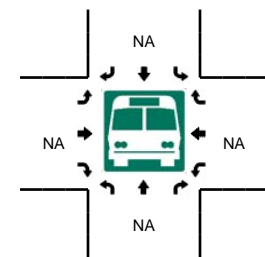
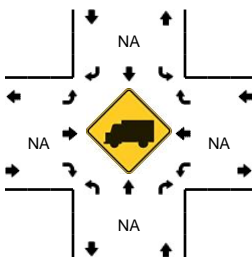
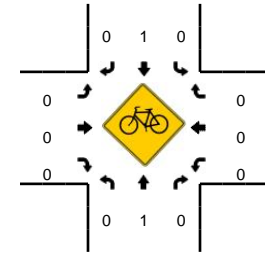
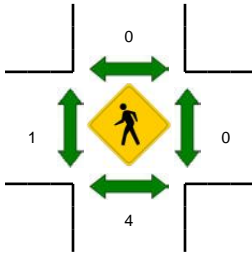
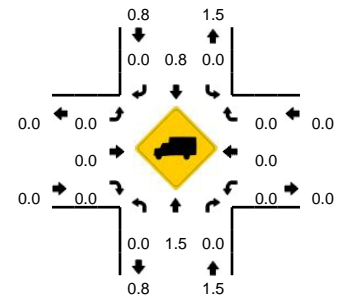
Comments:

**LOCATION:** 2. SE Rusk Rd -- Church Driveway  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793006  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 4:30 PM -- 5:30 PM**  
**Peak 15-Min: 5:15 PM -- 5:30 PM**

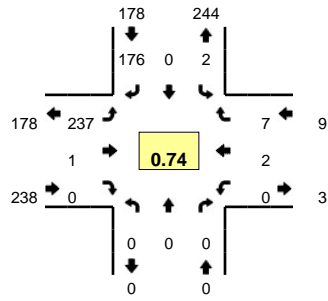


5-Min Count Period Beginning At	2. SE Rusk Rd (Northbound)				2. SE Rusk Rd (Southbound)				Church Driveway (Eastbound)				Church Driveway (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	13	0	0	0	20	1	0	0	0	0	0	0	0	0	0	34	
4:05 PM	0	5	0	0	0	25	1	0	0	0	1	0	0	0	0	0	32	
4:10 PM	0	10	0	0	0	33	0	0	1	0	0	0	0	0	0	0	44	
4:15 PM	0	14	0	0	0	26	0	0	0	0	0	0	0	0	0	0	40	
4:20 PM	0	9	0	0	0	32	1	0	0	0	0	0	0	0	0	0	42	
4:25 PM	0	5	0	0	0	31	0	0	0	0	0	0	0	0	0	0	36	
4:30 PM	0	11	0	0	0	26	0	0	0	0	0	0	0	0	0	0	37	
4:35 PM	0	7	0	0	0	37	1	0	0	0	0	0	0	0	0	0	45	
4:40 PM	1	8	0	0	0	22	0	0	1	0	1	0	0	0	0	0	33	
4:45 PM	0	8	0	0	0	25	0	0	0	0	0	0	0	0	0	0	33	
4:50 PM	0	8	0	0	0	38	0	0	0	0	0	0	0	0	0	0	46	
4:55 PM	0	12	0	0	0	27	0	0	0	0	0	0	0	0	0	0	39	461
5:00 PM	0	12	0	0	0	19	1	0	0	0	0	0	0	0	0	0	32	459
5:05 PM	0	17	0	0	0	32	1	0	0	0	0	0	0	0	0	0	50	477
5:10 PM	0	20	0	0	0	26	0	0	0	0	0	0	0	0	0	0	46	479
5:15 PM	0	6	0	0	0	32	0	0	0	0	0	0	0	0	0	0	38	477
5:20 PM	0	10	0	0	0	35	1	0	0	0	0	0	0	0	0	0	46	481
5:25 PM	0	13	0	0	0	40	0	0	0	0	0	0	0	0	0	0	53	498
5:30 PM	0	8	0	0	0	13	0	0	0	0	0	0	0	0	0	0	21	482
5:35 PM	0	10	0	0	0	20	0	0	0	0	0	0	0	0	0	0	30	467
5:40 PM	0	12	0	0	0	13	0	0	0	0	0	0	0	0	0	0	25	459
5:45 PM	0	11	0	0	0	19	0	0	0	0	0	0	0	0	0	0	30	456
5:50 PM	0	11	0	0	0	19	0	0	1	0	0	0	0	0	0	0	31	441
5:55 PM	0	7	0	0	0	24	0	0	0	0	0	0	0	0	0	0	31	433
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	116	0	0	0	428	4	0	0	0	0	0	0	0	0	0	548	
Heavy Trucks	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4	
Pedestrians		4				0					0			0			4	
Bicycles	0	1	0		0	1	0		0	0	0		0	0	0		2	
Railroad																		
Stopped Buses																		

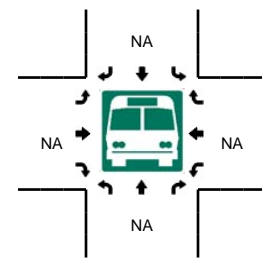
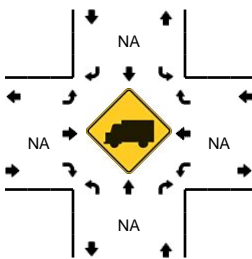
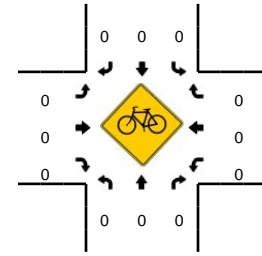
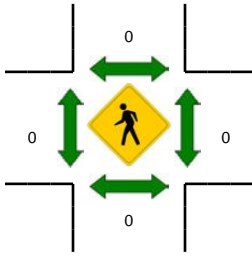
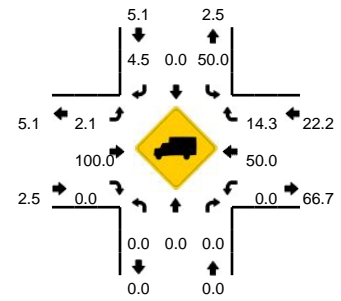
Comments:

**LOCATION:** 3. SE Rusk Rd -- SE Ruscliffe Rd  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793007  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 7:45 AM -- 8:45 AM**  
**Peak 15-Min: 8:15 AM -- 8:30 AM**

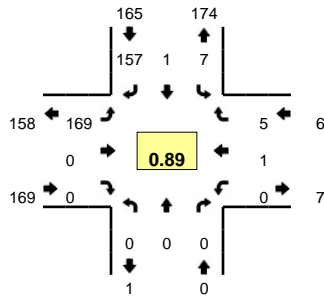


5-Min Count Period Beginning At	3. SE Rusk Rd (Northbound)				3. SE Rusk Rd (Southbound)				SE Ruscliffe Rd (Eastbound)				SE Ruscliffe Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	0	4	0	12	2	0	0	0	1	1	0	20	
7:05 AM	0	0	0	0	1	0	3	0	20	1	0	0	0	0	0	2	27	
7:10 AM	0	0	0	0	2	0	4	0	10	0	0	0	0	0	2	0	18	
7:15 AM	0	0	0	0	0	0	5	0	21	0	0	0	0	0	0	0	26	
7:20 AM	0	0	0	0	0	0	4	0	16	0	0	0	0	2	2	0	24	
7:25 AM	0	0	0	0	0	0	6	0	20	1	0	0	0	0	1	0	28	
7:30 AM	0	0	0	0	1	0	8	0	17	0	0	0	0	0	1	0	27	
7:35 AM	0	0	0	0	1	0	10	0	17	0	0	0	0	4	5	0	37	
7:40 AM	0	0	0	0	1	0	3	0	17	0	0	0	0	0	2	0	23	
7:45 AM	0	0	0	0	0	0	8	0	17	0	0	0	0	0	2	0	27	
7:50 AM	0	0	0	0	0	0	15	0	19	1	0	0	0	1	0	0	36	
7:55 AM	0	0	0	0	0	0	13	0	21	0	0	0	0	1	1	0	36	329
8:00 AM	0	0	0	0	1	0	9	0	19	0	0	0	0	0	1	0	30	339
8:05 AM	0	0	0	0	0	0	15	0	8	0	0	0	0	0	1	0	24	336
8:10 AM	0	0	0	0	1	0	12	0	11	0	0	0	0	0	0	0	24	342
8:15 AM	0	0	0	0	0	0	27	0	17	0	0	0	0	0	0	0	44	360
8:20 AM	0	0	0	0	0	0	18	0	31	0	0	0	0	0	0	0	49	385
8:25 AM	0	0	0	0	0	0	28	0	22	0	0	0	0	0	0	0	50	407
8:30 AM	0	0	0	0	0	0	12	0	22	0	0	0	0	0	1	0	35	415
8:35 AM	0	0	0	0	0	0	12	0	29	0	0	0	0	0	1	0	42	420
8:40 AM	0	0	0	0	0	0	7	0	21	0	0	0	0	0	0	0	28	425
8:45 AM	0	0	0	0	0	0	8	0	18	0	0	0	0	0	0	0	26	424
8:50 AM	0	0	0	0	2	0	6	0	20	0	0	0	0	0	2	0	30	418
8:55 AM	0	0	0	0	0	0	16	0	10	0	0	0	0	0	1	0	27	409
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	0	292	0	280	0	0	0	0	0	0	0	0	572
Heavy Trucks	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																		
Stopped Buses																		

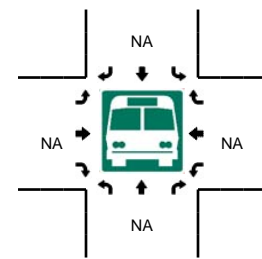
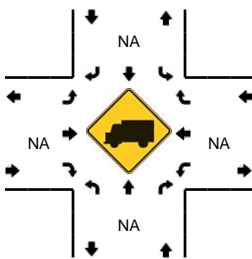
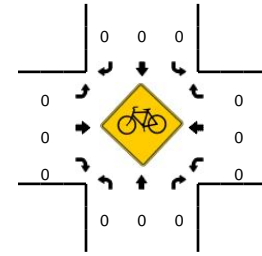
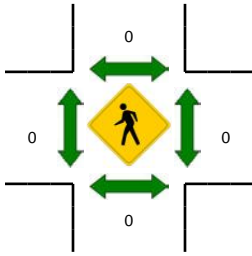
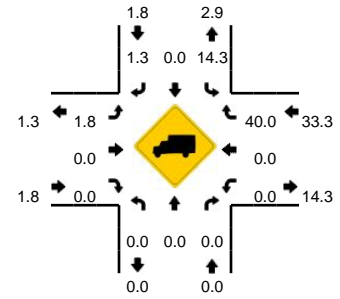
Comments:

**LOCATION:** 3. SE Rusk Rd -- SE Ruscliffe Rd  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793008  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 12:00 PM -- 1:00 PM**  
**Peak 15-Min: 12:15 PM -- 12:30 PM**



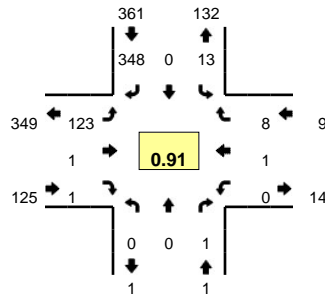
5-Min Count Period Beginning At	3. SE Rusk Rd (Northbound)				3. SE Rusk Rd (Southbound)				SE Ruscliffe Rd (Eastbound)				SE Ruscliffe Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	0	0	0	0	0	13	0	11	1	0	0	0	0	0	0	25	
11:05 AM	0	0	0	0	0	0	8	0	13	0	0	0	0	0	1	0	22	
11:10 AM	0	0	0	0	1	0	19	0	18	1	0	0	0	0	2	0	41	
11:15 AM	0	0	0	0	0	0	14	0	13	0	0	0	0	0	0	1	28	
11:20 AM	0	0	0	0	0	0	6	0	11	2	0	0	0	0	0	0	19	
11:25 AM	0	0	0	0	0	0	10	0	8	0	0	0	0	0	0	0	18	
11:30 AM	0	0	0	0	1	0	12	0	7	0	0	0	0	0	1	0	21	
11:35 AM	0	0	0	0	1	0	6	0	10	0	0	0	0	0	0	0	17	
11:40 AM	0	0	0	0	0	0	10	0	10	0	0	0	0	0	0	0	20	
11:45 AM	0	0	0	0	0	0	10	0	8	0	0	0	0	0	0	1	19	
11:50 AM	0	0	0	0	0	0	8	0	11	0	0	0	0	0	0	1	20	
11:55 AM	0	0	0	0	0	0	8	0	10	0	0	0	0	0	1	0	19	269
12:00 PM	0	0	0	0	1	0	13	0	13	0	0	0	0	0	0	0	27	271
12:05 PM	0	0	0	0	2	0	14	0	16	0	0	0	0	0	0	0	32	281
12:10 PM	0	0	0	0	0	0	12	0	17	0	0	0	0	0	1	0	30	270
12:15 PM	0	0	0	0	0	0	16	0	10	0	0	0	0	0	1	2	29	271
12:20 PM	0	0	0	0	0	0	15	0	17	0	0	0	0	0	0	0	32	284
12:25 PM	0	0	0	0	0	0	18	0	16	0	0	0	0	0	0	1	35	301
12:30 PM	0	0	0	0	1	0	14	0	11	0	0	0	0	0	0	0	26	306
12:35 PM	0	0	0	0	1	0	9	0	21	0	0	0	0	0	0	0	31	320
12:40 PM	0	0	0	0	0	0	12	0	8	0	0	0	0	0	0	1	21	321
12:45 PM	0	0	0	0	2	0	9	0	14	0	0	0	0	0	0	0	25	327
12:50 PM	0	0	0	0	0	0	15	0	17	0	0	0	0	0	0	0	32	339
12:55 PM	0	0	0	0	0	1	10	0	9	0	0	0	0	0	0	0	20	340
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	0	0	196	0	172	0	0	0	0	0	4	12	0	384
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	4
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Railroad																		
Stopped Buses																		

Comments:

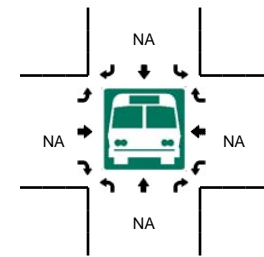
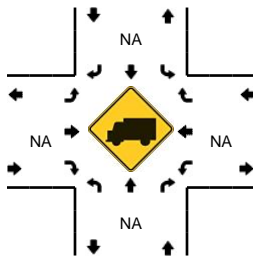
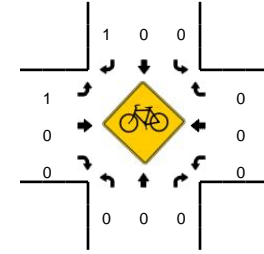
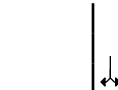
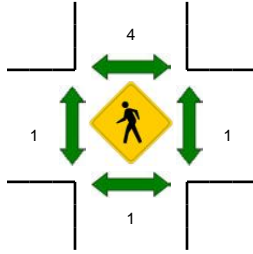
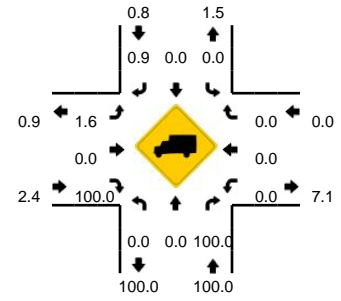


**LOCATION:** 3. SE Rusk Rd -- SE Ruscliffe Rd  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793009  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 4:30 PM -- 5:30 PM**  
**Peak 15-Min: 5:15 PM -- 5:30 PM**

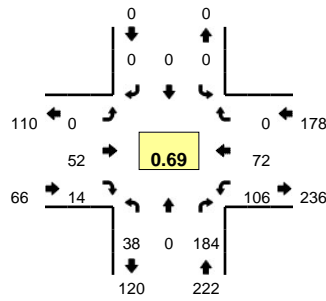


5-Min Count Period Beginning At	3. SE Rusk Rd (Northbound)				3. SE Rusk Rd (Southbound)				SE Ruscliffe Rd (Eastbound)				SE Ruscliffe Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	0	0	19	0	13	0	0	0	0	0	0	0	32	
4:05 PM	0	0	0	0	0	0	25	0	5	0	0	0	0	0	0	0	30	
4:10 PM	0	0	0	0	1	0	33	0	10	0	0	0	0	0	0	0	44	
4:15 PM	0	0	0	0	0	0	26	0	14	0	0	0	0	0	0	0	40	
4:20 PM	0	0	0	0	2	0	30	0	7	2	0	0	0	0	2	0	43	
4:25 PM	0	0	0	0	1	0	30	0	5	0	0	0	0	0	1	0	37	
4:30 PM	0	0	0	0	1	0	24	0	10	1	0	0	0	0	0	0	36	459
4:35 PM	0	0	0	0	1	0	36	0	7	0	0	0	0	0	0	0	44	
4:40 PM	0	0	0	0	0	0	24	0	9	0	0	0	0	0	0	0	33	
4:45 PM	0	0	0	0	1	0	24	0	7	0	0	0	0	0	1	0	33	
4:50 PM	0	0	0	0	2	0	35	0	7	0	0	0	0	0	1	0	45	
4:55 PM	0	0	0	0	2	0	26	0	11	0	1	0	0	0	2	0	42	
5:00 PM	0	0	1	0	1	0	17	1	8	0	0	0	0	1	2	0	31	
5:05 PM	0	0	0	0	1	0	31	0	17	0	0	0	0	0	0	0	49	
5:10 PM	0	0	0	0	0	0	27	0	19	0	0	0	0	0	1	0	47	
5:15 PM	0	0	0	0	1	0	30	0	5	0	0	0	0	0	1	0	37	
5:20 PM	0	0	0	0	1	0	34	0	10	0	0	0	0	0	0	0	45	
5:25 PM	0	0	0	0	1	0	40	0	13	0	0	0	0	0	0	0	54	
5:30 PM	0	0	0	0	0	0	13	0	8	1	0	0	0	0	0	0	22	
5:35 PM	0	0	0	0	0	0	20	0	10	0	0	0	0	0	0	0	30	
5:40 PM	0	0	0	0	0	0	13	0	10	0	0	0	0	0	2	0	25	
5:45 PM	0	0	0	0	1	0	19	0	11	0	0	0	0	0	1	0	32	
5:50 PM	0	0	0	0	1	0	18	0	10	0	0	0	0	1	0	0	30	
5:55 PM	0	0	0	0	0	0	24	0	7	1	0	0	0	0	0	0	32	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	12	0	416	0	112	0	0	0	0	0	0	4	0	544
Heavy Trucks	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
Pedestrians		4				4				4					4			16
Bicycles	0	0	0		0	0	1		1	0	0			0	0	0		2
Railroad																		
Stopped Buses																		

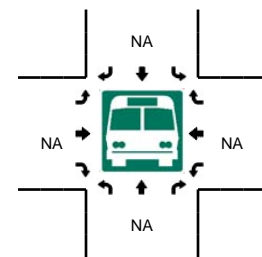
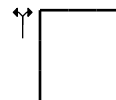
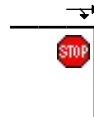
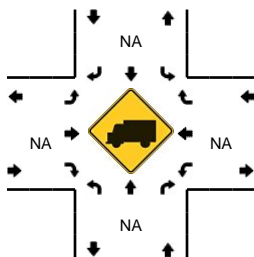
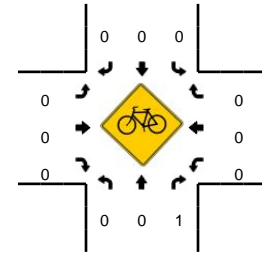
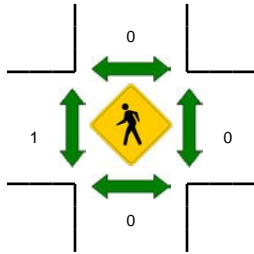
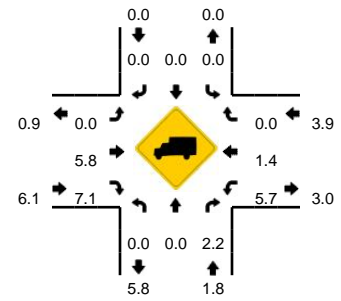
Comments:

**LOCATION:** 4. SE Rusk Rd -- SE Kellogg Creek Dr  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793010  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 7:50 AM -- 8:50 AM**  
**Peak 15-Min: 8:15 AM -- 8:30 AM**

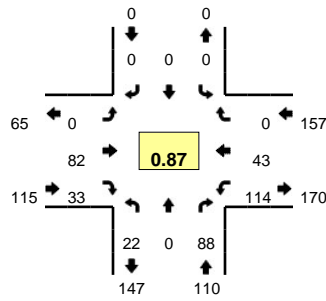


5-Min Count Period Beginning At	4. SE Rusk Rd (Northbound)				4. SE Rusk Rd (Southbound)				SE Kellogg Creek Dr (Eastbound)				SE Kellogg Creek Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	14	0	0	0	0	0	0	0	0	0	3	2	0	0	19	
7:05 AM	0	0	21	0	0	0	0	0	0	0	0	0	2	1	0	0	24	
7:10 AM	0	0	10	0	0	0	0	0	0	0	0	0	3	1	0	0	14	
7:15 AM	0	0	20	0	0	0	0	0	0	1	1	0	4	1	0	0	27	
7:20 AM	0	0	15	0	0	0	0	0	0	1	0	0	5	1	0	0	22	
7:25 AM	1	0	22	0	0	0	0	0	0	0	0	0	5	2	0	0	30	
7:30 AM	1	0	16	0	0	0	0	0	0	0	0	0	7	1	0	0	25	
7:35 AM	0	0	17	0	0	0	0	0	0	1	0	0	10	4	0	0	32	
7:40 AM	2	0	18	0	0	0	0	0	0	0	0	0	2	1	0	0	23	
7:45 AM	1	0	15	0	0	0	0	0	0	1	0	0	5	3	0	0	25	
7:50 AM	2	0	19	0	0	0	0	0	0	0	0	0	13	2	0	0	36	
7:55 AM	1	0	21	0	0	0	0	0	0	1	0	0	14	1	0	0	38	315
8:00 AM	1	0	18	0	0	0	0	0	0	1	1	0	9	0	0	0	30	326
8:05 AM	0	0	6	0	0	0	0	0	0	1	0	0	14	1	0	0	22	324
8:10 AM	4	0	10	0	0	0	0	0	0	1	0	0	5	7	0	0	27	337
8:15 AM	2	0	14	0	0	0	0	0	0	2	1	0	8	18	0	0	45	355
8:20 AM	10	0	24	0	0	0	0	0	0	8	0	0	7	12	0	0	61	394
8:25 AM	8	0	11	0	0	0	0	0	0	11	5	0	10	18	0	0	63	427
8:30 AM	6	0	16	0	0	0	0	0	0	7	3	0	6	7	0	0	45	447
8:35 AM	1	0	15	0	0	0	0	0	0	12	2	0	9	1	0	0	40	455
8:40 AM	1	0	16	0	0	0	0	0	0	5	2	0	6	3	0	0	33	465
8:45 AM	2	0	14	0	0	0	0	0	0	3	0	0	5	2	0	0	26	466
8:50 AM	0	0	12	0	0	0	0	0	0	8	1	0	5	2	0	0	28	458
8:55 AM	1	0	9	0	0	0	0	0	0	3	3	0	11	5	0	0	32	452
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	80	0	196	0	0	0	0	0	0	84	24	0	100	192	0	0	676	
Heavy Trucks	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Railroad																		
Stopped Buses																		

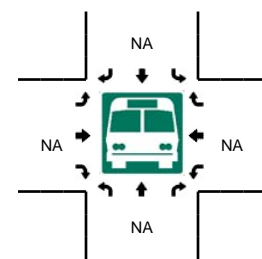
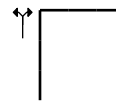
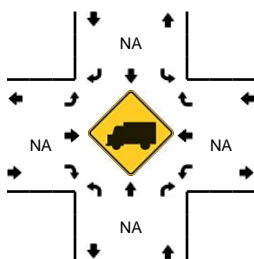
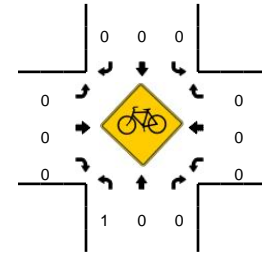
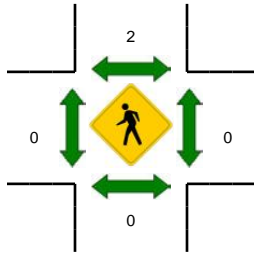
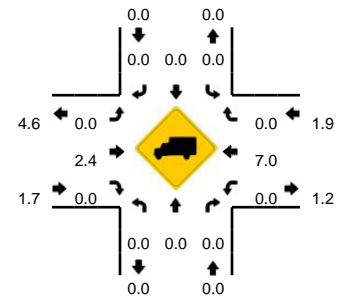
Comments:

**LOCATION:** 4. SE Rusk Rd -- SE Kellogg Creek Dr  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793011  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 11:55 AM -- 12:55 PM**  
**Peak 15-Min: 12:15 PM -- 12:30 PM**

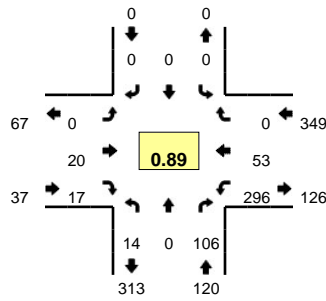


5-Min Count Period Beginning At	4. SE Rusk Rd (Northbound)				4. SE Rusk Rd (Southbound)				SE Kellogg Creek Dr (Eastbound)				SE Kellogg Creek Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	3	0	9	0	0	0	0	0	0	3	3	0	7	6	0	0	31	
11:05 AM	2	0	8	0	0	0	0	0	0	5	1	0	6	3	0	0	25	
11:10 AM	2	0	12	0	0	0	0	0	0	7	5	0	11	10	0	0	47	
11:15 AM	1	0	9	0	0	0	0	0	0	3	2	0	3	11	0	0	29	
11:20 AM	3	0	11	0	0	0	0	0	0	2	5	0	3	3	0	0	27	
11:25 AM	0	0	5	0	0	0	0	0	0	3	3	0	6	4	0	0	21	
11:30 AM	0	0	3	0	0	0	0	0	0	4	1	0	8	4	0	0	20	
11:35 AM	1	0	7	0	0	0	0	0	0	3	3	0	5	1	0	0	20	
11:40 AM	0	0	7	0	0	0	0	0	0	3	2	0	10	0	0	0	22	
11:45 AM	4	0	7	0	0	0	0	0	0	3	2	0	7	3	0	0	26	
11:50 AM	3	0	6	0	0	0	0	0	0	3	0	0	6	2	0	0	20	
11:55 AM	0	0	2	0	0	0	0	0	0	8	3	0	5	4	0	0	22	310
12:00 PM	1	0	6	0	0	0	0	0	0	7	3	0	11	2	0	0	30	309
12:05 PM	2	0	9	0	0	0	0	0	0	10	2	0	13	1	0	0	37	321
12:10 PM	3	0	10	0	0	0	0	0	0	7	4	0	6	6	0	0	36	310
12:15 PM	2	0	4	0	0	0	0	0	0	4	4	0	11	6	0	0	31	312
12:20 PM	3	0	9	0	0	0	0	0	0	8	6	0	10	5	0	0	41	326
12:25 PM	3	0	8	0	0	0	0	0	0	7	2	0	12	6	0	0	38	343
12:30 PM	0	0	5	0	0	0	0	0	0	7	3	0	8	6	0	0	29	352
12:35 PM	1	0	14	0	0	0	0	0	0	6	4	0	6	3	0	0	34	366
12:40 PM	0	0	7	0	0	0	0	0	0	4	0	0	12	0	0	0	23	367
12:45 PM	4	0	6	0	0	0	0	0	0	5	1	0	7	2	0	0	25	366
12:50 PM	3	0	8	0	0	0	0	0	0	9	1	0	13	2	0	0	36	382
12:55 PM	0	0	7	0	0	0	0	0	0	2	1	0	8	2	0	0	20	380
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	32	0	84	0	0	0	0	0	0	76	48	0	132	68	0	0	440	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

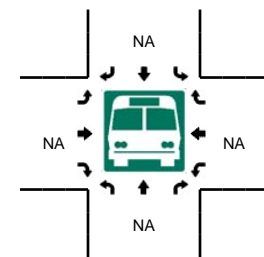
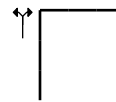
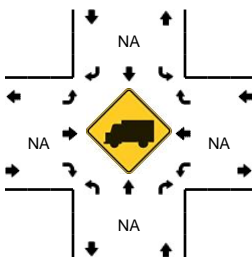
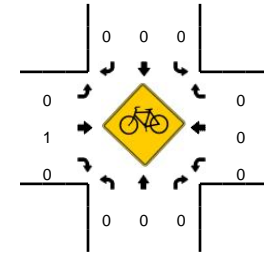
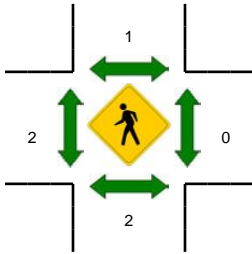
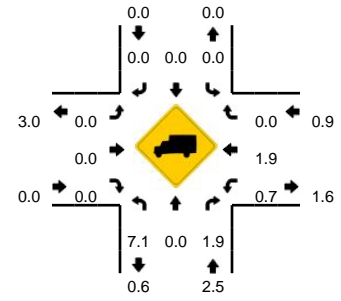
Comments:

**LOCATION:** 4. SE Rusk Rd -- SE Kellogg Creek Dr  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793012  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 4:30 PM -- 5:30 PM**  
**Peak 15-Min: 5:15 PM -- 5:30 PM**

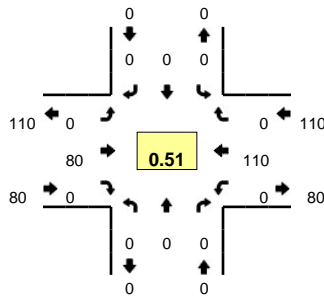


5-Min Count Period Beginning At	4. SE Rusk Rd (Northbound)				4. SE Rusk Rd (Southbound)				SE Kellogg Creek Dr (Eastbound)				SE Kellogg Creek Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	9	0	0	0	0	0	0	4	0	0	19	1	0	0	33	
4:05 PM	0	0	4	0	0	0	0	0	0	1	2	0	21	2	0	0	30	
4:10 PM	2	0	8	0	0	0	0	0	0	3	1	0	31	1	0	0	46	
4:15 PM	1	0	11	0	0	0	0	0	0	2	0	0	27	0	0	0	41	
4:20 PM	2	0	8	0	0	0	0	0	0	2	2	0	30	2	0	0	46	
4:25 PM	0	0	3	0	0	0	0	0	0	1	1	0	29	0	0	0	34	
4:30 PM	1	0	11	0	0	0	0	0	0	0	2	0	25	0	0	0	39	
4:35 PM	1	0	6	0	0	0	0	0	0	1	2	0	26	6	0	0	42	
4:40 PM	1	0	9	0	0	0	0	0	0	1	1	0	23	5	0	0	40	
4:45 PM	1	0	6	0	0	0	0	0	0	1	1	0	21	3	0	0	33	
4:50 PM	1	0	7	0	0	0	0	0	0	1	1	0	27	6	0	0	43	
4:55 PM	1	0	11	0	0	0	0	0	0	0	1	0	22	5	0	0	40	467
5:00 PM	1	0	9	0	0	0	0	0	0	1	2	0	17	1	0	0	31	465
5:05 PM	0	0	12	0	0	0	0	0	0	3	1	0	26	4	0	0	46	481
5:10 PM	2	0	15	0	0	0	0	0	0	4	1	0	24	4	0	0	50	485
5:15 PM	2	0	4	0	0	0	0	0	0	2	1	0	25	4	0	0	38	482
5:20 PM	1	0	5	0	0	0	0	0	0	4	0	0	27	4	0	0	41	477
5:25 PM	2	0	11	0	0	0	0	0	0	2	4	0	33	11	0	0	63	506
5:30 PM	0	0	6	0	0	0	0	0	0	3	0	0	12	1	0	0	22	489
5:35 PM	1	0	6	0	0	0	0	0	0	4	2	0	17	1	0	0	31	478
5:40 PM	2	0	8	0	0	0	0	0	0	2	0	0	13	2	0	0	27	465
5:45 PM	4	0	8	0	0	0	0	0	0	3	3	0	14	5	0	0	37	469
5:50 PM	0	0	6	0	0	0	0	0	0	5	3	0	11	8	0	0	33	459
5:55 PM	1	0	6	0	0	0	0	0	0	1	0	0	18	4	0	0	30	449
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	20	0	80	0	0	0	0	0	0	32	20	0	340	76	0	0	568	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	
Pedestrians	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4	
Bicycles	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
Railroad																		
Stopped Buses																		

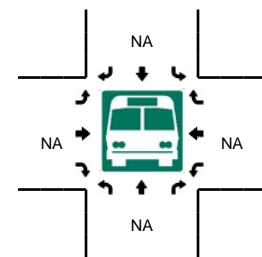
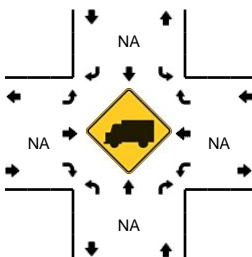
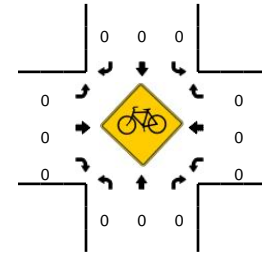
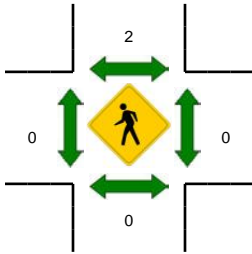
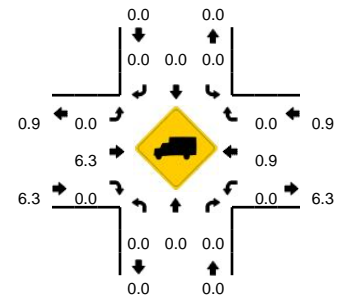
Comments:

**LOCATION:** 5. Church Driveway -- SE Kellogg Creek Dr  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793013  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 8:00 AM -- 9:00 AM**  
**Peak 15-Min: 8:20 AM -- 8:35 AM**

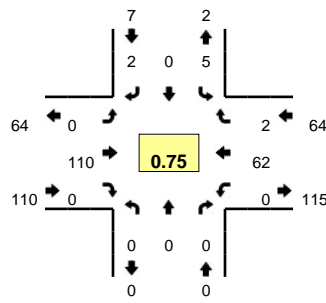


5-Min Count Period Beginning At	5. Church Driveway (Northbound)				5. Church Driveway (Southbound)				SE Kellogg Creek Dr (Eastbound)				SE Kellogg Creek Dr (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
7:05 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
7:10 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	
7:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	
7:20 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	3	
7:25 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	
7:35 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	0	5	
7:40 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	
7:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	4	0	0	0	5	
7:50 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	
7:55 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	3	34
8:00 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	3	35
8:05 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2	36
8:10 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	10	0	0	0	11	46
8:15 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	19	0	0	0	23	67
8:20 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	24	0	0	0	32	96
8:25 AM	0	0	0	0	0	0	0	0	0	15	0	0	0	23	0	0	0	38	131
8:30 AM	0	0	0	0	0	0	0	0	0	10	0	0	0	14	0	0	0	24	153
8:35 AM	0	0	0	0	0	0	0	0	0	14	0	0	0	2	0	0	0	16	164
8:40 AM	0	0	0	0	0	0	0	0	0	7	0	0	0	4	0	0	0	11	172
8:45 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	0	8	175
8:50 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	2	0	0	0	10	181
8:55 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0	0	0	12	190
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	0	0	0	0	0	0	0	0	0	132	0	0	0	244	0	0	376		
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Railroad																			
Stopped Buses																			

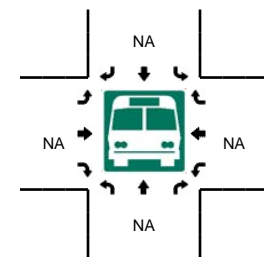
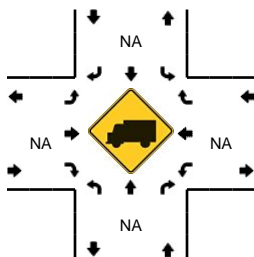
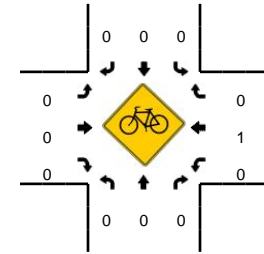
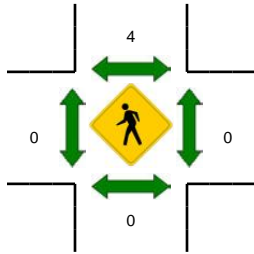
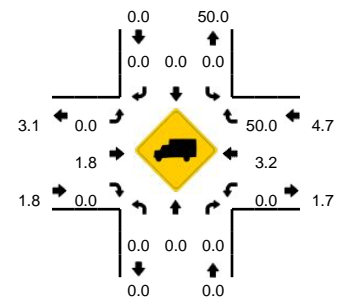
Comments:

**LOCATION:** 5. Church Driveway -- SE Kellogg Creek Dr  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793014  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 11:55 AM -- 12:55 PM**  
**Peak 15-Min: 12:20 PM -- 12:35 PM**

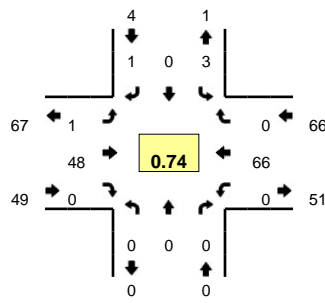


5-Min Count Period Beginning At	5. Church Driveway (Northbound)				5. Church Driveway (Southbound)				SE Kellogg Creek Dr (Eastbound)				SE Kellogg Creek Dr (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	9	0	0	15	
11:05 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	5	0	0	11	
11:10 AM	0	0	0	0	0	0	0	0	0	12	0	0	0	12	0	0	24	
11:15 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	11	0	0	16	
11:20 AM	0	0	0	0	1	0	0	0	0	6	0	0	0	6	0	0	13	
11:25 AM	0	0	0	0	0	0	1	0	0	7	0	0	0	4	0	0	12	
11:30 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	4	0	0	7	
11:35 AM	0	0	0	0	0	0	0	0	0	6	0	0	0	2	0	0	8	
11:40 AM	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5	
11:45 AM	0	0	0	0	0	0	0	0	0	4	0	0	0	7	0	0	11	
11:50 AM	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	0	8	
11:55 AM	0	0	0	0	0	0	0	0	0	11	0	0	0	3	1	0	15	145
12:00 PM	0	0	0	0	0	0	0	0	0	10	0	0	0	3	0	0	13	143
12:05 PM	0	0	0	0	0	0	0	0	0	12	0	0	0	3	0	0	15	147
12:10 PM	0	0	0	0	0	0	0	0	0	11	0	0	0	9	0	0	20	143
12:15 PM	0	0	0	0	2	0	0	0	0	6	0	0	0	8	0	0	16	143
12:20 PM	0	0	0	0	1	0	1	0	0	13	0	0	0	8	0	0	23	153
12:25 PM	0	0	0	0	2	0	0	0	0	7	0	0	0	9	0	0	18	159
12:30 PM	0	0	0	0	0	0	1	0	0	12	0	0	0	6	0	0	19	171
12:35 PM	0	0	0	0	0	0	0	0	0	8	0	0	0	4	0	0	12	175
12:40 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	5	175
12:45 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	5	1	0	11	175
12:50 PM	0	0	0	0	0	0	0	0	0	10	0	0	0	4	0	0	14	181
12:55 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	6	172
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	12	0	8	0	0	128	0	0	0	0	92	0	0	240
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

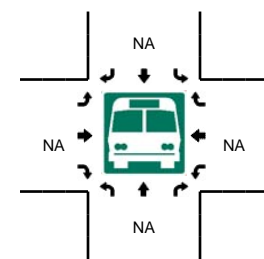
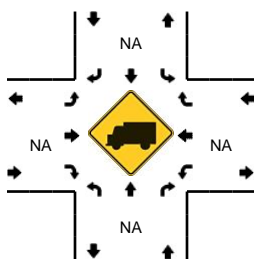
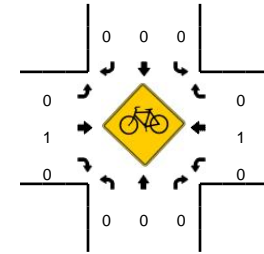
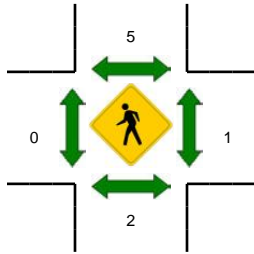
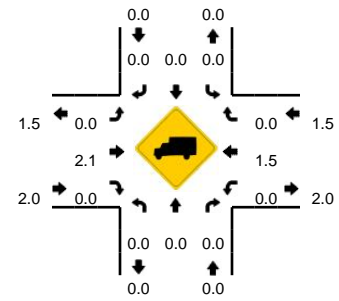
Comments:

**LOCATION:** 5. Church Driveway -- SE Kellogg Creek Dr  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793015  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 4:55 PM -- 5:55 PM**  
**Peak 15-Min: 5:15 PM -- 5:30 PM**

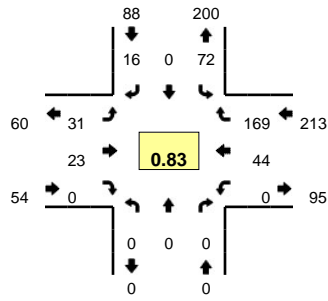


5-Min Count Period Beginning At	5. Church Driveway (Northbound)				5. Church Driveway (Southbound)				SE Kellogg Creek Dr (Eastbound)				SE Kellogg Creek Dr (Westbound)				Total	Hourly Totals		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U				
4:00 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	5		
4:05 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	5		
4:10 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	3	0	0	0	7		
4:15 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	4		
4:20 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	6		
4:25 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	3		
4:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	3		
4:35 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	7	0	0	0	10		
4:40 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	6	0	0	0	8		
4:45 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	0	6		
4:50 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	7	0	0	0	8		
4:55 PM	0	0	0	0	0	0	0	0	1	1	0	0	0	7	0	0	0	9	74	
5:00 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	5	74	
5:05 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	3	0	0	0	7	76	
5:10 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	6	0	0	0	11	80	
5:15 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	0	0	8	84	
5:20 PM	0	0	0	0	0	0	1	0	0	5	0	0	0	6	0	0	0	12	90	
5:25 PM	0	0	0	0	1	0	0	0	0	6	0	0	0	13	0	0	0	20	107	
5:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	0	3	107	
5:35 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	2	0	0	0	7	104	
5:40 PM	0	0	0	0	1	0	0	0	0	1	0	0	0	4	0	0	0	6	102	
5:45 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	9	0	0	0	15	111	
5:50 PM	0	0	0	0	1	0	0	0	0	7	0	0	0	8	0	0	0	16	119	
5:55 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	5	0	0	0	6	116	
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total			
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U				
All Vehicles	0	0	0	0	4	0	4	0	0	56	0	0	0	0	96	0	0	160		
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4		
Pedestrians		4				8				0					4			16		
Bicycles	0	0	0		0	0	0		0	0	0		0	1	0			1		
Railroad																				
Stopped Buses																				

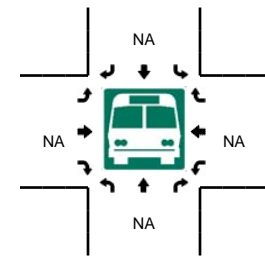
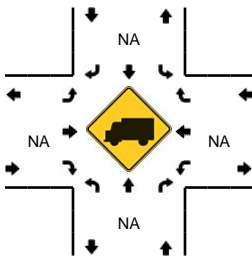
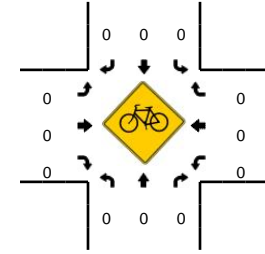
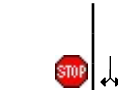
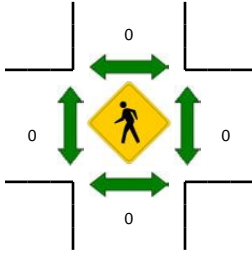
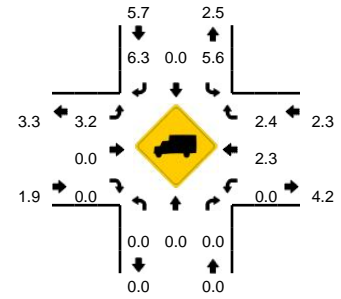
Comments:

**LOCATION:** 6. SE Rusk Rd -- SE Aldercrest Rd  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793016  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 7:25 AM -- 8:25 AM**  
**Peak 15-Min: 7:45 AM -- 8:00 AM**



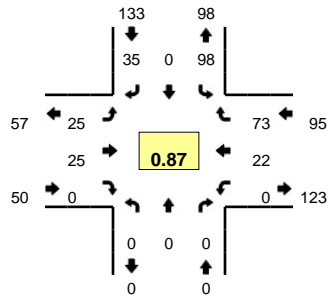
5-Min Count Period Beginning At	6. SE Rusk Rd (Northbound)				6. SE Rusk Rd (Southbound)				SE Aldercrest Rd (Eastbound)				SE Aldercrest Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	4	0	0	0	5	1	0	0	0	1	8	0	19	
7:05 AM	0	0	0	0	1	0	0	0	3	0	0	0	0	5	13	0	22	
7:10 AM	0	0	0	0	5	0	0	0	0	1	0	0	0	5	10	0	21	
7:15 AM	0	0	0	0	4	0	1	0	1	1	0	0	0	3	17	0	27	
7:20 AM	0	0	0	0	4	0	0	0	1	2	0	0	0	2	14	0	23	
7:25 AM	0	0	0	0	6	0	0	0	6	3	0	0	0	4	18	0	37	
7:30 AM	0	0	0	0	6	0	1	0	1	2	0	0	0	4	11	0	25	
7:35 AM	0	0	0	0	8	0	2	0	2	0	0	0	0	0	11	0	23	
7:40 AM	0	0	0	0	2	0	0	0	6	4	0	0	0	7	14	0	33	
7:45 AM	0	0	0	0	4	0	2	0	0	3	0	0	0	5	15	0	29	
7:50 AM	0	0	0	0	8	0	3	0	3	1	0	0	0	3	19	0	37	
7:55 AM	0	0	0	0	11	0	1	0	1	3	0	0	0	6	19	0	41	337
8:00 AM	0	0	0	0	7	0	2	0	4	0	0	0	0	3	11	0	27	345
8:05 AM	0	0	0	0	6	0	1	0	1	1	0	0	0	2	4	0	15	338
8:10 AM	0	0	0	0	5	0	1	0	0	0	0	0	0	6	12	0	24	341
8:15 AM	0	0	0	0	5	0	1	0	4	5	0	0	0	4	17	0	36	350
8:20 AM	0	0	0	0	4	0	2	0	3	1	0	0	0	0	18	0	28	355
8:25 AM	0	0	0	0	6	0	1	0	6	2	0	0	0	1	15	0	31	349
8:30 AM	0	0	0	0	8	0	4	0	4	2	0	0	0	4	9	0	31	355
8:35 AM	0	0	0	0	5	0	1	0	2	4	0	0	0	1	9	0	22	354
8:40 AM	0	0	0	0	7	0	4	0	5	1	0	0	0	0	8	0	25	346
8:45 AM	0	0	0	0	2	0	1	0	5	1	0	0	0	0	7	0	16	333
8:50 AM	0	0	0	0	6	0	2	0	4	2	0	0	0	5	8	0	27	323
8:55 AM	0	0	0	0	9	0	1	0	4	3	0	0	0	3	3	0	23	305
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	92	0	24	0	16	28	0	0	0	56	212	0	428	
Heavy Trucks	0	0	0	0	8	0	4	0	0	0	0	0	0	4	4	0	20	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Stopped Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

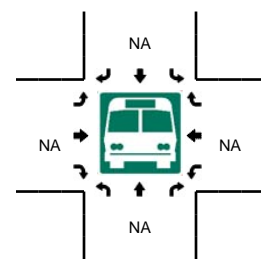
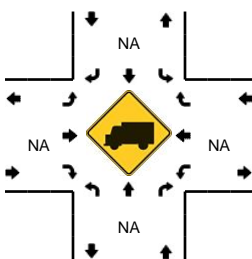
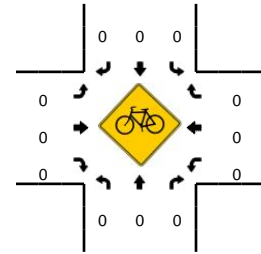
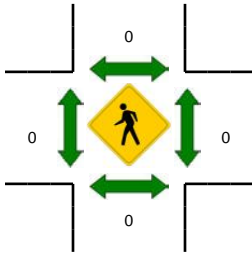
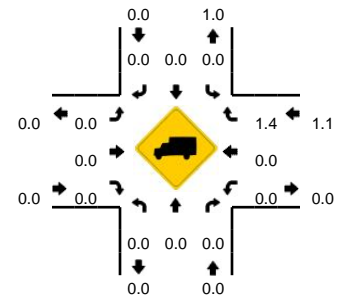


**LOCATION:** 6. SE Rusk Rd -- SE Aldercrest Rd  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793017  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 12:00 PM -- 1:00 PM**  
**Peak 15-Min: 12:15 PM -- 12:30 PM**

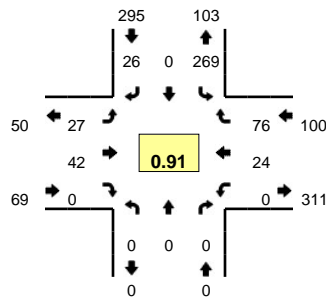


5-Min Count Period Beginning At	6. SE Rusk Rd (Northbound)				6. SE Rusk Rd (Southbound)				SE Aldercrest Rd (Eastbound)				SE Aldercrest Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
11:00 AM	0	0	0	0	7	0	0	0	1	2	0	0	0	0	5	0	15	
11:05 AM	0	0	0	0	6	0	1	0	3	2	0	0	0	3	8	0	23	
11:10 AM	0	0	0	0	7	0	2	0	2	0	0	0	0	0	8	0	19	
11:15 AM	0	0	0	0	8	0	1	0	1	3	0	0	0	2	6	0	21	
11:20 AM	0	0	0	0	7	0	0	0	5	2	0	0	0	3	9	0	26	
11:25 AM	0	0	0	0	7	0	1	0	0	1	0	0	0	0	3	0	12	
11:30 AM	0	0	0	0	7	0	0	0	0	2	0	0	0	1	1	0	11	
11:35 AM	0	0	0	0	5	0	3	0	5	1	0	0	0	2	4	0	20	
11:40 AM	0	0	0	0	8	0	2	0	1	1	0	0	0	1	7	0	20	
11:45 AM	0	0	0	0	6	0	2	0	0	1	0	0	0	2	8	0	19	
11:50 AM	0	0	0	0	4	0	1	0	1	0	0	0	0	1	6	0	13	
11:55 AM	0	0	0	0	6	0	1	0	0	0	0	0	0	2	2	0	11	210
12:00 PM	0	0	0	0	7	0	3	0	1	2	0	0	0	2	5	0	20	215
12:05 PM	0	0	0	0	12	0	3	0	1	1	0	0	0	1	7	0	25	217
12:10 PM	0	0	0	0	9	0	1	0	3	2	0	0	0	1	10	0	26	224
12:15 PM	0	0	0	0	13	0	3	0	2	2	0	0	0	2	5	0	27	230
12:20 PM	0	0	0	0	9	0	4	0	4	2	0	0	0	0	7	0	26	230
12:25 PM	0	0	0	0	9	0	3	0	3	3	0	0	0	2	7	0	27	245
12:30 PM	0	0	0	0	8	0	0	0	1	2	0	0	0	3	2	0	16	250
12:35 PM	0	0	0	0	6	0	2	0	2	2	0	0	0	3	10	0	25	255
12:40 PM	0	0	0	0	9	0	2	0	2	0	0	0	0	2	4	0	19	254
12:45 PM	0	0	0	0	5	0	3	0	4	3	0	0	0	0	4	0	19	254
12:50 PM	0	0	0	0	4	0	10	0	1	2	0	0	0	3	7	0	27	268
12:55 PM	0	0	0	0	7	0	1	0	1	4	0	0	0	3	5	0	21	278
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	124	0	40	0	36	28	0	0	0	16	76	0	320	
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Railroad																		
Stopped Buses																		

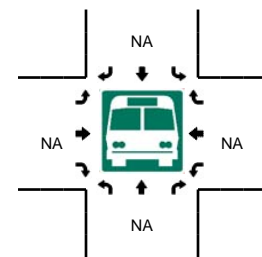
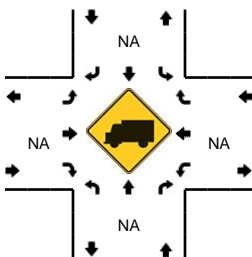
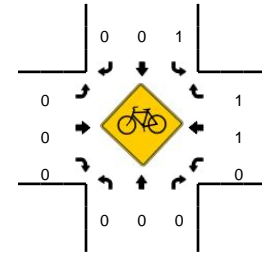
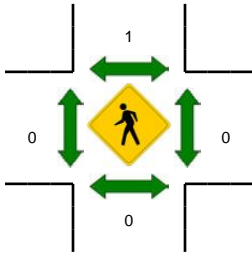
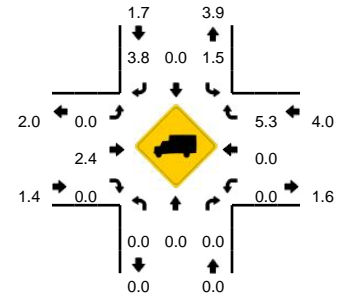
Comments:

**LOCATION:** 6. SE Rusk Rd -- SE Aldercrest Rd  
**CITY/STATE:** Milwaukie, OR

**QC JOB #:** 14793018  
**DATE:** Tue, Oct 09 2018



**Peak-Hour: 4:15 PM -- 5:15 PM**  
**Peak 15-Min: 4:20 PM -- 4:35 PM**



5-Min Count Period Beginning At	6. SE Rusk Rd (Northbound)				6. SE Rusk Rd (Southbound)				SE Aldercrest Rd (Eastbound)				SE Aldercrest Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	14	0	3	0	0	0	0	0	0	1	5	0	23	
4:05 PM	0	0	0	0	17	0	4	0	0	7	0	0	0	4	5	0	37	
4:10 PM	0	0	0	0	23	0	4	0	1	2	0	0	0	3	11	0	44	
4:15 PM	0	0	0	0	27	0	0	0	3	2	0	0	0	3	6	0	41	
4:20 PM	0	0	0	0	28	0	2	0	2	6	0	0	0	1	5	0	44	
4:25 PM	0	0	0	0	25	0	2	0	2	4	0	0	0	3	4	0	40	
4:30 PM	0	0	0	0	24	0	2	0	1	1	0	0	0	4	11	0	43	
4:35 PM	0	0	0	0	24	0	1	0	1	5	0	0	0	2	4	0	37	
4:40 PM	0	0	0	0	21	0	6	0	6	2	0	0	0	2	3	0	40	
4:45 PM	0	0	0	0	19	0	1	0	2	3	0	0	0	1	8	0	34	
4:50 PM	0	0	0	0	20	0	1	0	0	4	0	0	0	1	5	0	31	
4:55 PM	0	0	0	0	22	0	0	0	1	2	0	0	0	1	5	0	31	445
5:00 PM	0	0	0	0	25	0	2	0	1	3	0	0	0	1	6	0	38	460
5:05 PM	0	0	0	0	12	0	4	0	3	6	0	0	0	5	9	0	39	462
5:10 PM	0	0	0	0	22	0	5	0	5	4	0	0	0	0	10	0	46	464
5:15 PM	0	0	0	0	22	0	3	0	1	8	0	0	0	1	5	0	40	463
5:20 PM	0	0	0	0	20	0	5	0	0	5	0	0	0	3	8	0	41	460
5:25 PM	0	0	0	0	22	0	4	0	4	2	0	0	0	2	8	0	42	462
5:30 PM	0	0	0	0	20	0	2	0	2	3	0	0	0	5	2	0	34	453
5:35 PM	0	0	0	0	15	0	3	0	2	2	0	0	0	3	8	0	33	449
5:40 PM	0	0	0	0	7	0	0	0	3	2	0	0	0	3	7	0	22	431
5:45 PM	0	0	0	0	16	0	2	0	2	2	0	0	0	1	7	0	30	427
5:50 PM	0	0	0	0	9	0	1	0	3	2	0	0	0	4	2	0	21	417
5:55 PM	0	0	0	0	8	0	5	0	2	1	0	0	0	3	6	0	25	411
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	308	0	24	0	20	44	0	0	0	32	80	0	508	
Heavy Trucks	0	0	0	0	8	0	4	0	0	4	0	0	0	0	4	0	20	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	2	
Railroad																		
Stopped Buses																		

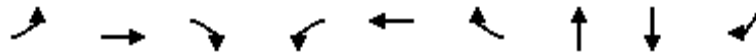
Comments:

**Attachment D - Existing Traffic  
Level-of-Service Worksheets**

Queues

1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	4	849	32	18	2124	19	230	64	5
v/c Ratio	0.06	0.36	0.03	0.21	0.85	0.02	0.90	0.24	0.02
Control Delay	55.5	8.7	0.1	58.8	17.7	0.4	82.5	44.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	8.7	0.1	58.8	17.7	0.4	82.5	44.8	0.0
Queue Length 50th (ft)	3	108	0	14	528	0	168	43	0
Queue Length 95th (ft)	15	205	0	38	#1001	2	#312	85	0
Internal Link Dist (ft)		263			1187		389	744	
Turn Bay Length (ft)	470		110	455		100			75
Base Capacity (vph)	132	2337	1097	254	2485	969	266	275	328
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.36	0.03	0.07	0.85	0.02	0.86	0.23	0.02

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗		↕			↖	↗
Traffic Volume (vph)	4	824	31	17	2060	18	136	41	47	21	41	5
Future Volume (vph)	4	824	31	17	2060	18	136	41	47	21	41	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00		1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97			0.98	1.00
Satd. Flow (prot)	1444	3343	1536	1456	3438	1324		1758			1698	1346
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.78			0.87	1.00
Satd. Flow (perm)	1444	3343	1536	1456	3438	1324		1407			1502	1346
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	4	849	32	18	2124	19	140	42	48	22	42	5
RTOR Reduction (vph)	0	0	10	0	0	6	0	8	0	0	0	4
Lane Group Flow (vph)	4	849	22	18	2124	13	0	222	0	0	64	1
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	25%	8%	3%	24%	5%	22%	2%	0%	2%	10%	10%	20%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	1.4	81.5	81.5	3.4	83.5	83.5		21.1			21.1	21.1
Effective Green, g (s)	1.4	81.5	81.5	3.4	83.5	83.5		21.1			21.1	21.1
Actuated g/C Ratio	0.01	0.68	0.68	0.03	0.70	0.70		0.18			0.18	0.18
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	16	2270	1043	41	2392	921		247			264	236
v/s Ratio Prot	0.00	0.25		c0.01	c0.62							
v/s Ratio Perm			0.01			0.01		c0.16			0.04	0.00
v/c Ratio	0.25	0.37	0.02	0.44	0.89	0.01		0.90			0.24	0.00
Uniform Delay, d1	58.8	8.3	6.3	57.4	14.5	5.6		48.4			42.6	40.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	8.1	0.5	0.0	7.3	5.4	0.0		31.4			0.5	0.0
Delay (s)	66.8	8.8	6.3	64.7	19.9	5.6		79.8			43.0	40.8
Level of Service	E	A	A	E	B	A		E			D	D
Approach Delay (s)		8.9			20.2			79.8			42.9	
Approach LOS		A			C			E			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.8									C
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			120.0								14.0	
Intersection Capacity Utilization			86.2%									E
Analysis Period (min)			15									

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	0	0	245	178	2
Future Vol, veh/h	2	0	0	245	178	2
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	0	0	2	5	0
Mvmt Flow	3	0	0	322	234	3

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	560	238	239	0	0
Stage 1	238	-	-	-	-
Stage 2	322	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	493	806	1340	-	-
Stage 1	806	-	-	-	-
Stage 2	739	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	491	805	1338	-	-
Mov Cap-2 Maneuver	491	-	-	-	-
Stage 1	804	-	-	-	-
Stage 2	738	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1338	-	491	-	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	0	-	12.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	2	7	237	1	2	176
Future Vol, veh/h	2	7	237	1	2	176
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	50	14	2	100	50	5
Mvmt Flow	3	9	320	1	3	238

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	565	321	0	0	321	0
Stage 1	321	-	-	-	-	-
Stage 2	244	-	-	-	-	-
Critical Hdwy	6.9	6.34	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.426	-	-	2.65	-
Pot Cap-1 Maneuver	414	693	-	-	1012	-
Stage 1	639	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	413	693	-	-	1012	-
Mov Cap-2 Maneuver	413	-	-	-	-	-
Stage 1	637	-	-	-	-	-
Stage 2	696	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	602	1012
HCM Lane V/C Ratio	-	-	0.02	0.003
HCM Control Delay (s)	-	-	11.1	8.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	52	14	38	184	106	72
Future Vol, veh/h	52	14	38	184	106	72
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	6	7	0	2	6	1
Mvmt Flow	75	20	55	267	154	104

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	584	207	259	0	0
Stage 1	207	-	-	-	-
Stage 2	377	-	-	-	-
Critical Hdwy	6.46	6.27	4.1	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-
Follow-up Hdwy	3.554	3.363	2.2	-	-
Pot Cap-1 Maneuver	467	821	1317	-	-
Stage 1	818	-	-	-	-
Stage 2	685	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	443	820	1316	-	-
Mov Cap-2 Maneuver	443	-	-	-	-
Stage 1	777	-	-	-	-
Stage 2	684	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1316	-	491	-	-
HCM Lane V/C Ratio	0.042	-	0.195	-	-
HCM Control Delay (s)	7.9	0	14.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-



Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	0	80	110	0	0	0
Future Vol, veh/h	0	80	110	0	0	0
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	51	51	51	51	51	51
Heavy Vehicles, %	0	6	1	0	0	0
Mvmt Flow	0	157	216	0	0	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	218	0	0	375	218
Stage 1	-	-	-	218	-
Stage 2	-	-	-	157	-
Critical Hdwy	4.1	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	3.5	3.3
Pot Cap-1 Maneuver	1364	-	-	630	827
Stage 1	-	-	-	823	-
Stage 2	-	-	-	876	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1362	-	-	627	826
Mov Cap-2 Maneuver	-	-	-	627	-
Stage 1	-	-	-	821	-
Stage 2	-	-	-	874	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1362	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↔		↕	
Traffic Vol, veh/h	31	23	44	169	72	16
Future Vol, veh/h	31	23	44	169	72	16
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	3	0	2	2	6	6
Mvmt Flow	37	28	53	204	87	19
Number of Lanes	0	1	1	0	1	0

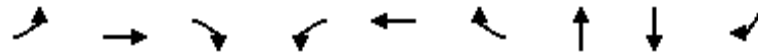
Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8	8.2	8.5
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	57%	0%	82%
Vol Thru, %	43%	21%	0%
Vol Right, %	0%	79%	18%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	54	213	88
LT Vol	31	0	72
Through Vol	23	44	0
RT Vol	0	169	16
Lane Flow Rate	65	257	106
Geometry Grp	1	1	1
Degree of Util (X)	0.083	0.271	0.139
Departure Headway (Hd)	4.569	3.796	4.713
Convergence, Y/N	Yes	Yes	Yes
Cap	787	950	762
Service Time	2.582	1.805	2.733
HCM Lane V/C Ratio	0.083	0.271	0.139
HCM Control Delay	8	8.2	8.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	1.1	0.5

# Queues

## 1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018
























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	13	1083	60	47	1069	6	172	78	11
v/c Ratio	0.12	0.48	0.06	0.33	0.45	0.01	0.70	0.34	0.04
Control Delay	46.2	11.0	3.5	48.9	7.7	0.0	47.5	40.5	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	11.0	3.5	48.9	7.7	0.0	47.5	40.5	0.3
Queue Length 50th (ft)	8	182	1	29	110	0	87	45	0
Queue Length 95th (ft)	27	301	20	64	275	0	148	83	0
Internal Link Dist (ft)		263			1187		389	741	
Turn Bay Length (ft)	470		110	455		100			75
Base Capacity (vph)	183	2273	1072	194	2397	1002	282	265	317
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.48	0.06	0.24	0.45	0.01	0.61	0.29	0.03

### Intersection Summary

HCM Signalized Intersection Capacity Analysis  
 1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	13	1061	59	46	1048	6	69	31	69	24	53	11	
Future Volume (vph)	13	1061	59	46	1048	6	69	31	69	24	53	11	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98		1.00			1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95			1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	1.00	
Satd. Flow (prot)	1671	3343	1551	1770	3282	1352		1745			1758	1463	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.83			0.85	1.00	
Satd. Flow (perm)	1671	3343	1551	1770	3282	1352		1484			1519	1463	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	
Adj. Flow (vph)	13	1083	60	47	1069	6	70	32	70	24	54	11	
RTOR Reduction (vph)	0	0	19	0	0	2	0	25	0	0	0	9	
Lane Group Flow (vph)	13	1083	41	47	1069	4	0	147	0	0	78	2	
Confl. Peds. (#/hr)							1					1	
Confl. Bikes (#/hr)			1			1							
Heavy Vehicles (%)	8%	8%	2%	2%	10%	17%	1%	0%	1%	21%	0%	9%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	Perm	
Protected Phases	5	2		1	6			8			4		
Permitted Phases			2			6	8			4		4	
Actuated Green, G (s)	1.6	65.4	65.4	5.6	69.4	69.4		15.0			15.0	15.0	
Effective Green, g (s)	1.6	65.4	65.4	5.6	69.4	69.4		15.0			15.0	15.0	
Actuated g/C Ratio	0.02	0.65	0.65	0.06	0.69	0.69		0.15			0.15	0.15	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	3.0	
Lane Grp Cap (vph)	26	2186	1014	99	2277	938		222			227	219	
v/s Ratio Prot	0.01	c0.32		c0.03	c0.33								
v/s Ratio Perm			0.03			0.00		c0.10			0.05	0.00	
v/c Ratio	0.50	0.50	0.04	0.47	0.47	0.00		0.66			0.34	0.01	
Uniform Delay, d1	48.8	8.9	6.1	45.8	6.9	4.7		40.1			38.1	36.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00	
Incremental Delay, d2	14.3	0.8	0.1	3.6	0.7	0.0		7.3			0.9	0.0	
Delay (s)	63.1	9.7	6.2	49.3	7.6	4.7		47.4			39.0	36.2	
Level of Service	E	A	A	D	A	A		D			D	D	
Approach Delay (s)		10.1			9.4			47.4			38.7		
Approach LOS		B			A			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			13.3									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.52										
Actuated Cycle Length (s)			100.0									Sum of lost time (s)	14.0
Intersection Capacity Utilization			60.7%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	1	1	173	164	3
Future Vol, veh/h	7	1	1	173	164	3
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	8	1	1	197	186	3

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	389	190	191	0	0
Stage 1	190	-	-	-	-
Stage 2	199	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	619	857	1395	-	-
Stage 1	847	-	-	-	-
Stage 2	839	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	616	856	1393	-	-
Mov Cap-2 Maneuver	616	-	-	-	-
Stage 1	844	-	-	-	-
Stage 2	837	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1393	-	638	-	-
HCM Lane V/C Ratio	0.001	-	0.014	-	-
HCM Control Delay (s)	7.6	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	1	5	169	0	7	157
Future Vol, veh/h	1	5	169	0	7	157
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	40	2	0	14	1
Mvmt Flow	1	6	190	0	8	176

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	382	190	0	0	190
Stage 1	190	-	-	-	-
Stage 2	192	-	-	-	-
Critical Hdwy	6.4	6.6	-	-	4.24
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.66	-	-	2.326
Pot Cap-1 Maneuver	624	764	-	-	1315
Stage 1	847	-	-	-	-
Stage 2	845	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	620	764	-	-	1315
Mov Cap-2 Maneuver	620	-	-	-	-
Stage 1	841	-	-	-	-
Stage 2	845	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	736	1315
HCM Lane V/C Ratio	-	-	0.009	0.006
HCM Control Delay (s)	-	-	9.9	7.8
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	82	33	22	88	114	43
Future Vol, veh/h	82	33	22	88	114	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	0	0	0	0	7
Mvmt Flow	94	38	25	101	131	49

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	307	156	180	0	0
Stage 1	156	-	-	-	-
Stage 2	151	-	-	-	-
Critical Hdwy	6.42	6.2	4.1	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.2	-	-
Pot Cap-1 Maneuver	685	895	1408	-	-
Stage 1	872	-	-	-	-
Stage 2	877	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	672	895	1408	-	-
Mov Cap-2 Maneuver	672	-	-	-	-
Stage 1	855	-	-	-	-
Stage 2	877	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1408	-	724	-	-
HCM Lane V/C Ratio	0.018	-	0.183	-	-
HCM Control Delay (s)	7.6	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

**Intersection**

Int Delay, s/veh 0.4

**Movement** EBL EBT WBT WBR SBL SBR

Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	0	110	62	2	5	2
Future Vol, veh/h	0	110	62	2	5	2
Conflicting Peds, #/hr	4	0	0	4	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	0	2	3	50	0	0
Mvmt Flow	0	147	83	3	7	3

**Major/Minor** Major1 Major2 Minor2

Conflicting Flow All	90	0	-	0	236	89
Stage 1	-	-	-	-	89	-
Stage 2	-	-	-	-	147	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1518	-	-	-	757	975
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	885	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1513	-	-	-	752	972
Mov Cap-2 Maneuver	-	-	-	-	752	-
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	882	-

**Approach** EB WB SB




HCM Control Delay, s 0 0 9.5  
 HCM LOS A

**Minor Lane/Major Mvmt** EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1513	-	-	-	804
HCM Lane V/C Ratio	-	-	-	-	0.012
HCM Control Delay (s)	0	-	-	-	9.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0



Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	25	22	73	98	35
Future Vol, veh/h	25	25	22	73	98	35
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	29	29	25	84	113	40
Number of Lanes	0	1	1	0	1	0

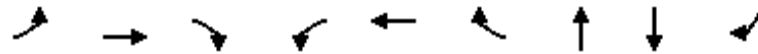
Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.8	7.3	8.2
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	0%	74%
Vol Thru, %	50%	23%	0%
Vol Right, %	0%	77%	26%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	50	95	133
LT Vol	25	0	98
Through Vol	25	22	0
RT Vol	0	73	35
Lane Flow Rate	57	109	153
Geometry Grp	1	1	1
Degree of Util (X)	0.07	0.114	0.177
Departure Headway (Hd)	4.355	3.751	4.175
Convergence, Y/N	Yes	Yes	Yes
Cap	809	937	852
Service Time	2.453	1.85	2.243
HCM Lane V/C Ratio	0.07	0.116	0.18
HCM Control Delay	7.8	7.3	8.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0.4	0.6

Queues

1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	24	2035	204	98	1362	12	144	132	32
v/c Ratio	0.26	0.86	0.18	0.64	0.54	0.01	0.90	0.72	0.12
Control Delay	64.5	22.7	5.9	76.8	10.3	0.0	97.1	74.5	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.5	22.7	5.9	76.8	10.3	0.0	97.1	74.5	3.9
Queue Length 50th (ft)	20	685	37	80	272	0	107	108	0
Queue Length 95th (ft)	49	889	74	#157	400	0	#198	172	10
Internal Link Dist (ft)		263			1187		389	767	
Turn Bay Length (ft)	470		110	455		100			75
Base Capacity (vph)	140	2361	1113	161	2539	1192	206	243	330
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.86	0.18	0.61	0.54	0.01	0.70	0.54	0.10

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗		↕			↗	↗
Traffic Volume (vph)	22	1872	188	90	1253	11	53	35	44	49	73	29
Future Volume (vph)	22	1872	188	90	1253	11	53	35	44	49	73	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	1.00
Satd. Flow (prot)	1656	3505	1615	1805	3471	1615		1756			1852	1593
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.61			0.73	1.00
Satd. Flow (perm)	1656	3505	1615	1805	3471	1615		1086			1374	1593
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	2035	204	98	1362	12	58	38	48	53	79	32
RTOR Reduction (vph)	0	0	25	0	0	3	0	15	0	0	0	28
Lane Group Flow (vph)	24	2035	179	98	1362	9	0	129	0	0	132	4
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	9%	3%	0%	0%	4%	0%	2%	0%	0%	0%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	5.1	87.6	87.6	11.0	93.5	93.5		17.4			17.4	17.4
Effective Green, g (s)	5.1	87.6	87.6	11.0	93.5	93.5		17.4			17.4	17.4
Actuated g/C Ratio	0.04	0.67	0.67	0.08	0.72	0.72		0.13			0.13	0.13
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	64	2361	1088	152	2496	1161		145			183	213
v/s Ratio Prot	0.01	c0.58		c0.05	0.39							
v/s Ratio Perm			0.11			0.01		c0.12			0.10	0.00
v/c Ratio	0.38	0.86	0.16	0.64	0.55	0.01		0.89			0.72	0.02
Uniform Delay, d1	60.9	16.5	7.8	57.6	8.4	5.2		55.4			54.0	48.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	3.7	4.4	0.3	9.0	0.9	0.0		44.2			13.1	0.0
Delay (s)	64.6	20.9	8.1	66.6	9.3	5.2		99.5			67.1	48.9
Level of Service	E	C	A	E	A	A		F			E	D
Approach Delay (s)		20.2			13.1			99.5			63.5	
Approach LOS		C			B			F			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			22.2			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			14.0			
Intersection Capacity Utilization			82.5%			ICU Level of Service			E			
Analysis Period (min)			15									

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	1	1	1	132	359	4
Future Vol, veh/h	1	1	1	132	359	4
Conflicting Peds, #/hr	0	4	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	2	1	0
Mvmt Flow	1	1	1	145	395	4

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	545	402	400	0	-	0
Stage 1	398	-	-	-	-	-
Stage 2	147	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	503	653	1170	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	501	650	1169	-	-	-
Mov Cap-2 Maneuver	501	-	-	-	-	-
Stage 1	682	-	-	-	-	-
Stage 2	884	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.4	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1169	-	566	-	-
HCM Lane V/C Ratio	0.001	-	0.004	-	-
HCM Control Delay (s)	8.1	0	11.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	1	8	123	1	13	348
Future Vol, veh/h	1	8	123	1	13	348
Conflicting Peds, #/hr	0	4	0	0	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	1	9	135	1	14	382

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	547	141	0	0	137
Stage 1	137	-	-	-	-
Stage 2	410	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	502	912	-	-	1459
Stage 1	895	-	-	-	-
Stage 2	674	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	495	908	-	-	1458
Mov Cap-2 Maneuver	495	-	-	-	-
Stage 1	883	-	-	-	-
Stage 2	674	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	831	1458
HCM Lane V/C Ratio	-	-	0.012	0.01
HCM Control Delay (s)	-	-	9.4	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	20	17	14	106	296	53
Future Vol, veh/h	20	17	14	106	296	53
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	7	2	1	2
Mvmt Flow	22	19	16	119	333	60

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	516	367	395	0	0
Stage 1	365	-	-	-	-
Stage 2	151	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-
Pot Cap-1 Maneuver	523	683	1137	-	-
Stage 1	707	-	-	-	-
Stage 2	882	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	513	681	1135	-	-
Mov Cap-2 Maneuver	513	-	-	-	-
Stage 1	695	-	-	-	-
Stage 2	880	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1135	-	579	-	-
HCM Lane V/C Ratio	0.014	-	0.072	-	-
HCM Control Delay (s)	8.2	0	11.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-




Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	1	48	66	0	3	1
Future Vol, veh/h	1	48	66	0	3	1
Conflicting Peds, #/hr	5	0	0	5	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	1	65	89	0	4	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	94	0	-	0	162
Stage 1	-	-	-	-	94
Stage 2	-	-	-	-	68
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1513	-	-	-	834
Stage 1	-	-	-	-	935
Stage 2	-	-	-	-	960
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1507	-	-	-	826
Mov Cap-2 Maneuver	-	-	-	-	826
Stage 1	-	-	-	-	930
Stage 2	-	-	-	-	956

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1507	-	-	-	857
HCM Lane V/C Ratio	0.001	-	-	-	0.006
HCM Control Delay (s)	7.4	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

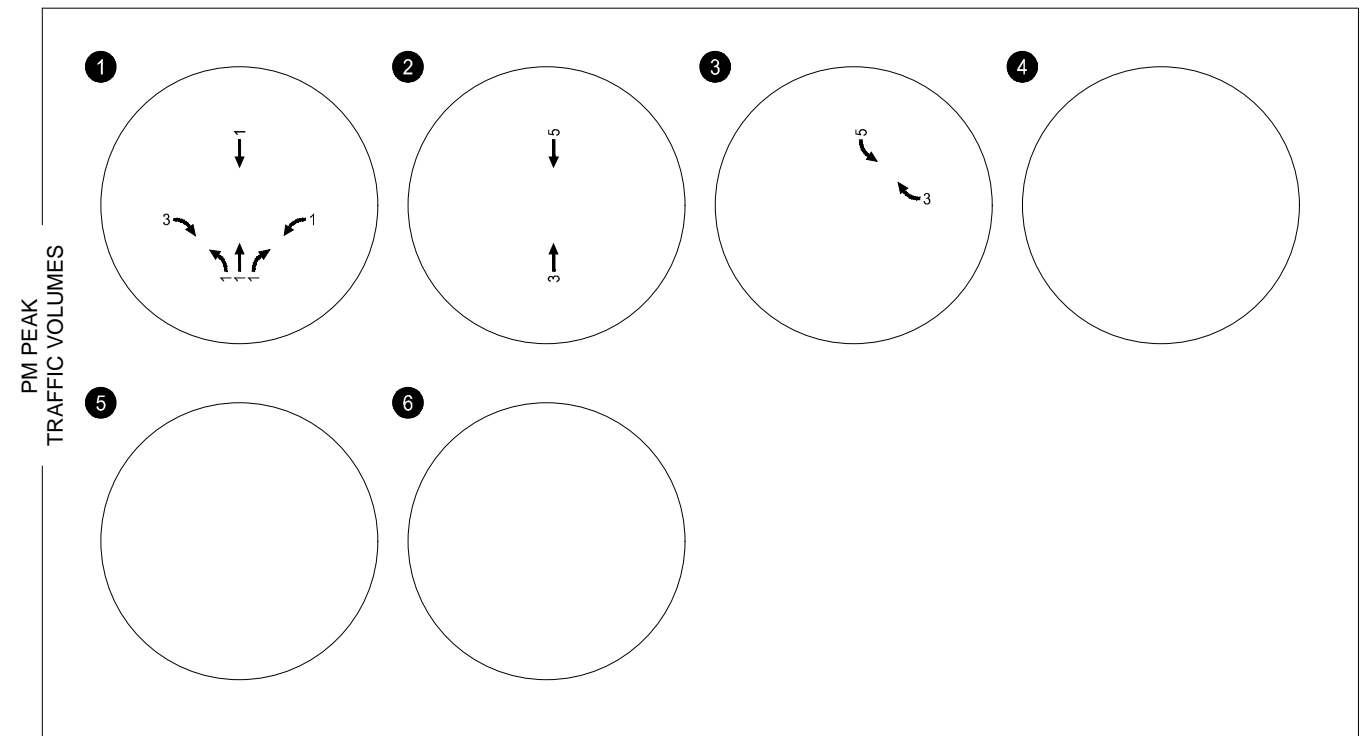
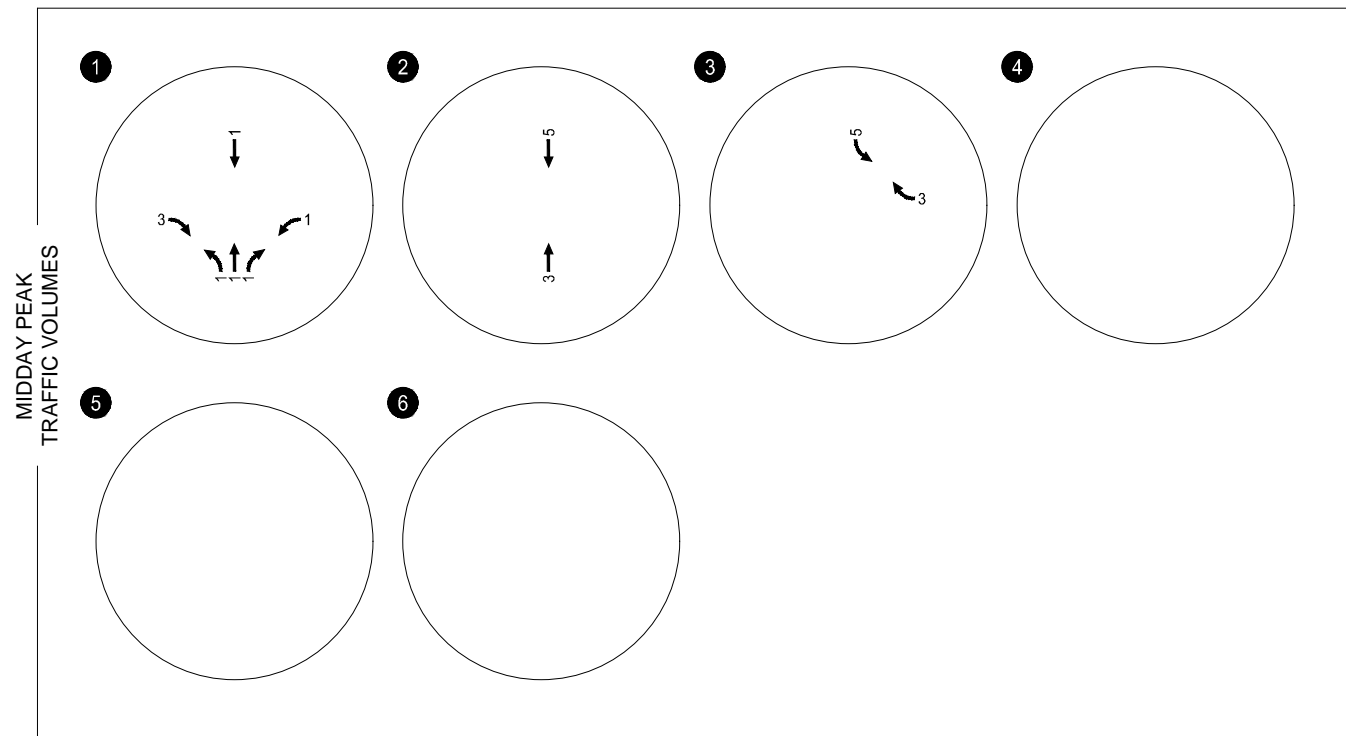
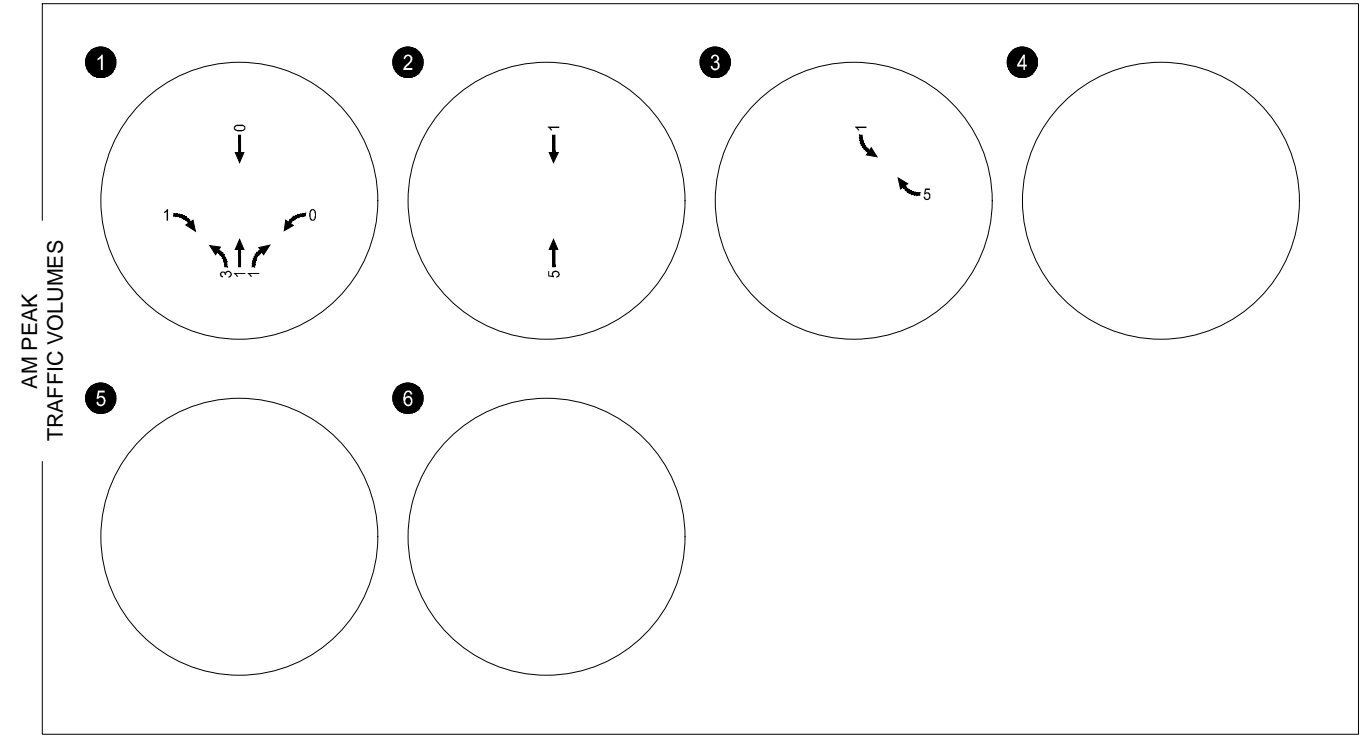
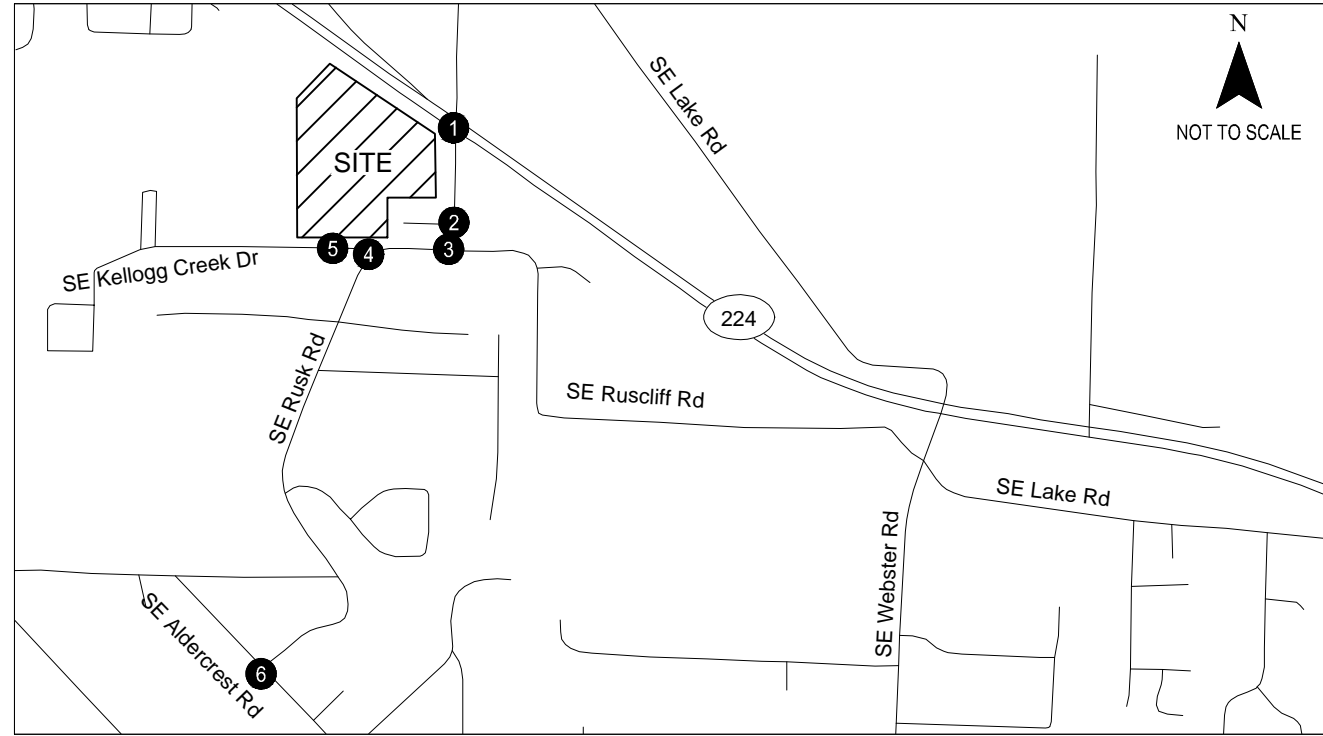
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	42	24	76	269	26
Future Vol, veh/h	27	42	24	76	269	26
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	2	0	5	1	4
Mvmt Flow	30	46	26	84	296	29
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.5	8	10.5
HCM LOS	A	A	B

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	39%	0%	91%
Vol Thru, %	61%	24%	0%
Vol Right, %	0%	76%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	69	100	295
LT Vol	27	0	269
Through Vol	42	24	0
RT Vol	0	76	26
Lane Flow Rate	76	110	324
Geometry Grp	1	1	1
Degree of Util (X)	0.103	0.132	0.403
Departure Headway (Hd)	4.878	4.313	4.472
Convergence, Y/N	Yes	Yes	Yes
Cap	735	832	804
Service Time	2.906	2.338	2.497
HCM Lane V/C Ratio	0.103	0.132	0.403
HCM Control Delay	8.5	8	10.5
HCM Lane LOS	A	A	B
HCM 95th-tile Q	0.3	0.5	2



**Attachment E – 2019 Background  
Traffic Level-of-Service Worksheets**



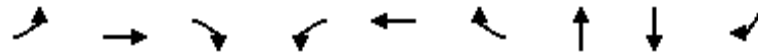
In-Process Trip Assignment  
AM, Midday & PM Peak Hours  
Milwaukie, Oregon

Figure  
E-1

Queues

1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	4	855	33	18	2137	19	236	64	5
v/c Ratio	0.06	0.37	0.03	0.21	0.86	0.02	0.92	0.24	0.02
Control Delay	55.5	8.8	0.1	58.8	18.1	0.4	86.0	44.7	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	8.8	0.1	58.8	18.1	0.4	86.0	44.7	0.0
Queue Length 50th (ft)	3	109	0	14	536	0	173	43	0
Queue Length 95th (ft)	15	206	0	38	#1013	2	#324	85	0
Internal Link Dist (ft)		263			1187		389	744	
Turn Bay Length (ft)	470		110	455		100			75
Base Capacity (vph)	132	2332	1095	254	2480	967	265	275	328
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.37	0.03	0.07	0.86	0.02	0.89	0.23	0.02






















Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	829	32	17	2073	18	140	42	48	21	41	5
Future Volume (vph)	4	829	32	17	2073	18	140	42	48	21	41	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00		1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97			0.98	1.00
Satd. Flow (prot)	1444	3343	1536	1456	3438	1324		1758			1698	1346
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.78			0.87	1.00
Satd. Flow (perm)	1444	3343	1536	1456	3438	1324		1406			1502	1346
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	4	855	33	18	2137	19	144	43	49	22	42	5
RTOR Reduction (vph)	0	0	11	0	0	6	0	8	0	0	0	4
Lane Group Flow (vph)	4	855	22	18	2137	13	0	228	0	0	64	1
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	25%	8%	3%	24%	5%	22%	2%	0%	2%	10%	10%	20%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	1.4	81.4	81.4	3.4	83.4	83.4		21.2			21.2	21.2
Effective Green, g (s)	1.4	81.4	81.4	3.4	83.4	83.4		21.2			21.2	21.2
Actuated g/C Ratio	0.01	0.68	0.68	0.03	0.70	0.70		0.18			0.18	0.18
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	16	2267	1041	41	2389	920		248			265	237
v/s Ratio Prot	0.00	0.26		c0.01	c0.62							
v/s Ratio Perm			0.01			0.01		c0.16			0.04	0.00
v/c Ratio	0.25	0.38	0.02	0.44	0.89	0.01		0.92			0.24	0.00
Uniform Delay, d1	58.8	8.3	6.3	57.4	14.8	5.6		48.6			42.5	40.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	8.1	0.5	0.0	7.3	5.7	0.0		35.5			0.5	0.0
Delay (s)	66.8	8.8	6.3	64.7	20.5	5.7		84.1			43.0	40.7
Level of Service	E	A	A	E	C	A		F			D	D
Approach Delay (s)		9.0			20.7			84.1			42.8	
Approach LOS		A			C			F			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			22.5			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			14.0			
Intersection Capacity Utilization			86.9%			ICU Level of Service			E			
Analysis Period (min)			15									

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	2	0	0	251	180	2
Future Vol, veh/h	2	0	0	251	180	2
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	0	0	2	5	0
Mvmt Flow	3	0	0	330	237	3

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	571	241	242	0	0
Stage 1	241	-	-	-	-
Stage 2	330	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	486	803	1336	-	-
Stage 1	804	-	-	-	-
Stage 2	733	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	484	802	1334	-	-
Mov Cap-2 Maneuver	484	-	-	-	-
Stage 1	802	-	-	-	-
Stage 2	732	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1334	-	484	-	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	0	-	12.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	R	T	R	L	T
Traffic Vol, veh/h	2	12	238	1	3	177
Future Vol, veh/h	2	12	238	1	3	177
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	50	14	2	100	50	5
Mvmt Flow	3	16	322	1	4	239

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	570	323	0	0	323	0
Stage 1	323	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Critical Hdwy	6.9	6.34	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.426	-	-	2.65	-
Pot Cap-1 Maneuver	411	691	-	-	1010	-
Stage 1	638	-	-	-	-	-
Stage 2	694	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	409	691	-	-	1010	-
Mov Cap-2 Maneuver	409	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	694	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	629	1010
HCM Lane V/C Ratio	-	-	0.03	0.004
HCM Control Delay (s)	-	-	10.9	8.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection						
Int Delay, s/veh	2.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	52	14	38	185	107	72
Future Vol, veh/h	52	14	38	185	107	72
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	6	7	0	2	6	1
Mvmt Flow	75	20	55	268	155	104

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	586	208	260	0	-	0
Stage 1	208	-	-	-	-	-
Stage 2	378	-	-	-	-	-
Critical Hdwy	6.46	6.27	4.1	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.363	2.2	-	-	-
Pot Cap-1 Maneuver	466	820	1316	-	-	-
Stage 1	817	-	-	-	-	-
Stage 2	684	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	442	819	1315	-	-	-
Mov Cap-2 Maneuver	442	-	-	-	-	-
Stage 1	776	-	-	-	-	-
Stage 2	683	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1315	-	490	-	-
HCM Lane V/C Ratio	0.042	-	0.195	-	-
HCM Control Delay (s)	7.9	0	14.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	0	80	111	0	0	0
Future Vol, veh/h	0	80	111	0	0	0
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	51	51	51	51	51	51
Heavy Vehicles, %	0	6	1	0	0	0
Mvmt Flow	0	157	218	0	0	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	220	0	-	0	377 220
Stage 1	-	-	-	-	220 -
Stage 2	-	-	-	-	157 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1361	-	-	-	629 825
Stage 1	-	-	-	-	821 -
Stage 2	-	-	-	-	876 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1359	-	-	-	626 824
Mov Cap-2 Maneuver	-	-	-	-	626 -
Stage 1	-	-	-	-	819 -
Stage 2	-	-	-	-	874 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1359	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-



Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	23	44	170	72	16
Future Vol, veh/h	31	23	44	170	72	16
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	3	0	2	2	6	6
Mvmt Flow	37	28	53	205	87	19
Number of Lanes	0	1	1	0	1	0

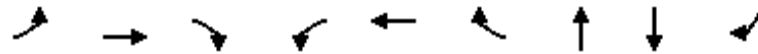
Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8	8.2	8.5
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	57%	0%	82%
Vol Thru, %	43%	21%	0%
Vol Right, %	0%	79%	18%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	54	214	88
LT Vol	31	0	72
Through Vol	23	44	0
RT Vol	0	170	16
Lane Flow Rate	65	258	106
Geometry Grp	1	1	1
Degree of Util (X)	0.083	0.272	0.139
Departure Headway (Hd)	4.57	3.795	4.715
Convergence, Y/N	Yes	Yes	Yes
Cap	787	951	762
Service Time	2.583	1.804	2.735
HCM Lane V/C Ratio	0.083	0.271	0.139
HCM Control Delay	8	8.2	8.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	1.1	0.5

Queues

1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018
























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	13	1089	63	48	1076	6	175	79	11
v/c Ratio	0.12	0.49	0.06	0.33	0.45	0.01	0.70	0.34	0.04
Control Delay	46.2	11.3	3.7	48.8	7.9	0.0	47.3	40.1	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	11.3	3.7	48.8	7.9	0.0	47.3	40.1	0.3
Queue Length 50th (ft)	8	186	2	29	113	0	89	46	0
Queue Length 95th (ft)	27	306	21	64	280	0	150	84	0
Internal Link Dist (ft)		263			1187		389	741	
Turn Bay Length (ft)	470		110	455		100			75
Base Capacity (vph)	183	2268	1070	194	2390	999	284	268	319
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.48	0.06	0.25	0.45	0.01	0.62	0.29	0.03

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	13	1067	62	47	1054	6	70	32	70	24	54	11	
Future Volume (vph)	13	1067	62	47	1054	6	70	32	70	24	54	11	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98		1.00			1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95			1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.99	1.00	
Satd. Flow (prot)	1671	3343	1551	1770	3282	1352		1746			1759	1463	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.83			0.85	1.00	
Satd. Flow (perm)	1671	3343	1551	1770	3282	1352		1484			1525	1463	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	
Adj. Flow (vph)	13	1089	63	48	1076	6	71	33	71	24	55	11	
RTOR Reduction (vph)	0	0	19	0	0	2	0	25	0	0	0	9	
Lane Group Flow (vph)	13	1089	44	48	1076	4	0	150	0	0	79	2	
Confl. Peds. (#/hr)							1					1	
Confl. Bikes (#/hr)			1			1							
Heavy Vehicles (%)	8%	8%	2%	2%	10%	17%	1%	0%	1%	21%	0%	9%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	Perm	
Protected Phases	5	2		1	6			8			4		
Permitted Phases			2			6	8			4		4	
Actuated Green, G (s)	1.6	65.0	65.0	5.7	69.1	69.1		15.3			15.3	15.3	
Effective Green, g (s)	1.6	65.0	65.0	5.7	69.1	69.1		15.3			15.3	15.3	
Actuated g/C Ratio	0.02	0.65	0.65	0.06	0.69	0.69		0.15			0.15	0.15	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	3.0	
Lane Grp Cap (vph)	26	2172	1008	100	2267	934		227			233	223	
v/s Ratio Prot	0.01	c0.33		c0.03	0.33								
v/s Ratio Perm			0.03			0.00		c0.10			0.05	0.00	
v/c Ratio	0.50	0.50	0.04	0.48	0.47	0.00		0.66			0.34	0.01	
Uniform Delay, d1	48.8	9.1	6.3	45.7	7.1	4.8		39.9			37.8	35.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00	
Incremental Delay, d2	14.3	0.8	0.1	3.6	0.7	0.0		7.1			0.9	0.0	
Delay (s)	63.1	9.9	6.4	49.3	7.8	4.8		47.0			38.7	35.9	
Level of Service	E	A	A	D	A	A		D			D	D	
Approach Delay (s)		10.3			9.6			47.0			38.4		
Approach LOS		B			A			D			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			13.5									HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.53										
Actuated Cycle Length (s)			100.0									Sum of lost time (s)	14.0
Intersection Capacity Utilization			61.0%									ICU Level of Service	B
Analysis Period (min)			15										
c Critical Lane Group													

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	1	1	177	170	3
Future Vol, veh/h	7	1	1	177	170	3
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	8	1	1	201	193	3

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	400	197	198	0	0
Stage 1	197	-	-	-	-
Stage 2	203	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	610	849	1387	-	-
Stage 1	841	-	-	-	-
Stage 2	836	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	607	848	1385	-	-
Mov Cap-2 Maneuver	607	-	-	-	-
Stage 1	838	-	-	-	-
Stage 2	834	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1385	-	629	-	-
HCM Lane V/C Ratio	0.001	-	0.014	-	-
HCM Control Delay (s)	7.6	0	10.8	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	1	8	170	0	12	158
Future Vol, veh/h	1	8	170	0	12	158
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	40	2	0	14	1
Mvmt Flow	1	9	191	0	13	178

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	395	191	0	0	191
Stage 1	191	-	-	-	-
Stage 2	204	-	-	-	-
Critical Hdwy	6.4	6.6	-	-	4.24
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.66	-	-	2.326
Pot Cap-1 Maneuver	614	762	-	-	1314
Stage 1	846	-	-	-	-
Stage 2	835	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	607	762	-	-	1314
Mov Cap-2 Maneuver	607	-	-	-	-
Stage 1	837	-	-	-	-
Stage 2	835	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0.5
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	741	1314
HCM Lane V/C Ratio	-	-	0.014	0.01
HCM Control Delay (s)	-	-	9.9	7.8
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	3.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	83	33	22	89	115	43
Future Vol, veh/h	83	33	22	89	115	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	0	0	0	0	7
Mvmt Flow	95	38	25	102	132	49

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	309	157	181	0	0
Stage 1	157	-	-	-	-
Stage 2	152	-	-	-	-
Critical Hdwy	6.42	6.2	4.1	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.2	-	-
Pot Cap-1 Maneuver	683	894	1407	-	-
Stage 1	871	-	-	-	-
Stage 2	876	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	670	894	1407	-	-
Mov Cap-2 Maneuver	670	-	-	-	-
Stage 1	854	-	-	-	-
Stage 2	876	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1407	-	721	-	-
HCM Lane V/C Ratio	0.018	-	0.185	-	-
HCM Control Delay (s)	7.6	0	11.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	0	111	62	2	5	2
Future Vol, veh/h	0	111	62	2	5	2
Conflicting Peds, #/hr	4	0	0	4	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	0	2	3	50	0	0
Mvmt Flow	0	148	83	3	7	3

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	90	0	-	0	237 89
Stage 1	-	-	-	-	89 -
Stage 2	-	-	-	-	148 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1518	-	-	-	756 975
Stage 1	-	-	-	-	940 -
Stage 2	-	-	-	-	884 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1513	-	-	-	751 972
Mov Cap-2 Maneuver	-	-	-	-	751 -
Stage 1	-	-	-	-	937 -
Stage 2	-	-	-	-	881 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1513	-	-	-	803
HCM Lane V/C Ratio	-	-	-	-	0.012
HCM Control Delay (s)	0	-	-	-	9.5
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	25	22	73	99	35
Future Vol, veh/h	25	25	22	73	99	35
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	29	29	25	84	114	40
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.8	7.4	8.2
HCM LOS	A	A	A

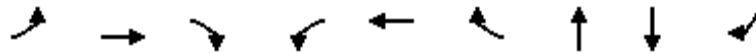
Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	50%	0%	74%
Vol Thru, %	50%	23%	0%
Vol Right, %	0%	77%	26%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	50	95	134
LT Vol	25	0	99
Through Vol	25	22	0
RT Vol	0	73	35
Lane Flow Rate	57	109	154
Geometry Grp	1	1	1
Degree of Util (X)	0.071	0.117	0.179
Departure Headway (Hd)	4.46	3.854	4.177
Convergence, Y/N	Yes	Yes	Yes
Cap	808	936	849
Service Time	2.46	1.855	2.253
HCM Lane V/C Ratio	0.071	0.116	0.181
HCM Control Delay	7.8	7.4	8.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0.4	0.6



Queues

1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	24	2047	209	100	1371	12	147	133	32
v/c Ratio	0.26	0.87	0.19	0.66	0.54	0.01	0.91	0.72	0.12
Control Delay	64.5	23.3	6.0	77.8	10.4	0.0	99.0	73.9	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.5	23.3	6.0	77.8	10.4	0.0	99.0	73.9	3.9
Queue Length 50th (ft)	20	704	38	82	278	0	110	108	0
Queue Length 95th (ft)	49	903	76	#160	404	0	#205	174	10
Internal Link Dist (ft)		263			1187		389	767	
Turn Bay Length (ft)	470		110	455		100			75
Base Capacity (vph)	140	2355	1111	161	2532	1189	205	242	330
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.87	0.19	0.62	0.54	0.01	0.72	0.55	0.10






















Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1883	192	92	1261	11	54	36	45	49	74	29
Future Volume (vph)	22	1883	192	92	1261	11	54	36	45	49	74	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00			1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98			0.98	1.00
Satd. Flow (prot)	1656	3505	1615	1805	3471	1615		1757			1852	1593
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.60			0.73	1.00
Satd. Flow (perm)	1656	3505	1615	1805	3471	1615		1084			1374	1593
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	2047	209	100	1371	12	59	39	49	53	80	32
RTOR Reduction (vph)	0	0	26	0	0	3	0	15	0	0	0	28
Lane Group Flow (vph)	24	2047	183	100	1371	9	0	132	0	0	133	4
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	9%	3%	0%	0%	4%	0%	2%	0%	0%	0%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	5.1	87.4	87.4	11.0	93.3	93.3		17.6			17.6	17.6
Effective Green, g (s)	5.1	87.4	87.4	11.0	93.3	93.3		17.6			17.6	17.6
Actuated g/C Ratio	0.04	0.67	0.67	0.08	0.72	0.72		0.14			0.14	0.14
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0			4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	64	2356	1085	152	2491	1159		146			186	215
v/s Ratio Prot	0.01	c0.58		c0.06	0.39							
v/s Ratio Perm			0.11			0.01		c0.12			0.10	0.00
v/c Ratio	0.38	0.87	0.17	0.66	0.55	0.01		0.91			0.72	0.02
Uniform Delay, d1	60.9	16.8	7.9	57.7	8.6	5.2		55.4			53.8	48.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	3.7	4.7	0.3	9.8	0.9	0.0		47.2			12.3	0.0
Delay (s)	64.6	21.5	8.2	67.5	9.4	5.2		102.6			66.1	48.8
Level of Service	E	C	A	E	A	A		F			E	D
Approach Delay (s)		20.7			13.3			102.6			62.7	
Approach LOS		C			B			F			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			22.7			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			130.0			Sum of lost time (s)			14.0			
Intersection Capacity Utilization			83.1%			ICU Level of Service			E			
Analysis Period (min)			15									

c Critical Lane Group

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	1	1	1	136	366	4
Future Vol, veh/h	1	1	1	136	366	4
Conflicting Peds, #/hr	0	4	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	2	1	0
Mvmt Flow	1	1	1	149	402	4

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	556	409	407	0	-	0
Stage 1	405	-	-	-	-	-
Stage 2	151	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	496	647	1163	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	882	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	495	644	1162	-	-	-
Mov Cap-2 Maneuver	495	-	-	-	-	-
Stage 1	677	-	-	-	-	-
Stage 2	881	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1162	-	560	-	-
HCM Lane V/C Ratio	0.001	-	0.004	-	-
HCM Control Delay (s)	8.1	0	11.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	11	124	1	18	350
Future Vol, veh/h	1	11	124	1	18	350
Conflicting Peds, #/hr	0	4	0	0	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	1	12	136	1	20	385

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	563	142	0	0	138
Stage 1	138	-	-	-	-
Stage 2	425	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	491	911	-	-	1458
Stage 1	894	-	-	-	-
Stage 2	664	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	482	907	-	-	1457
Mov Cap-2 Maneuver	482	-	-	-	-
Stage 1	878	-	-	-	-
Stage 2	664	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	845	1457
HCM Lane V/C Ratio	-	-	0.016	0.014
HCM Control Delay (s)	-	-	9.3	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		
Traffic Vol, veh/h	20	17	14	107	298	53
Future Vol, veh/h	20	17	14	107	298	53
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	7	2	1	2
Mvmt Flow	22	19	16	120	335	60

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	519	369	397	0	0
Stage 1	367	-	-	-	-
Stage 2	152	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-
Pot Cap-1 Maneuver	521	681	1135	-	-
Stage 1	705	-	-	-	-
Stage 2	881	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	511	679	1133	-	-
Mov Cap-2 Maneuver	511	-	-	-	-
Stage 1	693	-	-	-	-
Stage 2	879	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1133	-	577	-	-
HCM Lane V/C Ratio	0.014	-	0.072	-	-
HCM Control Delay (s)	8.2	0	11.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	1	48	66	0	3	1
Future Vol, veh/h	1	48	66	0	3	1
Conflicting Peds, #/hr	5	0	0	5	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	1	65	89	0	4	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	94	0	-	0	162
Stage 1	-	-	-	-	94
Stage 2	-	-	-	-	68
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1513	-	-	-	834
Stage 1	-	-	-	-	935
Stage 2	-	-	-	-	960
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1507	-	-	-	826
Mov Cap-2 Maneuver	-	-	-	-	826
Stage 1	-	-	-	-	930
Stage 2	-	-	-	-	956

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1507	-	-	-	857
HCM Lane V/C Ratio	0.001	-	-	-	0.006
HCM Control Delay (s)	7.4	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

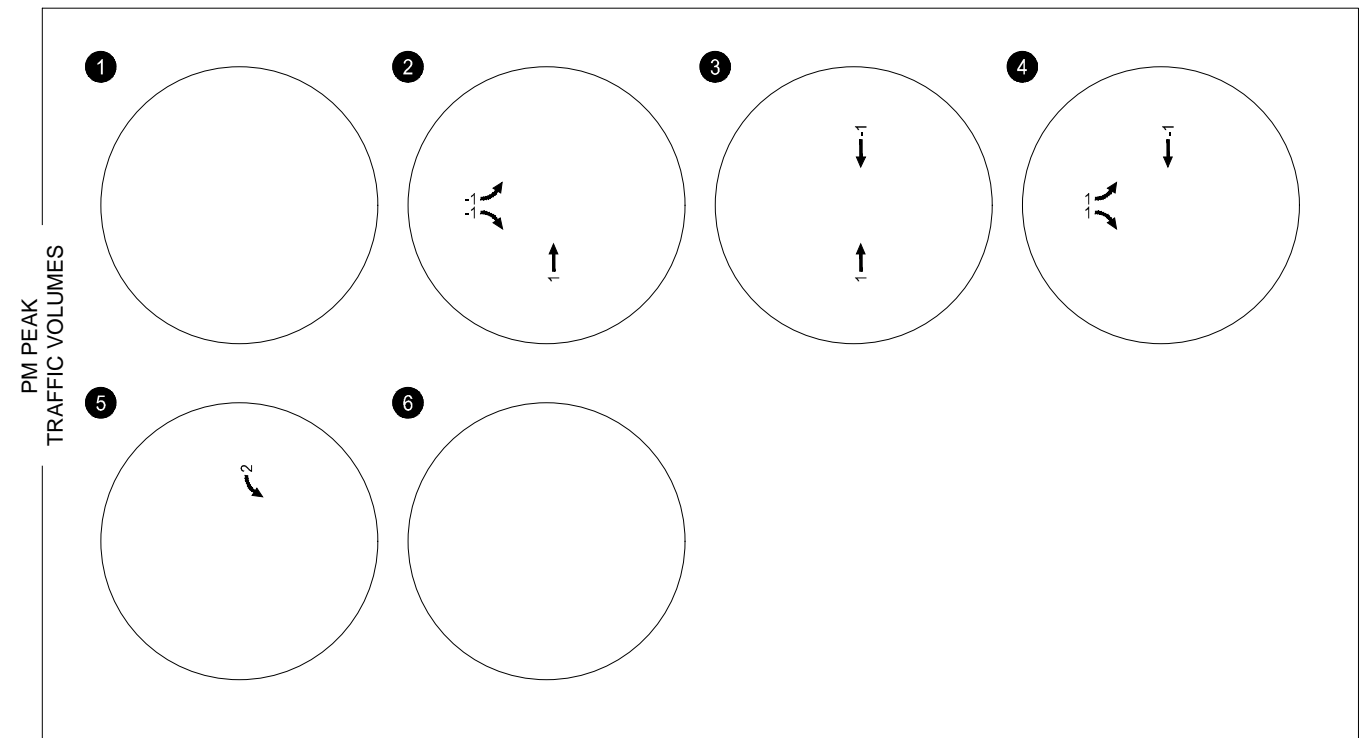
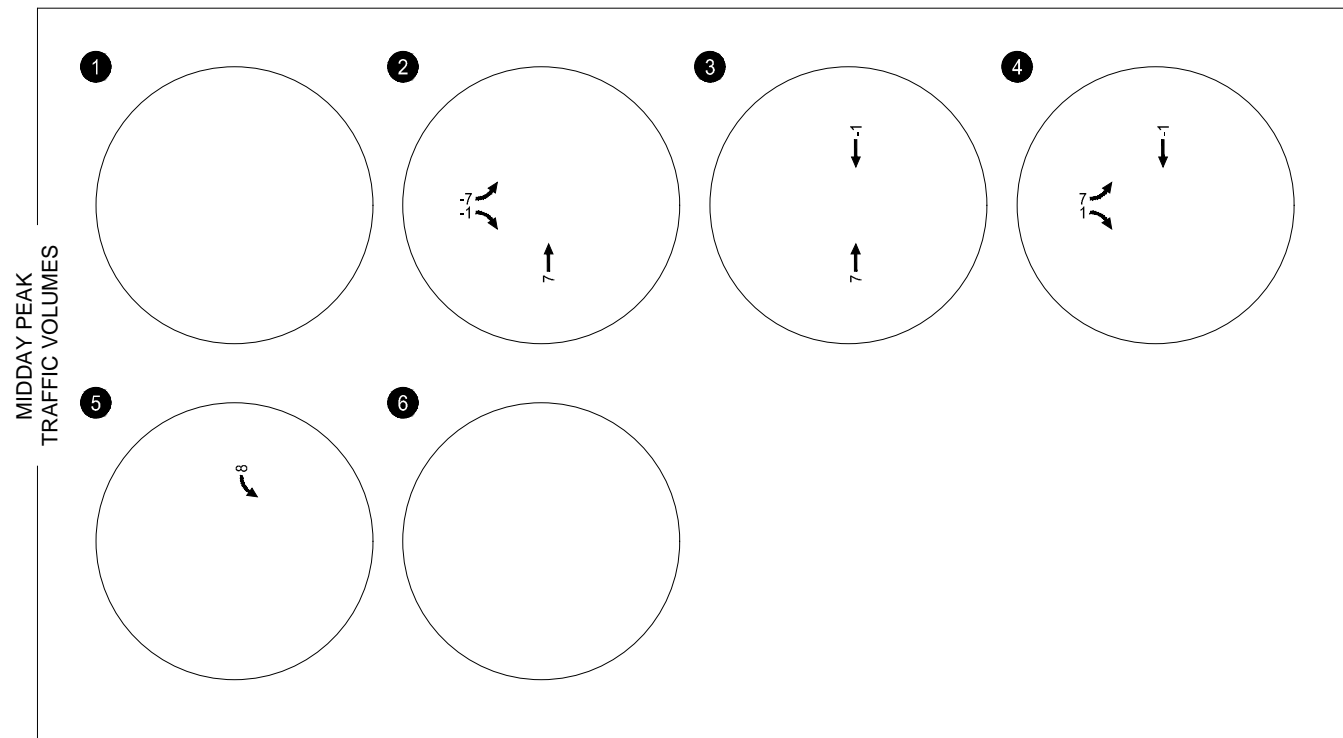
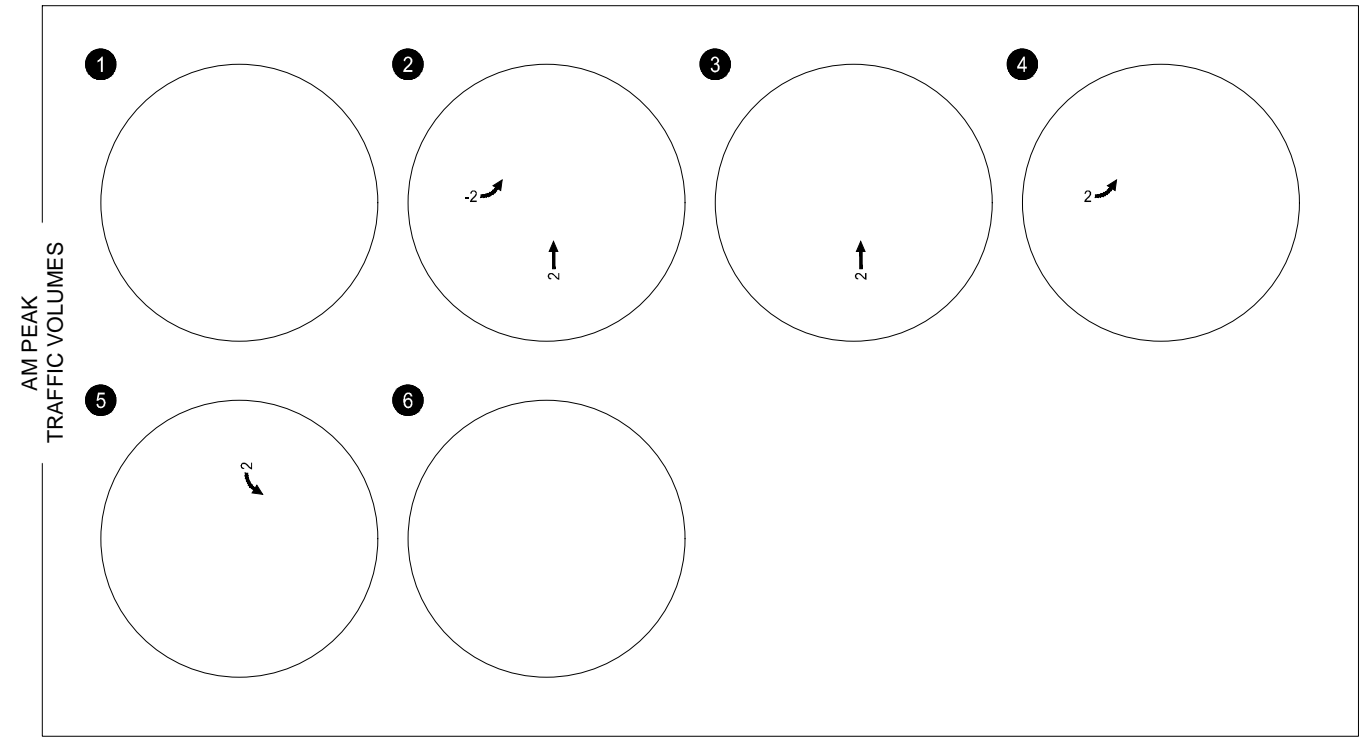
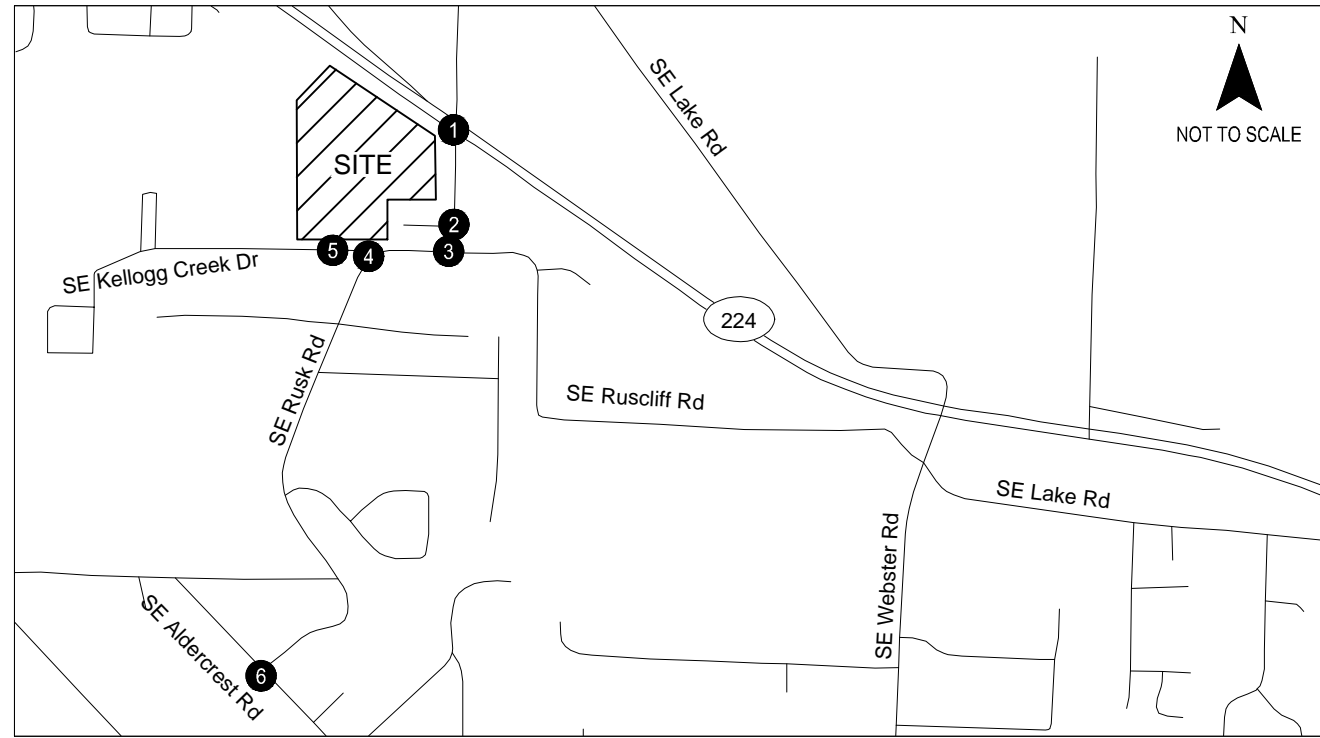
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	42	24	76	271	26
Future Vol, veh/h	27	42	24	76	271	26
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	2	0	5	1	4
Mvmt Flow	30	46	26	84	298	29
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.5	8	10.5
HCM LOS	A	A	B

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	39%	0%	91%
Vol Thru, %	61%	24%	0%
Vol Right, %	0%	76%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	69	100	297
LT Vol	27	0	271
Through Vol	42	24	0
RT Vol	0	76	26
Lane Flow Rate	76	110	326
Geometry Grp	1	1	1
Degree of Util (X)	0.103	0.132	0.406
Departure Headway (Hd)	4.884	4.319	4.473
Convergence, Y/N	Yes	Yes	Yes
Cap	734	831	806
Service Time	2.912	2.344	2.497
HCM Lane V/C Ratio	0.104	0.132	0.404
HCM Control Delay	8.5	8	10.5
HCM Lane LOS	A	A	B
HCM 95th-tile Q	0.3	0.5	2

**Attachment F – 2019 Total Traffic  
Level-of-Service Worksheets**





Redistributed Trip Assignment  
 AM, Midday & PM Peak Hours  
 Milwaukie, Oregon

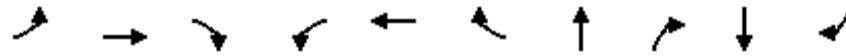
Figure  
 F-1

H:\23\23248 - Rusk Road Senior Housing\dwg\Figs\23248\_Figures.dwg Nov 02, 2018 - 11:31am - bcullimore Layout Tab: Redistributed 11x17

Queues

1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	4	855	42	23	2137	19	196	52	68	5
v/c Ratio	0.06	0.37	0.04	0.26	0.85	0.02	0.86	0.15	0.30	0.02
Control Delay	55.5	9.6	0.3	59.8	17.2	0.4	80.3	1.4	46.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	9.6	0.3	59.8	17.2	0.4	80.3	1.4	46.8	0.0
Queue Length 50th (ft)	3	156	0	17	536	0	146	0	46	0
Queue Length 95th (ft)	15	210	2	44	#1013	2	#265	3	90	0
Internal Link Dist (ft)		263			1187		389		744	
Turn Bay Length (ft)	470		110	455		100		100		75
Base Capacity (vph)	132	2293	1079	254	2512	979	250	368	246	328
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.37	0.04	0.09	0.85	0.02	0.78	0.14	0.28	0.02

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

# HCM Signalized Intersection Capacity Analysis

## 1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↘	↑↑	↗	↘	↑↑	↗		↑	↗		↘	↗	
Traffic Volume (vph)	4	829	41	22	2073	18	146	44	50	21	45	5	
Future Volume (vph)	4	829	41	22	2073	18	146	44	50	21	45	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.98	1.00	
Satd. Flow (prot)	1444	3343	1536	1456	3438	1324		1802	1562		1700	1346	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.73	1.00		0.78	1.00	
Satd. Flow (perm)	1444	3343	1536	1456	3438	1324		1367	1562		1343	1346	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	
Adj. Flow (vph)	4	855	42	23	2137	19	151	45	52	22	46	5	
RTOR Reduction (vph)	0	0	14	0	0	6	0	0	43	0	0	4	
Lane Group Flow (vph)	4	855	28	23	2137	13	0	196	9	0	68	1	
Confl. Bikes (#/hr)			1						1				
Heavy Vehicles (%)	25%	8%	3%	24%	5%	22%	2%	0%	2%	10%	10%	20%	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm	
Protected Phases	5	2		1	6			8			4		
Permitted Phases			2			6	8		8	4		4	
Actuated Green, G (s)	1.4	80.8	80.8	5.1	84.5	84.5		20.1	20.1		20.1	20.1	
Effective Green, g (s)	1.4	80.8	80.8	5.1	84.5	84.5		20.1	20.1		20.1	20.1	
Actuated g/C Ratio	0.01	0.67	0.67	0.04	0.70	0.70		0.17	0.17		0.17	0.17	
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	16	2250	1034	61	2420	932		228	261		224	225	
v/s Ratio Prot	0.00	0.26		c0.02	c0.62								
v/s Ratio Perm			0.02			0.01		c0.14	0.01		0.05	0.00	
v/c Ratio	0.25	0.38	0.03	0.38	0.88	0.01		0.86	0.03		0.30	0.00	
Uniform Delay, d1	58.8	8.6	6.5	55.9	13.9	5.3		48.6	41.8		43.8	41.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.1	0.5	0.0	3.9	5.1	0.0		26.0	0.1		0.8	0.0	
Delay (s)	66.8	9.1	6.6	59.8	19.0	5.3		74.6	41.9		44.6	41.6	
Level of Service	E	A	A	E	B	A		E	D		D	D	
Approach Delay (s)		9.2			19.3			67.7			44.4		
Approach LOS		A			B			E			D		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			20.7	HCM 2000 Level of Service					C				
HCM 2000 Volume to Capacity ratio			0.88										
Actuated Cycle Length (s)			120.0	Sum of lost time (s)					14.0				
Intersection Capacity Utilization			84.4%	ICU Level of Service					E				
Analysis Period (min)			15										

c Critical Lane Group

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	263	198	2
Future Vol, veh/h	0	0	0	263	198	2
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	76	76	76	76
Heavy Vehicles, %	0	0	0	2	5	0
Mvmt Flow	0	0	0	346	261	3

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	611	265	266	0	0
Stage 1	265	-	-	-	-
Stage 2	346	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	460	779	1310	-	-
Stage 1	784	-	-	-	-
Stage 2	721	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	458	778	1308	-	-
Mov Cap-2 Maneuver	458	-	-	-	-
Stage 1	782	-	-	-	-
Stage 2	720	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1308	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	2	12	250	1	3	195
Future Vol, veh/h	2	12	250	1	3	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	50	14	2	100	50	5
Mvmt Flow	3	16	338	1	4	264

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	611	339	0	0	339	0
Stage 1	339	-	-	-	-	-
Stage 2	272	-	-	-	-	-
Critical Hdwy	6.9	6.34	-	-	4.6	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.95	3.426	-	-	2.65	-
Pot Cap-1 Maneuver	388	677	-	-	995	-
Stage 1	626	-	-	-	-	-
Stage 2	675	-	-	-	-	-
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	386	677	-	-	995	-
Mov Cap-2 Maneuver	386	-	-	-	-	-
Stage 1	623	-	-	-	-	-
Stage 2	675	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	0.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	611	995
HCM Lane V/C Ratio	-	-	0.031	0.004
HCM Control Delay (s)	-	-	11.1	8.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection						
Int Delay, s/veh	3.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	64	16	43	185	107	90
Future Vol, veh/h	64	16	43	185	107	90
Conflicting Peds, #/hr	0	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	6	7	0	2	6	1
Mvmt Flow	93	23	62	268	155	130

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	613	221	286	0	-	0
Stage 1	221	-	-	-	-	-
Stage 2	392	-	-	-	-	-
Critical Hdwy	6.46	6.27	4.1	-	-	-
Critical Hdwy Stg 1	5.46	-	-	-	-	-
Critical Hdwy Stg 2	5.46	-	-	-	-	-
Follow-up Hdwy	3.554	3.363	2.2	-	-	-
Pot Cap-1 Maneuver	449	806	1288	-	-	-
Stage 1	806	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	423	805	1287	-	-	-
Mov Cap-2 Maneuver	423	-	-	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	673	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.2	1.5	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1287	-	467	-	-
HCM Lane V/C Ratio	0.048	-	0.248	-	-
HCM Control Delay (s)	7.9	0	15.2	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.2	-	1	-	-




Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	0	80	111	23	14	0
Future Vol, veh/h	0	80	111	23	14	0
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	51	51	51	51	51	51
Heavy Vehicles, %	0	6	1	0	0	0
Mvmt Flow	0	157	218	45	27	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	265	0	0	400	243
Stage 1	-	-	-	243	-
Stage 2	-	-	-	157	-
Critical Hdwy	4.1	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	3.5	3.3
Pot Cap-1 Maneuver	1311	-	-	610	801
Stage 1	-	-	-	802	-
Stage 2	-	-	-	876	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1309	-	-	608	800
Mov Cap-2 Maneuver	-	-	-	608	-
Stage 1	-	-	-	800	-
Stage 2	-	-	-	874	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1309	-	-	-	608
HCM Lane V/C Ratio	-	-	-	-	0.045
HCM Control Delay (s)	0	-	-	-	11.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	32	23	44	174	74	16
Future Vol, veh/h	32	23	44	174	74	16
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	3	0	2	2	6	6
Mvmt Flow	39	28	53	210	89	19
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8	8.3	8.5
HCM LOS	A	A	A

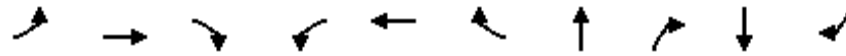
Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	58%	0%	82%
Vol Thru, %	42%	20%	0%
Vol Right, %	0%	80%	18%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	55	218	90
LT Vol	32	0	74
Through Vol	23	44	0
RT Vol	0	174	16
Lane Flow Rate	66	263	108
Geometry Grp	1	1	1
Degree of Util (X)	0.084	0.277	0.143
Departure Headway (Hd)	4.583	3.801	4.733
Convergence, Y/N	Yes	Yes	Yes
Cap	784	948	759
Service Time	2.598	1.811	2.75
HCM Lane V/C Ratio	0.084	0.277	0.142
HCM Control Delay	8	8.3	8.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	1.1	0.5



Queues

1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018

























Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	13	1089	68	51	1076	6	119	76	82	11
v/c Ratio	0.12	0.49	0.07	0.35	0.44	0.01	0.63	0.27	0.38	0.04
Control Delay	46.2	11.2	3.6	49.0	7.0	0.0	54.5	10.9	42.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.2	11.2	3.6	49.0	7.0	0.0	54.5	10.9	42.8	0.3
Queue Length 50th (ft)	8	176	3	31	103	0	73	0	48	0
Queue Length 95th (ft)	27	291	22	67	263	0	124	38	88	0
Internal Link Dist (ft)		263			1187		389		741	
Turn Bay Length (ft)	470		110	455		100		100		75
Base Capacity (vph)	183	2228	1052	195	2428	1014	231	329	265	307
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.49	0.06	0.26	0.44	0.01	0.52	0.23	0.31	0.04

Intersection Summary

# HCM Signalized Intersection Capacity Analysis

## 1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	1067	67	50	1054	6	80	36	74	24	57	11
Future Volume (vph)	13	1067	67	50	1054	6	80	36	74	24	57	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98		1.00	1.00		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.99	1.00
Satd. Flow (prot)	1671	3343	1551	1770	3282	1352		1823	1599		1764	1463
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.74	1.00		0.89	1.00
Satd. Flow (perm)	1671	3343	1551	1770	3282	1352		1390	1599		1594	1463
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	13	1089	68	51	1076	6	82	37	76	24	58	11
RTOR Reduction (vph)	0	0	20	0	0	2	0	0	66	0	0	9
Lane Group Flow (vph)	13	1089	48	51	1076	4	0	119	10	0	82	2
Confl. Peds. (#/hr)							1					1
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	8%	8%	2%	2%	10%	17%	1%	0%	1%	21%	0%	9%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	1.6	65.1	65.1	7.2	70.7	70.7		13.7	13.7		13.7	13.7
Effective Green, g (s)	1.6	65.1	65.1	7.2	70.7	70.7		13.7	13.7		13.7	13.7
Actuated g/C Ratio	0.02	0.65	0.65	0.07	0.71	0.71		0.14	0.14		0.14	0.14
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	26	2176	1009	127	2320	955		190	219		218	200
v/s Ratio Prot	0.01	c0.33		c0.03	0.33							
v/s Ratio Perm			0.03			0.00		c0.09	0.01		0.05	0.00
v/c Ratio	0.50	0.50	0.05	0.40	0.46	0.00		0.63	0.05		0.38	0.01
Uniform Delay, d1	48.8	9.0	6.3	44.3	6.4	4.3		40.7	37.5		39.3	37.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	14.3	0.8	0.1	2.1	0.7	0.0		6.3	0.1		1.1	0.0
Delay (s)	63.1	9.9	6.4	46.4	7.1	4.3		47.0	37.6		40.4	37.3
Level of Service	E	A	A	D	A	A		D	D		D	D
Approach Delay (s)		10.2			8.8			43.3			40.0	
Approach LOS		B			A			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.2				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)		14.0			
Intersection Capacity Utilization			57.5%				ICU Level of Service				B	
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	1	202	181	3
Future Vol, veh/h	0	0	1	202	181	3
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	0	3	2	0
Mvmt Flow	0	0	1	230	206	3

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	442	210	211	0	0
Stage 1	210	-	-	-	-
Stage 2	232	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-
Pot Cap-1 Maneuver	577	835	1372	-	-
Stage 1	830	-	-	-	-
Stage 2	811	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	574	834	1370	-	-
Mov Cap-2 Maneuver	574	-	-	-	-
Stage 1	828	-	-	-	-
Stage 2	809	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1370	-	-	-	-
HCM Lane V/C Ratio	0.001	-	-	-	-
HCM Control Delay (s)	7.6	0	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	8	195	0	12	168
Future Vol, veh/h	1	8	195	0	12	168
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	40	2	0	14	1
Mvmt Flow	1	9	219	0	13	189

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	434	219	0	0	219
Stage 1	219	-	-	-	-
Stage 2	215	-	-	-	-
Critical Hdwy	6.4	6.6	-	-	4.24
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.66	-	-	2.326
Pot Cap-1 Maneuver	583	734	-	-	1282
Stage 1	822	-	-	-	-
Stage 2	826	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	577	734	-	-	1282
Mov Cap-2 Maneuver	577	-	-	-	-
Stage 1	813	-	-	-	-
Stage 2	826	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	712	1282
HCM Lane V/C Ratio	-	-	0.014	0.011
HCM Control Delay (s)	-	-	10.1	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	108	38	25	89	114	54
Future Vol, veh/h	108	38	25	89	114	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	0	0	0	0	7
Mvmt Flow	124	44	29	102	131	62

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	322	162	193	0	0
Stage 1	162	-	-	-	-
Stage 2	160	-	-	-	-
Critical Hdwy	6.42	6.2	4.1	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.3	2.2	-	-
Pot Cap-1 Maneuver	672	888	1392	-	-
Stage 1	867	-	-	-	-
Stage 2	869	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	657	888	1392	-	-
Mov Cap-2 Maneuver	657	-	-	-	-
Stage 1	848	-	-	-	-
Stage 2	869	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.7	1.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1392	-	705	-	-
HCM Lane V/C Ratio	0.021	-	0.238	-	-
HCM Control Delay (s)	7.6	0	11.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-	-




Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	0	111	62	16	35	2
Future Vol, veh/h	0	111	62	16	35	2
Conflicting Peds, #/hr	4	0	0	4	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	0	2	3	50	0	0
Mvmt Flow	0	148	83	21	47	3

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	108	0	-	0	246 98
Stage 1	-	-	-	-	98 -
Stage 2	-	-	-	-	148 -
Critical Hdwy	4.1	-	-	-	6.4 6.2
Critical Hdwy Stg 1	-	-	-	-	5.4 -
Critical Hdwy Stg 2	-	-	-	-	5.4 -
Follow-up Hdwy	2.2	-	-	-	3.5 3.3
Pot Cap-1 Maneuver	1495	-	-	-	747 963
Stage 1	-	-	-	-	931 -
Stage 2	-	-	-	-	884 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1490	-	-	-	743 960
Mov Cap-2 Maneuver	-	-	-	-	743 -
Stage 1	-	-	-	-	928 -
Stage 2	-	-	-	-	881 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1490	-	-	-	752
HCM Lane V/C Ratio	-	-	-	-	0.066
HCM Control Delay (s)	0	-	-	-	10.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	26	25	22	75	102	36
Future Vol, veh/h	26	25	22	75	102	36
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	0	0	0	1	0	0
Mvmt Flow	30	29	25	86	117	41
Number of Lanes	0	1	1	0	1	0

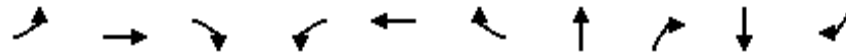
Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	7.8	7.4	8.2
HCM LOS	A	A	A

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	0%	74%
Vol Thru, %	49%	23%	0%
Vol Right, %	0%	77%	26%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	51	97	138
LT Vol	26	0	102
Through Vol	25	22	0
RT Vol	0	75	36
Lane Flow Rate	59	111	159
Geometry Grp	1	1	1
Degree of Util (X)	0.073	0.12	0.184
Departure Headway (Hd)	4.471	3.862	4.183
Convergence, Y/N	Yes	Yes	Yes
Cap	805	933	847
Service Time	2.475	1.864	2.262
HCM Lane V/C Ratio	0.073	0.119	0.188
HCM Control Delay	7.8	7.4	8.2
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.2	0.4	0.7

Queues

1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	24	2047	214	103	1371	12	113	53	137	32
v/c Ratio	0.26	0.87	0.19	0.66	0.54	0.01	0.89	0.20	0.78	0.12
Control Delay	64.5	23.3	6.1	77.3	10.3	0.0	108.5	11.5	81.5	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.5	23.3	6.1	77.3	10.3	0.0	108.5	11.5	81.5	3.9
Queue Length 50th (ft)	20	700	40	84	274	0	94	0	113	0
Queue Length 95th (ft)	49	903	78	#167	404	0	#176	33	179	10
Internal Link Dist (ft)		263			1187		389		767	
Turn Bay Length (ft)	470		110	455		100		100		75
Base Capacity (vph)	140	2354	1111	164	2539	1192	169	330	234	330
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.87	0.19	0.63	0.54	0.01	0.67	0.16	0.59	0.10

Intersection Summary























# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.



# HCM Signalized Intersection Capacity Analysis

## 1: SE Rusk Rd & Milwaukie Expy (Hwy 224)

11/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	1883	197	95	1261	11	64	40	49	49	77	29
Future Volume (vph)	22	1883	197	95	1261	11	64	40	49	49	77	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00		0.98	1.00
Satd. Flow (prot)	1656	3505	1615	1805	3471	1615		1820	1593		1853	1593
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.51	1.00		0.70	1.00
Satd. Flow (perm)	1656	3505	1615	1805	3471	1615		957	1593		1324	1593
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	2047	214	103	1371	12	70	43	53	53	84	32
RTOR Reduction (vph)	0	0	26	0	0	3	0	0	46	0	0	28
Lane Group Flow (vph)	24	2047	188	103	1371	9	0	113	7	0	137	4
Confl. Bikes (#/hr)									1			1
Heavy Vehicles (%)	9%	3%	0%	0%	4%	0%	2%	0%	0%	0%	1%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8		8	4		4
Actuated Green, G (s)	5.1	87.3	87.3	11.3	93.5	93.5		17.4	17.4		17.4	17.4
Effective Green, g (s)	5.1	87.3	87.3	11.3	93.5	93.5		17.4	17.4		17.4	17.4
Actuated g/C Ratio	0.04	0.67	0.67	0.09	0.72	0.72		0.13	0.13		0.13	0.13
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0		4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	64	2353	1084	156	2496	1161		128	213		177	213
v/s Ratio Prot	0.01	c0.58		c0.06	0.39							
v/s Ratio Perm			0.12			0.01		c0.12	0.00		0.10	0.00
v/c Ratio	0.38	0.87	0.17	0.66	0.55	0.01		0.88	0.03		0.77	0.02
Uniform Delay, d1	60.9	16.9	7.9	57.5	8.5	5.2		55.3	49.0		54.4	48.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	3.7	4.7	0.3	10.0	0.9	0.0		45.8	0.1		18.8	0.0
Delay (s)	64.6	21.6	8.3	67.5	9.3	5.2		101.1	49.0		73.2	48.9
Level of Service	E	C	A	E	A	A		F	D		E	D
Approach Delay (s)		20.8			13.3			84.5			68.6	
Approach LOS		C			B			F			E	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			22.6									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			130.0									Sum of lost time (s) 14.0
Intersection Capacity Utilization			82.4%									ICU Level of Service E
Analysis Period (min)			15									

c Critical Lane Group

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T			T		T
Traffic Vol, veh/h	0	0	1	155	377	4
Future Vol, veh/h	0	0	1	155	377	4
Conflicting Peds, #/hr	0	4	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	2	1	0
Mvmt Flow	0	0	1	170	414	4

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	589	421	419	0	-	0
Stage 1	417	-	-	-	-	-
Stage 2	172	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	474	637	1151	-	-	-
Stage 1	669	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	473	634	1150	-	-	-
Mov Cap-2 Maneuver	473	-	-	-	-	-
Stage 1	668	-	-	-	-	-
Stage 2	862	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1150	-	-	-	-
HCM Lane V/C Ratio	0.001	-	-	-	-
HCM Control Delay (s)	8.1	0	0	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	11	143	1	18	360
Future Vol, veh/h	1	11	143	1	18	360
Conflicting Peds, #/hr	0	4	0	0	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	2	0	0	1
Mvmt Flow	1	12	157	1	20	396

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	595	163	0	0	159
Stage 1	159	-	-	-	-
Stage 2	436	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2
Pot Cap-1 Maneuver	470	887	-	-	1433
Stage 1	875	-	-	-	-
Stage 2	656	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	461	883	-	-	1432
Mov Cap-2 Maneuver	461	-	-	-	-
Stage 1	858	-	-	-	-
Stage 2	656	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	820	1432
HCM Lane V/C Ratio	-	-	0.016	0.014
HCM Control Delay (s)	-	-	9.5	7.5
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	T		T		T	
Traffic Vol, veh/h	39	22	17	107	297	64
Future Vol, veh/h	39	22	17	107	297	64
Conflicting Peds, #/hr	0	2	2	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	0	0	7	2	1	2
Mvmt Flow	44	25	19	120	334	72

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	530	374	408	0	-	0
Stage 1	372	-	-	-	-	-
Stage 2	158	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.263	-	-	-
Pot Cap-1 Maneuver	513	677	1124	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	875	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	502	675	1122	-	-	-
Mov Cap-2 Maneuver	502	-	-	-	-	-
Stage 1	688	-	-	-	-	-
Stage 2	873	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.4	1.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1122	-	553	-	-
HCM Lane V/C Ratio	0.017	-	0.124	-	-
HCM Control Delay (s)	8.3	0	12.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	1	48	66	14	27	1
Future Vol, veh/h	1	48	66	14	27	1
Conflicting Peds, #/hr	5	0	0	5	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	0	2	2	0	0	0
Mvmt Flow	1	65	89	19	36	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	113	0	-	0	172
Stage 1	-	-	-	-	104
Stage 2	-	-	-	-	68
Critical Hdwy	4.1	-	-	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	3.5
Pot Cap-1 Maneuver	1489	-	-	-	823
Stage 1	-	-	-	-	925
Stage 2	-	-	-	-	960
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1483	-	-	-	816
Mov Cap-2 Maneuver	-	-	-	-	816
Stage 1	-	-	-	-	920
Stage 2	-	-	-	-	956

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1483	-	-	-	820
HCM Lane V/C Ratio	0.001	-	-	-	0.046
HCM Control Delay (s)	7.4	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	42	24	78	274	27
Future Vol, veh/h	28	42	24	78	274	27
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	2	0	5	1	4
Mvmt Flow	31	46	26	86	301	30
Number of Lanes	0	1	1	0	1	0

Approach	EB	WB	SB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left	SB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right		SB	EB
Conflicting Lanes Right	0	1	1
HCM Control Delay	8.5	8	10.6
HCM LOS	A	A	B

Lane	EBLn1	WBLn1	SBLn1
Vol Left, %	40%	0%	91%
Vol Thru, %	60%	24%	0%
Vol Right, %	0%	76%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	70	102	301
LT Vol	28	0	274
Through Vol	42	24	0
RT Vol	0	78	27
Lane Flow Rate	77	112	331
Geometry Grp	1	1	1
Degree of Util (X)	0.105	0.135	0.412
Departure Headway (Hd)	4.899	4.327	4.479
Convergence, Y/N	Yes	Yes	Yes
Cap	732	828	804
Service Time	2.929	2.355	2.505
HCM Lane V/C Ratio	0.105	0.135	0.412
HCM Control Delay	8.5	8	10.6
HCM Lane LOS	A	A	B
HCM 95th-tile Q	0.4	0.5	2

## **EXHIBIT E: PRELIMINARY DRAINAGE REPORT**







Preliminary  
Drainage Report  
Bonaventure Senior Living  
2322.14497.01

Prepared for  
**Bonaventure, Inc.**  
3425 Boone Road SE  
Salem, Oregon 97317

February 6, 2019

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Preliminary Drainage Report  
Bonaventure Senior Living

Prepared for                Bonaventure, Inc.  
Project Name               Preliminary Drainage Report  
Job Number                2322.14497.01  
Date                         February 6, 2019

**DOWL**

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Name	Title	Date	Revision	Reviewer
Scott Emmens	WR Project Manager	11/30/18	-	Kyle Glidden
Scott Emmens	WR Project Manager	02/05/19	-	Kyle Glidden

## Executive Summary

The proposed Bonaventure senior housing development is located at 13333 Rusk Road in Milwaukie, Oregon (See Figure 1-1 Vicinity Map). The development requires just over 5 acres of the 14 total acres and will include a multilevel building and private perimeter roadway. Frontage improvements to SE Kellogg Creek Drive will also be completed as part of this project.

### Stormwater Management Standards

The proposed storm design will meet the requirements of the City of Milwaukie as listed in the *Public Works Standards* dated February 2015. The City of Milwaukie follows the current City of Portland's *Stormwater Management Manual* for water quality facility design.

The proposed project will fill a small area of wetlands located on the site. Therefore, the project must comply with the National Marine Fisheries Service (NMFS) criteria as part of the March 2014 Programmatic Biological Opinion and Essential Fish Habitat Consultation for Revisions to Standard Local Operating Procedures for Endangered Species (SLOPES V) as part of the Wetland Fill Permit with the Army Corp of Engineers.

Additionally, the project is located within the FEMA map (GIS) version of the 100-year floodplain of Mt. Scott Creek. The actual 100-year elevation is applied to the existing conditions and is not impacted by this development. A Conditional Letter of Map Revision (CLOMR) will be submitted to FEMA for review and is intended to demonstrate that no impact to the flood plain will occur.

### Water Quality

The project will discharge into Mt. Scott Creek, a tributary of Kellogg Creek and the Willamette River. Mt. Scott and Kellogg Creek are not listed as water quality limited and the Willamette River is listed for E. Coli. Typical pollutants from single-family residential projects include: nutrients, pesticides, metals, oil, grease and other petroleum products, and sediment. Dissolved copper, dissolved zinc, and PAHs are generally the primary constituents of concern for stormwater runoff in Oregon streams for their impact on ESA listed species. These pollutants are specially targeted for treatment in the selected stormwater management systems.

Water quality treatment will occur through stormwater swales and flow control ponds. These facilities are landscaped reservoirs that collect and treat stormwater runoff through vegetation and soil media. They provide pollution reduction and flow attenuation to reduce hydraulic impacts from urban developments on downstream rivers. Specific elements are incorporated into the design to increase the effectiveness of this stormwater facility type. Design elements include trapped catch basins to remove coarse sediment, soil media to provide stormwater filtration, and vegetation to will provide plant uptake.

The basins are designed using the BMP Sizing Tool developed by Clackamas County. This continuous simulation software is a regional tool for the Portland metro area. City of Milwaukie standards were checked using the City of Portland Presumptive Approach Calculator (PAC). The stormwater facilities were designed to the standards below:

- Water Quality: 50% of the cumulative rainfall from the 2-year storm event. (Using a continuous rainfall/runoff model).

The calculated peak water quality flow from the 3.84 ac of impervious area is 0.778 cfs.

### **Water Quantity**

Water quantity control will occur within the proposed bioretention facilities. Control structures will be placed within each facility to limit runoff to the SLOPES V criteria listed below. The City of Milwaukie does not require water quantity control for this project as the site discharge location into Mt. Scott Creek and Kellogg Creek.

- City of Milwaukie = Match existing flow rate to proposed flow from the 2 through 25-year storm event. – Not required for this project.
- SLOPES V = limit pre-developed discharge rates using a continuous simulation for flows between 42% of the 2-year event and the 10-year flow event.

### **Conveyance**

The proposed conveyance system will be designed using the 100-year storm event in the final Drainage Report.

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# 1 Project Overview

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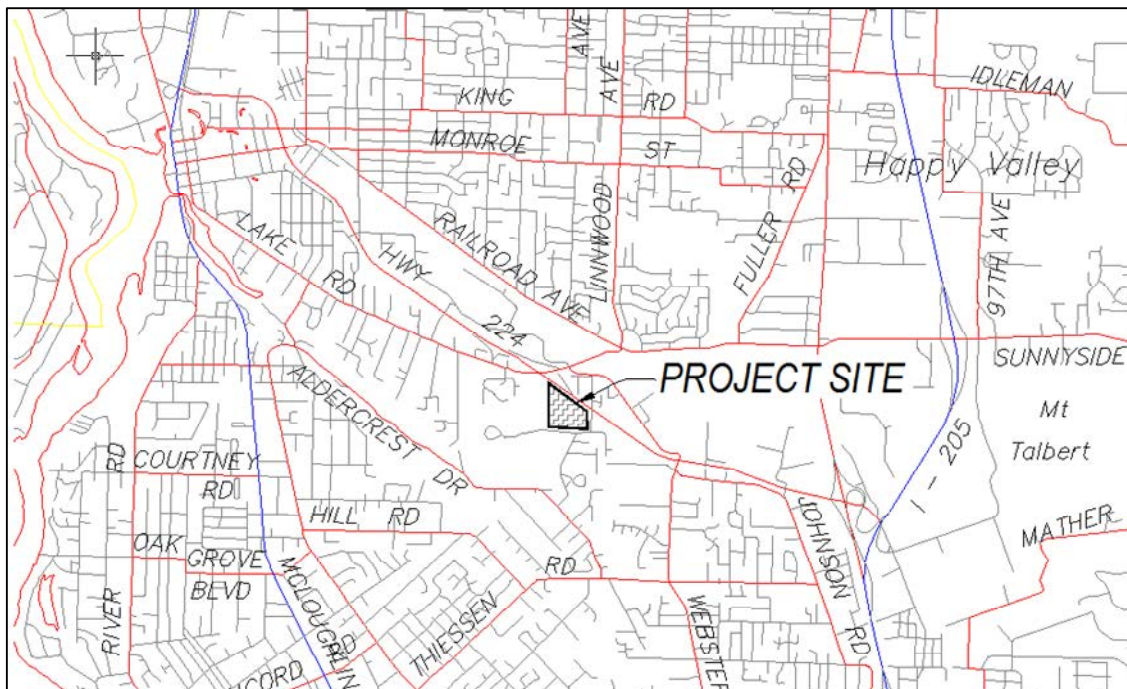
## 1.1 Project Overview

The proposed Bonaventure senior housing development is located at 13333 Rusk Road in Milwaukie, Oregon (See Figure 1-1 Vicinity Map). The development requires just over 5 acres of the 14 total acres and will include a multilevel building and private perimeter roadway. Frontage improvements to SE Kellogg Creek Drive will also be completed as part of this project.

## 1.2 Location

The proposed project is located at 13333 Rusk Road in Milwaukie, Oregon (See Figure 1-1 Vicinity Map). The property includes the following tax lots: TL 22E 06AD 600, TL 22E 06AD 700, TL 22E 06AD 900, and TL 22E 06AD 901.

**Figure 1-1 Vicinity Map**



## 1.3 Methodology

The proposed storm design will meet the requirements of the City of Milwaukie as listed in the *Public Works Standards* dated February 2015. The City of Milwaukie follows the current City of Portland's *Stormwater Management Manual* for water quality facility design.

Additionally, the project must conform to Standard Local Operating Procedures for Endangered Species (SLOPES V) as part of the Wetland Fill Permit with the Army Corp of Engineers.

## 2 Existing Conditions

---

### 2.1 Topography

The existing site contains a driveway entrance for the adjacent Turning Point Church, grass, blackberry bushes and a scattering of trees. Fill material was previously placed at the site adjacent to the church parking lot. Mt. Scott Creek runs through the northern portion of the site. The site has gradual slopes between 0.5 and 5% and generally drains towards the northwest - west. Steeper slopes occur at the end of fill placed at the site and along Mt. Scott Creek. The highest elevation within the project area is 78; located along the southeast property corner. The lowest elevation of 66 is located in the western property boundary.

### 2.2 Climate

The site is in Milwaukie, Oregon and is located approximately 65 miles inland from the Pacific Ocean. There is a gradual change in seasons with defined seasonal characteristics. Average daily temperatures range from 36°F to 83°F. Record temperatures recorded for this region of the state are -3°F and 107°F. Average annual rainfall recorded in this area is 42-inches. Average annual snowfall is approximately 1-inches between December and February.

### 2.3 Site Geology

The underlying soil types on the site, as classified by the United States Department of Agriculture Soil Survey of Clackamas County, Oregon are identified in Table 2-1 (See Technical Appendix: Hydrologic Soils Map - Clackamas County).

**Table 2-1 Soil Characteristics**

Soil Type	Hydrologic Group
Cove Silty Clay Loam	D
Salem Silt Loam	B
Wapato Silty Clay Loam	C/D
Woodburn Silt Loam	C

A majority of the site is classified as Cove Silty Clay Loam. Therefore, the entire site has conservatively been assigned a soil Group D. Group D soils have very slow infiltration rates when thoroughly saturated.

Groundwater was encountered during the geotechnical evaluation completed by GEO Consultants Northwest. Groundwater depths varied across the site from 3 to 12 feet below the ground surface. This variation of groundwater depths is a result of the varying amount of existing fill at the site. The elevation of groundwater is approximately 65 ft across the site.

### 2.4 Curve Number

The curve number represents runoff potential from the soil. The major factors for determining the curve number values are hydrologic soil group, cover type, hydrologic condition and antecedent runoff condition. The pervious curve numbers of 79 representing Woods-Grass Combination in Good Condition was used at the site. A pre-development condition of forested was used in conformance with SLOPES V criteria. (See Technical Appendix: Table 2-2c – Technical Release 55-Urban Hydrology for Small Watersheds).



**2.5 Time of Concentration**

The time of concentration ( $T_C$ ) as described in NEH-4 Chapter 15 is defined in two ways; the time for runoff to travel from the furthestmost point of the watershed to the point in question, and the time from the end of excess rainfall to the point of inflection on the trailing limb of the unit hydrograph. Time of concentration can be estimated from the following formulas. The time of concentration was calculated to be 24 minutes (See Technical Appendix: Time of Concentration Calculation).

Sheet Flow

$$T_t = \frac{0.007(nL)^{0.8}}{(P_2)^{0.5} s^{0.4}}$$

- $T_t$  = Travel Time (hours)
- $L$  = Length of flow (ft)
- $s$  = Slope (ft / ft)
- $n$  = Manning’s “n” of slope
- $P_2$  = 2-Year, 24-hour rainfall (in)

Shallow Concentrated Flow

$$T_t = \frac{L}{3600V}$$

- $T_t$  = Travel Time (hours)
- $V$  = Average Velocity (ft / s)
- $L$  = Flow Length (ft)
- $3600$  = seconds / hour

**2.6 Hydrology**

Stormwater runoff from the site sheet flows north to Mt. Scott Creek with the exception of the church driveway entrance and a small area of pervious area. Catch basins collect this impervious area and the adjacent church and sends runoff south to a public storm sewer in SE Kellogg Creek Dr. The SE Kellogg Creek Dr. storm sewer heads south and outfalls into a tributary of Kellogg Creek. Water quality treatment is not provided at the site.

**2.7 Basin Area**

Impervious and pervious surface areas for the existing conditions are shown in Table 2-2. The site is 1.4% impervious. Approximately 1.466 acres of the site drains south to Kellogg Creek (See Technical Appendix: Figure 1 – Existing Basin Delineation).

**Table 2-2 Existing Basin Areas**

Basin	Impervious Area, ac	Pervious Area, ac	Total Area, ac
Site (Mt Scott Creek)	0.202	13.846	14.048
Kellogg Creek Dr.	0.319	0.044	0.363
Total	0.521	13.890	14.411

### 3 Proposed Conditions

#### 3.1 Curve Number

The pervious curve numbers of 80 representing Open Space in Good Condition was used at the site. (See Technical Appendix: Table 2-2a – Technical Release 55-Urban Hydrology for Small Watersheds).

#### 3.2 Time of Concentration

A time of concentration of 5 minutes was used for the delineated basins.

#### 3.3 Hydrology

Stormwater runoff outside the limits of work will continue to sheet flow to Mt. Scott Creek. Floodplain grading will occur so that floodwaters will recede back into the creek channel. Two new outfalls are proposed as part of this project. These outfalls are included as part of the wetland fill permit. The church entrance will be modified as part of this project.

Water quality treatment and quantity facilities will be added to the site. A summary of each facility is provided below.

- Bioretention Basin A: Dry Pond to the tributary of Kellogg Creek
- Bioretention Basin B & C: Bioretention Pond, Outfall to wetland to Mt. Scott Creek through a flow dispersion trench.
- Bioretention Basin D: Bioretention Pond connects to existing storm pipe.
- Untreated: Street outflow constraints prohibit portions of Kellogg Creek Drive from flowing to a treatment facility.

#### 3.4 Basin Area

Impervious and pervious surface areas for proposed conditions are shown in Table 3-1. The site is 28.2 % impervious in proposed conditions. The majority of the project will occur at the site, although some work is being done within church property. Street improvements to SE Kellogg Creek Dr. will also occur as part of this project. The Creek basin will not be developed but includes grading to balance the floodplain. The amount of area draining to the tributary of Kellogg Creek is 0.94 acres, slightly more than in existing conditions (See Technical Appendix: Figure 2 – proposed Basin Delineation).

**Table 3-1 Proposed Basin Areas**

Basin	Impervious Area, ac	Pervious Area, ac	Total Area, ac
Basin A	0.910	0.390	1.300
Basin B	0.710	0.290	1.000
Basin C	1.090	0.430	1.520
Basin D	1.130	0.790	1.920
Total	3.840	1.900	5.740

## 4 Hydrologic and Hydraulic Analysis

### 4.1 Design Guidelines

The proposed storm design will meet the requirements of the City of Milwaukie as listed in the *Public Works Standards* dated February 2015. Section 2.0013 describes the allowable flow determination methods including the selected Unity Hydrograph Method.

### 4.2 Hydrologic Method

The Santa Barbara Urban Hydrograph (SBUH) was used for this analysis. The SBUH method is based on the curve number (CN) approach, and uses the Natural Resources Conservation Service’s (NRCS) equations for computing soil absorption and precipitation excess.

The SBUH method converts the incremental runoff depths into instantaneous hydrographs, which are then routed through an imaginary reservoir with a time delay equal to the basin time of concentration.

The runoff function of xpswmm generates surface and subsurface runoff based on design or measured rainfall conditions, land use and topography. xpswmm Version 17.1 was used for our hydrology and hydraulics analysis. xpswmm is based on the public EPA SWMM program. xpswmm is an approved method of analysis by City of Milwaukie.

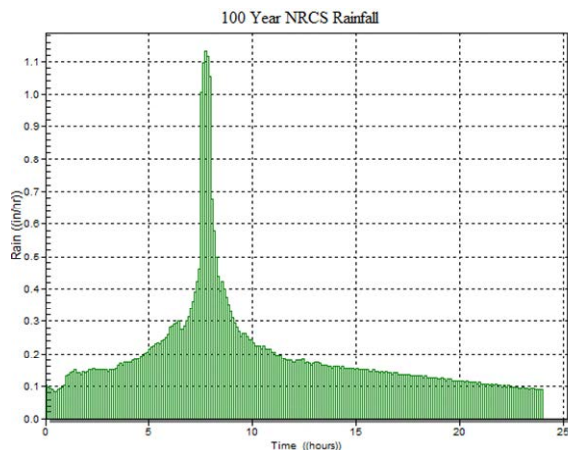
### 4.3 Design Storm

The rainfall distribution to be used within the City of Milwaukie jurisdiction is the design storm of 24-hour duration based on the standard Type 1A rainfall distribution. Table 4-1 shows total precipitation depths for different storm events. The NRCS Distribution for a type 1A 24-hour rainfall distribution for a 25-year storm event is shown in Figure 4-1.

**Table 4-1 Precipitation Depth**

Recurrence interval (years)	Total Precipitation Depth (in)
2	2.40
10	3.50
25	4.00
100	4.70

**Figure 4-1 100-Year Type 1A Rainfall Distribution**



#### 4.4 Basin Runoff

Table 4-2 lists the runoff rates for existing and proposed conditions for the site during the 2, 5, 10, and 25-year storm events. These values do not include onsite detention. (See Technical Appendix: Existing and Proposed Hydrographs).

**Table 4-2 Runoff Rates**

Recurrence Interval (years)	Existing* Peak Runoff Rate (cfs)	Proposed* Peak Runoff Rate (cfs)
2	1.556	3.423
5	2.856	5.047
10	4.063	6.493
25	5.357	8.002

\*Existing and proposed peak runoff rates are calculated for entire site.

## 5 Conveyance Analysis

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### 5.1 Design Guidelines

The analysis and design criteria described in this section will follow the City of Milwaukie's *Public Works Standards*. The manual requires storm drainage system and facilities be designed to convey the 100-year storm event.

### 5.2 System Capacity

The proposed conveyance system was designed to convey and contain the peak runoff from a 100-year design storm.

### 5.3 System Performance

A complete conveyance analysis will be completed in the final Drainage Report.

## 6 Water Quality & Quantity

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### 6.1 Design Guidelines

The proposed water quality and quantity facilities were designed per the City of Milwaukie requirements as listed in the *Public Works Standards* dated February 2015. The City of Milwaukie follows the current City of Portland's *Stormwater Management Manual* for water quality facility design. The City of Milwaukie requires the proposed discharge rate for the 2, 5, 10, and 25-year events to be that of the existing discharge rate. The City of Milwaukie does not require water quantity control for this project as the site discharge location into Mt. Scott Creek and Kellogg Creek.

Detention is also required to meet SLOPES V criteria. SLOPES V limits the proposed discharge rates using a continuous simulation for flows between 42% of the 2-year event and the 10-year flow event of existing flows. Existing conditions are assumed to be forested.

## 6.2 Water Quality and Quantity Facilities

The project will discharge into Mt. Scott Creek, a tributary of Kellogg Creek and the Willamette River. Mt. Scott and Kellogg Creek are not listed as water quality limited and the Willamette River is listed for E. Coli. Typical pollutants from single-family residential projects include: nutrients, pesticides, metals, oil, grease and other petroleum products, and sediment. Dissolved copper, dissolved zinc, and PAHs are generally the primary constituents of concern for stormwater runoff in Oregon streams for their impact on ESA listed species. These pollutants are specially targeted for treatment in the selected stormwater management systems.

Water quality treatment will occur through stormwater bioretention basins, planters and a pond. These facilities are landscaped reservoirs that collect and treat stormwater runoff through vegetation and soil media. They provide pollution reduction and flow attenuation to reduce hydraulic impacts from urban developments on downstream rivers. Specific elements are incorporated into the design to increase the effectiveness of this stormwater facility type. Design elements include trapped catch basins to remove coarse sediment, soil media to provide stormwater filtration, and vegetation to will provide plant uptake.

The basins are designed using the BMP Sizing Tool developed by Clackamas County. This continuous simulation software is a regional tool for the Portland metro area. City of Milwaukie standards were checked using the City of Portland Presumptive Approach Calculator (PAC).

Bioretention facilities are designed to incorporate the following criteria:

- Water Depth: 10 to 18 inches
- Drain Rock Depth: 6 to 18 inches
- Growing Medium Depth: 18 inches
- Minimum Freeboard: 2 inches
- Perforated Pipe Under Drain
- Minimum Orifice Size: 1 inch

There are five (5) proposed bioretention facilities located in the proposed project. Each facility was designed to maximize water contact with vegetation for biological treatment. A control structure with one or two orifices will control the allowable release rate. Appropriate vegetation will be planted in the basin as specified by the City of Portland's *Stormwater Management Manual* (See Technical Appendix: WES BMP Sizing Report). Table 6-1 provides a summary of each facility.

**Table 6-1 Bioretention Facility Summary**

Basin ID	Facility Type	Minimum Top Area (not including Freeboard) (sf)	Minimum Bottom Area (sf)	Water Depth (in)	Soil Depth (in)	Rock Depth (in)	Total Depth (in)
Basin A	Bioretention Basin	5,244	2,817	18	18	6	42
Basin B	Bioretention Basin	3,414	2,393	18	18	6	42
Basin C	Bioretention Basin	4,031	2,585	18	18	6	42
Basin D	Bioretention Basin	3,600	1,749	18	18	6	42

\*Basin A is treated and detained using two separate facilities that are tied together and are modeled as one facility.

**Table 6-2 Bioretention Facility Volume Provided vs Volume Calculated**

Basin ID	Facility Type	Facility Top Area Calculated by PAC (Including Freeboard) (sf)	Facility Top Area Calculated by WES (sf)	Provided on Plan Minimum Top Area (including Freeboard) (sf)
Basin A	Bioretention Basin	2,812	2,837	6,109
Basin B	Bioretention Basin	3,993	2,304	4,037
Basin C	Bioretention Basin	3,231	3,943	4,542
Basin D	Bioretention Basin	5,177	4,036	5,236

### 6.3 Flow Dispersion

A flow dispersion trench will be used at the outfall of Bioretention Basin B, C and D. This flow spreader was designed to disperse flow over a large area in an effort to reduce erosive velocities of the stormwater discharge entering the wetland during the 100-year event. The flow spreader will be a gravel filled trench with a perforation pipe in the bottom of the trench.

Soils in the proposed discharge location were conservatively assumed to consist of silty clay loam. This soil type has a maximum permissible velocity of 0.5-fps, which was used to determine the facility length (See Technical Appendix: Chow – Fig. 7-3 U.S. and U.S.S.R. data on Permissible Velocities for Non-cohesive Soils). The flow spreader was treated as a broad crested weir with a weir coefficient of 2.4. The broad crested weir equation is shown below.

$$q = 2.4H^{3/2}$$

Where:

q= Volumetric flow rate per unit length, cfs/ft

H= Depth of flow over weir

**Table 6-3 Flow Dispersion Trench**

Trench	Length (ft)	Discharge (cfs)	Depth (ft)	q (cfs/ft)	Velocity (fps)
B	70	1.45	0.04	0.02	0.492
C	60	1.30	0.04	0.02	0.500

## 7 Floodplain Analysis

FEMA Flood Insurance Rate Maps were used to determine the 10, 25 and 100-year flood stage for Mt. Scott Creek. The site is located on map number FM41005C0036D, with an effective date of June 17, 2008. Elevations are provided in the NAVD 1988 datum, the same as used for this project. The upstream most cross section is C located just downstream of Hwy 224. The 100-year elevation at cross section C is 69.9.

The 25-year elevation was interpolated from the FEMA profile. These elevations were used to balance the floodplain and determine the elevation of the stormwater facilities. FEMA determined elevations are listed

DOWL

in Table 7-1 (See Technical Appendix: Flood Insurance Study, Clackamas County - Mt. Scott Creek Profile).

**Table 7-1 Mt. Scott Creek Water Surface Elevations**

Recurrence Interval (years)	Water Surface Elevation	
	Upstream Property Boundary	Downstream Property Boundary
10	69.4	67.5
25	69.7	67.3
100	69.9	67.3

## 8 Operation & Maintenance

---

Maintenance of water quality and quantity facilities is very important to ensure they operate as designed. Inadequate maintenance can be attributed to premature failures of these facilities. Stormwater facilities for the site will be maintained and operated privately by the homeowners. Prior to creation of an HOA, please contact Daniel Dobson at 503-373-3154 about inspection and maintenance of the proposed stormwater facilities.

The owners must insure the water quality systems efficiently perform their function of removing petroleum hydrocarbons, sediments, metals, bacteria and nutrients from stormwater runoff and that the water quantity system performs their function of regulating the rate and volume of stormwater runoff leaving the property.

The Operation and Maintenance Plan is provided within the Technical Appendix.

## 9 Summary

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The proposed water quality and quantity facility design follows the City of Milwaukie’s *Public Works Standards* dated February 2015. The City of Milwaukie follows the current City of Portland’s *Stormwater Management Manual* for water quality facility design. Stormwater facility sizing meets and exceeds the larger calculated area from the WES BMP Sizing Tool or the BES PAC Calculator.

Additionally, the project must comply with the National Marine Fisheries Service (NMFS) criteria as part of the March 2014 Programmatic Biological Opinion and Essential Fish Habitat Consultation for Revisions to Standard Local Operating Procedures for Endangered Species (SLOPES V) as part of the Wetland Fill Permit with the Army Corp of Engineers.

Bioretention facilities are proposed to provide a high level of treatment and detention.



# Technical Appendix



## Technical Appendix

- Figure 1 – Existing Basin Delineation
- Figure 2 – Proposed Basin Delineation
  
- Hydrologic Soil Map – Washington County
- Table 2-2c – Runoff Curve Numbers for Other Agricultural Lands
- Table 2-2a – Runoff Curve Numbers for Urban Areas
- Time of Concentration
- WES BMP Sizing Report
- PAC
- Existing & Proposed Hydrographs
- Flood Insurance Study, Clackamas County - Mt. Scott Creek Profile
- Chow – Fig. 7-3 U.S. and U.S.S.R. data on Permissible Velocities for Non-cohesive Soils
- Operation and Maintenance Plan
- Geotechnical Evaluation – Kellogg Creek Development, GEO Consultants Northwest, October 7, 2016.

## References

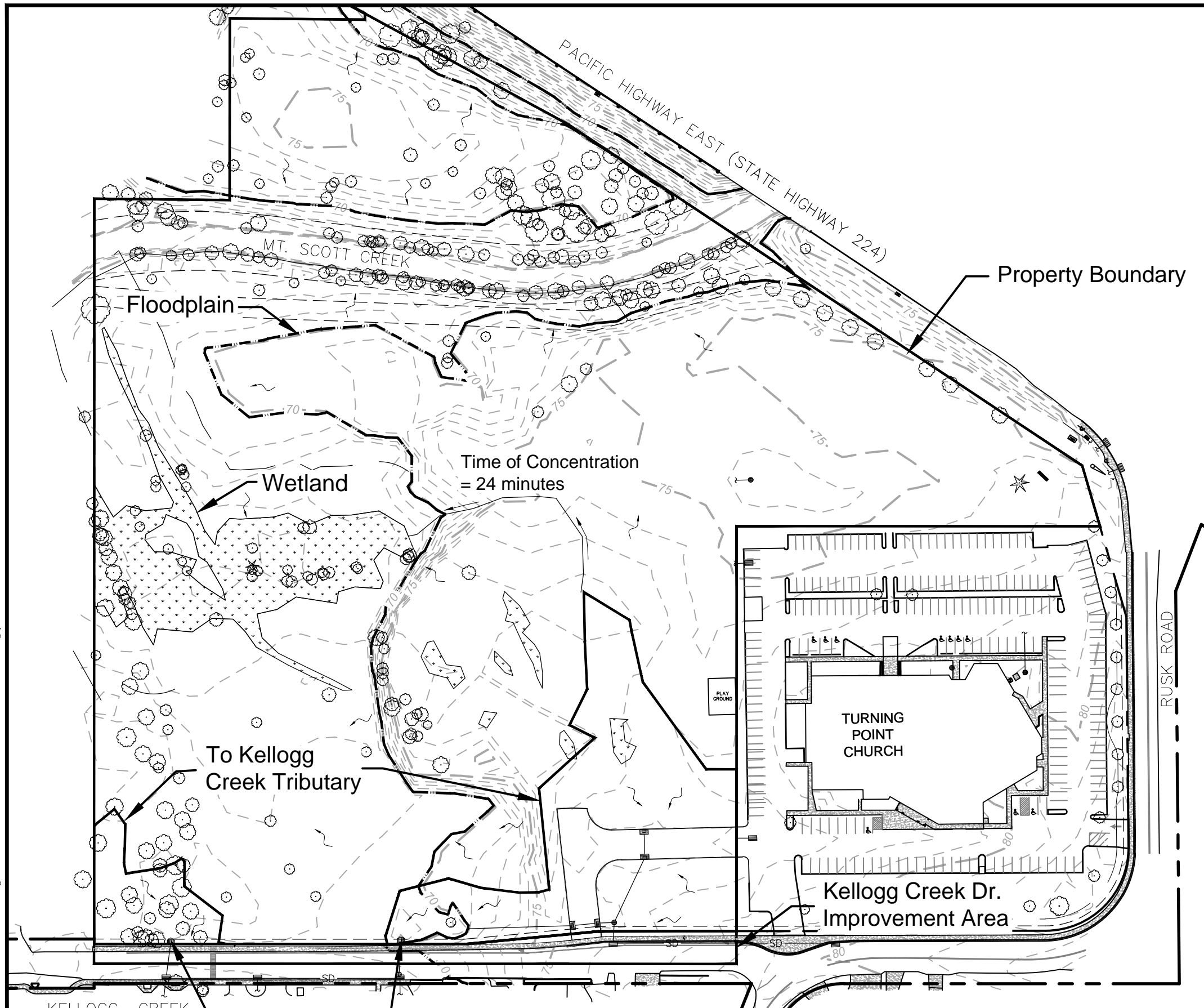
*Flood Insurance Study (FIS) – Clackamas County, Oregon and Incorporated Areas*, FEMA, June 17, 2008.

*Public Works Standards*, City of Milwaukie, February 2015.

*Stormwater Management Manual*, City of Portland, August 2016.

*Programmatic Biological Opinion and Essential Fish Habitat Consultation for Revisions to Standard Local Operating Procedures for Endangered Species (SLOPES V)*, National Marine Fisheries Service (NMFS), March 2014.

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Existing Basin Area  
 Impervious Area = 0.202 acres  
 Pervious Area = 13.846 acres  
 Total Area = 14.048 acres

Kellogg Creek Dr. Improvement Area  
 Impervious Area = 0.319 acres  
 Pervious Area = 0.044 acres  
 Total Area = 0.363 acres

Time of Concentration  
 = 24 minutes

To Kellogg  
 Creek Tributary

TURNING  
 POINT  
 CHURCH

Kellogg Creek Dr.  
 Improvement Area

KELLOGG CREEK  
 DRIVE

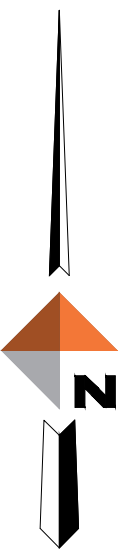
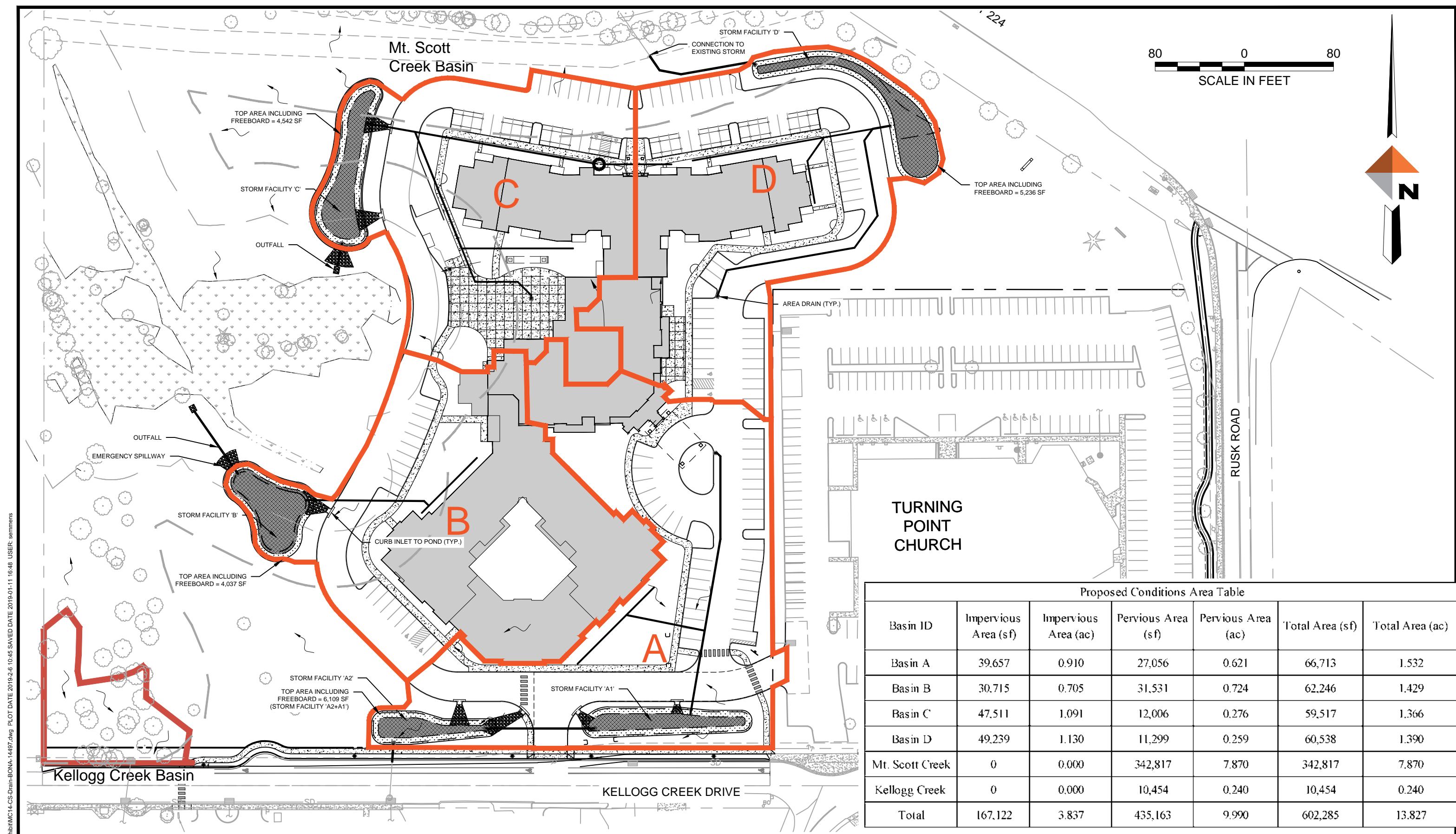
Ditch Inlets



EXISTING BASIN DELINEATION  
 KELLOGG CREEK SUBDIVISION  
 MILWAUKIE, OREGON

PROJECT	14497.01
DATE	11/15/2018
	ASR

FIGURE 1



Proposed Conditions Area Table

Basin ID	Impervious Area (sf)	Impervious Area (ac)	Pervious Area (sf)	Pervious Area (ac)	Total Area (sf)	Total Area (ac)
Basin A	39,657	0.910	27,056	0.621	66,713	1.532
Basin B	30,715	0.705	31,531	0.724	62,246	1.429
Basin C	47,511	1.091	12,006	0.276	59,517	1.366
Basin D	49,239	1.130	11,299	0.259	60,538	1.390
Mt. Scott Creek	0	0.000	342,817	7.870	342,817	7.870
Kellogg Creek	0	0.000	10,454	0.240	10,454	0.240
Total	167,122	3.837	435,163	9.990	602,285	13.827

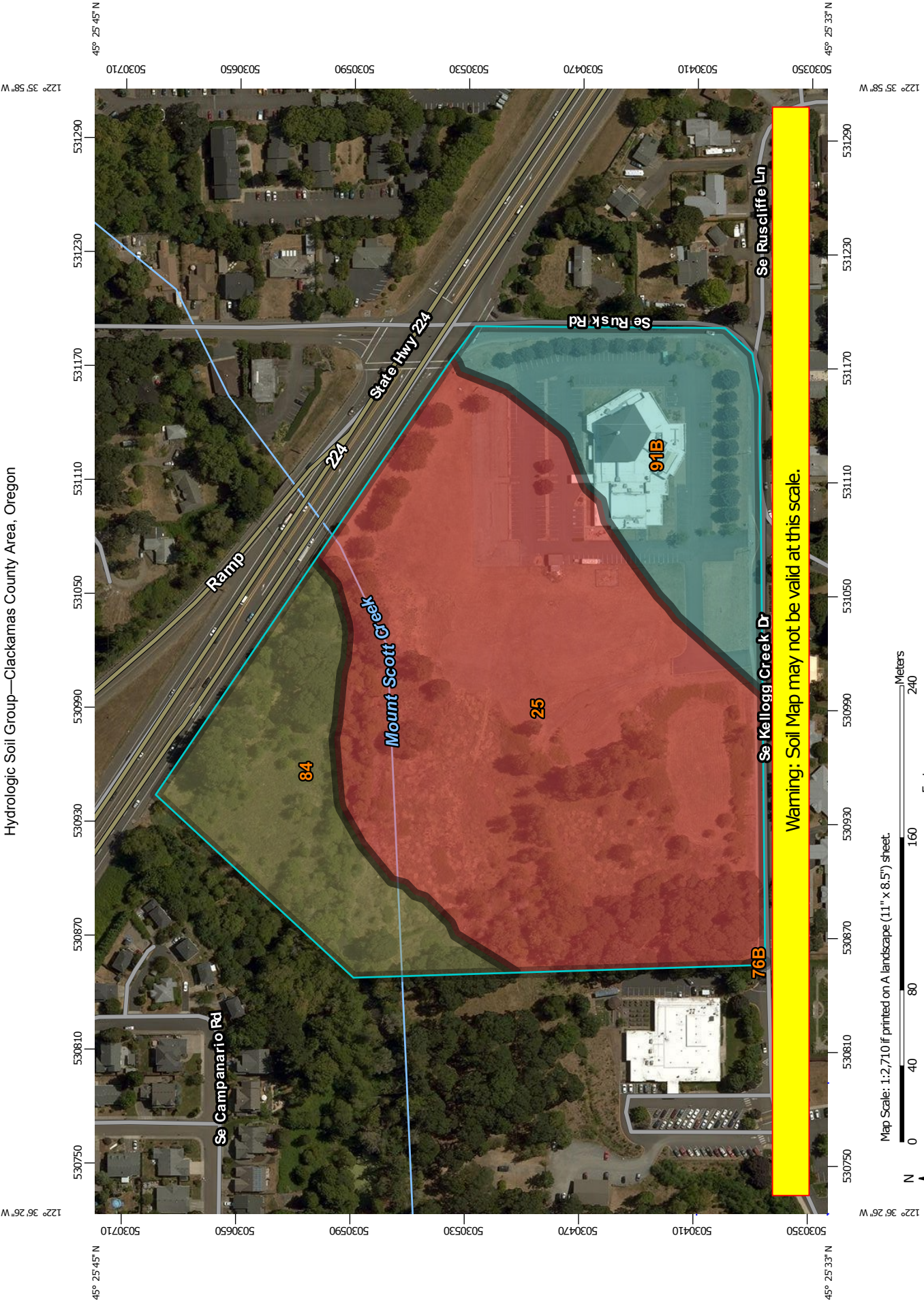
Q:\221\14497-01\MSStudy\Drain\Exhibit\M14-CS-Drain-BONA-14497.dwg PLOT DATE: 2019-02-06 10:45 SAVED DATE: 2019-01-11 16:48 USER: sarmmins



**PROPOSED BASIN DELINEATION  
KELLOGG CREEK SUBDIVISION  
MILWAUKIE, OREGON**

PROJECT	14497.01
DATE	02/04/19
	OAG

**FIGURE 2**



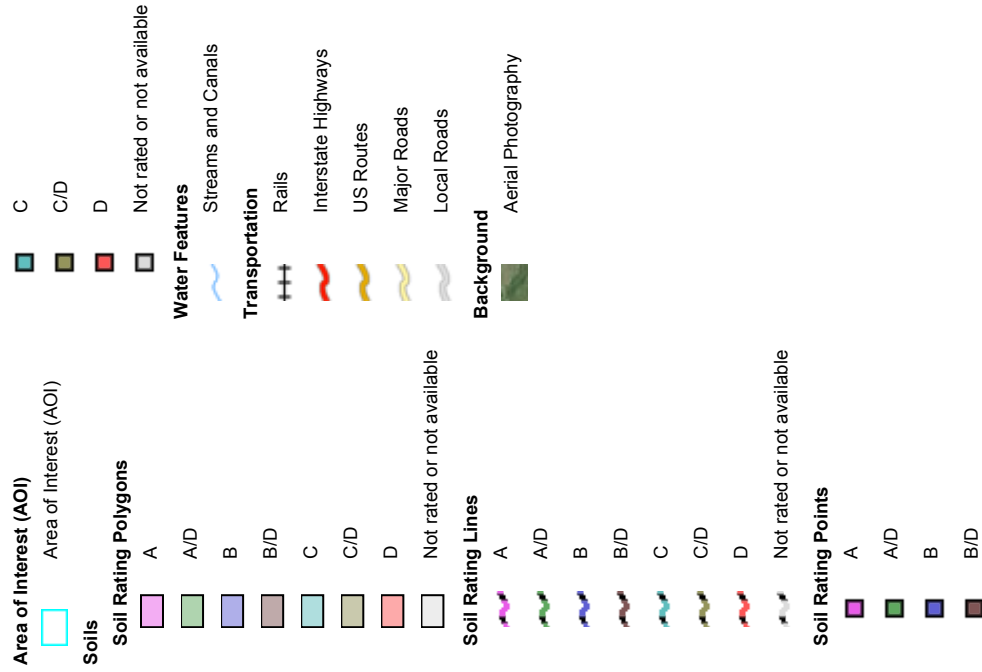
Warning: Soil Map may not be valid at this scale.

Map Scale: 1:2,710 if printed on A landscape (11" x 8.5") sheet.



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

## MAP LEGEND



## 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: <http://websoilsurvey.nrcs.usda.gov>  
 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 10, Sep 18, 2015

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

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

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

## Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Clackamas County Area, Oregon (OR610)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
25	Cove silty clay loam	D	12.9	63.1%
76B	Salem silt loam, 0 to 7 percent slopes	B	0.0	0.0%
84	Wapato silty clay loam	C/D	3.6	17.6%
91B	Woodburn silt loam, 3 to 8 percent slopes	C	4.0	19.3%
<b>Totals for Area of Interest</b>			<b>20.5</b>	<b>100.0%</b>

### Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

**Table 2-2a** Runoff curve numbers for urban areas <sup>1/</sup>

Cover description	Average percent impervious area <sup>2/</sup>	Curve numbers for hydrologic soil group			
		A	B	C	D
<b>Fully developed urban areas (vegetation established)</b>					
Open space (lawns, parks, golf courses, cemeteries, etc.) <sup>3/</sup> :					
Poor condition (grass cover < 50%) .....		68	79	86	89
Fair condition (grass cover 50% to 75%) .....		49	69	79	84
Good condition (grass cover > 75%) .....		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way) .....		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way) .....		98	98	98	98
Paved; open ditches (including right-of-way) .....		83	89	92	93
Gravel (including right-of-way) .....		76	85	89	91
Dirt (including right-of-way) .....		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) <sup>4/</sup> .....		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders) .....		96	96	96	96
Urban districts:					
Commercial and business .....	85	89	92	94	95
Industrial .....	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses) .....	65	77	85	90	92
1/4 acre .....	38	61	75	83	87
1/3 acre .....	30	57	72	81	86
1/2 acre .....	25	54	70	80	85
1 acre .....	20	51	68	79	84
2 acres .....	12	46	65	77	82

**Developing urban areas**

Newly graded areas  
(pervious areas only, no vegetation) <sup>5/</sup> .....

	77	86	91	94
--	----	----	----	----

Idle lands (CN's are determined using cover types  
similar to those in table 2-2c).

<sup>1</sup> Average runoff condition, and  $I_a = 0.2S$ .

<sup>2</sup> The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

<sup>3</sup> CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

<sup>4</sup> Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

<sup>5</sup> Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

**Table 2-2c** Runoff curve numbers for other agricultural lands <sup>1/</sup>

Cover description	Hydrologic condition	Curve numbers for hydrologic soil group			
		A	B	C	D
Pasture, grassland, or range—continuous forage for grazing. <sup>2/</sup>	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow—continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush—brush-weed-grass mixture with brush the major element. <sup>3/</sup>	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 <sup>4/</sup>	48	65	73
Woods—grass combination (orchard or tree farm). <sup>5/</sup>	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. <sup>6/</sup>	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 <sup>4/</sup>	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

<sup>1</sup> Average runoff condition, and  $I_a = 0.2S$ .

<sup>2</sup> **Poor:** <50% ground cover or heavily grazed with no mulch.

**Fair:** 50 to 75% ground cover and not heavily grazed.

**Good:** > 75% ground cover and lightly or only occasionally grazed.

<sup>3</sup> **Poor:** <50% ground cover.

**Fair:** 50 to 75% ground cover.

**Good:** >75% ground cover.

<sup>4</sup> Actual curve number is less than 30; use CN = 30 for runoff computations.

<sup>5</sup> CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

<sup>6</sup> **Poor:** Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

**Fair:** Woods are grazed but not burned, and some forest litter covers the soil.

**Good:** Woods are protected from grazing, and litter and brush adequately cover the soil.



# Time of Concentration



<b>SUBJECT</b>	Time of Concentration - Mt Scott Creek		
<b>PROJECT NO.</b>	2322.14497.01	<b>BY</b>	KRG
		<b>DATE</b>	11/12/2018

		<b>Existing</b>	
<b>SHEET FLOW</b>			
INPUT		VALUE	
Surface Description	Type	<b>5</b>	
		<b>Grass (short prairie)</b>	
Manning's "n"		<b>0.15</b>	
Flow Length, L (<300 ft)	<b>163</b>	ft	
2-Yr 24 Hour Rainfall, P <sub>2</sub>	<b>2.6</b>	in	
Land Slope, s	<b>0.02</b>	ft/ft	
OUTPUT			
Travel Time	0.25	hr	
<b>SHALLOW CONCENTRATED FLOW</b>			
INPUT		VALUE	
Surface Description		<b>Unpaved</b>	
Flow Length, L	<b>100</b>	ft	
Watercourse Slope*, s	<b>0.073</b>	ft/ft	
OUTPUT			
Average Velocity, V	4.36	ft/s	
Travel Time	0.006	hr	
<b>SHALLOW CONCENTRATED FLOW</b>			
INPUT		VALUE	
Surface Description		<b>Unpaved</b>	
Flow Length, L	<b>0</b>	ft	
Watercourse Slope*, s	<b>0.01</b>	ft/ft	
OUTPUT			
Average Velocity, V	1.61	ft/s	
Travel Time	0.000	hr	
	<b>Watershed or Subarea T<sub>c</sub> =</b>	<b>0.26</b>	<b>hr</b>
	<b>Watershed or Subarea T<sub>c</sub> =</b>	<b>15</b>	<b>minutes</b>

# Time of Concentration



<b>SUBJECT</b>	Time of Concentration - Kellogg Creek		
<b>PROJECT NO.</b>	2322.14497.01	<b>BY</b>	KRG
		<b>DATE</b>	11/12/2018

		<b>Existing</b>	
<b>SHEET FLOW</b>			
INPUT		VALUE	
Surface Description	Type	<b>5</b>	
	<b>Grass (short prairie)</b>		
Manning's "n"	<b>0.15</b>		
Flow Length, L (<300 ft)	<b>270</b>	ft	
2-Yr 24 Hour Rainfall, P <sub>2</sub>	<b>2.6</b>	in	
Land Slope, s	<b>0.01</b>	ft/ft	
OUTPUT			
Travel Time	0.49	hr	
<b>SHALLOW CONCENTRATED FLOW</b>			
INPUT		VALUE	
Surface Description	<b>Paved</b>		
Flow Length, L	<b>12</b>	ft	
Watercourse Slope*, s	<b>0.02</b>	ft/ft	
OUTPUT			
Average Velocity, V	2.87	ft/s	
Travel Time	0.001	hr	
<b>SHALLOW CONCENTRATED FLOW</b>			
INPUT		VALUE	
Surface Description	<b>Unpaved</b>		
Flow Length, L	<b>0</b>	ft	
Watercourse Slope*, s	<b>0.01</b>	ft/ft	
OUTPUT			
Average Velocity, V	1.61	ft/s	
Travel Time	0.000	hr	
	<b>Watershed or Subarea T<sub>c</sub> =</b>	<b>0.49</b>	<b>hr</b>
	<b>Watershed or Subarea T<sub>c</sub> =</b>	<b>29</b>	<b>minutes</b>

## WES BMP Sizing Report

## Project Information

Project Name	Bonaventure Senior Living
Project Type	MultiFamily
Location	13333 SE Rusk Rd, Portland, OR 97222
Stormwater Management Area	34104
Project Applicant	Bonaventure
Jurisdiction	CCSD1NCSA

## Drainage Management Area

Name	Area (sq-ft)	Pre-Project Cover	Post-Project Cover	DMA Soil Type	BMP
Basin A - Imp	39,657	Forested	ConventionalConcrete	D	Ponds A1 & A2
Basin A - Per	27,056	Forested	Grass	D	Ponds A1 & A2
Basin B - Imp	30,715	Forested	ConventionalConcrete	D	Pond B
Basin B - Per	31,531	Forested	Grass	D	Pond B
Basin C - Imp	47,511	Forested	ConventionalConcrete	D	Pond C
Basin C - Per	12,006	Forested	Grass	D	Pond C
Basin D - Imp	49,239	Forested	ConventionalConcrete	D	Pond D
Basin D - Per	11,299	Forested	Grass	D	Pond D

## LID Facility Sizing Details

## Pond Sizing Details

Pond ID	Design Criteria(1)	Facility Soil Type	Max Depth (ft)(2)	Top Area (sq-ft)	Side Slope (1:H)	Facility Vol. (cu-ft)(3)	Water Storage Vol. (cu-ft)(4)	Adequate Size?
Ponds A1 & A2	FCWQT	Lined	4.00	2,837.0	3	7,001.8	4,318.3	Yes
Pond B	FCWQT	Lined	4.00	2,304.0	3	5,376.0	3,367.2	Yes
Pond C	FCWQT	Lined	4.00	3,943.0	3	10,512.0	6,351.8	Yes

Pond D	FCWQT	Lined	4.00	4,036.0	3	10,814.2	6,525.8	Yes
--------	-------	-------	------	---------	---	----------	---------	-----

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only
2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).
3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.
4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a 40 percent porosity.

# Simple Pond Geometry Configuration

Pond ID: Ponds A1 & A2

Design: FlowControlAndTreatment

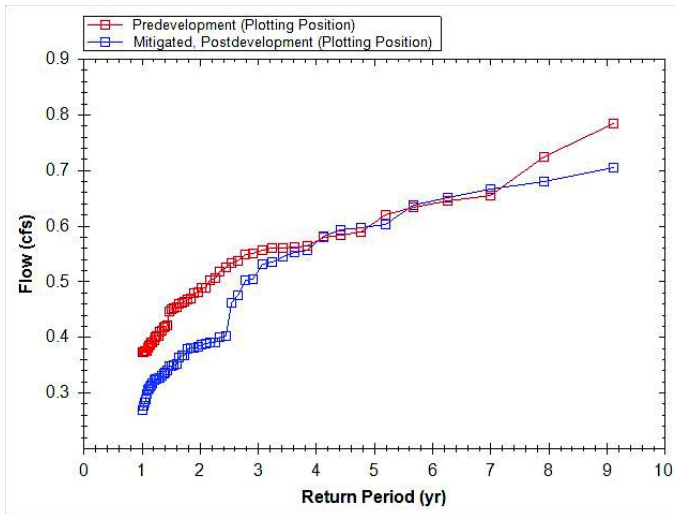
## Shape Curve

Depth (ft)	Area (sq ft)
4.0	2,837.0

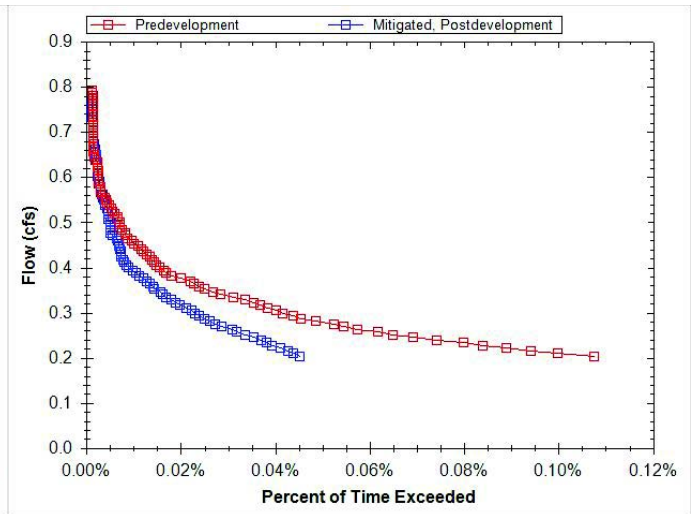
## Outlet Structure Details

Lower Orifice Invert (ft)	0.0
Lower Orifice Dia (in)	2.0
Upper Orifice Invert(ft)	2.7
Upper Orifice Dia (in)	4.4
Overflow Weir Invert(ft)	3.0
Overflow Weir Length (ft)	6.3

Flow Frequency Chart



Flow Duration Chart



# Simple Pond Geometry Configuration

Pond ID: Pond B

Design: FlowControlAndTreatment

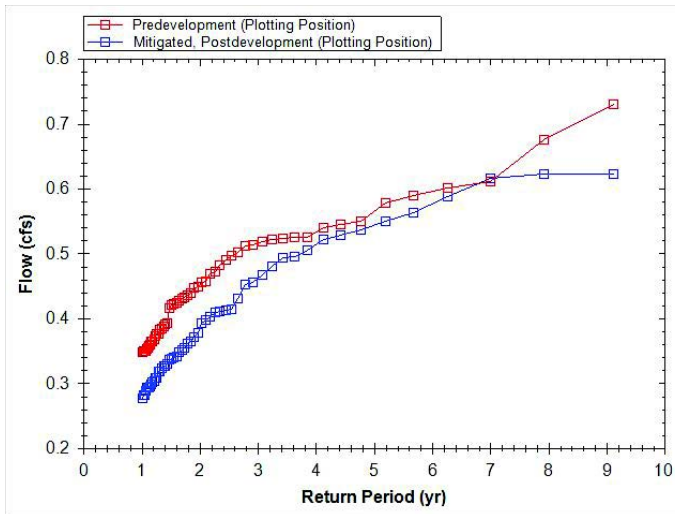
## Shape Curve

Depth (ft)	Area (sq ft)
4.0	2,304.0

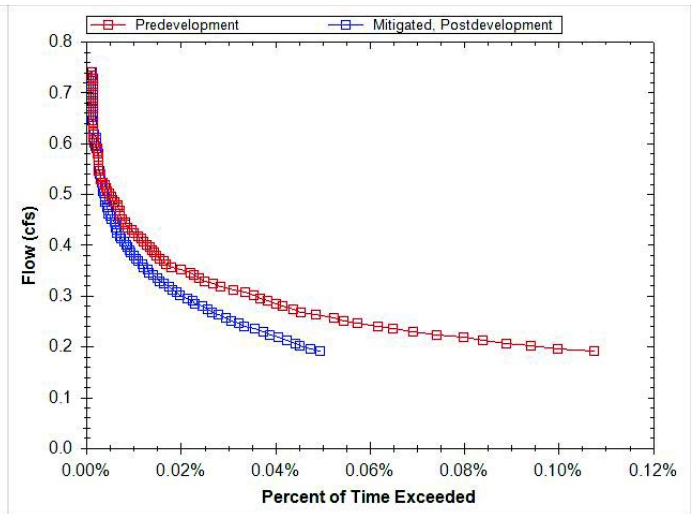
## Outlet Structure Details

Lower Orifice Invert (ft)	0.0
Lower Orifice Dia (in)	1.9
Upper Orifice Invert(ft)	2.7
Upper Orifice Dia (in)	4.3
Overflow Weir Invert(ft)	3.0
Overflow Weir Length (ft)	6.3

Flow Frequency Chart



Flow Duration Chart



# Simple Pond Geometry Configuration

Pond ID: Pond C

Design: FlowControlAndTreatment

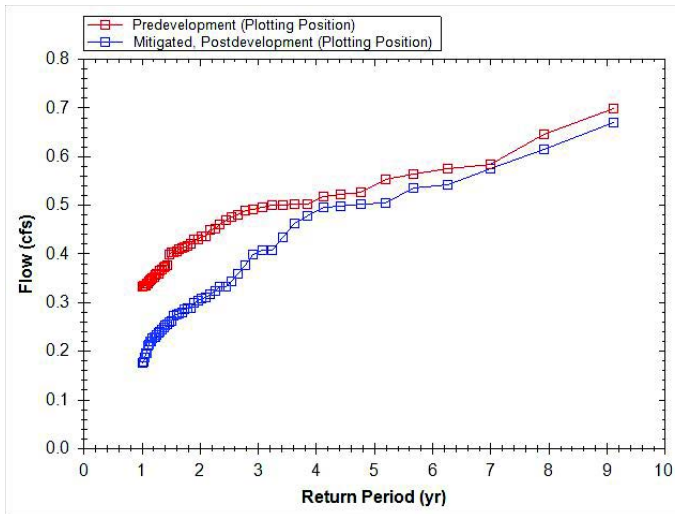
## Shape Curve

Depth (ft)	Area (sq ft)
4.0	3,943.0

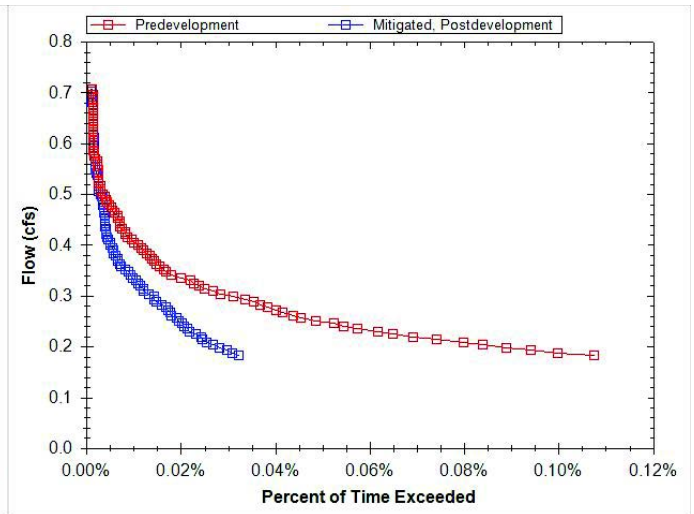
## Outlet Structure Details

Lower Orifice Invert (ft)	0.0
Lower Orifice Dia (in)	1.9
Upper Orifice Invert(ft)	2.7
Upper Orifice Dia (in)	4.2
Overflow Weir Invert(ft)	3.0
Overflow Weir Length (ft)	6.3

Flow Frequency Chart



Flow Duration Chart



# Simple Pond Geometry Configuration

Pond ID: Pond D

Design: FlowControlAndTreatment

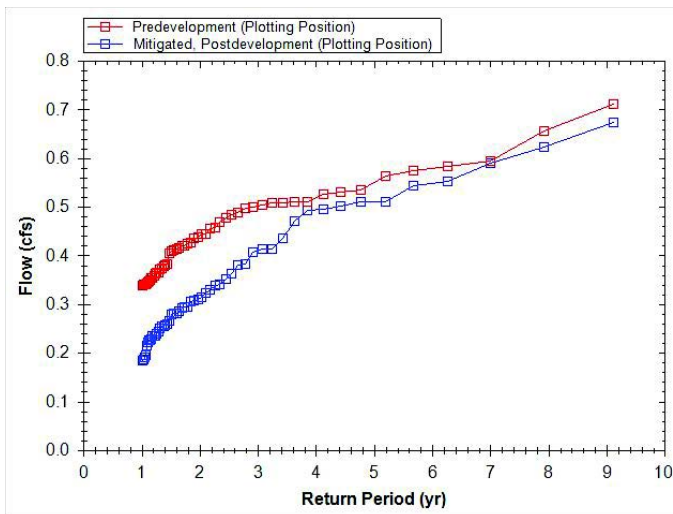
## Shape Curve

Depth (ft)	Area (sq ft)
4.0	4,036.0

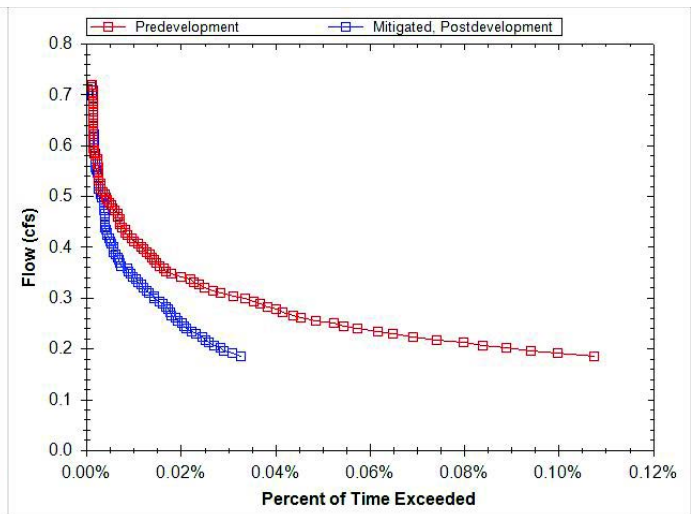
## Outlet Structure Details

Lower Orifice Invert (ft)	0.0
Lower Orifice Dia (in)	1.9
Upper Orifice Invert(ft)	2.7
Upper Orifice Dia (in)	4.2
Overflow Weir Invert(ft)	3.0
Overflow Weir Length (ft)	6.3

Flow Frequency Chart



Flow Duration Chart





# PAC Report

Project Name <b>Bonaventure Sr Living - Milwaukie</b>	Permit No.	Created <b>11/8/18 12:30 PM</b>
Project Address <b>13333 Rusk road Milwaukie, OR 97222</b>	Designer <b>JSE</b>	Last Modified <b>11/8/18 4:03 PM</b>
	Company <b>DOWL</b>	Report Generated <b>11/8/18 4:03 PM</b>

## Project Summary

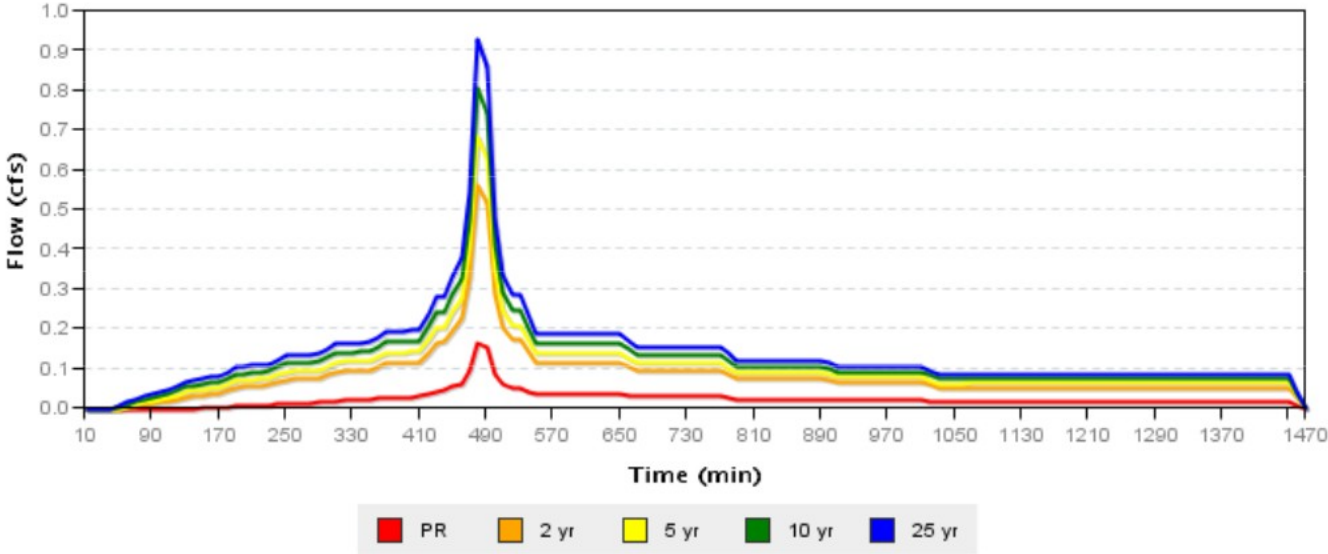
Senior Housing Development

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
Basin A	39657	4.00	3	Basin	B	1400	7.1%	Pass	Pass
Basin B	30718	4.00	3	Basin	B	865	13%	Pass	Pass
Basin C	47511	4.00	3	Basin	B	1736	6.8%	Pass	Pass
Basin D	49239	4.00	3	Basin	B	2046	10.5%	Pass	Pass

## Catchment Basin A

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	Encased Falling Head
	Native Soil Infiltration Rate ( $I_{test}$ )	4.00
Correction Factor	$CF_{test}$	2
Design Infiltration Rates	Native Soil ( $I_{dsgn}$ )	2.00 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	39657 sq ft 0.910 acre
	Time of Concentration ( $T_c$ )	5
	Pre-Development Curve Number ( $CN_{pre}$ )	79
	Post-Development Curve Number ( $CN_{post}$ )	98

**SBUH Results BASIN A**



	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0.003	99.498	0.164	2072.19
2 yr	0.141	2548.512	0.56	7175.771
5 yr	0.227	3687.731	0.684	8819.381
10 yr	0.321	4919.802	0.807	10465.451
25 yr	0.425	6221.614	0.93	12113.073

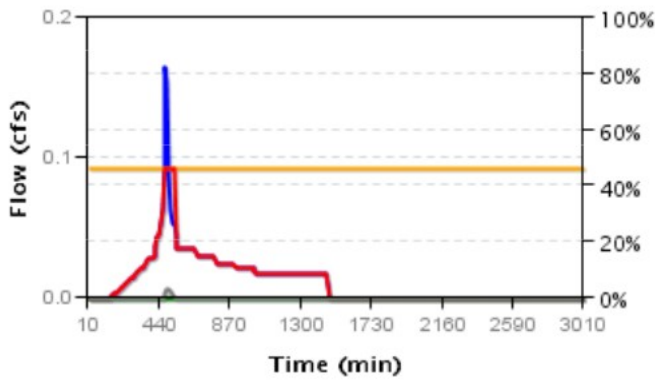
# Facility Basin A

Facility Details	Facility Type	Basin
	Facility Configuration	<b>B: Infl. with rock storage (RS)</b>
	Facility Shape	<b>Rectangle</b>
<b>Above Grade Storage Data</b>		
	Bottom Area	<b>1400 sq ft</b>
	Bottom Width	<b>24.00 ft</b>
	Side Slope	<b>3.0:1</b>
	Storage Depth 1	<b>18.0 in</b>
	Growing Medium Depth	<b>18 in</b>
	Freeboard Depth	<b>12.00 in</b>
	Surface Capacity at Depth 1	<b>2687.6 cu ft</b>
	Design Infiltration Rate for Native Soil	<b>0.065 in/hr</b>
	Infiltration Capacity	<b>0.092 cfs</b>
<b>Below Grade Storage Data</b>		
	Rock Storage Bottom Area	<b>1400 sq ft</b>
	Rock Storage Depth	<b>18 in</b>
	Rock Porosity	<b>0.30 in</b>
<b>Facility Facts</b>	Total Facility Area Including Freeboard	<b>2811.72 sq ft</b>
	Sizing Ratio	<b>7.1%</b>
<b>Pollution Reduction Results</b>	Pollution Reduction Score	<b>Pass</b>
	Overflow Volume	<b>0.000 cf</b>
	Surface Capacity Used	<b>3%</b>
	Rock Capacity Used	<b>18%</b>
<b>Flow Control Results</b>	Flow Control Score	<b>Pass</b>
	Overflow Volume	<b>1857.428 cf</b>
	Surface Capacity Used	<b>100%</b>
	Rock Capacity Used	<b>100%</b>

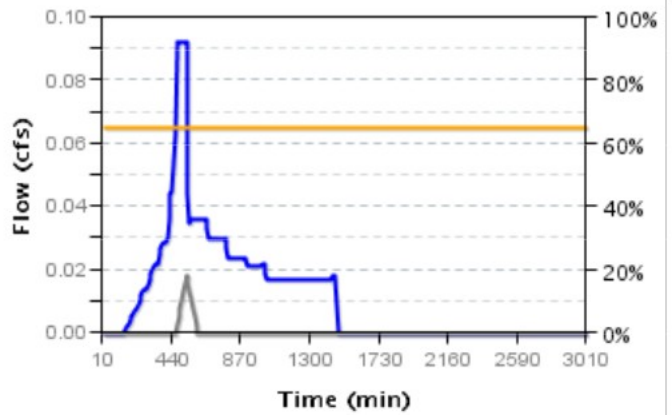
	<b>Post-development outflow (cfs)</b>		<b>Pre-development inflow (cfs)</b>	
<b>2 year</b>	0	$\leq \frac{1}{2}$ of	0.141	<b>Pass</b>

5 year	0.049	≤	0.227	Pass
10 year	0.099	≤	0.321	Pass
25 year	0.385	≤	0.425	Pass

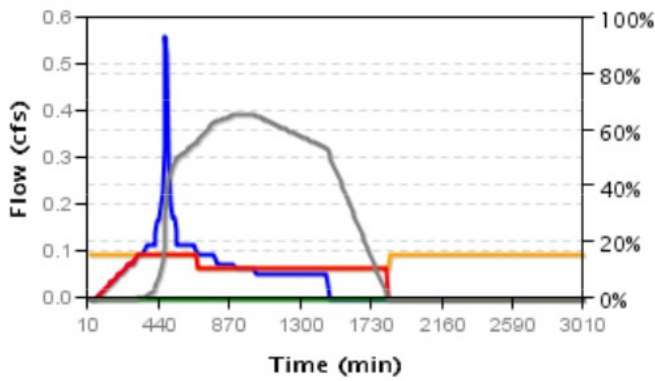
**Pollution Reduction Event Surface Facility Modeling**



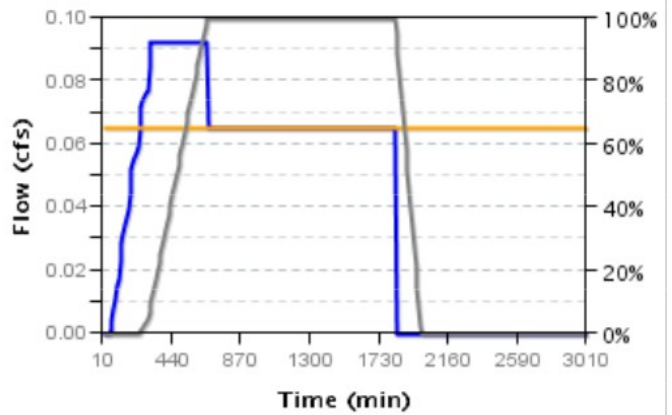
**Pollution Reduction Event Below Grade Modeling**



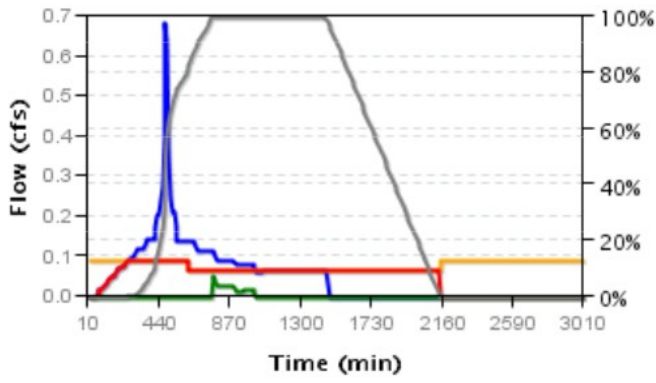
**2 Year Event Surface Facility Modeling**



**2 Year Event Below Grade Modeling**

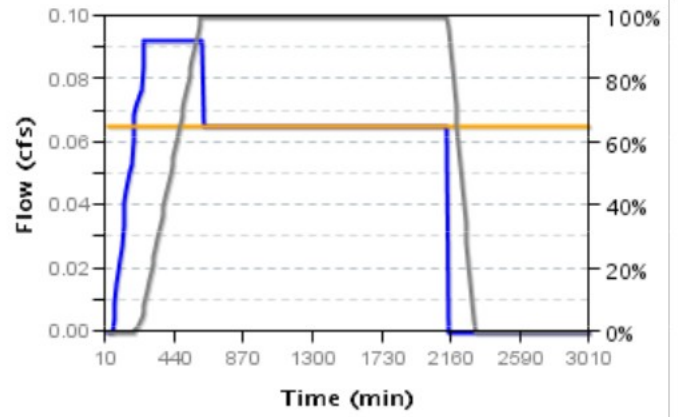


5 Year Event Surface Facility Modeling



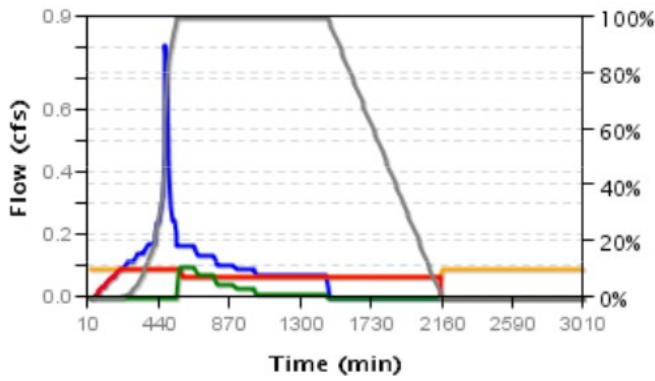
- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge

5 Year Event Below Grade Modeling



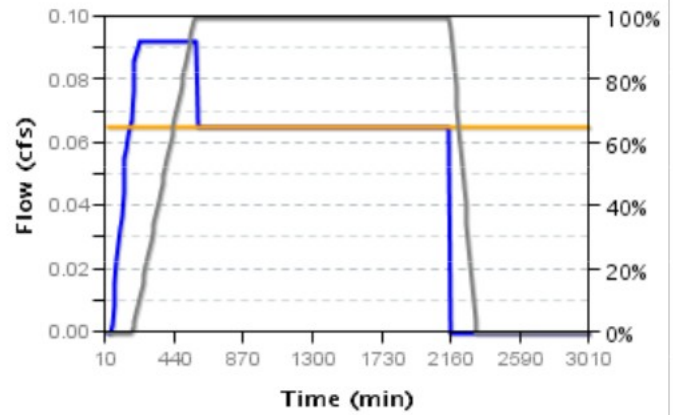
- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

**10 Year Event Surface Facility Modeling**



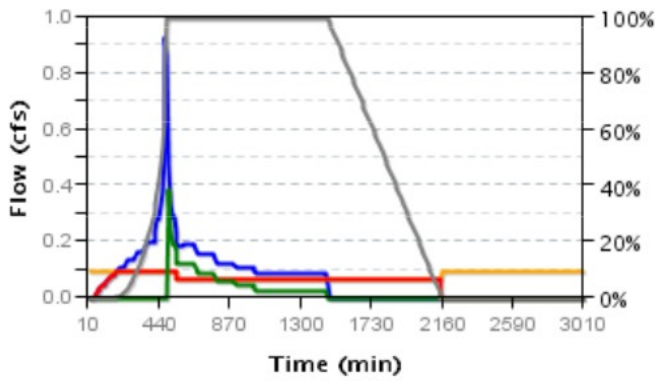
- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge

**10 Year Event Below Grade Modeling**



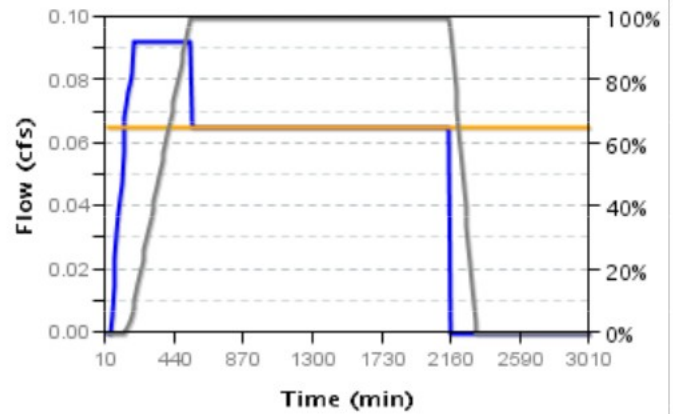
- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

**25 Year Event Surface Facility Modeling**



- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge

**25 Year Event Below Grade Modeling**



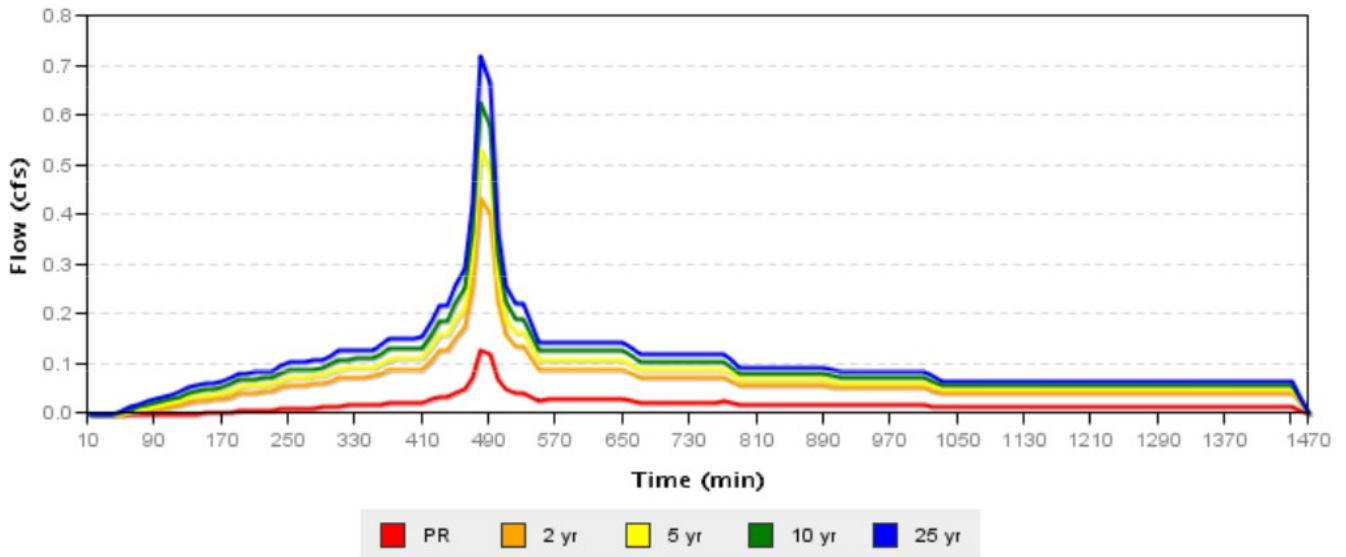
- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

## Catchment Basin B

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	Encased Falling Head
	Native Soil Infiltration Rate ( $I_{test}$ )	4.00
Correction Factor	$CF_{test}$	2
Design Infiltration Rates	Native Soil ( $I_{dsgn}$ )	2.00 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	30718 sq ft 0.705 acre
	Time of Concentration ( $T_c$ )	5
	Pre-Development Curve Number ( $CN_{pre}$ )	79
	Post-Development Curve Number ( $CN_{post}$ )	98



**SBUH Results BASIN B**



	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0.003	77.07	0.127	1605.102
2 yr	0.109	1974.058	0.434	5558.296
5 yr	0.176	2856.487	0.53	6831.423
10 yr	0.249	3810.84	0.625	8106.456
25 yr	0.329	4819.213	0.72	9382.691

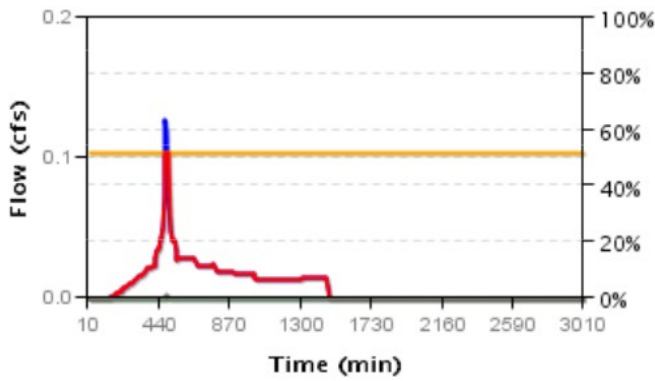
## Facility Basin B

Facility Details	Facility Type	Basin
	Facility Configuration	<b>B: Infl. with rock storage (RS)</b>
	Facility Shape	<b>Rectangle</b>
<b>Above Grade Storage Data</b>		
	Bottom Area	<b>865 sq ft</b>
	Bottom Width	<b>4.50 ft</b>
	Side Slope	<b>3.0:1</b>
	Storage Depth 1	<b>18.0 in</b>
	Growing Medium Depth	<b>18 in</b>
	Freeboard Depth	<b>12.00 in</b>
	Surface Capacity at Depth 1	<b>2657.2 cu ft</b>
	Design Infiltration Rate for Native Soil	<b>0.040 in/hr</b>
	Infiltration Capacity	<b>0.103 cfs</b>
<b>Below Grade Storage Data</b>		
	Rock Storage Bottom Area	<b>865 sq ft</b>
	Rock Storage Depth	<b>12 in</b>
	Rock Porosity	<b>0.30 in</b>
<b>Facility Facts</b>	Total Facility Area Including Freeboard	<b>3992.55 sq ft</b>
	Sizing Ratio	<b>13%</b>
<b>Pollution Reduction Results</b>	Pollution Reduction Score	<b>Pass</b>
	Overflow Volume	<b>0.000 cf</b>
	Surface Capacity Used	<b>1%</b>
	Rock Capacity Used	<b>56%</b>
<b>Flow Control Results</b>	Flow Control Score	<b>Pass</b>
	Overflow Volume	<b>1896.602 cf</b>
	Surface Capacity Used	<b>100%</b>
	Rock Capacity Used	<b>100%</b>

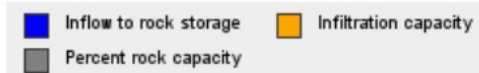
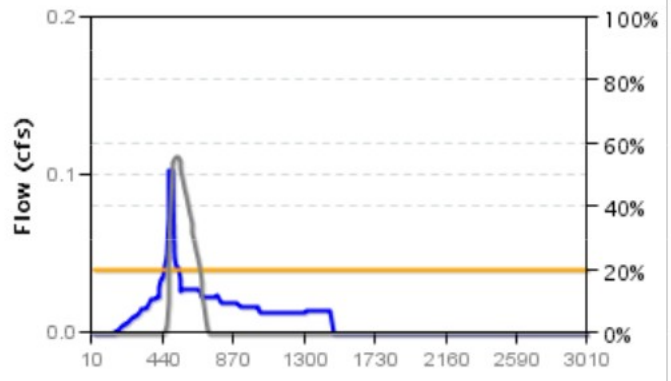
	<b>Post-development outflow (cfs)</b>		<b>Pre-development inflow (cfs)</b>	
<b>2 year</b>	0	≤ ½ of	0.109	<b>Pass</b>

5 year	0.048	≤	0.176	Pass
10 year	0.087	≤	0.249	Pass
25 year	0.218	≤	0.329	Pass

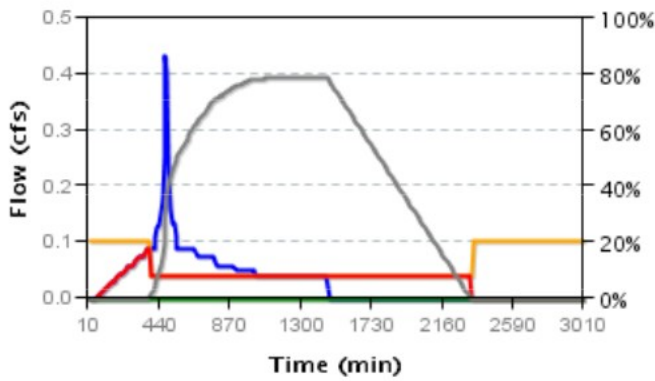
**Pollution Reduction Event Surface Facility Modeling**



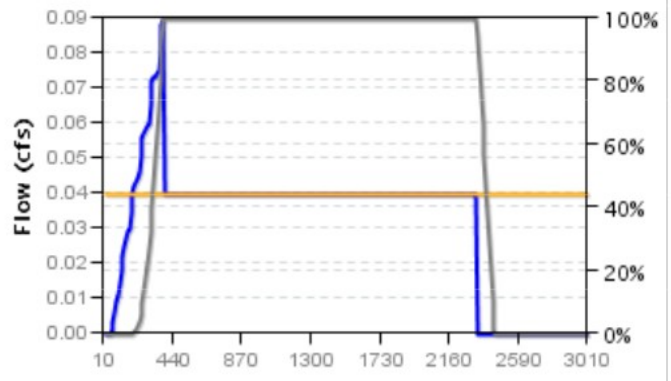
**Pollution Reduction Event Below Grade Modeling**



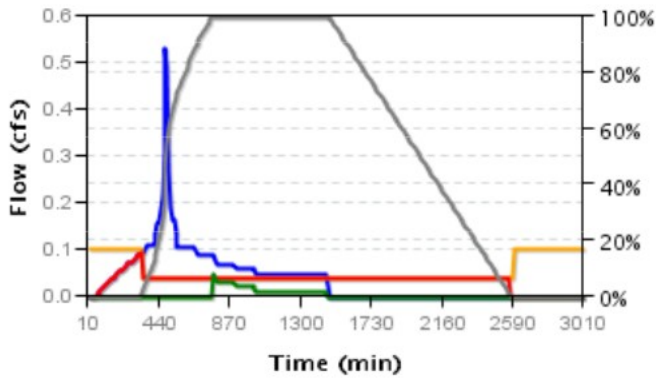
**2 Year Event Surface Facility Modeling**



**2 Year Event Below Grade Modeling**

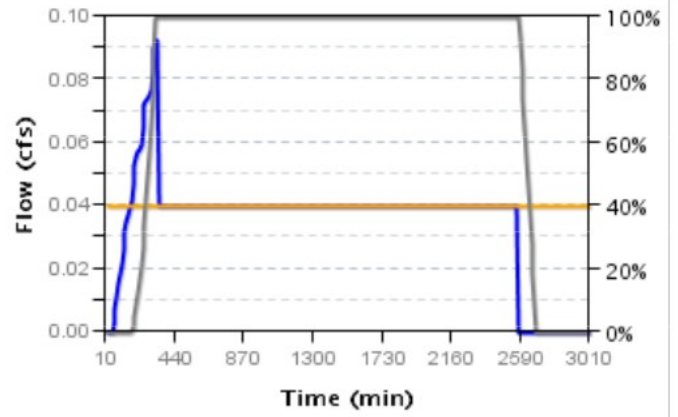


**5 Year Event Surface Facility Modeling**



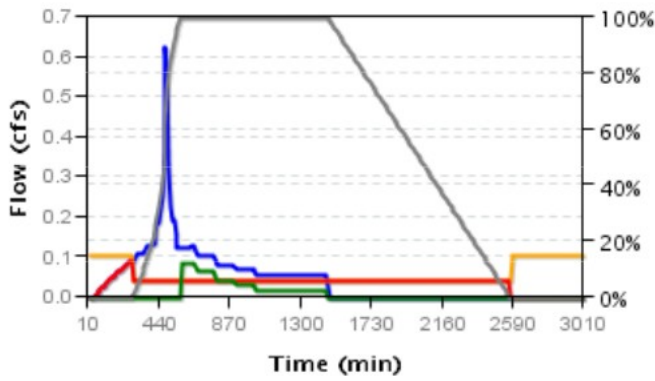
- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge

**5 Year Event Below Grade Modeling**



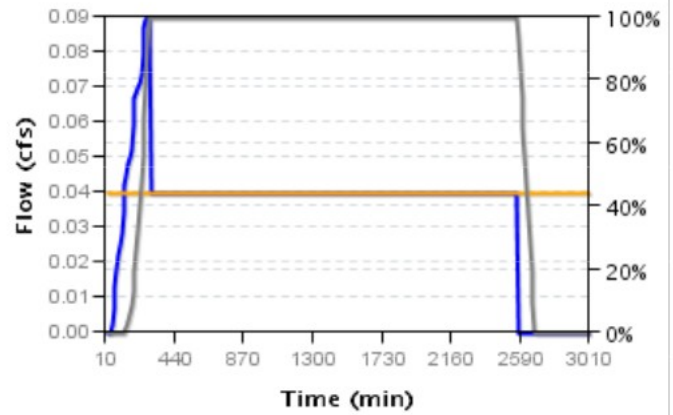
- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

**10 Year Event Surface Facility Modeling**



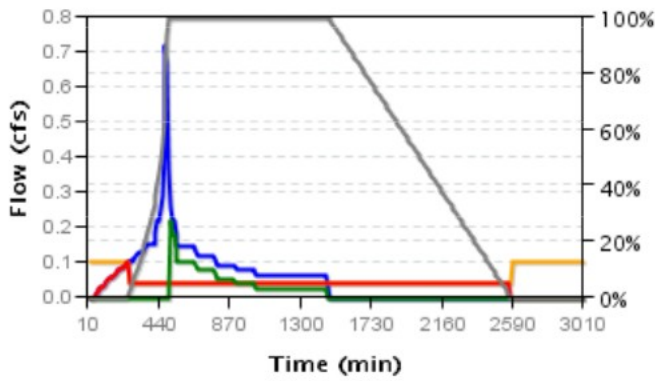
- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge

**10 Year Event Below Grade Modeling**



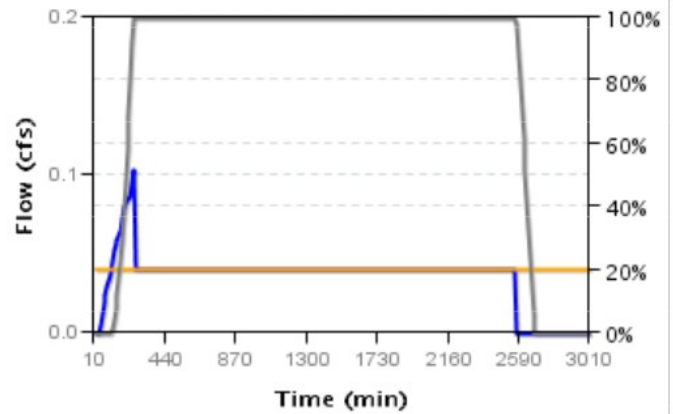
- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

**25 Year Event Surface Facility Modeling**




- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge

**25 Year Event Below Grade Modeling**



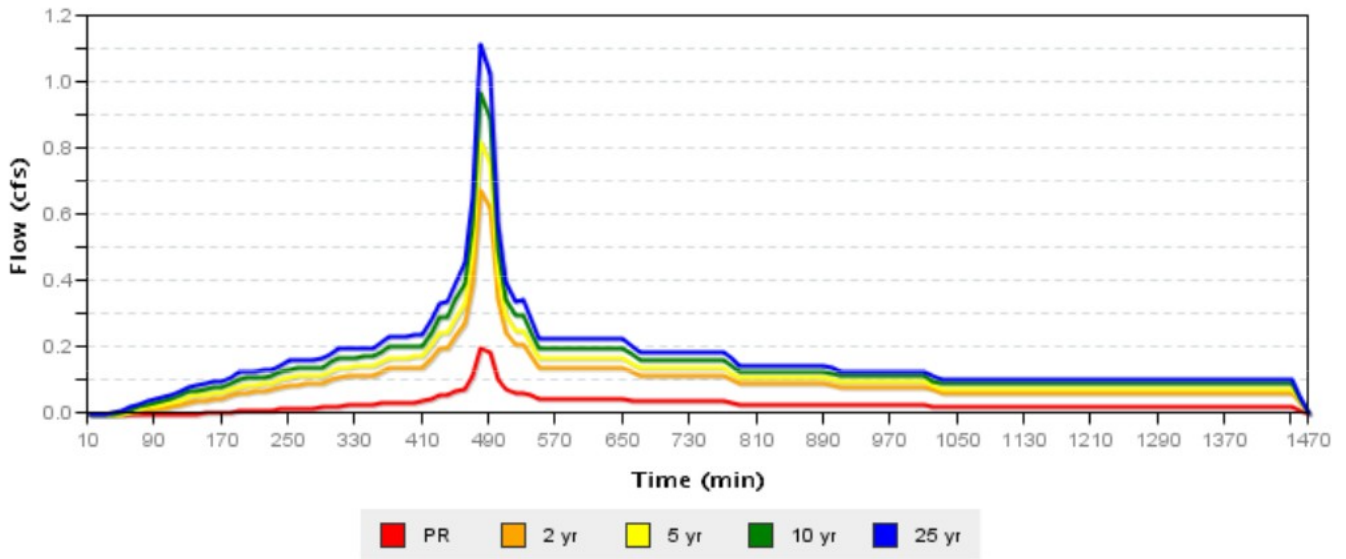
- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

## Catchment Basin C

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	Encased Falling Head
	Native Soil Infiltration Rate ( $I_{test}$ )	4.00
Correction Factor	$CF_{test}$	2
Design Infiltration Rates	Native Soil ( $I_{dsgn}$ )	2.00 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	47511 sq ft  1.091 acre
	Time of Concentration ( $T_c$ )	5
	Pre-Development Curve Number ( $CN_{pre}$ )	79
	Post-Development Curve Number ( $CN_{post}$ )	98

 Indicates value is outside of recommended range

**SBUH Results BASIN C**



	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0.004	119.203	0.196	2482.583
2 yr	0.169	3053.241	0.671	8596.92
5 yr	0.272	4418.079	0.819	10566.044
10 yr	0.385	5894.16	0.967	12538.116
25 yr	0.509	7453.794	1.114	14512.046

## Facility Basin C

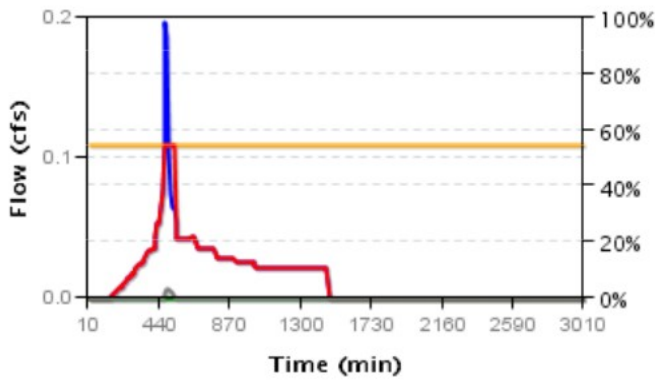
Facility Details	Facility Type	Basin
	Facility Configuration	<b>B: Infl. with rock storage (RS)</b>
	Facility Shape	<b>Rectangle</b>
<b>Above Grade Storage Data</b>		
	Bottom Area	<b>1736 sq ft</b>
	Bottom Width	<b>30.00 ft</b>
	Side Slope	<b>3.0:1</b>
	Storage Depth 1	<b>18.0 in</b>
	Growing Medium Depth	<b>18 in</b>
	Freeboard Depth	<b>12.00 in</b>
	Surface Capacity at Depth 1	<b>3228.9 cu ft</b>
	Design Infiltration Rate for Native Soil	<b>0.080 in/hr</b>
	Infiltration Capacity	<b>0.109 cfs</b>
<b>Below Grade Storage Data</b>		
	Rock Storage Bottom Area	<b>1736 sq ft</b>
	Rock Storage Depth	<b>18 in</b>
	Rock Porosity	<b>0.30 in</b>
<b>Facility Facts</b>	Total Facility Area Including Freeboard	<b>3230.72 sq ft</b>
	Sizing Ratio	<b>6.8%</b>
<b>Pollution Reduction Results</b>	Pollution Reduction Score	<b>Pass</b>
	Overflow Volume	<b>0.000 cf</b>
	Surface Capacity Used	<b>3%</b>
	Rock Capacity Used	<b>16%</b>
<b>Flow Control Results</b>	Flow Control Score	<b>Pass</b>
	Overflow Volume	<b>2027.270 cf</b>
	Surface Capacity Used	<b>100%</b>
	Rock Capacity Used	<b>100%</b>

	<b>Post-development outflow (cfs)</b>		<b>Pre-development inflow (cfs)</b>	
<b>2 year</b>	0	≤ ½ of	0.169	<b>Pass</b>

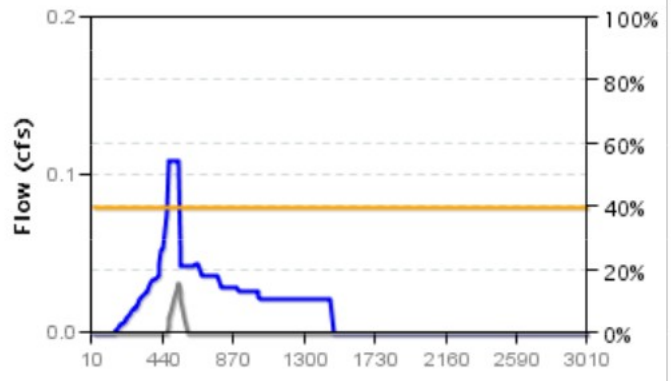


5 year	0.028	≤	0.272	Pass
10 year	0.115	≤	0.385	Pass
25 year	0.463	≤	0.509	Pass

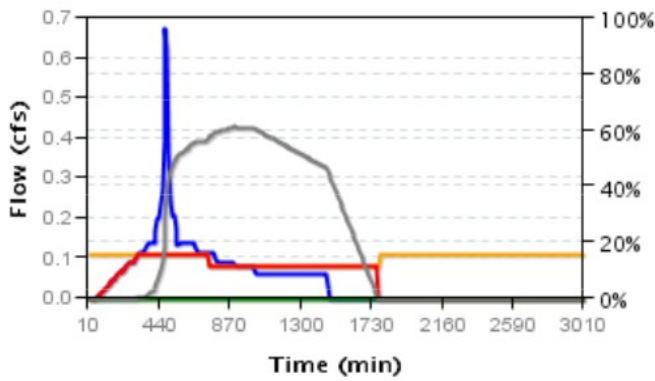
**Pollution Reduction Event Surface Facility Modeling**



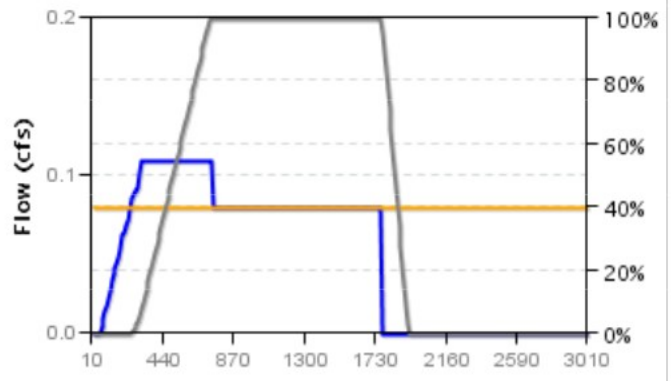
**Pollution Reduction Event Below Grade Modeling**



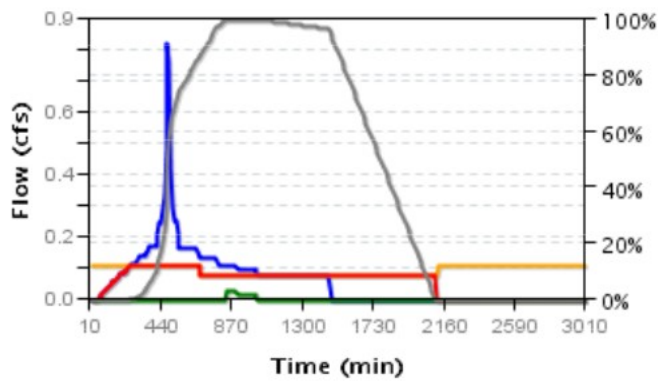
**2 Year Event Surface Facility Modeling**



**2 Year Event Below Grade Modeling**

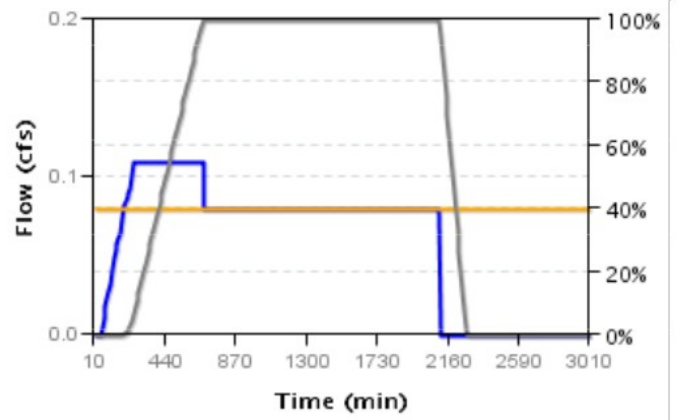


**5 Year Event Surface Facility Modeling**



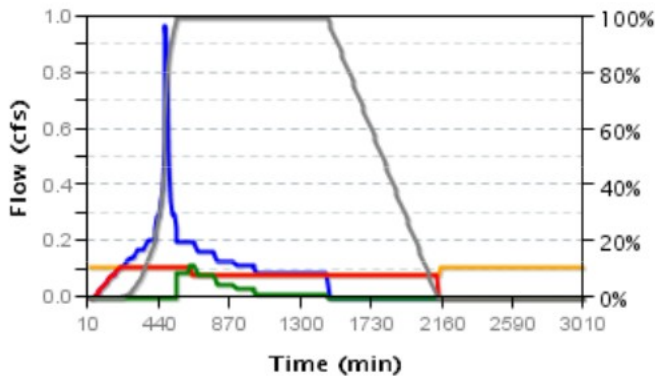
- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge

**5 Year Event Below Grade Modeling**



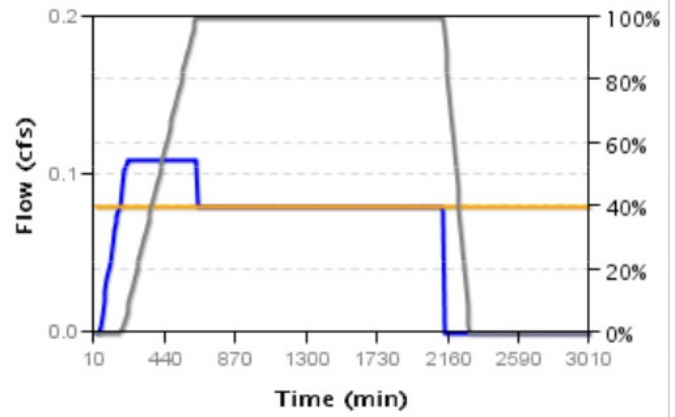
- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

**10 Year Event Surface Facility Modeling**



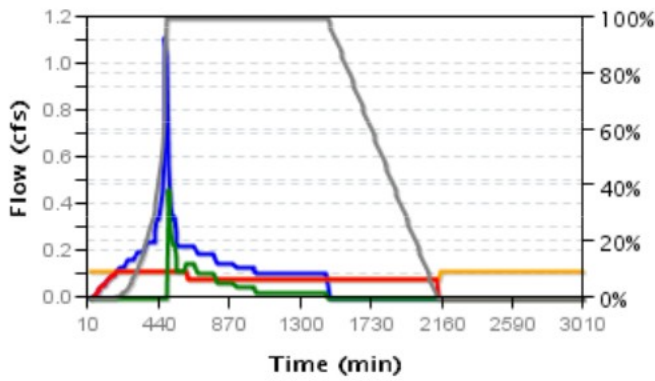
- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge

**10 Year Event Below Grade Modeling**



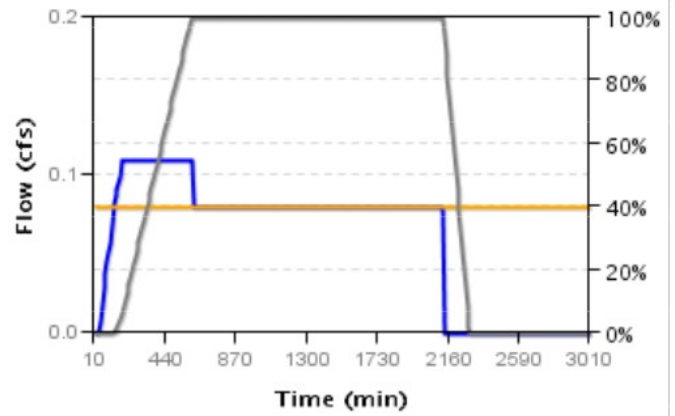
- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

**25 Year Event Surface Facility Modeling**




- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge


**25 Year Event Below Grade Modeling**



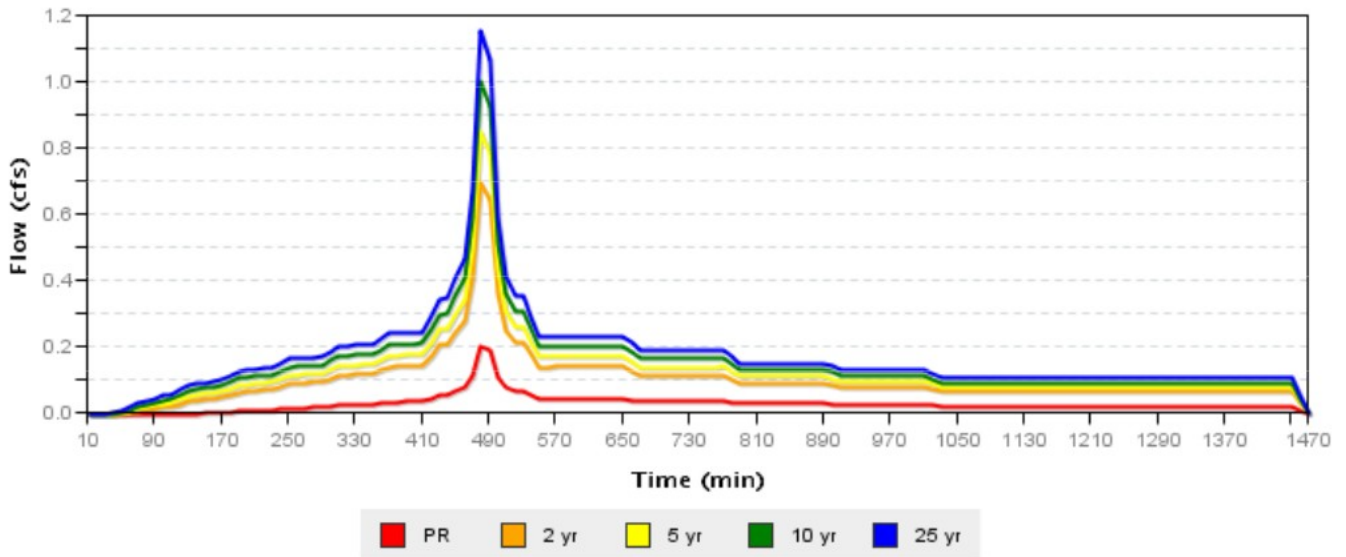
- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

## Catchment Basin D

Site Soils & Infiltration Testing Data	Infiltration Testing Procedure	Encased Falling Head
	Native Soil Infiltration Rate ( $I_{test}$ )	4.00
Correction Factor	$CF_{test}$	2
Design Infiltration Rates	Native Soil ( $I_{dsgn}$ )	2.00 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	49239 sq ft  1.130 acre
	Time of Concentration ( $T_c$ )	5
	Pre-Development Curve Number ( $CN_{pre}$ )	79
	Post-Development Curve Number ( $CN_{post}$ )	98

 Indicates value is outside of recommended range

**SBUH Results    BASIN D**



	Pre-Development Rate and Volume		Post-Development Rate and Volume	
	Peak Rate (cfs)	Volume (cf)	Peak Rate (cfs)	Volume (cf)
PR	0.004	123.539	0.203	2572.876
2 yr	0.175	3164.289	0.695	8909.594
5 yr	0.282	4578.767	0.849	10950.337
10 yr	0.399	6108.534	1.002	12994.133
25 yr	0.527	7724.893	1.155	15039.857

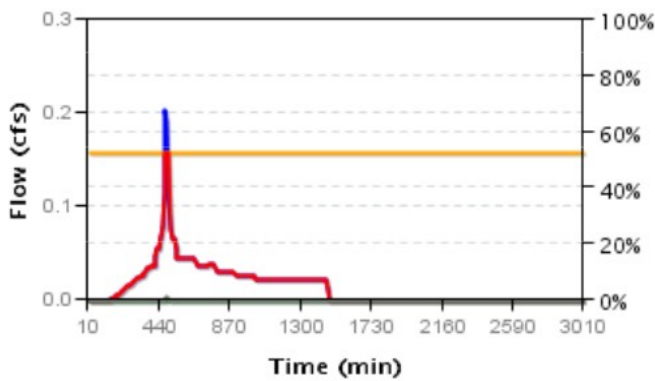
## Facility Basin D

Facility Details	Facility Type	Basin
	Facility Configuration	<b>B: Infl. with rock storage (RS)</b>
	Facility Shape	<b>Rectangle</b>
<b>Above Grade Storage Data</b>		
	Bottom Area	<b>2046 sq ft</b>
	Bottom Width	<b>11.00 ft</b>
	Side Slope	<b>3.0:1</b>
	Storage Depth 1	<b>18.0 in</b>
	Growing Medium Depth	<b>18 in</b>
	Freeboard Depth	<b>12.00 in</b>
	Surface Capacity at Depth 1	<b>4430.6 cu ft</b>
	Design Infiltration Rate for Native Soil	<b>0.095 in/hr</b>
	Infiltration Capacity	<b>0.158 cfs</b>
<b>Below Grade Storage Data</b>		
	Rock Storage Bottom Area	<b>2046 sq ft</b>
	Rock Storage Depth	<b>6 in</b>
	Rock Porosity	<b>0.30 in</b>
<b>Facility Facts</b>	Total Facility Area Including Freeboard	<b>5177.72 sq ft</b>
	Sizing Ratio	<b>10.5%</b>
<b>Pollution Reduction Results</b>	Pollution Reduction Score	<b>Pass</b>
	Overflow Volume	<b>0.000 cf</b>
	Surface Capacity Used	<b>1%</b>
	Rock Capacity Used	<b>41%</b>
<b>Flow Control Results</b>	Flow Control Score	<b>Pass</b>
	Overflow Volume	<b>652.790 cf</b>
	Surface Capacity Used	<b>100%</b>
	Rock Capacity Used	<b>100%</b>

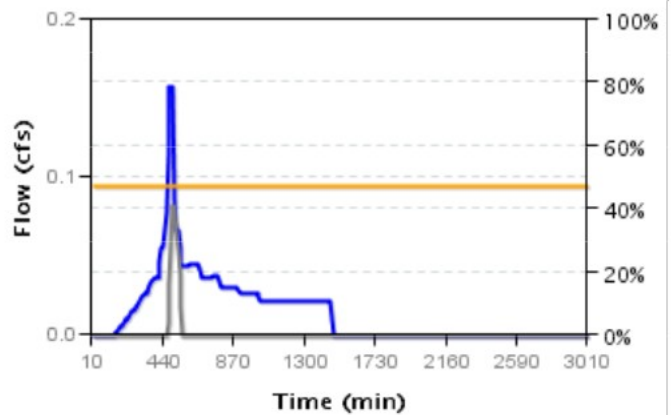
	<b>Post-development outflow (cfs)</b>		<b>Pre-development inflow (cfs)</b>	
<b>2 year</b>	0	≤ ½ of	0.175	<b>Pass</b>

5 year	0	≤	0.282	Pass
10 year	0.072	≤	0.399	Pass
25 year	0.138	≤	0.527	Pass

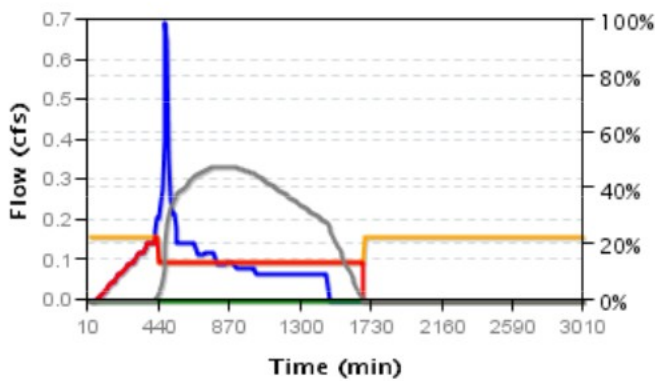
**Pollution Reduction Event Surface Facility Modeling**



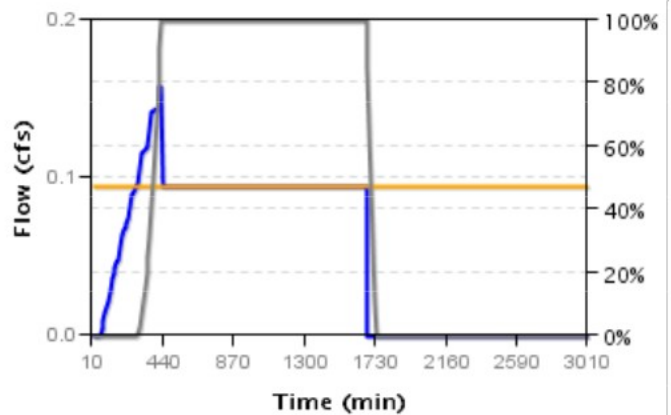
**Pollution Reduction Event Below Grade Modeling**



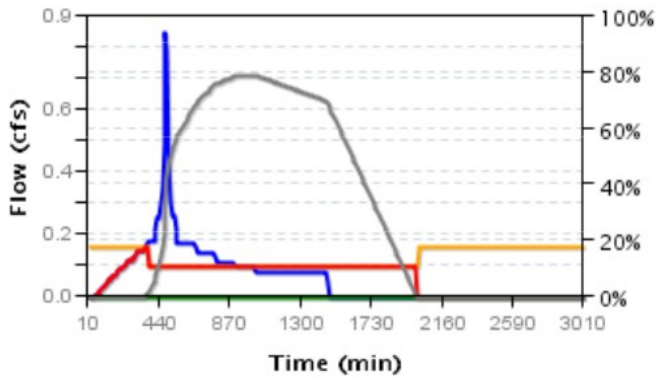
**2 Year Event Surface Facility Modeling**



**2 Year Event Below Grade Modeling**

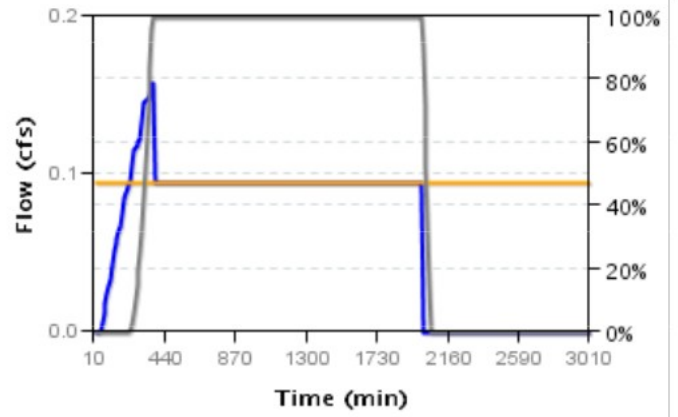


5 Year Event Surface Facility Modeling



- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge

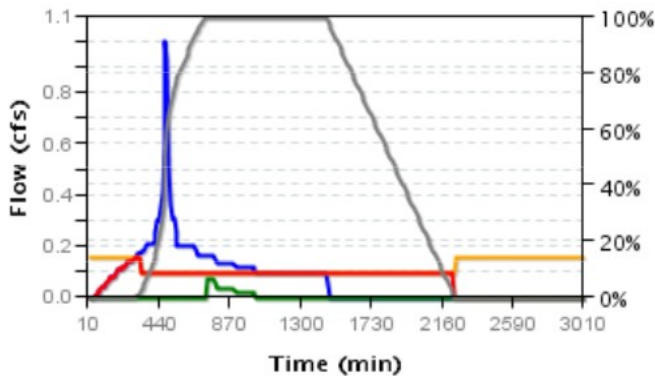
5 Year Event Below Grade Modeling



- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

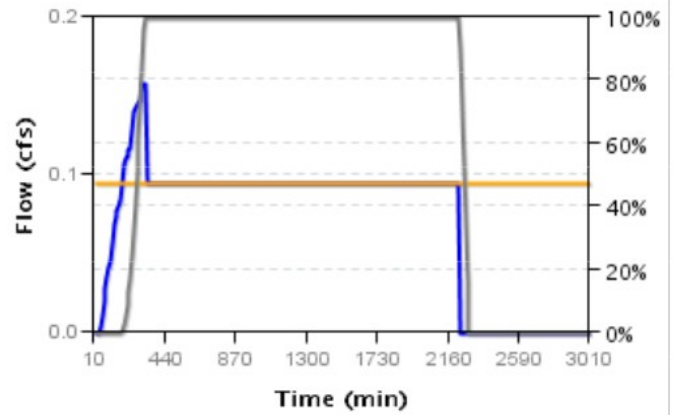


**10 Year Event Surface Facility Modeling**



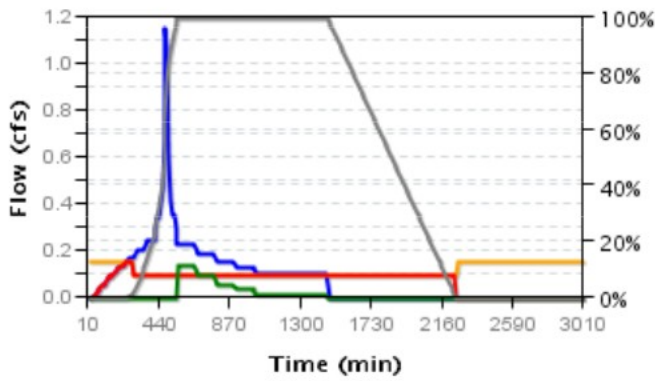
- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge

**10 Year Event Below Grade Modeling**



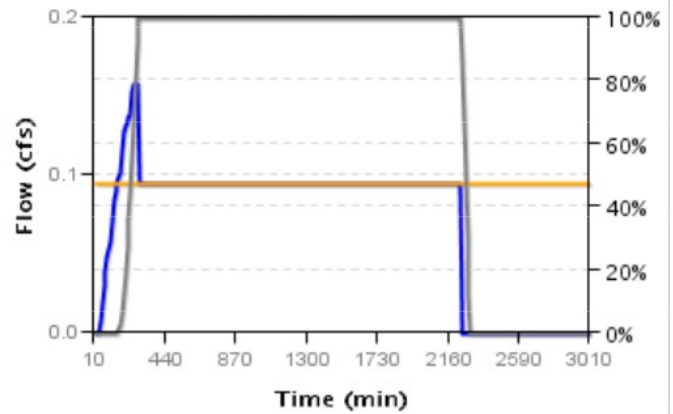
- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

**25 Year Event Surface Facility Modeling**



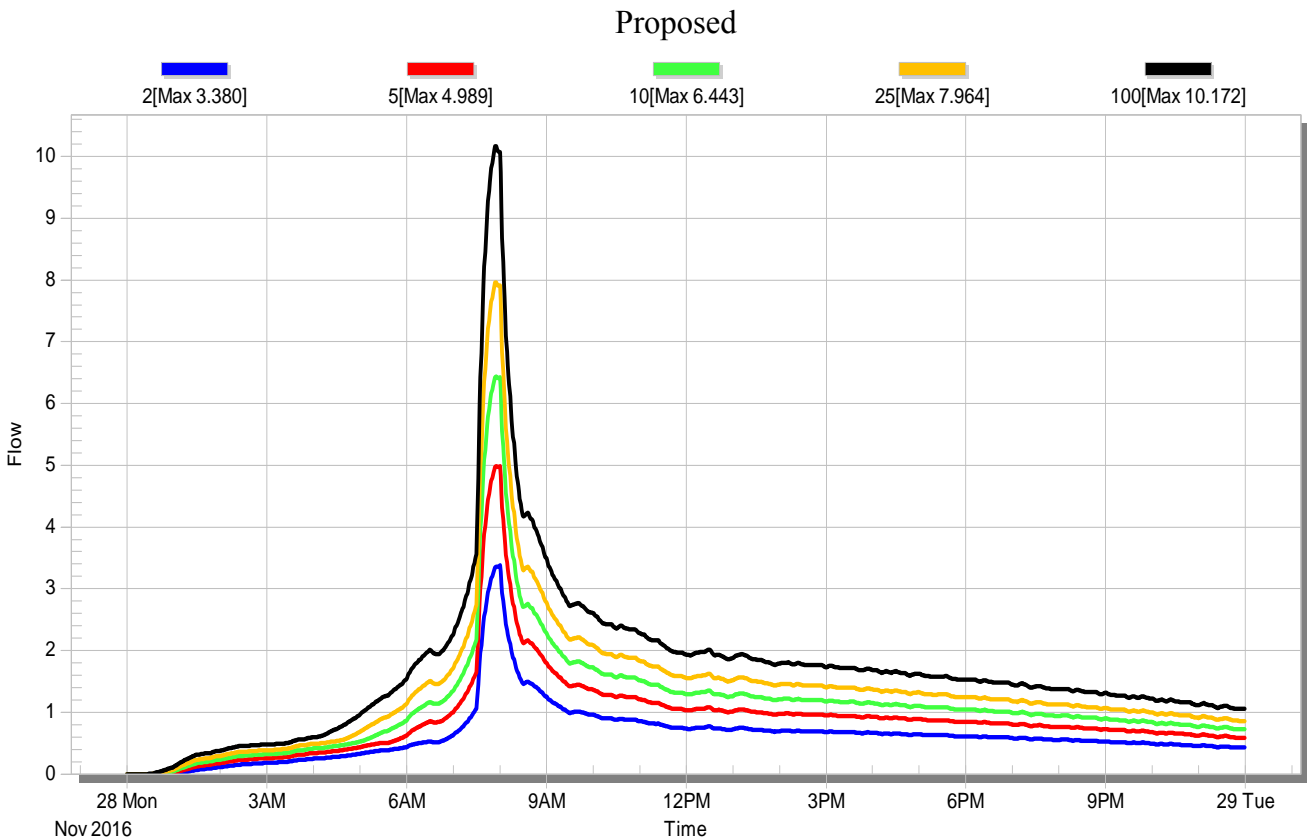
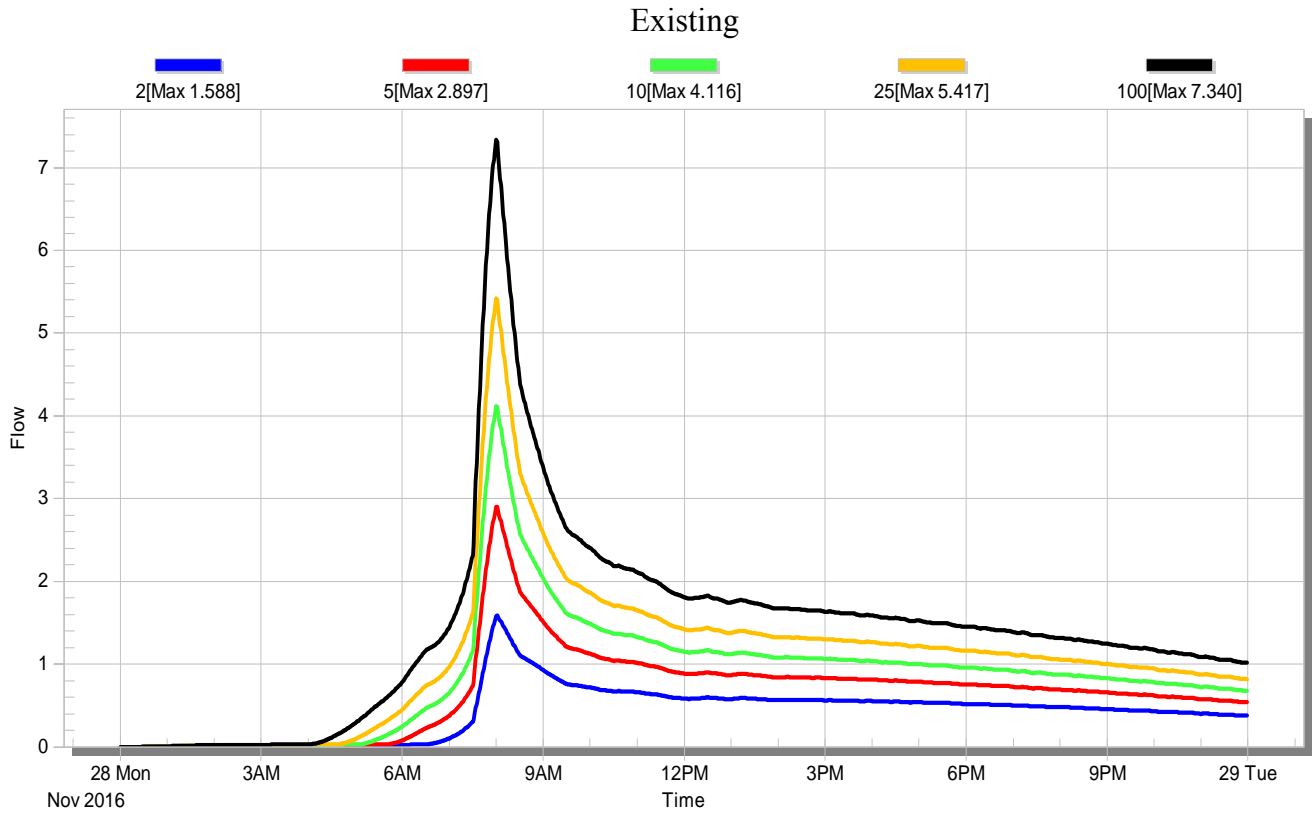
- Inflow from rain
- Percolation to below grade storage
- Percent surface capacity
- Infiltration capacity
- Overflow to approved discharge

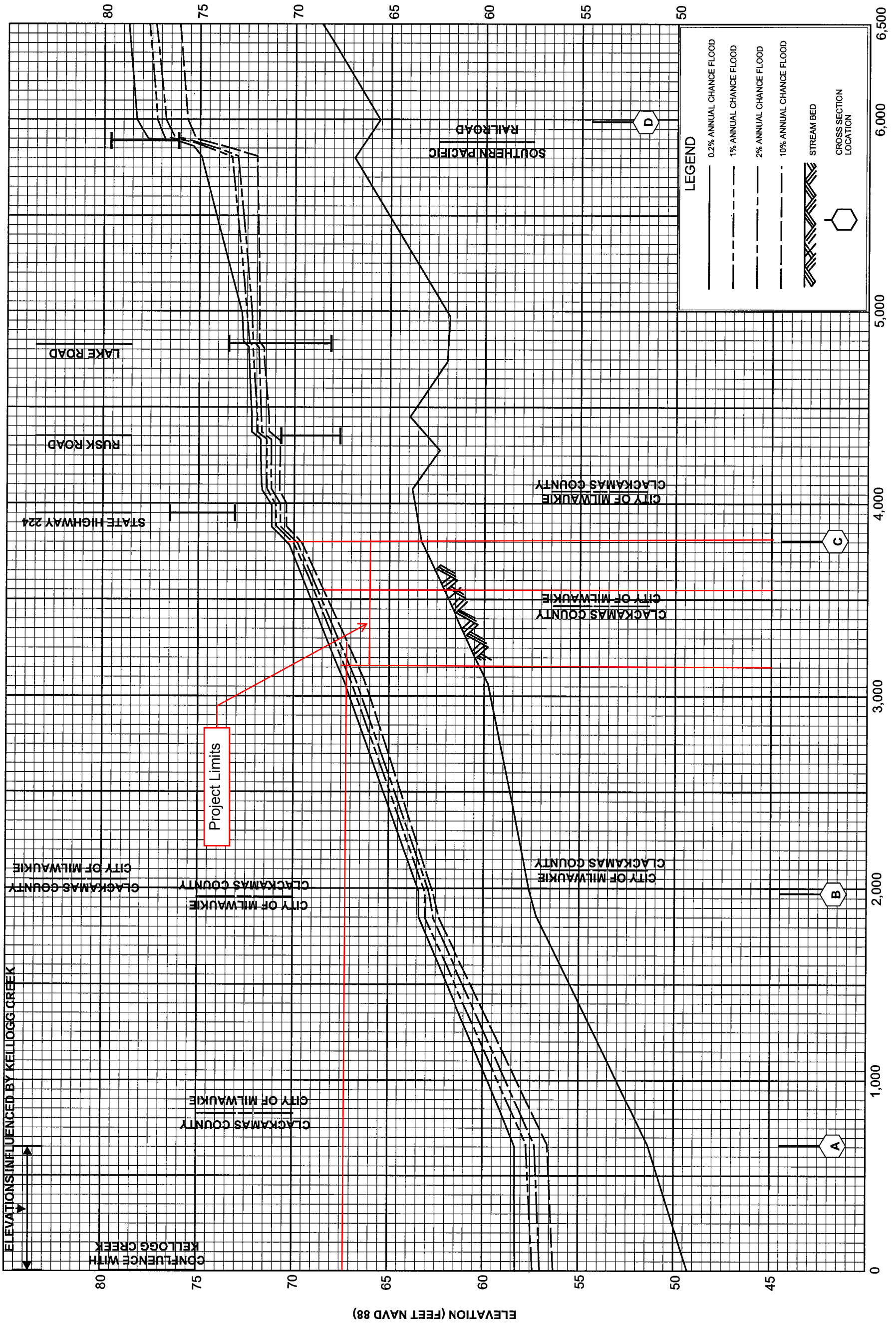
**25 Year Event Below Grade Modeling**



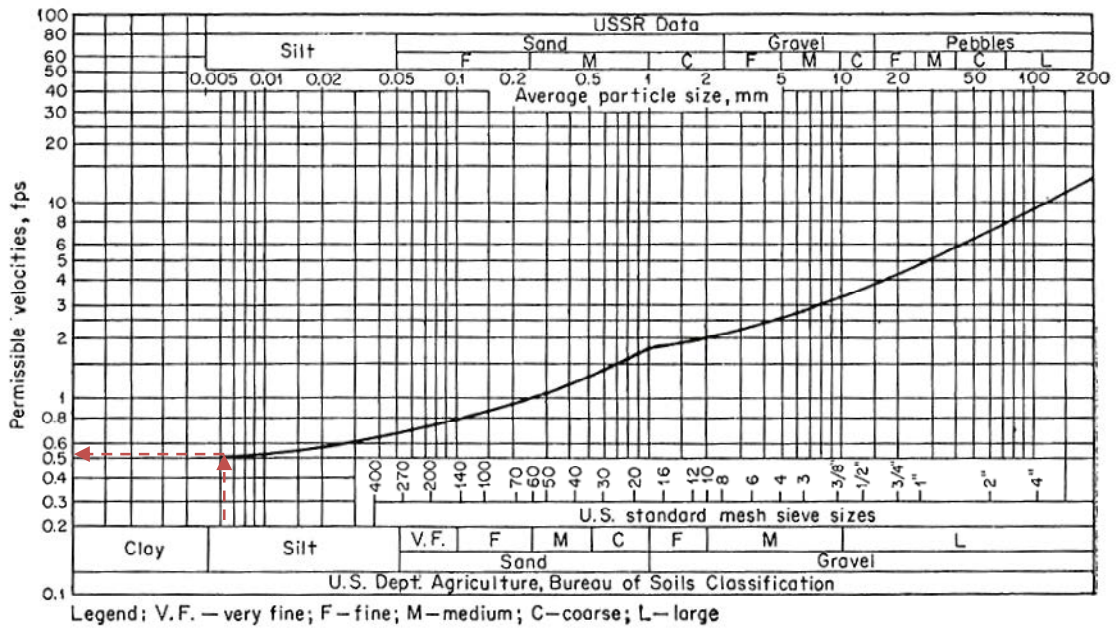
- Inflow to rock storage
- Percent rock capacity
- Infiltration capacity

# Bonaventure Senior Living — Hydrographs





STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH KELLOGG CREEK



**FIG. 7-3. U.S. and U.S.S.R. data on permissible velocities for noncohesive soils.**

**Source:** Chow, V.T., 1959: *Open-channel hydraulics*. New York: McGraw-Hill. Page 166



**Operation & Maintenance  
Plan**

Bonaventure Senior Living

2322.14497.01

Prepared for

**Bonaventure, Inc.**

3425 Boone Road SE  
Salem, Oregon 97317

November 16, 2018

---

Prepared for                    Bonaventure, Inc.  
Project Name                    Operation & Maintenance Plan  
Job Number                    2322.14497.01  
Date                                November 16, 2018

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Name	Title	Date	Revision	Reviewer
Scott Emmens	WR Project Manager	11/16/2018	1	Kyle Gildden

## EXECUTIVE SUMMARY

Maintenance of water quality facilities is very important to ensure they operate as designed. Inadequate maintenance can be attributed to premature failures of these facilities. This Operation and Maintenance Plan provides guidance on how to maintain your facility, control source pollution, frequency of inspection and maintenance, potential problems with each facility, different conditions to check for, and the actual conditions that should exist. Maintenance guidelines and checklists have been provided in the Technical Appendix of this document.

The purpose of this Operation and Maintenance Plan is to describe the required type and frequency of long-term maintenance of the stormwater facilities and to identify the responsible maintenance organization. Several sources were used for obtaining maintenance information including City of Portland’s *Stormwater Management Manual* dated August 2016.

This Plan should be kept onsite or within reasonable access to the site. Maintenance logs must be kept and made available for City inspection.

## I. STORMWATER APPROACH DESCRIPTION

### I.1 Stormwater Approach

Water quality treatment and flow control at Kellogg Creek site will be accomplished through bioretention ponds and planters. All stormwater runoff will be released to Mt. Scott Creek and the public storm sewer in Kellogg Creek Drive. The Technical Appendix of this manual contains stormwater plans showing facility locations.

**Table I-1 Stormwater Facility Summary**

Facility	Facility Type	Facility Parameters	Stormwater Source	Contributing Impervious Area (ac)	Latitude	Longitude	Discharge Point
Pond A1	Pond	*Volume: 3,860 cf Depth: 18 inch	Roof & Roadway	*0.91	45.42637	122.60323	SE Kellogg Creek Dr.
Pond A2	Pond	*Volume: 3,860 cf Depth: 18 inch	Roof & Roadway	*0.91	45.42635	122.60412	SE Kellogg Creek Dr.
Pond B	Pond	Volume: 6,400 cf Depth: 18 inch	Roof & Roadway	0.710	45.42699	122.60459	Mt. Scott Creek
Pond C	Pond	Volume: 5,700 cf Depth: 18 inch	Roof & Roadway	1.090	45.42771	122.60439	Mt. Scott Creek
Pond D	Pond	Volume: 5,970 cf Depth: 18 inch	Roof & Roadway	1.130	45.42791	122.60279	Mt. Scott Creek

\*Facility volumes and contributing impervious area for ponds A1 & A2 are combined.

## II. INSPECTION

### II.1 Inspection Schedule

In accordance with SLOPES V, inspection and maintenance will be required at least

- Quarterly for the first three (3) years.
- Twice a year thereafter.
- Within 48 hours of major rainfall events (defined as more than one inch of rain over a 24-hour period).

A recommended maintenance calendar is provided below.

Recommended Maintenance Schedule													
Purpose of Visit	Frequency	J	F	M	A	M	J	J	A	S	O	N	D
Routine inspection	Min. 4/year (first 3 years)			✓		✓					✓		✓
Vegetation	Min. 12/year	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Soil	Min. 8/year	✓	✓	✓	✓	✓					✓	✓	✓
Sediment & Trash	Min. 2/year				✓						✓		
Flow Control Structures	Min. 2/year				✓						✓		

## III. MAINTENANCE ACTIVITIES AND VISUAL INDICATORS OF DIMINISHED PERFORMANCE

### Site Best Management Practices

Onsite maintenance practices can reduce maintenance needs for stormwater facilities. Good housekeeping procedures such as trash or source control practices can reduce spills and prevent pollutants from entering facilities.

Remove trash, debris and sediment from catch basins. Identify sources of visible pollutants or spills and clean up sources to protect the stormwater system. Sweep or vacuum driveways or other ground-level surfaces. Report all spills that threaten or enter the public sanitary or storm system.

### Sediment and Oil Removal and Disposal

Stormwater facilities are designed to remove pollutants by capturing sediment, dirt, leaves and litter. Removing sediment and oil helps maintain facility infiltration rates, provide good water quality treatment, and prevent clogging and flooding.

In vegetated facilities, sediment should be removed when it reaches a depth of four inches, when the quantity reaches 30 percent of total capacity (as designed or measured) or when accumulated sediment is impeding facility function. Examples include when sediment is damaging vegetation, preventing the facility from draining, blocking inlets or causing bypass.

Remove sediment by hand unless professionals are needed because of confined space entry requirements or the need for a vacuum truck. Dispose of sediment per solid waste disposal requirements. Removing sediment during dry periods is easier because the material weighs substantially less.



### **Vegetation Management**

Healthy plants play important roles: the root systems absorb stormwater, help maintain infiltration rates, prevent erosion, and capture pollutants. If a vegetated stormwater facility has bare soil, or if vegetation is stressed, unhealthy, or dead, replant per the approved planting plan and/or address cause of stress. Remove nuisance and invasive plants.

Healthy vegetation must cover at least 90% of stormwater facility surface area. Grass must be mowed to keep it four to nine inches tall. Prune or trim vegetation or roots to ensure free conveyance of stormwater or improve sight lines. Remove leaves or other debris. Use weed-free mulch to inhibit weeds. Irrigate as needed.

The use of fertilizers and pesticides (including herbicides) is strongly discouraged in stormwater management facilities because of the potential for negative impacts to downstream systems. Integrated Pest Management strategies are encouraged to reduce or eliminate the need for pesticides. If pesticides are required, use the services of a licensed applicator and products approved for aquatic use.

### **Erosion, Bank Failure, and Channel Formation**

Erosion in the flow path, inside or outside a facility, can clog inlets and outlets and reduce both conveyance efficiency and infiltration rates. Forms of erosion include channels, undercutting, scouring, and slumping. Any area with erosion more than two inches deep must be addressed. Install long-term erosion control practices and fill the eroded areas.

### **Structural Repairs**

Structural components control the conveyance of stormwater. Examples include inlets, outlets, trash racks, concrete curbs, retaining walls, manholes and check dams. Repair or replace items when damaged, loose, broken, cracked, or askew. Monitor minor damage such as dents, rust, or minor cracks in concrete for indications of when repair or replacement is required.

### **Ponding Water**

Most stormwater facilities are designed to drain in a certain amount of time. The facilities have an anticipated ponding depth of 10 to 12 inches are designed to have a long-term infiltration rate of 2 inches/hour. The anticipated drawdown time is approximately 24 hours, after the completion of the storm event. When the facility does not drain as anticipated, inspect the facility to determine the cause. Clearly clogged inlets or outlets, remove sediment that may be preventing infiltration, or add vegetation.

### **Pests**

Stormwater facilities are designed to drain quickly enough to avoid providing breeding areas for pests. If mosquitos are found, the stormwater facility may be ponding water longer than the approved design but also search for nearby sources of standing water. If rodents are found, remove plant debris, fruit or nuts that are providing shelter and food and contact the appropriate county vector control office for trapping and removal.

### **Safety**

Stormwater facilities must be maintained to protect workers, visitors, and the general public. Vegetation should be pruned for adequate visual clearance. Avoid maintenance in wet weather to reduce potential injuries from slipping and always use appropriate safety gear. Only personnel approved for confined space entry should enter underground stormwater facilities.

## **IV. FINANCIAL RESPONSIBILITY**

---

Stormwater facilities for the property site will be maintained and operated privately by the home owners association (HOA). The proposed property is located at 13333 Rusk Road in Milwaukie, Oregon.

The owner must ensure that the water quality systems efficiently perform their function of removing petroleum hydrocarbons, sediments, metals, bacteria and nutrients from stormwater runoff and that detention systems perform their function of detaining runoff onsite.

All appropriate property owners should be knowledgeable regarding stormwater operation and maintenance. They should recognize that protection and successful operation of the stormwater drainage system is essential to the continued successful operation of the system and to protecting the natural environment.

This plan should be reviewed and adjusted as needed. After the first year, evaluate if additional maintenance practices are necessary.

---

## **V. INSPECTION AND MAINTENANCE LOG**

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Maintenance Logs are to be kept for stormwater facilities by the property owner. Maintenance logs should be completed at the time of stormwater facility maintenance, and must be kept onsite.

The checklist included in the Technical Appendix should be used to determine the frequency of inspection/maintenance, the different drainage system feature to be inspected/maintained, the potential problem with the particular drainage feature, different conditions to check for and the actual conditions that should exist for that drainage feature.

The Maintenance Log has been included in this manual that can be used for catch basins, pipes, landscaping and detention facilities. Additionally, manufacture maintenance guidance documents have been included in the Technical Appendix.

---

## **VI. TECHNICAL APPENDIX**

---

- *Operations and Maintenance Specifications – Catch Basins* – 2008 City of Portland Stormwater Management Manual
- *Standard O&M Plan and Maintenance Log - Planters* - 2016 City of Portland Stormwater Management Manual
- *Standard O&M Plan and Maintenance Log - Basins* - 2016 City of Portland Stormwater Management Manual
  
- Civil Plans

## Operations and Maintenance Specifications

### CATCH BASINS

#### Catch Basins

The performance of catch basins for removing sediment and other pollutants depends on routine maintenance to retain the storage available in the sump in order to capture sediment and most floatables.

- Remove debris and sediment every 6 months (or when one-third full of sediment).
- Dewater and dispose of sediment properly. Test sediment that has a heavy oil sheen and/or odors to determine the appropriate disposal.
- Maintain the hooded outlet to prevent floatable materials, such as trash and debris, from entering the storm drain system.
- Maintain the grate as designed for safety reasons and to prevent trash and debris from collecting in the catch basin.
- Repair/seal cracks. Replace when repair is insufficient.
- Keep a log of the amount of sediment collected and the date of removal.

## STANDARD O&M PLAN FOR THE SIMPLIFIED AND PRESUMPTIVE APPROACHES

### 3.1.1.8. Planters

Structural components must be operated and maintained in accordance with the design specifications.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged inlets or outlets	Remove sediment and debris from catch basins, trench drains, curb inlets, and pipes; maintain at least 50% conveyance at all times.
Broken inlets or outlets	Repair/replace broken downspouts, curb cuts, standpipes, and screens.
Damaged liners and walls	Extend and secure liner to planter walls above the high water mark. The facility must be water tight to protect abutting foundations from moisture damage.
Cracked or exposed drain pipes	Repair or seal cracks. Replace when repair is insufficient. Cover with 6 inches of growing medium to prevent freeze/thaw and UV damage
Vegetation must cover at least 90% of the facility at maturity.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Dead or stressed vegetation	Replant per original planting plan, or substitute from the plant list in <a href="#">Section 2.4.1</a> . Irrigate and mulch as needed; prune tall, dry grasses and remove clippings.
Tall grass and vegetation	Maintain grass height at 6"-9". Trim to allow sight lines and foot traffic, also to ensure inlets and outlets freely convey stormwater into and/or out of facility.
Weeds	Manually remove weeds.
Growing medium must sustain healthy plant cover and infiltrate within 48 hours.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Gullies, erosion, exposed soils, sediment accumulations	Fill in and lightly compact areas of erosion with City-approved soil mix (see <a href="#">Section 2.3.6</a> ) and replant according to planting plan or substitute from the plant list in <a href="#">Section 2.4.1</a> . Sediment more than 4 inches deep must be removed.
Scouring at the inlet(s)	Ensure splash blocks or inlet gravel/rock are adequate.
Ponding	Rake, till, or amend soil surface with City-approved soil mix to restore infiltration rate. Remove and replace sediment at entrances.

### Annual Maintenance Schedule

<b>Summer</b>	Make structural repairs; clean gutters and downspouts; remove any build-up of weeds or organic debris.
<b>Fall</b>	Replant exposed soil and replace dead plants. Remove sediment and plant debris.
<b>Winter</b>	Clear gutters and downspouts.
<b>Spring</b>	Remove sediment and plant debris. Replant exposed soil and replace dead plants.
<b>All seasons</b>	Weed as necessary.

**Maintenance Records:** All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

**Fertilizers/Pesticides/Herbicides:** Their use is strongly discouraged because of the potential for damage to downstream systems. If pesticides or herbicides are required, use the services of a licensed applicator and products approved for aquatic use.

**Access:** Maintain ingress/egress per design standards.

**Infiltration/Flow Control:** All facilities must drain within 48 hours. Record time/date, weather, and conditions when ponding occurs.

**Pollution Prevention:** All sites must implement Best Management Practices to prevent contamination of stormwater. Call 503-823-7180 to report spills. Never wash spills into a stormwater facility. If contamination occurs, document the circumstances and the corrective action taken; include the time/date, weather, and site conditions.

**Vectors (Mosquitoes and Rats):** Stormwater facilities must not harbor mosquito larvae or rodents that pose a threat to public health or that undermine facility structures. Record the time/date, weather, and site conditions when vector activity observed. Record when vector abatement started and ended.

## Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed					Notes	Initials
		Clean inlets and Outlets	Sediment and Trash Removal	Plant Replacement type, location	Structural Repairs – type, location	Other		

## STANDARD O&M PLAN FOR THE SIMPLIFIED AND PRESUMPTIVE APPROACHES

### 3.1.1.9. Basins

Structural components must be operated and maintained in accordance with the design specifications.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Clogged inlets or outlets	Remove sediment, debris, and blockages from catch basins, trench drains, curb inlets, and pipes to maintain at least 50% conveyance at all times
Broken inlets or outlets, including grates	Repair or replace broken downspouts, curb cuts, standpipes, and screens as needed.
Cracked or exposed drain pipes	Repair or seal cracks. Replace when repair is insufficient. Cover with 6 inches of growing medium to prevent freeze/thaw and UV damage.
Check dams missing/broken	Maintain or replace rock check dams as per design specifications.
Perforated liner	Replace or repair liner as needed.
Vegetation must cover at least 90% of the facility at maturity.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Dead or stressed vegetation	Replant per original planting plan, or substitute from the plant list in <a href="#">Section 2.4.1</a> . Irrigate and mulch as needed; prune tall, dry grasses and remove clippings.
Tall grass and vegetation	Maintain grass height at 6"-9". Trim to allow sight lines and foot traffic, also to ensure inlets and outlets freely convey stormwater into and/or out of facility.
Weeds	Manually remove weeds.
Growing medium must sustain healthy plant cover and infiltrate within 48 hours.	
MAINTENANCE INDICATOR	CORRECTIVE ACTION
Gullies, erosion, exposed soil, sediment accumulation	Fill in and lightly compact areas of erosion with City-approved soil mix (see <a href="#">Section 2.3.6</a> ) and replant according to planting plan or substitute from the plant list in <a href="#">Section 2.4.1</a> . Erosion more than 2 inches deep must be addressed. Sediment more than 4 inches deep must be removed.
Scouring at the inlet(s)	Ensure splash blocks or inlet gravel/rock are adequate.
Slope slippage	Stabilize 3:1 slopes/banks with plantings from the original planting plan or from the plant list in <a href="#">Section 2.4.1</a> .
Ponding	Rake, till, or amend soil surface with City-approved soil mix to restore infiltration rate. Remove sediment at entrance.

### Annual Maintenance Schedule

<b>Summer</b>	Make structural repairs; clean gutters and downspouts; remove any build-up of weeds or organic debris.
<b>Fall</b>	Replant exposed soil and replace dead plants. Remove sediment and plant debris.
<b>Winter</b>	Clear gutters and downspouts.
<b>Spring</b>	Remove sediment and plant debris. Replant exposed soil and replace dead plants.
<b>All seasons</b>	Weed as necessary.

**Maintenance Records:** All facility operators are required to keep an inspection and maintenance log. Record date, description, and contractor (if applicable) for all repairs, landscape maintenance, and facility cleanout activities. Keep work orders and invoices on file and make available upon request of the City inspector.

**Fertilizers/Pesticides/Herbicides.** Their use is strongly discouraged because of the potential for damage to downstream systems. If pesticides or herbicides are required, use the services of a licensed applicator and products approved for aquatic use.

**Access:** Maintain ingress/egress per design standards.

**Infiltration/Flow Control:** All facilities must drain within 48 hours. Record time/date, weather, and conditions when ponding occurs.

**Pollution Prevention:** All sites must implement Best Management Practices to prevent contamination of stormwater. Call 503-823-7180 to report spills. Never wash spills into a stormwater facility. If contamination occurs, document the circumstances and the corrective action taken; include the time/date, weather, and site conditions.

**Vectors (Mosquitoes and Rats):** Facilities must not harbor mosquito larvae or rodents. Record the time/date, weather, and site conditions when vector activity is observed. Record when vector abatement started and ended.

## Operations and Maintenance Log

Date	Work Performed By	Type of Work Performed					Notes	Initials
		Clean inlets and Outlets	Sediment and Trash Removal	Plant Replacement type, location	Structural Repairs – type, location	Other		



**Geotechnical Investigation and Consultation Services**  
**Proposed Bonaventure of Milwaukie Development Site**  
**Tax Lot No's. 600 and 901**  
**13333 SE Rusk Road**  
**Milwaukie (Clackamas County), Oregon**

**for**

**Bonaventure**

**Project No. 1004.032.G**  
**September 28, 2018**



September 28, 2018

Mr. Daniel Dobson  
Development Project Manager  
Bonaventure  
3425 Boone Road SE  
Salem, Oregon 97317

Dear Mr. Dobson:

**Re: Geotechnical Investigation and Consultation Services, Proposed Bonaventure of Milwaukie Development Site, Tax Lot No's. 600 and 901, 13333 SE Rusk Road, Milwaukie (Clackamas County), Oregon**

Submitted herewith is our report entitled "Geotechnical Investigation and Consultation Services, Proposed Bonaventure of Milwaukie Development Site, Tax Lot No's. 600 and 901, 13333 SE Rusk Road, Milwaukie (Clackamas County), Oregon". The scope of our services was outlined in our formal proposal to Mr. Daniel Dobson of Bonaventure dated June 25, 2018. Written authorization of our services was provided by Mr. Daniel Dobson on August 16, 2018.

During the course of our investigation, we have kept you and/or others advised of our schedule and preliminary findings. We appreciate the opportunity to assist you with this phase of the project. Should you have any questions regarding this report, please do not hesitate to call.

Sincerely,



Daniel M. Redmond, P.E., G.E.  
President/Principal Engineer



09-12-31-18

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**GEOTECHNICAL INVESTIGATION AND CONSULTATION SERVICES  
PROPOSED BONAVENTURE OF MILWAUKIE SITE  
TAX LOT NO'S. 600 AND 901  
13333 SE RUSK ROAD  
MILWAUKIE (CLACKAMAS COUNTY) OREGON**

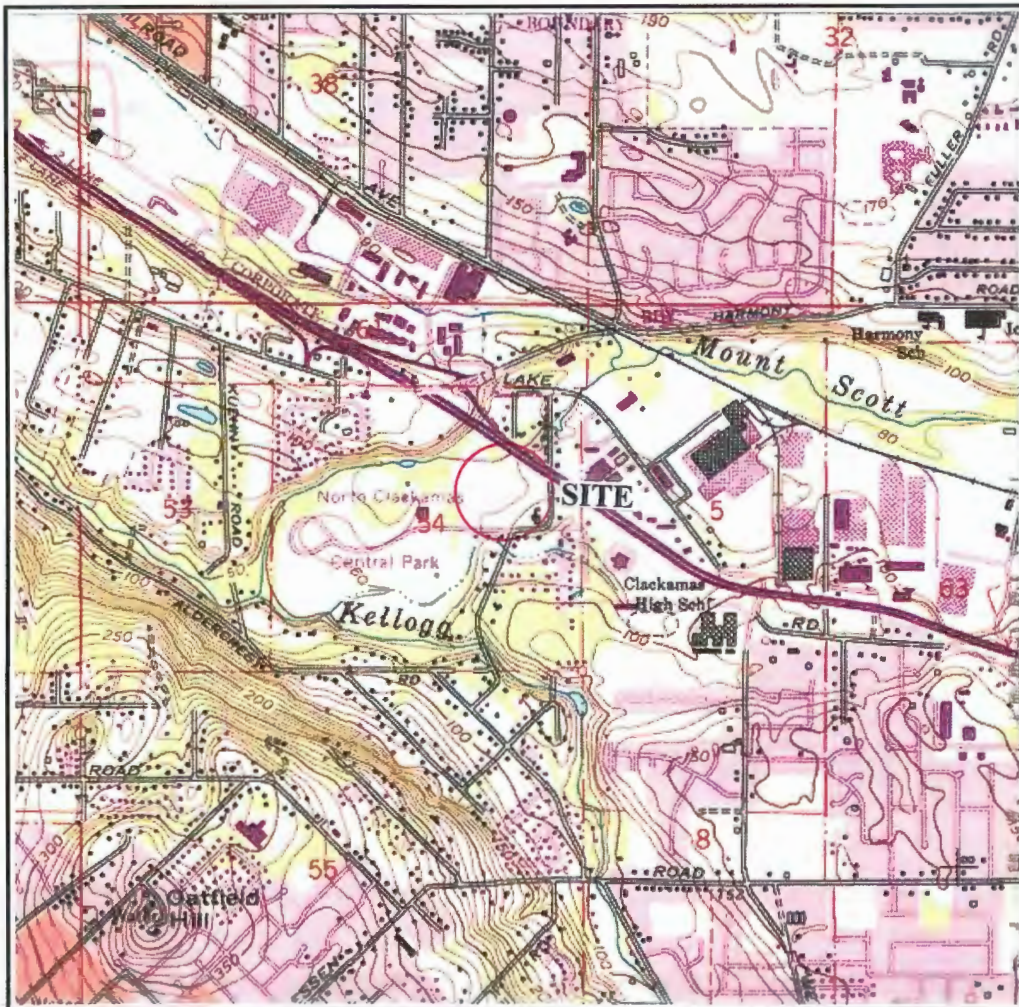
**INTRODUCTION**

Redmond Geotechnical Services, LLC is please to submit to you the results of our Geotechnical Investigation and Consultation Services at the site of the proposed new Bonaventure of Milwaukie development located to the west of SE Rusk Road and to the north of SE Kellogg Creek Drive in Milwaukie (Clackamas County), Oregon. The general location of the subject site is shown on the Site Vicinity Map, Figure No. 1. The purpose of our geotechnical investigation and consultation services at this time was to explore the existing subsurface soils and/or groundwater conditions across the subject site and to evaluate any potential concerns with regard to development at the site as well as to develop and/or provide appropriate geotechnical design and construction recommendations for the proposed new Bonaventure of Milwaukie development project.

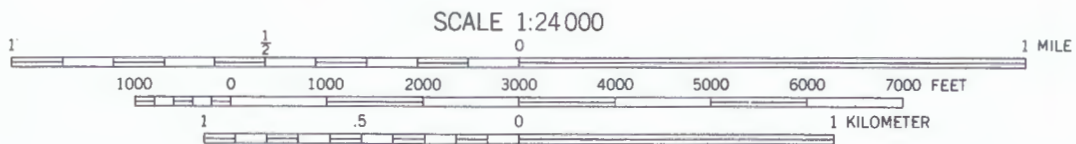
**PROJECT DESCRIPTION**

Although the project is still in the preliminary planning stages, we understand that present plans for the project is to develop the subject property into a new senior living and/or care facility. Specifically, we understand that the project will consist of the construction of a new single- and/or four-story senior living building which will be constructed with wood-framing and a concrete slab-on-grade floor system. The new senior care and/or living facility reportedly will total approximately 170,000 square feet and will include a single-story memory care (MC) wing totaling approximately 20 to 30 units, a three- and/or four-story assisted living and memory care (AL/MC) wing totaling approximately 50 to 60 units, and a three- and/or four-story independent living (IL) wing totaling approximately 70 to 80 units. Support of the new senior living and/or care facility structure is anticipated to consist primarily of conventional shallow strip (continuous) footings although some individual (column) footings may also be required. Structural loading information, although unavailable at this time, is anticipated to be fairly typical for this type of single- and/or four-story wood-frame structure and is expected to result in maximum dead plus live continuous (strip) and individual (column) footing loads on the order of about 2.0 to 4.0 kips per lineal foot (klf) and 15 to 125 kips, respectively.

Although a site grading plan is not available at this time, we understand that both cuts and/or fills are presently planned for the project. In general, both cuts and/or fills of less than five (5) feet are generally anticipated across the site.



GLADSTONE QUADRANGLE  
 OREGON  
 7.5 MINUTE SERIES (TOPOGRAPHIC)



CONTOUR INTERVAL 10 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929  
 DEPTH CURVES AND SOUNDINGS IN FEET—COLUMBIA RIVER DATUM

**SITE VICINITY MAP**

**BONAVENTURE OF MILWAUKIE  
 TL'S 600 & 901/13333 SE RUSK RD**

Project No. 1004.032.G

Figure No. 1

Other associated site improvements for the project will include construction of new paved access drives and parking areas. Additionally, the project will include the construction of new underground utility services and new concrete curbs and sidewalks as well as possible on-site storm water collection and/or disposal systems.

## **SCOPE OF WORK**

The purpose of our geotechnical studies was to evaluate the overall subsurface soil and/or groundwater conditions underlying the subject site with regard to the proposed new senior living and/or care facility development and construction at the site and any associated impacts or concerns with respect to development at the site as well as provide appropriate geotechnical design and construction recommendations for the project. Specifically, our geotechnical investigation included the following scope of work items:

1. Review of available and relevant geologic and/or geotechnical investigation reports for the subject site and/or area including a Geotechnical Engineering Report prepared by GeoPacific Engineering, Inc dated August 8, 2013 and a Geotechnical Evaluation prepared by GEO Consultants Northwest dated October 7, 2016.
2. A detailed field reconnaissance and subsurface exploration program of the soil and ground water conditions underlying the site by means of eleven (11) exploratory test pit excavations. The exploratory test pits were excavated to depths ranging from about five (5) to eight (8) feet beneath existing site grades at the approximate locations as shown on the Site Exploration Plan, Figure No. 2. Additionally, field infiltration testing was also performed within various test pits excavated across the subject site.
3. Laboratory testing to evaluate and identify pertinent physical and engineering properties of the subsurface soils encountered relative to the planned site development and construction at the site. The laboratory testing program included tests to help evaluate the natural (field) moisture content and dry density, maximum dry density and optimum moisture content, gradational characteristics, Atterberg Limits and (remolded) direct shear strength tests as well as consolidation and "R"-value tests.
4. A literature review and engineering evaluation and assessment of the regional seismicity to evaluate the potential ground motion hazard(s) at the subject site. The evaluation and assessment included a review of the regional earthquake history and sources such as potential seismic sources, maximum credible earthquakes, and reoccurrence intervals as well as a discussion of the possible ground response to the selected design earthquake(s), fault rupture, landsliding, liquefaction, and tsunami and seiche flooding.

5. Engineering analyses utilizing the field and laboratory data as a basis for furnishing recommendations for foundation support of the proposed new senior living structure. Recommendations include maximum design allowable contact bearing pressure(s), depth of footing embedment, estimates of foundation settlement, lateral soil resistance, and foundation subgrade preparation. Additionally, construction and/or permanent subsurface water drainage considerations have also been prepared. Further, our report includes recommendations regarding site preparation, placement and compaction of structural fill materials, suitability of the on-site soils for use as structural fill, criteria for import fill materials, and preparation of foundation, pavement and/or floor slab subgrades.
6. Flexible pavement design and construction recommendations for the proposed new private access drives and parking area improvements.

## **SITE CONDITIONS**

### **Site Geology**

The site is located within the Columbia River/Puget Sound lowland which is a broad structural depression situated between the Coast Range to the west and the Cascade Range to the east. A series of discontinuous faults subdivide the Columbia River basin 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.

Available geologic mapping of the area and/or subject site indicates that the near surface soils consist of fine grained alluvial soil deposits (Qff) comprised of crudely to complexly layered, poorly consolidated medium sand to silt deposited by one or more phases of catastrophic glacial outburst floods from late Pleistocene lake Missoula. Sediments of unit Qff occur along both sides of the Willamette and/or Columbia Rivers and throughout the Tualatin basin. The thickness of unit Qff is typically 30 to 60 feet with a maximum thickness of about 180 feet. However, the site is also underlain at relatively shallow depths by more recent alluvial deposits comprised of silty clay as well as silty and sandy gravel associated with the nearby Mount Scott and Kellogg Creek.

### **Surface Conditions**

The subject proposed new Bonaventure of Milwaukie development property consists of two (2) rectangular and/or irregular shaped tax lots (TL's 600 and 901) which encompass a total plan area of approximately 12 acres. The proposed Bonaventure of Milwaukie development property is roughly located to the west of SE Rusk Road and to the north of SE Kellogg Creek Drive. The subject property is presently unimproved and void of existing structures and/or site improvements.

Surface vegetation across the site generally consists of a light to moderate growth of grass, weeds and brush as well as several small to large sized trees across the northerly and westerly portions of the subject property. Additionally, the northerly and/or northwesterly portions of the subject property are generally low lying and contains an existing seasonal drainage basin and/or wetland.

Topographically, the site is characterized as relatively flat-lying to gently to moderately sloping terrain (10 to 20 percent) descending downward towards the north and west with overall topographic relief estimated at about ten (10) to fifteen (15) feet and is estimated to lie at about Elevation 70 feet.

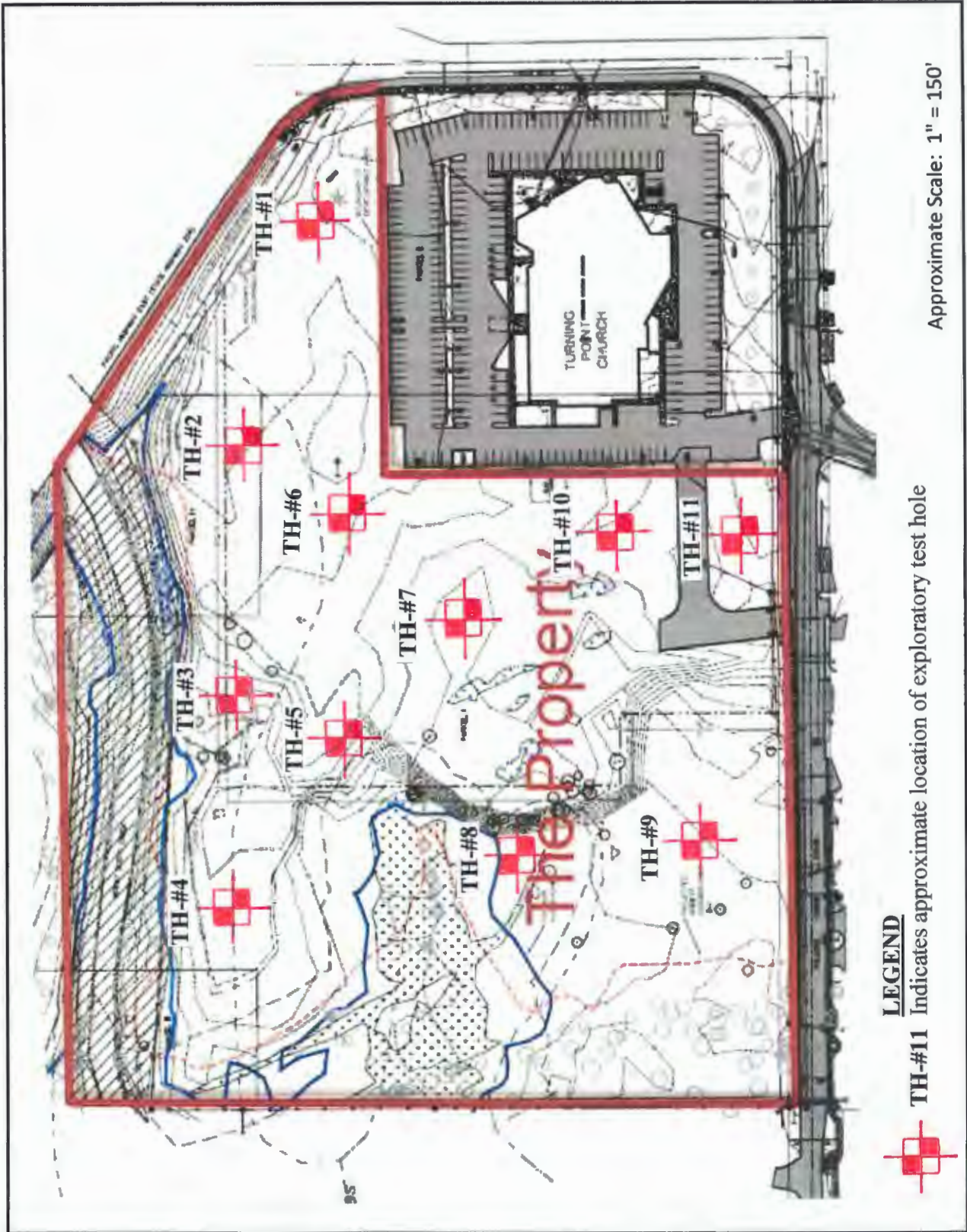
### **Subsurface Soil Conditions**

Our understanding of the subsurface soil conditions underlying the site was developed by means of eleven (11) exploratory test pits excavated to depths ranging from about five (5) to eight (8) feet beneath existing site grades on September 9, 2018 with a John Deere 200C track-mounted excavator. The location of the exploratory test pits were located in the field by marking off distances from existing and/or known site features and are shown in relation to the existing site features and/or site improvements on the Site Exploration Plan, Figure No. 2. Detailed logs of the test pit explorations, presenting conditions encountered at each location explored, are presented in the Appendix, Figure No's. A-5 through A-10.

The exploratory test pit excavations were observed by staff from Redmond Geotechnical Services, LLC who logged each of the test pit explorations and obtained representative samples of the subsurface soils encountered across the site. Additionally, the elevation of the exploratory test pit excavations were referenced from the USGS Map of the Gladstone Quadrangle and should be considered as approximate. All subsurface soils encountered at the site and/or within the exploratory test pit excavations were logged and classified in general conformance with the Unified Soil Classification System (USCS) which is outlined on Figure No. A-4.

The test pit explorations revealed that the subject site is underlain by both manmade fill soils and native soil deposits. Specifically, the test pit excavations found that much of the subject property contains fill soils consisting of a highly variable mixture of clay, silt, sand and gravel which also contained various amounts of construction debris (i.e., concrete and asphalt rubble) as well as organics and/or deleterious materials. The fill materials, which are believed to be undocumented, were found to be poorly to moderately compacted and ranged in depth from about 1.5 to at least 6.0 feet below the existing ground surface. However, the existing fill depth across the subject property has been reported at about 12 to 13 feet by others. The upper fill materials were found to be underlain by native soil deposits consisting of an upper layer of old topsoil remnants consisting of approximately 12 to 18 inches of dark brown to dark gray-brown, moist to very moist, slightly to moderately organic, soft to medium stiff, sandy, clayey silt. The old topsoil zone was in turn underlain by other native alluvial soil deposits consisting of an upper unit of medium to gray-brown, moist to very moist, medium stiff to medium dense, clayey, sandy silt to silty sand to depths of approximately 5.0 to 7.0 feet beneath the existing site and/or surface grades. These underlying clayey, sandy silt to silty sand subgrade soils are best characterized by relatively low to moderate strength and moderate compressibility. All soils were found to be underlain at depth by medium to gray-brown, moist to very moist, medium dense to dense, slightly clayey, silty and sandy gravel with cobbles to the maximum depth explored of 8.0 feet beneath the existing site and/or surface grades.





**SITE EXPLORATION PLAN**

**BONAVENTURE OF MILWAUKIE  
TL'S 600 & 901/13333 SE RUSK RD**

Project No. 1004.032.G

Figure No. 2

**LEGEND**

**TH-#11** Indicates approximate location of exploratory test hole

Approximate Scale: 1" = 150'

These underlying medium dense to dense gravel deposits are best characterized by relatively moderate to high strength and low compressibility.

### **Groundwater**

Groundwater was generally not encountered within any of the exploratory test pit explorations excavated across the site at the time of the excavations to depths of up to 8.0 feet beneath existing surface grades except. However, the test pits were excavated near the end of the dry season. Additionally, the northerly and northwesterly portions of the subject property are bounded by and/or contain an existing seasonal drainage basin and/or wetlands. Further, Mount Scott Creek and Kellogg Creek are located to the north and south of the subject property.

In this regard, groundwater elevations at the site may fluctuate seasonally in accordance with rainfall conditions and/or runoff associated with Mount Scott Creek and Kellogg Creek as well as changes in site utilization. Additionally, according to USGS mapping, the regional groundwater elevation in the vicinity of the subject property is at about Elevation 65 to Elevation 70 feet.

### **INFILTRATION TESTING**

We performed three (3) field infiltration tests at the site on September 9, 2018. The infiltration tests were performed in test holes TH-#1 , TH-#4 and TH-#9 at depths of between four (4) to six (6) feet beneath the existing site and/or surface grades. The subgrade soils encountered in the infiltration test hole consisted of clayey, sandy silt to silty sand. The infiltration testing was performed in general conformance with current EPA and/or the City of Milwaukie/Clackamas County Encased Falling Head test method which consisted of advancing a 6-inch diameter PVC pipe approximately 6 inches into the exposed soil horizon at each test location. Using a steady water flow, water was discharged into the pipe and allowed to penetrate and saturate the subgrade soils. The water level was adjusted over a two (2) hour period and allowed to achieve a saturated subgrade soil condition consistent with the bottom elevation of the surrounding test pit excavation. Following the required saturating period, water was again added into the PVC pipe and the time and/or rate at which the water level dropped was monitored and recorded. Each measurable drop in the water level was recorded until a consistent infiltration rate was observed and/or repeated.

Based on the results of the field infiltration testing at the site, we have found that the underlying native clayey, sandy silt to silty sand subgrade soil deposits possess an ultimate infiltration rate on the order of about 4 to 6 inches per hour (in/hr).

### **LABORATORY TESTING**

Representative samples of the on-site subsurface soils were collected at selected depths and intervals from various test pit excavations and returned to our laboratory for further examination and testing and/or to aid in the classification of the subsurface soils as well as to help evaluate and identify their engineering strength and compressibility characteristics.

The laboratory testing consisted of visual and textural sample inspection, moisture content and dry density determinations, maximum dry density and optimum moisture content, gradation analyses and Atterberg Limits as well as direct shear strength, consolidation and "R"-value tests. Results of the various laboratory tests are presented in the Appendix, Figure No's. A-11 through A-16.

## **SEISMICITY AND EARTHQUAKE SOURCES**

The seismicity of the southwest Washington and northwest Oregon area, and hence the potential for ground shaking, is controlled by three separate fault mechanisms. These include the Cascadia Subduction Zone (CSZ), the mid-depth intraplate zone, and the relatively shallow crustal zone. Descriptions of these potential earthquake sources are presented below.

The CSZ is located offshore and extends from northern California to British Columbia. Within this zone, the oceanic Juan de Fuca Plate is being subducted beneath the continental North American Plate to the east. The interface between these two plates is located at a depth of approximately 15 to 20 kilometers (km). The seismicity of the CSZ is subject to several uncertainties, including the maximum earthquake magnitude and the recurrence intervals associated with various magnitude earthquakes. Anecdotal evidence of previous CSZ earthquakes has been observed within coastal marshes along the Washington and Oregon coastlines. Sequences of interlayered peat and sands have been interpreted to be the result of large Subduction zone earthquakes occurring at intervals on the order of 300 to 500 years, with the most recent event taking place approximately 300 years ago. A study by Geomatrix (1995) and/or USGS (2008) suggests that the maximum earthquake associated with the CSZ is moment magnitude (Mw) 8 to 9. This is based on an empirical expression relating moment magnitude to the area of fault rupture derived from earthquakes that have occurred within Subduction zones in other parts of the world. An Mw 9 earthquake would involve a rupture of the entire CSZ. As discussed by Geomatrix (1995) this has not occurred in other subduction zones that have exhibited much higher levels of historical seismicity than the CSZ. However, the 2008 USGS report has assigned a probability of 0.67 for a Mw 9 earthquake and a probability of 0.33 for a Mw 8.3 earthquake. For the purpose of this study an earthquake of Mw 9.0 was assumed to occur within the CSZ.

The intraplate zone encompasses the portion of the subducting Juan de Fuca Plate located at a depth of approximately 30 to 50 km below western Washington and western Oregon. Very low levels of seismicity have been observed within the intraplate zone in western Oregon and western Washington. However, much higher levels of seismicity within this zone have been recorded in Washington and California. Several reasons for this seismic quiescence were suggested in the Geomatrix (1995) study and include changes in the direction of Subduction between Oregon, Washington, and British Columbia as well as the effects of volcanic activity along the Cascade Range. Historical activity associated with the intraplate zone includes the 1949 Olympia magnitude 7.1 and the 1965 Puget Sound magnitude 6.5 earthquakes. Based on the data presented within the Geomatrix (1995) report, an earthquake of magnitude 7.25 has been chosen to represent the seismic potential of the intraplate zone.

The third source of seismicity that can result in ground shaking within the Vancouver and southwest Washington area is near-surface crustal earthquakes occurring within the North American Plate. The historical seismicity of crustal earthquakes in this area is higher than the seismicity associated with the CSZ and the intraplate zone. The 1993 Scotts Mills (magnitude 5.6) and Klamath Falls (magnitude 6.0), Oregon earthquakes were crustal earthquakes.

### **Liquefaction**

Seismic induced soil liquefaction is a phenomenon in which loose, granular soils and some silty soils, located below the water table, develop high pore water pressures and lose strength due to ground vibrations induced by earthquakes. Soil liquefaction can result in lateral flow of material into river channels, ground settlements and increased lateral and uplift pressures on underground structures. Buildings supported on soils that have liquefied often settle and tilt and may displace laterally. Soils located above the ground water table cannot liquefy, but granular soils located above the water table may settle during the earthquake shaking.

Our review of the subsurface soil test pit logs from our exploratory field explorations (TH-#1 through TH-#11) and laboratory test results indicate that the site is generally underlain at depth by medium dense to dense, slightly clayey, silty and sandy gravel with cobbles deposits to depths of at least 8.0 feet beneath existing site grades. Additionally, groundwater was generally not encountered within any of the exploratory test pit excavations (TH-#1 through TH-#11) at the site during our field exploration work. As such, due to the medium dense to dense nature of the slightly clayey, silty and sandy gravel with cobbles subgrade soil deposits beneath the site, it is our opinion that the native subgrade soil deposits located beneath the subject site have a very low potential for liquefaction during the design earthquake motions previously described.

### **Landslides**

No ancient and/or active landslides were observed or are known to be present on the subject site. Additionally, the subject property does not contain any steep slopes. As such, development of the subject site into the planned senior living and/or care facility does not appear to present a potential geologic and/or landslide hazard provided that the site grading and development activities conform with the recommendations presented within this report.

### **Surface Rupture**

Although the site is generally located within a region of the country known for seismic activity, no known faults exist on and/or immediately adjacent to the subject site. The closest known faults to the subject property are the Oatfield Fault and the Portland Hills Fault which are sited approximately 0.2 miles and 1.5 miles to the southwest of the subject site, respectively, and the East Bank Fault which is sited approximately 3.0 miles to the northeast of the subject site. As such, the risk of surface rupture due to faulting is considered negligible.

### **Tsunami and Seiche**

A tsunami, or seismic sea wave, is produced when a major fault under the ocean floor moves vertically and shifts the water column above it. A seiche is a periodic oscillation of a body of water resulting in changing water levels, sometimes caused by an earthquake. Tsunami and seiche are not considered a potential hazard at this site because the site is not near to the coast and/or there are no adjacent significant bodies of water.

### **Flooding and Erosion**

Stream flooding is a potential hazard that should be considered in lowland areas of Lane County and Eugene. The FEMA (Federal Emergency Management Agency) flood maps should be reviewed as part of the design for the proposed new senior living and/or care facility structure and site improvements. Elevations of structures on the site should be designed based upon consultants reports, FEMA (Federal Emergency Management Agency), and Lane County requirements for the 100-year flood levels of any nearby creeks, streams and/or drainage basins.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **General**

Based on the results of our field explorations, laboratory testing, and engineering analyses, it is our opinion that the site is generally suitable for the proposed new Bonaventure of Milwaukie senior living and/or care facility development and its associated site improvements provided that the recommendations contained within this report are properly incorporated into the design and construction of the project.

The primary feature of concern at the site is the presence of the existing fill soil materials present across the site.

With regard to the existing fill soil materials present across the site, we understand that the existing fill soils were likely placed prior to 1995 during two (2) or more events and are "undocumented". Additionally, the existing fill materials were found to contain various amounts of construction debris (i.e., asphalt and concrete) as well as some organic matter. Further, the results of our field and laboratory work indicates that the existing fill soil materials are generally only moderately compacted. In addition to the above, the existing fill soil materials were found to be placed directly above the old topsoil zone which is characterized as soft to medium stiff and contains some organics. In this regard, due to the variable nature (composition) and/or depth (thickness) of the existing undocumented fill soil materials across the site, it is our professional opinion that construction of the proposed single- and/or four-story wood-frame structure directly on and/or above the existing undocumented fill soil materials would expose the proposed senior living and/or care facility of potential excessive post-construction settlements.

As such, we are of the opinion that the existing fill soil materials as well as the underlying old topsoil zone subgrade soils be removed in their entirety from beneath the proposed senior living and/or care facility down to an approved native subgrade soil following which the area over-excavated may then be filled with properly placed and compacted structural fill materials back to the required design grades and/or elevations.

Secondary features of concern for the project are 1) the moisture sensitive clayey and silty fill and/or native subgrade soils across and/or beneath the site and 2) the anticipated relatively high seasonal groundwater elevations beneath the subject property.

With regard to the moisture sensitive clayey and silty fill and/or native subgrade soils across and/or beneath the site, we are generally of the opinion that all site grading and earthwork activities be scheduled for the drier summer months which is typically June through September. In regards to the anticipated relatively high seasonal groundwater elevations beneath the subject property, we are again of the opinion that all site grading and earthwork associated with removal of the existing undocumented fill soil materials as well as the placement and compaction of any required structural fill soil be performed during the drier summer months.

The following sections of this report provide specific recommendations regarding subgrade preparation and grading as well as foundation and floor slab design and construction for the new Bonaventure of Milwaukie senior living and/or care facility development project.

### **Site Preparation**

As an initial step in site preparation, we recommend that the proposed new senior living and/or care facility building as well as its associated structural and/or site improvement area(s) be stripped and cleared of all existing improvements, any existing unsuitable fill materials, surface debris, existing vegetation, topsoil materials, and/or any other deleterious materials present at the time of construction. In general, we envision that the site stripping to remove existing vegetation and topsoil materials will generally be about 16 to 12 inches. However, localized areas requiring deeper removals, such as the existing undocumented and/or unsuitable fill materials as well as the old topsoil remnants located within the proposed senior living and/or care facility building foot print, will likely be encountered and should be evaluated at the time of construction by the Geotechnical Engineer. The stripped and cleared materials should be properly disposed of as they are generally considered unsuitable for use/reuse as fill materials.

Following the completion of the site stripping and clearing work and prior to the placement of any required structural fill materials and/or structural improvements, the exposed subgrade soils within the planned structural improvement area(s) should be inspected and approved by the Geotechnical Engineer and possibly proof-rolled with a half and/or fully loaded dump truck. Areas found to be soft or otherwise unsuitable should be over-excavated and removed or scarified and recompacted as structural fill. During wet and/or inclement weather conditions, proof rolling and/or scarification and recompaction as noted above may not be appropriate.

The on-site native clayey, sandy silt and/or silty sand subgrade soil materials are generally considered suitable for use/reuse as structural fill materials provided that they are free of organic materials, debris, and rock fragments in excess of about 6 inches in dimension. However, if site grading is performed during wet or inclement weather conditions, the use of some of the on-site native soil materials which contain significant silt and clay sized particles will be difficult at best. In this regard, during wet or inclement weather conditions, we recommend that an import structural fill material be utilized which should consist of a free-draining (clean) granular fill (sand & gravel) containing no more than about 5 percent fines. Representative samples of the materials which are to be used as structural fill materials should be submitted to the Geotechnical Engineer and/or laboratory for approval and determination of the maximum dry density and optimum moisture content for compaction.

In general, all site earthwork and grading activities should be scheduled for the drier summer months (June through September) if possible. However, if wet weather site preparation and grading is required, it is generally recommended that the stripping of topsoil materials be accomplished with a tracked excavator utilizing a large smooth-toothed bucket working from areas yet to be excavated. Additionally, the loading of strippings into trucks and/or protection of moisture sensitive subgrade soils will also be required during wet weather grading and construction. In this regard, we recommend that areas in which construction equipment will be traveling be protected by covering the exposed subgrade soils with a geotextile fabric such as Mirafi FW404 followed by at least 12 inches or more of crushed aggregate base rock. Further, the geotextile fabric should have a minimum Mullen burst strength of at least 250 pounds per square inch for puncture resistance and an apparent opening size (AOS) between the U.S. Standard No. 70 and No. 100 sieves.

All structural fill materials placed within the new building and/or pavement areas should be moistened or dried as necessary to near (within 3 percent) optimum moisture conditions and compacted by mechanical means to a minimum of 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Structural fill materials should be placed in lifts (layers) such that when compacted do not exceed about 8 inches. Additionally, all fill materials placed within five (5) lineal feet of the perimeter (limits) of the proposed senior living and/or care facility structure and/or pavements should be considered structural fill. Additionally, due to the sloping site conditions, we recommend that all structural fill materials planned in areas where existing surface and/or slope gradients exceed about 20 percent (1V:5H) be properly benched and/or keyed into the native (natural) slope subgrade soils. In general, a bench width of at least eight (8) feet and a keyway depth of at least one (1) foot is recommended. However, the actual bench width and keyway depth should be determined at the time of construction by the Geotechnical Engineer. Further, all fill slopes should be constructed with a finish slope surface gradient no steeper than about 2H:1V.

All aspects of the site grading, including a review of the proposed site grading plan(s), should be approved and/or monitored by a representative of Redmond Geotechnical Services, LLC.

## **Foundation Support**

Based on the results of our investigation, it is our opinion that the site of the proposed new Bonaventure of Milwaukie senior living and/or care facility development is generally suitable for support of the planned single- and/or four-story wood-frame structure provided that the following foundation design recommendations are followed. As previously noted, the subject site contains existing undocumented fill soil materials which are only moderately compacted and contain various amounts of construction debris as well as organics and/or other deleterious materials. Additionally, the existing fill soil materials are underlain by the old topsoil zone which are also considered to be moderately compressible. In this regard, in order to prevent the potential for excessive post-construction settlements, we are of the opinion that the proposed new senior living and/or care facility not be supported directly by the existing fill soils materials. As such, it is our professional opinion that all of the existing undocumented fill materials as well as the underlying old topsoil remnants be removed in their entirety from beneath the proposed building area down to an approved native subgrade soil following which the area over-excavated can then be filled to the required design grades and/or elevations with properly placed and compacted structural fill materials.

The following sections of this report present specific foundation design and construction recommendations for the planned new senior living and/or care facility structure.

### **Shallow Foundations**

In general, conventional shallow continuous (strip) footings and individual (spread) column footings may be supported by approved native (untreated) subgrade soil materials and/or by properly placed and compacted structural fill soils based on an allowable contact bearing pressure of about 2,500 pounds per square foot (psf). This recommended allowable contact bearing pressure is intended for dead loads and sustained live loads and may be increased by one-third for the total of all loads including short-term wind or seismic loads. In general, continuous strip footings should have a minimum width of at least 16 inches and be embedded at least 18 inches below the lowest adjacent finish grade (includes frost protection). Individual column footings (where required) should be embedded at least 18 inches below grade and have a minimum width of at least 24 inches. Additionally, if foundation excavation and construction work is planned to be performed during wet and/or inclement weather conditions, we recommend that a 2 to 4 inch layer of compacted crushed rock be used to help protect the exposed foundation bearing surfaces until the placement of concrete.

Total and differential settlements of foundations constructed as recommended above and supported by approved native subgrade soils or by properly compacted structural fill materials are expected to be well within the tolerable limits for this type of single- and/or four- wood-frame structure and should generally be less than about 1-inch and 1/2-inch, respectively.



Allowable lateral frictional resistance between the base of the footing element and the supporting subgrade bearing soil can be expressed as the applied vertical load multiplied by a coefficient of friction of 0.30 and 0.45 for native silty subgrade soils and/or import gravel fill materials, respectively. In addition, lateral loads may be resisted by passive earth pressures on footings poured “neat” against in-situ (native) subgrade soils or properly backfilled with structural fill materials based on an equivalent fluid density of 300 pounds per cubic foot (pcf). This recommended value includes a factor of safety of approximately 1.5 which is appropriate due to the amount of movement required to develop full passive resistance.

### **Floor Slab Support**

In order to provide uniform subgrade reaction beneath concrete slab-on-grade floors, we recommend that the floor slab area be underlain by a minimum of 6 inches of free-draining (less than 5 percent passing the No. 200 sieve), well-graded, crushed rock. The crushed rock should help provide a capillary break to prevent migration of moisture through the slab. However, additional moisture protection can be provided by using a 10-mil polyolefin geo-membrane sheet such as StegoWrap.

The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Where floor slab subgrade materials are undisturbed, firm and stable and where the underslab aggregate base rock section has been prepared and compacted as recommended above, we recommend that a modulus of subgrade reaction of 150 pci be used for design.

### **Retaining/Below Grade Walls**

Retaining and/or below grade walls should be designed to resist lateral earth pressures imposed by native soils or granular backfill materials as well as any adjacent surcharge loads. For walls which are unrestrained at the top and free to rotate about their base, we recommend that active earth pressures be computed on the basis of the following equivalent fluid densities:

#### **Non-Restrained Retaining Wall Pressure Design Recommendations**

<b>Slope Backfill (Horizontal/Vertical)</b>	<b>Equivalent Fluid Density/Silt (pcf)</b>	<b>Equivalent Fluid Density/Gravel (pcf)</b>
Level	35	30
3H:1V	60	50
2H:1V	90	80

For walls which are fully restrained at the top and prevented from rotation about their base, we recommend that at-rest earth pressures be computed on the basis of the following equivalent fluid densities:

**Restrained Retaining Wall Pressure Design Recommendations**

<b>Slope Backfill (Horizontal/Vertical)</b>	<b>Equivalent Fluid Density/Silt (pcf)</b>	<b>Equivalent Fluid Density/Gravel (pcf)</b>
Level	45	35
3H:1V	65	60
2H:1V	95	90

The above recommended values assume that the walls will be adequately drained to prevent the buildup of hydrostatic pressures. Where wall drainage will not be present and/or if adjacent surcharge loading is present, the above recommended values will be significantly higher.

Backfill materials behind walls should be compacted to 90 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Special care should be taken to avoid over-compaction near the walls which could result in higher lateral earth pressures than those indicated herein. In areas within three (3) to five (5) feet behind walls, we recommend the use of hand-operated compaction equipment.

**Pavements**

Flexible pavement design for the project was determined on the basis of projected (anticipated) traffic volume and loading conditions relative to laboratory subgrade soil strength ("R"-value) characteristics. Based on an average laboratory subgrade "R"-value of 30 (Resilient Modulus = 5,000 to 10,000) and utilizing the Asphalt Institute Flexible Pavement Design Procedures and/or the American Association of State Highway and Transportation Officials (AASHTO) 1993 "Design of Pavement Structures" manual, we recommend that the asphaltic concrete pavement section(s) for the new senior living and/or care facility development areas at the site consist of the following:

	<b><u>Asphaltic Concrete Thickness (inches)</u></b>	<b><u>Crushed Base Rock Thickness (inches)</u></b>
Automobile Parking Areas	3.0	8.0
Automobile Drive Areas	3.5	10.0

Note: Where heavy vehicle traffic is anticipated such as those required for fire and/or garbage trucks, we recommend that the automobile drive area pavement section be increased by adding 0.5 inches of asphaltic concrete and 2.0 inches of aggregate base rock. Additionally, the above recommended flexible pavement section(s) assumes a design life of 20 years.

**Pavement Subgrade, Base Course & Asphalt Materials**

The above recommended pavement section(s) were based on the design assumptions listed herein and on the assumption that construction of the pavement section(s) will be completed during an extended period of reasonably dry weather.

All thicknesses given are intended to be the minimum acceptable. Increased base rock sections and the use of a woven geotextile fabric may be required during wet and/or inclement weather conditions and/or in order to adequately support construction traffic and protect the subgrade during construction. Additionally, the above recommended pavement section(s) assume that the subgrade will be prepared as recommended herein, that the exposed subgrade soils will be properly protected from rain and construction traffic, and that the subgrade is firm and unyielding at the time of paving. Further, it assumes that the subgrade is graded to prevent any ponding of water which may tend to accumulate in the base course.

Pavement base course materials should consist of well-graded 1-1/2 inch and/or 3/4-inch minus crushed base rock having less than 5 percent fine materials passing the No. 200 sieve. The base course and asphaltic concrete materials should conform to the requirements set forth in the latest edition of the Oregon Department of Transportation, Standard Specifications for Highway Construction. The base course materials should be compacted to at least 95 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. The asphaltic concrete paving materials should be compacted to at least 92 percent of the theoretical maximum density as determined by the ASTM D-2041 (Rice Gravity) test method.

#### **Wet Weather Grading and Soft Spot Mitigation**

Construction of the proposed new paved site improvements is generally recommended during dry weather. However, during wet weather grading and construction, excavation to subgrade can proceed during periods of light to moderate rainfall provided that the subgrade remains covered with aggregate. A total aggregate thickness of 8- to 12-inches may be necessary to protect the subgrade soils from heavy construction traffic. Construction traffic should not be allowed directly on the exposed subgrade but only atop a sufficient compacted base rock thickness to help mitigate subgrade pumping. If the subgrade becomes wet and pumps, no construction traffic shall be allowed on the road alignment. Positive site drainage shall be maintained if site paving will not occur before the on-set of the wet season.

Depending on the timing for the project, any soft subgrade found during proof-rolling or by visual observations can either be removed and replaced with properly dried and compacted fill soils or removed and replaced with compacted crushed aggregate. However, and where approved by the Geotechnical Engineer, the soft area may be covered with a bi-axial geogrid and covered with compacted crushed aggregate.

#### **Soil Shrink-Swell and Frost Heave**

The results of the laboratory "R"-value tests indicate that the native subgrade and/or existing fill soils possess a low to moderate expansion potential. As such, the exposed subgrade soils should not be allowed to completely dry and should be moistened to near optimum moisture content (plus or minus 3 percent) at the time of the placement of the crushed aggregate base rock materials.

Additionally, exposure of the subgrade soils to freezing weather may result in frost heave and softening of the subgrade. As such, all subgrade soils exposed to freezing weather should be evaluated and approved by the Geotechnical Engineer prior to the placement of the crushed aggregate base rock materials.

### **Excavation/Slopes**

Temporary excavations of up to about four (4) feet in depth may be constructed with near vertical inclinations. Temporary excavations greater than about four (4) feet but less than eight (8) feet should be excavated with inclinations of at least 1 to 1 (horizontal to vertical) or properly braced/shored. Where excavations are planned to exceed about eight (8) feet, this office should be consulted. All shoring systems and/or temporary excavation bracing for the project should be the responsibility of the excavation contractor. Permanent slopes should be constructed no steeper than about 2H to 1V unless approved by the Geotechnical Engineer.

Depending on the time of year in which trench excavations occur, trench dewatering may be required in order to maintain dry working conditions if the invert elevations of the proposed utilities are located at and/or below the groundwater level. If groundwater is encountered during utility excavation work, we recommend placing trench stabilization materials along the base of the excavation. Trench stabilization materials should consist of 1-foot of well-graded gravel, crushed gravel, or crushed rock with a maximum particle size of 4 inches and less than 5 percent fines passing the No. 200 sieve. The material should be free of organic matter and other deleterious material and placed in a single lift and compacted until well keyed.

### **Surface Drainage/Groundwater**

We recommend that positive measures be taken to properly finish grade the site so that drainage waters from the senior living and/or care facility structure and landscaping areas as well as adjacent properties or buildings are directed away from the new structures foundations and/or floor slabs. All roof drainage should be directed into conduits that carry runoff water away from the senior living and/or care facility structure to a suitable outfall. Roof downspouts should not be connected to foundation drains. A minimum ground slope of about 2 percent is generally recommended in unpaved areas around the proposed new structure.

Groundwater was not encountered at the site within any of the exploratory test pits excavated across the site at the time of excavation to depths of at least 8.0 feet beneath existing site grades. However, the northerly and/or northwesterly portions of the site are bounded by an existing seasonal drainage basin and/or wetland. Additionally, although groundwater elevations in the area and/or across the subject property may fluctuate seasonally and may temporarily pond/perch near the ground surface during periods of prolonged rainfall, the depth to the seasonal high groundwater is approximately Elevation 65 to Elevation 70 feet.

As such, based on our current understand of the possible site grading required to bring the subject site to finish design grade(s), we are of the opinion that an underslab drainage system is generally not required for the proposed senior living and/or care facility structure. However, a perimeter foundation drain is recommended for any perimeter footings and/or below grade retaining walls. A typical recommended perimeter footing/retaining wall drain detail is shown on Figure No. 3.

Further, due to our anticipation that various surface infiltration ditches and/or swales may be utilized for the project as well as the relatively low infiltration rates of the anticipated new structural fill soil materials within and/or near to the foundation bearing level of the proposed senior living and/or care facility structure, we are generally of the opinion that storm water detention and/or disposal systems should not be utilized around and/or up-gradient of the proposed senior living and/or care facility structure unless approved by the Geotechnical Engineer.

### **Design Infiltration Rates**

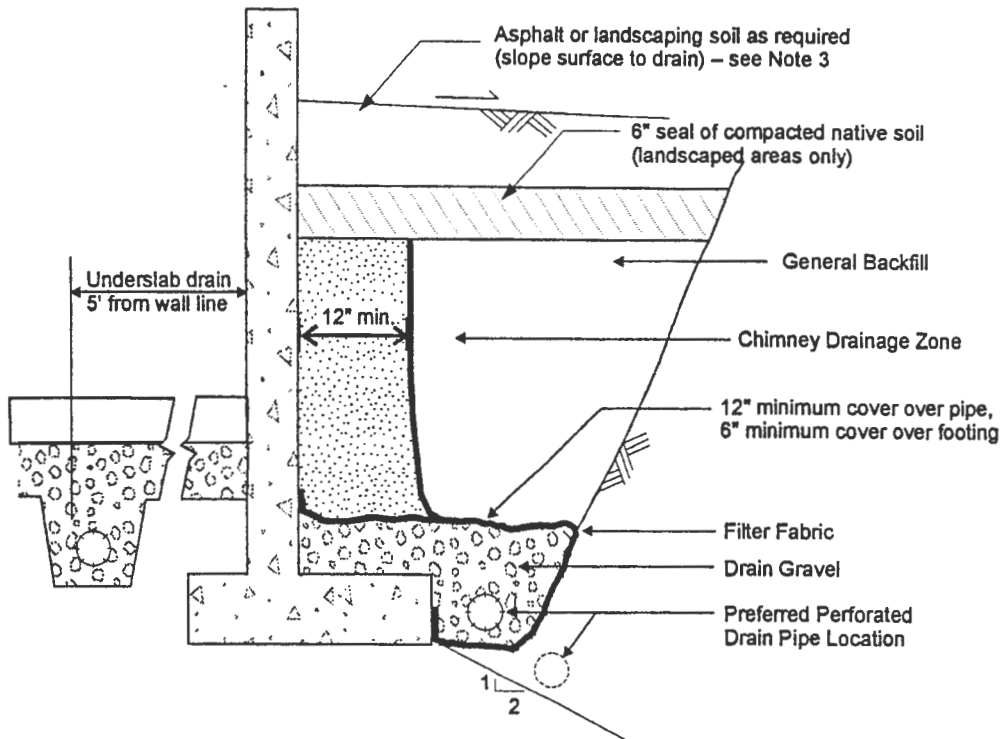
Based on the results of our field infiltration testing, we recommend using the following infiltration rate to design any on-site subsurface storm water infiltration and/or disposal systems for the project:

<b>Subgrade Soil Type</b>	<b>Recommended Infiltration Rate</b>
clayey, sandy SILT/silty SAND (ML/SM)	2 to 3 inches per hour (in/hr)

Note: A safety factor of two (2) was used to calculate the above recommended design infiltration rate. Additionally, given the gradational variability of the native clayey, sandy silt to silty sand subgrade soils beneath the site as well as the anticipation of some site grading for the project, it is generally recommended that field testing be performed during and/or following construction of any on-site storm water infiltration system(s) in order to confirm that the above recommended design infiltration rates are appropriate.

### **Seismic Design Considerations**

Structures at the site should be designed to resist earthquake loading in accordance with the methodology described in the 2014 and/or latest edition of the State of Oregon Structural Specialty Code (OSSC) and/or Amendments to the 2015 International Building Code (IBC). The maximum considered earthquake ground motion for short period and 1.0 period spectral response may be determined from the Oregon Structural Specialty Code and/or from the National Earthquake Hazard Reduction Program (NEHRP) "Recommended Provisions for Seismic Regulations for New Buildings and Other Structures" published by the Building Seismic Safety Council. We recommend Site Class "D" be used for design. Using this information, the structural engineer can select the appropriate site coefficient values ( $F_a$  and  $F_v$ ) from the 2015 IBC to determine the maximum considered earthquake spectral response acceleration for the project. However, we have assumed the following response spectrum for the project:



**SCHEMATIC - NOT TO SCALE**

**NOTES:**

1. Filter Fabric to be non-woven geotextile (Amoco 4545, Mirafi 140N, or equivalent)
2. Lay perforated drain pipe on minimum 0.5% gradient, widening excavation as required. Maintain pipe above 2:1 slope, as shown.
3. All-granular backfill is recommended for support of slabs, pavements, etc. (see text for structural fill).
4. Drain gravel to be clean, washed ¾" to 1½" gravel.
5. General backfill to be on-site gravels, or ¾"-0 or 1½"-0 crushed rock compacted to 92% Modified Proctor (AASHTO T-180).
6. Chimney drainage zone to be 12" wide (minimum) zone of clean washed, medium to coarse sand or drain gravel if protected with filter fabric. Alternatively, prefabricated drainage structures (Miradrain 6000 or similar) may be used.

**PERIMETER FOOTING/RETAINING WALL DRAIN DETAIL**

Project No. 1004.032.G

**BONAVENTURE OF MILWAUKIE  
TL'S 600 & 901/13333 SE RUSK RD**

Figure No. 3

**Table 1. Recommended Seismic Design Parameters**

Site Class	S <sub>s</sub>	S <sub>1</sub>	F <sub>a</sub>	F <sub>v</sub>	S <sub>MS</sub>	S <sub>M1</sub>	S <sub>DS</sub>	S <sub>D1</sub>
D	0.965	0.412	1.114	1.588	1.075	0.654	0.717	0.436

Notes: 1. S<sub>s</sub> and S<sub>1</sub> were established based on the USGS 2015 mapped maximum considered earthquake spectral acceleration maps for 2% probability of exceedence in 50 years.

2. F<sub>a</sub> and F<sub>v</sub> were established based on IBC 2015 tables using the selected S<sub>s</sub> and S<sub>1</sub> values.

### **CONSTRUCTION MONITORING AND TESTING**

We recommend that **Redmond Geotechnical Services, LLC** be retained to provide construction monitoring and testing services during all earthwork operations for the proposed new Bonaventure of Milwaukie senior living and/or care facility development. The purpose of our monitoring services would be to confirm that the site conditions reported herein are as anticipated, provide field recommendations as required based on the actual conditions encountered, document the activities of the grading contractor and assess his/her compliance with the project specifications and recommendations. It is important that our representative meet with the contractor prior to any site grading to help establish a plan that will minimize costly over-excavation and site preparation work. Of primary importance will be observations made during site preparation and stripping, structural fill placement, footing excavations and construction as well as retaining wall backfill.

### **CLOSURE AND LIMITATIONS**

This report is intended for the exclusive use of the addressee and/or their representative(s) to use to design and construct the proposed new Bonaventure of Milwaukie senior living and/or care facility structure and its associated site improvements described herein as well as to prepare any related construction documents. The conclusions and recommendations contained in this report are based on site conditions as they presently exist and assume that the explorations are representative of the subsurface conditions between the explorations and/or at other locations across the study area. The data, analyses, and recommendations herein may not be appropriate for other structures and/or purposes. We recommend that parties contemplating other structures and/or purposes contact our office. In the absence of our written approval, we make no representation and assume no responsibility to other parties regarding this report. Additionally, the above recommendations are contingent on Redmond Geotechnical Services, LLC being retained to provide all site inspections and construction monitoring services for this project. Redmond Geotechnical Services, LLC will not assume any responsibility and/or liability for any engineering judgment, inspection and/or testing services performed by others.

It is the owners/developers responsibility for insuring that the project designers and/or contractors involved with this project implement our recommendations into the final design plans, specifications and/or construction activities for the project. Further, in order to avoid delays during construction, we recommend that the final design plans and specifications for the project be reviewed by our office to evaluate as to whether our recommendations have been properly interpreted and incorporated into the project.

If during any future site grading and construction, subsurface conditions different from those encountered in the explorations are observed or appear to be present beneath excavations, we should be advised immediately so that we may review these conditions and evaluate whether modifications of the design criteria are required. We also should be advised if significant modifications of the proposed site development are anticipated so that we may review our conclusions and recommendations.

### **LEVEL OF CARE**

The services performed by the Geotechnical Engineer for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in the area under similar budget and time restraints. No warranty or other conditions, either expressed or implied, is made.



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# **Appendix "A"**

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**Test Pit Logs and Laboratory Test Data**

## **APPENDIX**

### **FIELD EXPLORATIONS AND LABORATORY TESTING**

#### **FIELD EXPLORATION**

Subsurface conditions at the site were explored by excavating eleven (11) exploratory test pits (TH-#1 through TH-#11) on September 7, 2018. The approximate location of the test pit explorations are shown in relation to the existing site improvements on the Site Exploration Plan, Figure No. 2.

The test pits were excavated using track-mounted excavating equipment in general conformance with ASTM Methods in Vol. 4.08, D-1586-94 and D-1587-83. The test pits were excavated to depths ranging from about 5.0 to 8.0 feet beneath existing site grades. Detailed logs of the test pits are presented on the Log of Test Pits, Figure No's. A-5 through A-10. The soils were classified in accordance with the Unified Soil Classification System (USCS), which is outlined on Figure No. A-4.

The exploration program was coordinated by a field engineer who monitored the excavating and exploration activity, obtained representative samples of the subsurface soils encountered, classified the soils by visual and textural examination, and maintained continuous logs of the subsurface conditions. Disturbed and/or undisturbed samples of the subsurface soils were obtained at appropriate depths and/or intervals and placed in plastic bags and/or with a thin walled ring sample.

Groundwater was not encountered within any of the exploratory test pits (TH-#1 through TH-#11) excavated at the site at the time of excavating to depths of up to 8.0 feet beneath existing surface grades.

#### **LABORATORY TESTING**

Pertinent physical and engineering characteristics of the soils encountered during our subsurface investigation were evaluated by a laboratory testing program to be used as a basis for selection of soil design parameters and for correlation purposes. Selected tests were conducted on representative soil samples. The program consisted of tests to evaluate the existing (in-situ) moisture-density, maximum dry density and optimum moisture content, gradational characteristics, and Atterberg Limits as well as direct shear strength, consolidation and "R"-value tests.

##### **Dry Density and Moisture Content Determinations**

Density and moisture content determinations were performed on both disturbed and relatively undisturbed samples from the test pit explorations in general conformance with ASTM Vol. 4.08 Part D-216. The results of these tests were used to calculate existing overburden pressures and to correlate strength and compressibility characteristics of the soils. Test results are shown on the test pit logs at the appropriate sample depths.

### **Maximum Dry Density**

Two (2) Maximum Dry Density and Optimum Moisture Content tests were performed on representative samples of the on-site sandy, clayey silt subgrade soils in accordance with ASTM Vol. 4.08 Part D-1557. This test was conducted to help establish various engineering properties for use as structural fill. The test results are presented on Figure No. A-11.

### **Atterberg Limits**

Two (2) Liquid Limit (LL) and Plastic Limit (PL) tests were performed on representative samples of the clayey, sandy silt and/or silty sand subgrade soils in accordance with ASTM Vol. 4.08 Part D-4318-85. These tests were conducted to facilitate classification of the soils and for correlation purposes. The test results appear on Figure No. A-12.

### **Gradation Analysis**

Two (2) Gradation analyses were performed on representative samples of the subsurface soils in accordance with ASTM Vol. 4.08 Part D-422. The test results were used to classify the soil in accordance with the Unified Soil Classification System (USCS). The test results are shown graphically on Figure No. A-13.

### **Direct Shear Strength Test**

One (1) Direct Shear Strength test was performed on a undisturbed and/or remolded sample at a continuous rate of shearing deflection (0.02 inches per minute) in accordance with ASTM Vol. 4.08 Part D-3080-79. The test results were used to determine engineering strength properties and are shown graphically on Figure No. A-14.

### **Consolidation Test**

One (1) Consolidation test was performed on a representative sample of the sandy, clayey silt subgrade soil to assess the compressibility characteristics of the underlying subgrade soils in accordance with ASTM Vol. 4.08 Part D-2435-80.

Conventional loading increments of 100, 200, 400, ... 12,800 psf were applied after the 100 percent time of primary consolidation was identified for each loading increment. The samples were unloaded and allowed to rebound after the completion of the loading sequence. Deflection versus time readings were recorded for all load increments from 100 through 12,800 psf. The deflection corresponding to 100 percent primary consolidation was plotted on the consolidation strain versus consolidation pressure curve, which is presented on Figure No. A-15.

**"R"-Value Tests**

Two (2) "R"-value tests were performed on remolded subgrade soil samples in accordance with ASTM Vol. 4.08 Part D-2844. The test results were used to help evaluate the subgrade soils supporting and performance capabilities when subjected to traffic loading. The test results are shown on Figure No. A-16.

The following figures are attached and complete the Appendix:

Figure No. A-4	Key To Exploratory Test Pit Logs
Figure No's. A-5 through A-10	Log of Test Pits/Dynamic Cone
Figure No. A-11	Maximum Dry Density
Figure No. A-12	Atterberg Limits Test Results
Figure No. A-13	Gradation Test Results
Figure No. A-14	Direct Shear Strength Test Results
Figure No. A-15	Consolidation Test Results
Figure No. A-16	Results of "R"-Value Tests

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
			GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
		GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.	
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES	SP	Poorly graded sands or gravelly sands, little or no fines.
			SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty, or clayey fine sands or clayey silts with slight plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

### DEFINITION OF TERMS

SILTS AND CLAYS	U.S. STANDARD SERIES SIEVE			CLEAR SQUARE SIEVE OPENINGS			COBBLES	BOULDERS
	200	40	10	4	3/4"	3"		
	SAND			GRAVEL				
	FINE	MEDIUM	COARSE	FINE	COARSE			

### GRAIN SIZES

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT <sup>†</sup>
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CLAYS AND PLASTIC SILTS	STRENGTH <sup>‡</sup>	BLOWS/FOOT <sup>†</sup>
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

#### RELATIVE DENSITY

<sup>†</sup> Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

<sup>‡</sup> Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

#### CONSISTENCY

### KEY TO EXPLORATORY TEST PIT LOGS Unified Soil Classification System (ASTM D-2487)

BONAVENTURE OF MILWAUKIE  
Milwaukie, Oregon

PROJECT NO.	DATE	Figure A-4
1004.032.G	9/28/18	



DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. TH-#1	ELEVATION
0	X			13.1	GM		FILL: Gray-brown, dry, medium dense, crushed aggregate base rock
		ML/SM	FILL: Medium brown, moist, moderately compacted, clayey, sandy SILT to silty SAND with occasional debris				
5		ML	NATIVE GROUND: Dark gray-brown, moist, soft to medium stiff, sandy, clayey SILT with organics (Old Topsoil Zone)				
					ML/SM		Medium brown with gray mottling, moist to very moist, medium stiff to medium dense, clayey, sandy SILT to silty SAND
10							Total Depth = 5.0 feet No groundwater encountered at time of exploration

						TEST PIT NO. TH-#2	ELEVATION
0	X			12.8	ML/SM		FILL: Medium brown, damp to moist, poorly to moderately compacted, clayey, sandy SILT to silty SAND with occasional concrete debris and trace of organics
		ML	NATIVE GROUND: Dark gray-brown, moist, soft to medium stiff, sandy, clayey SILT with organics (Old Topsoil Zone)				
5		ML/SM	Gray-brown with brown mottling, moist to very moist, medium stiff to medium dense, clayey, sandy SILT to silty SAND				
10							Total Depth = 6.0 feet No groundwater encountered at time of exploration

**LOG OF TEST PITS**



DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION	
						TEST PIT NO. TH-#3	ELEVATION
0					GM	FILL: Gray-brown, damp to moist, poorly to moderately compacted, slightly clayey, silty and sandy GRAVEL with cobbles and trace of organics	
5					ML/SM	FILL: Medium brown, moist to very moist, poorly to moderately compacted, clayey, sandy SILT to silty SAND with occasional debris and trace of organics	
					ML	NATIVE GROUND: Dark gray-brown, very moist, soft, to medium stiff, sandy, clayey SILT with organics (Old Topsoil Zone)	
10					GM	Medium brown, very moist, medium dense to dense, slightly clayey, silty and sandy GRAVEL with cobbles	
						Total Depth = 7.0 feet No groundwater encountered at time of exploration	

						TEST PIT NO. TH-#4	ELEVATION
0					ML/SM	FILL: Medium brown, damp to moist, poorly to moderately compacted, clayey, sandy SILT to silty SAND with gravel and trace organics	
5					ML	NATIVE GROUND: Dark gray-brown, moist to very moist, soft to medium stiff, sandy, clayey SILT with organics (Old Topsoil Zone)	
					ML/SM	Medium brown with gray mottling, very moist to wet, soft to loose, clayey, sandy SILT to silty SAND	
10					GM	Gray-brown, very moist to wet, medium dense to dense, slightly clayey, silty and sandy GRAVEL with cobbles	
						Total Depth = 7.0 feet No groundwater encountered at time of exploration	

**LOG OF TEST PITS**

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#5
0	X	X	101.2	12.6	ML/SM	<u>FILL</u> : Medium brown, damp to moist, poorly to moderately compacted, clayey, sandy SILT to silty SAND with occasional gravel and debris
5	X			17.7	ML	<u>NATIVE GROUND</u> : Dark gray-brown, moist to very moist, soft to medium stiff, sandy, clayey SILT with trace organics (Old Topsoil Zone)
					GM	Dark gray-brown, very moist, medium dense to dense, slightly clayey, silty and sandy GRAVEL with cobbles
10						Total Depth = 7.0 feet No groundwater encountered at time of exploration

						TEST PIT NO. TH-#6	ELEVATION
0	X	X	97.7	13.4	ML/SM	<u>FILL</u> : Medium brown, damp to moist, poorly to moderately compacted, clayey, sandy SILT to silty SAND with occasional gravel and debris	
5	X			24.4	ML	<u>NATIVE GROUND</u> : Dark gray-brown, moist to very moist, soft to medium stiff, sandy, clayey SILT with organics (Old Topsoil Zone)	
					ML/SM	Medium brown with gray mottling, moist to very moist, medium stiff to medium dense, clayey, sandy SILT to silty SAND	
10						Total Depth = 7.0 feet No groundwater encountered at time of exploration	

**LOG OF TEST PITS**

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#7
0					ML / SM	<u>FILL</u> : Medium brown, damp to moist, poorly to moderately compacted, clayey, sandy SILT to silty SAND with concrete, brick and organics
5					GM	<u>FILL</u> : Gray-brown, moist, moderately compacted, slightly clayey, silty and sandy GRAVEL with cobbles and trace organics
					ML	<u>NATIVE GROUND</u> : Dark gray-brown, moist to very moist, soft to medium stiff, sandy, clayey SILT with organics (Old Topsoil Zone)
10					GM	Gray-brown, moist to very moist, medium dense to dense, slightly clayey, silty and sandy GRAVEL with cobbles
						Total Depth = 8.0 feet No groundwater encountered at time of exploration

						TEST PIT NO. TH-#8	ELEVATION
0					GM	<u>FILL</u> : Medium brown, moist, moderately compacted, slightly clayey, silty and sandy GRAVEL with cobbles and trace organics	
5	X			18.8	ML	<u>NATIVE GROUND</u> : Dark brown, moist to very moist, soft, organic, sandy, clayey SILT (Old Topsoil Zone)	
					SM / SP	Gray-brown to bluish-gray, very moist to wet, loose, silty to slightly silty, fine to medium SAND	
10					Total Depth = 7.0 feet No groundwater encountered at time of exploration		

**LOG OF TEST PITS**

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH_#9
0					ML/SM	FILL: Medium brown, damp to moist, poorly to moderately compacted, clayey, sandy SILT to silty SAND with gravel and miscellaneous construction debris
5					ML	NATIVE GROUND: Dark brown, moist to very moist, soft, organic, sandy, clayey SILT (Old Topsoil Zone)
					SM	Medium to olive-brown, very moist, loose to medium dense, silty, fine to medium SAND
10					GM	Gray-brown, very moist, medium dense to dense, slightly clayey, silty and sandy GRAVEL with cobbles
						Total Depth = 7.0 feet No groundwater encountered at time of exploration

						TEST PIT NO. TH-#10	ELEVATION
0	X	X	99.1	14.4	ML/SM	FILL: Medium brown, damp to moist, poorly to moderately compacted, clayey, sandy SILT to silty SAND with organics and construction debris	
5	X	X	90.3	17.7			
					ML	NATIVE GROUND: Dark gray-brown, very moist, soft to medium stiff, sandy, clayey SILT with organics (Old Topsoil Zone)	
10					SM	Gray-brown, very moist, loose to medium dense, slightly clayey, silty SAND	
						Total Depth = 8.0 feet No groundwater encountered at time of exploration	

**LOG OF TEST PITS**

PROJECT NO. 1004.032.G	BONAVENTURE OF MILWAUKIE	FIGURE NO. A-9
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DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#11 ELEVATION
0					ML/SM	<u>FILL</u> : Medium brown, moist, moderately compacted, clayey, sandy SILT to silty SAND with occasional gravel and trace organics
5					ML	<u>NATIVE GROUND</u> : Dark gray-brown, moist, soft to medium stiff, slightly organic, sandy, clayey SILT (Old Topsoil Zone)
					ML/SM	Medium brown with gray mottling, moist to very moist, medium stiff to medium dense, clayey, sandy SILT to silty SAND
10						Total Depth = 5.0 feet No groundwater encountered at time of exploration

TEST PIT NO.						ELEVATION					
0											
5											
10											
15											

**LOG OF TEST PITS**

**MAXIMUM DENSITY TEST RESULTS**

SAMPLE LOCATION	SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
TH-#5 @ 1.5'	Medium brown, clayey, sandy SILT to silty SAND with gravel (ML/SM)	110.0	17.0
TH-#10 @ 1.5'	Medium brown, clayey, sandy SILT to silty SAND with gravel (ML/SM)	112.0	16.0

**EXPANSION INDEX TEST RESULTS**

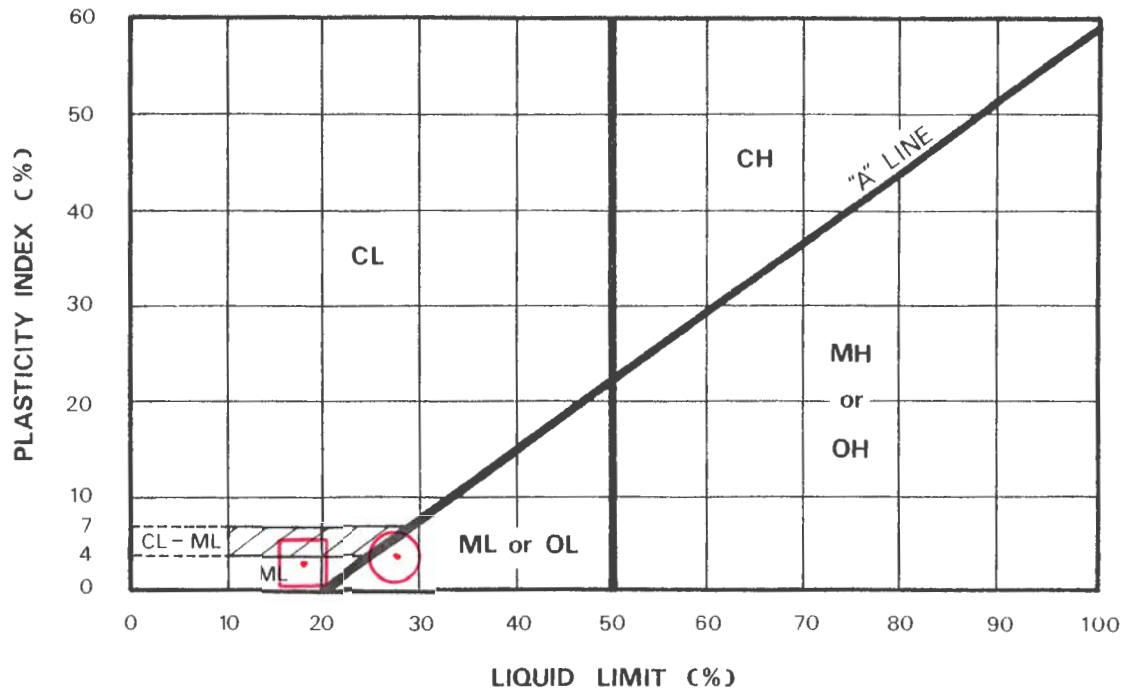
SAMPLE LOCATION	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (pcf)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (%)	EXPANSION INDEX	EXPANSIVE CLASS.

**MAXIMUM DENSITY & EXPANSION INDEX TEST RESULTS**

PROJECT NO.: 1004.032.G

BONAVENTURE OF MILWAUKIE

FIGURE NO.: A-11



KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	NATURAL WATER CONTENT %	LIQUID LIMIT %	PLASTICITY INDEX %	PASSING NO. 200 SIEVE %	LIQUIDITY INDEX	UNIFIED SOIL CLASSIFICATION SYMBOL
	TH-#6	5.5	24.4	27.8	4.1	60.3		ML
	TH-#8	5.5	18.8	18.5	3.7	23.2		SM



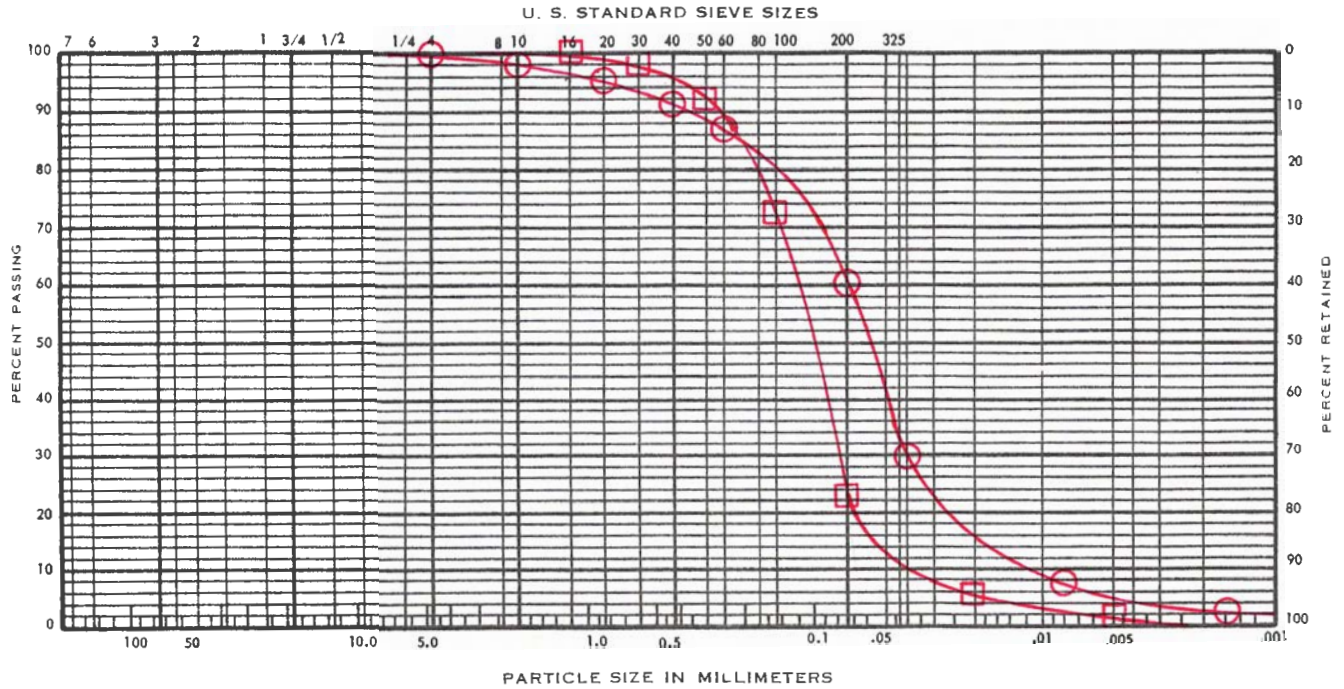
**PLASTICITY CHART AND DATA**

BONAVENTURE OF MILWAUKIE  
Milwaukie, Oregon

PROJECT NO.	DATE	Figure A-12
1004.032.G	9/28/18	

# UNIFIED SOIL CLASSIFICATION SYSTEM

(ASTM D 422-72)



COBBLES	GRAVEL		SAND			SILT AND CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

KEY SYMBOL	BORING NO.	SAMPLE DEPTH (feet)	ELEV. (feet)	UNIFIED SOIL CLASSIFICATION SYMBOL	SAMPLE DESCRIPTION
□	TH-#6	5.5		ML	Medium brown, clayey, sandy SILT to silty SAND
○	TH-#8	5.5		SM	Gray-brown, silty fine to medium SAND

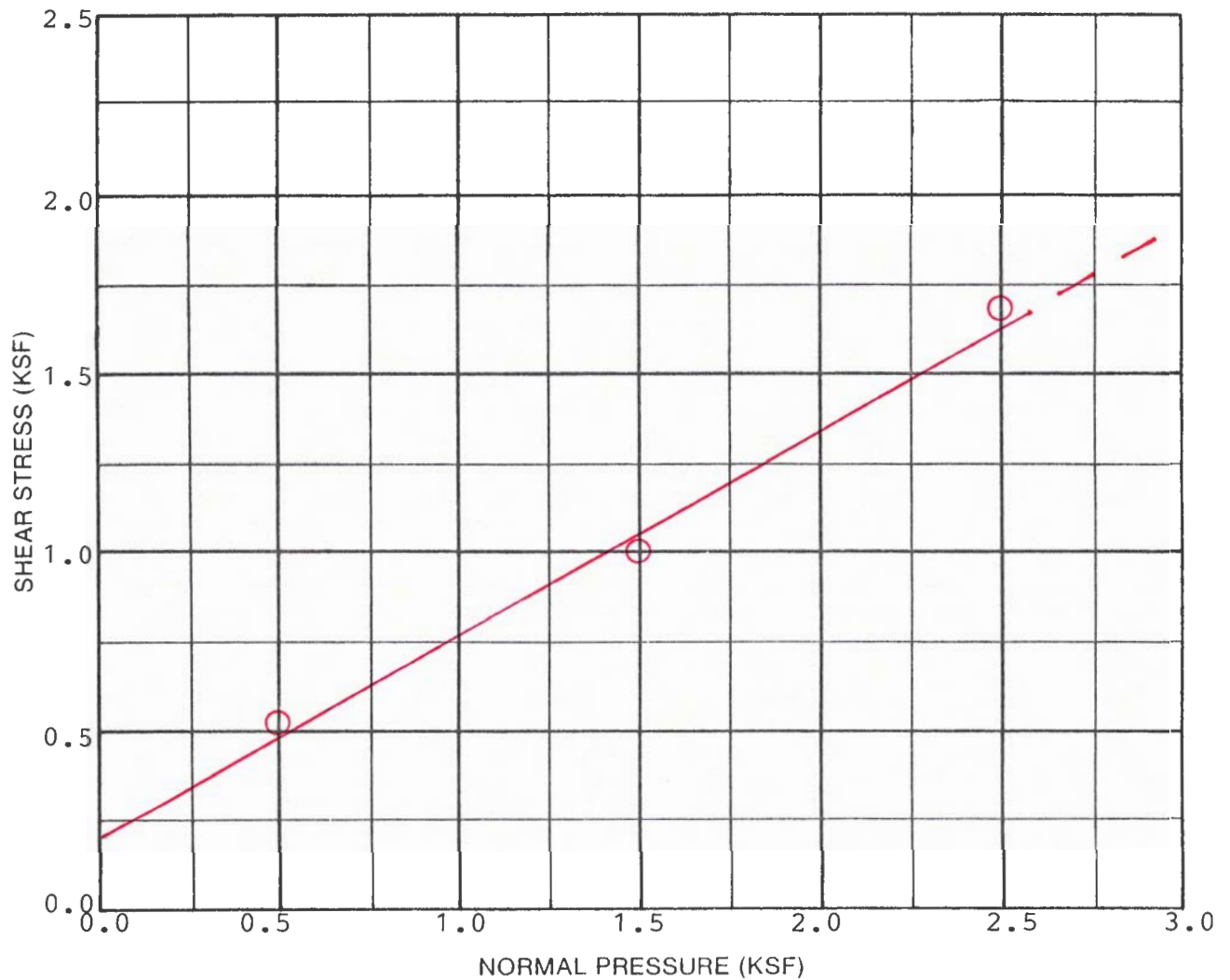


## GRADATION TEST DATA

BONAVENTURE OF MILWAUKIE  
Milwaukie, Oregon

PROJECT NO.	DATE	FIGURE
1004.032.G	9/28/18	A-13





SAMPLE DATA	
DESCRIPTION: Medium brown, clayey, sandy SILT to silty SAND (ML/SM) (Remolded)	
BORING NO.: TH-#5	
DEPTH (ft): 1.5	ELEVATION (ft):
TEST RESULTS	
APPARENT COHESION (C): 200 psf	
APPARENT ANGLE OF INTERNAL FRICTION ( $\phi$ ): 28°	

TEST DATA				
TEST NUMBER	1	2	3	4
NORMAL PRESSURE (KSF)	0.5	1.5	2.5	
SHEAR STRENGTH (KSF)	0.5	1.0	1.6	
INITIAL H <sub>2</sub> O CONTENT (%)	16.0	16.0	16.0	
FINAL H <sub>2</sub> O CONTENT (%)	16.4	12.1	7.8	
INITIAL DRY DENSITY (PCF)	98.0	98.0	98.0	
FINAL DRY DENSITY (PCF)	98.8	102.9	106.8	
STRAIN RATE: 0.02 inches per minute				



DIRECT SHEAR TEST DATA		
BONAVENTURE OF MILWAUKIE Milwaukie, Oregon		
PROJECT NO.	DATE	Figure A-14
1004.032.G	9/28/18	



BORING : TH-#5                      DESCRIPTION : clayey, sandy SILT (FILL)  
 DEPTH (ft) : 1.5                      LIQUID LIMIT : 18.5  
 SPEC. GRAVITY : 2.5 (assumed)                      PLASTIC LIMIT : 14.8

	<u>MOISTURE CONTENT (%)</u>	<u>DRY DENSITY (pcf)</u>	<u>PERCENT SATURATION</u>	<u>VOID RATIO</u>
INITIAL	16.0	98.0	91.1	
FINAL	7.8	106.6	97.2	



**CONSOLIDATION TEST DATA**

BONAVENTURE OF MILWAUKIE  
 Milwaukie, Oregon

PROJECT NO.	DATE	Figure A-15
1004.032.G	9/28/18	

## RESULTS OF R (RESISTANCE) VALUE TESTS

**SAMPLE LOCATION: TH-#6**

**SAMPLE DEPTH: 1.5 feet bgs**

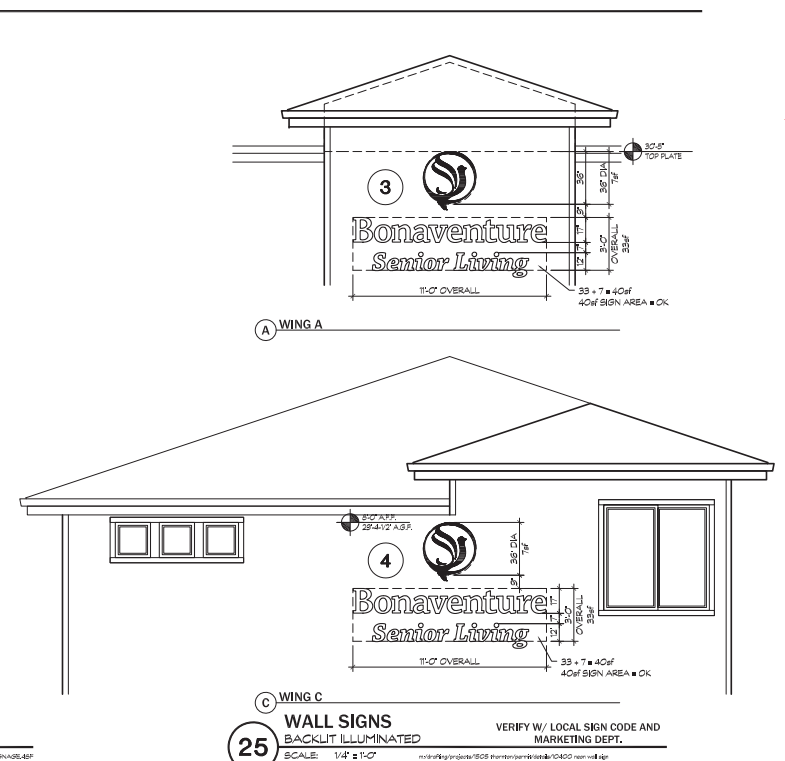
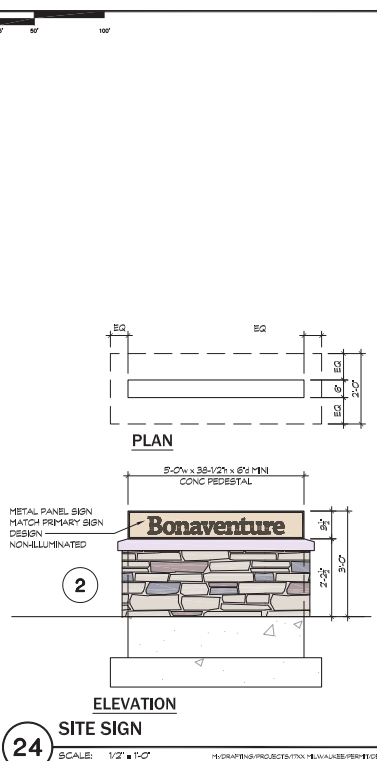
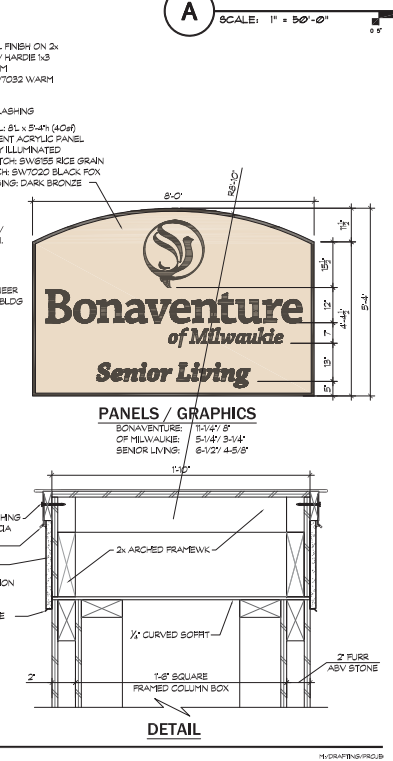
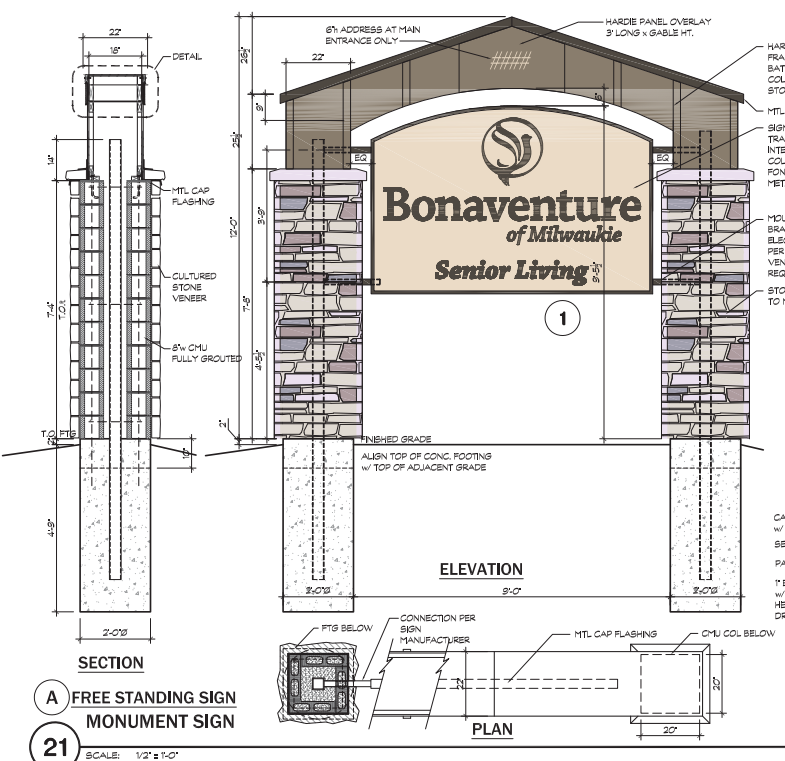
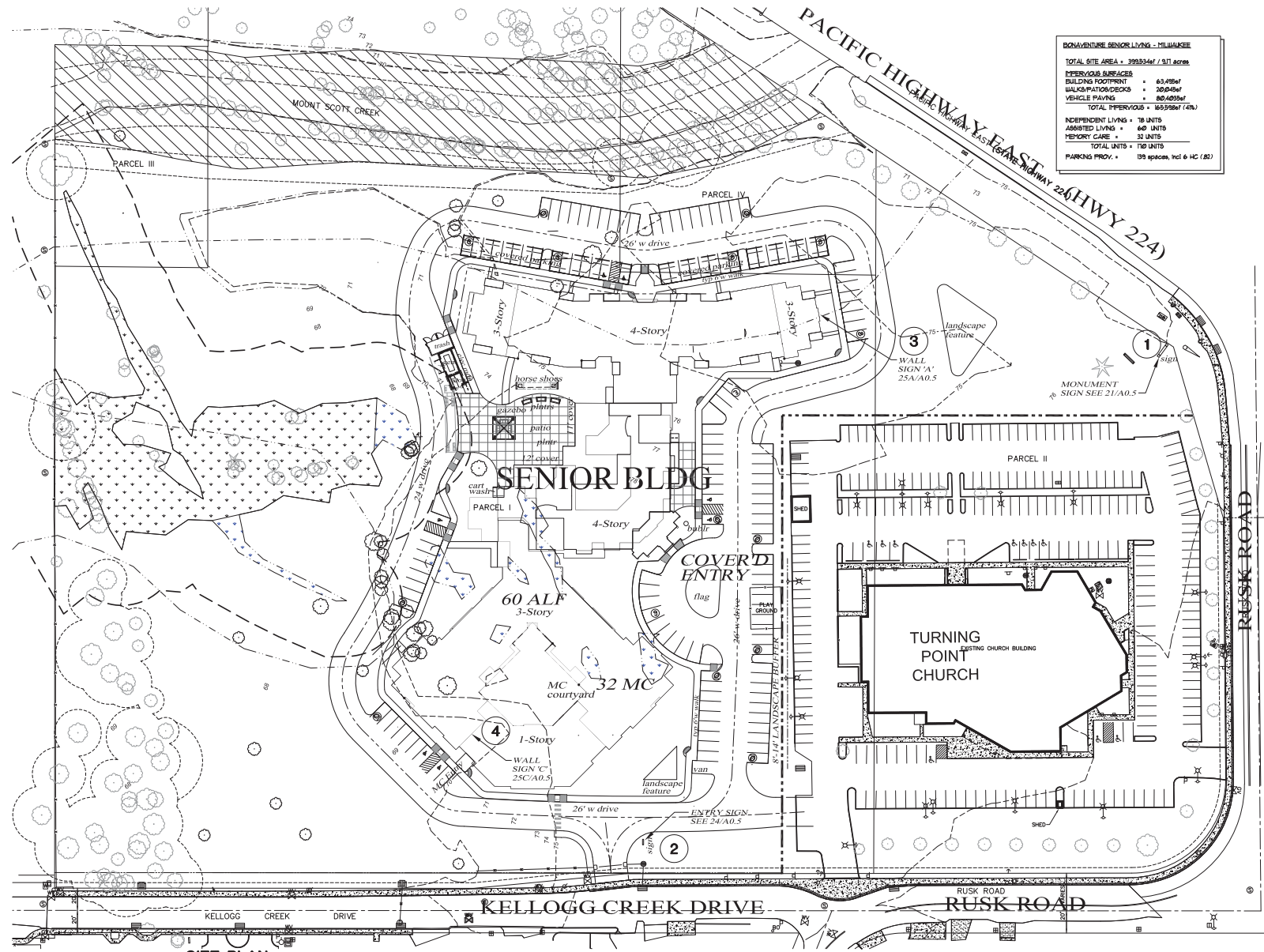
Specimen	A	B	C
Exudation Pressure (psi)	219	329	431
Expansion Dial (0.0001")	0	1	2
Expansion Pressure (psf)	0	3	8
Moisture Content (%)	17.6	14.4	11.1
Dry Density (pcf)	96.4	101.2	107.6
Resistance Value, "R"	18	29	36
"R"-Value at 300 psi Exudation Pressure = 28			

**SAMPLE LOCATION: TH-#10**

**SAMPLE DEPTH: 1.5 feet bgs**

Specimen	A	B	C
Exudation Pressure (psi)	208	326	439
Expansion Dial (0.0001")	0	1	2
Expansion Pressure (psf)	0	3	8
Moisture Content (%)	17.3	14.1	10.7
Dry Density (pcf)	98.9	103.1	109.7
Resistance Value "R"	19	33	40
"R"-Value at 300 psi Exudation Pressure = 32			

BONAVENTURE SENIOR LIVING - MILWAUKIE	
TOTAL SITE AREA	399334ft <sup>2</sup> / 911 acres
PERVIOUS SURFACES	
BUILDING FOOTPRINT	63,495sf
WALKWAY/PORCHES	28,000sf
VEHICLE PAVING	80,405sf
TOTAL PERVIOUS	165,900sf (41%)
INDEPENDENT LIVING	78 UNITS
ASSISTED LIVING	140 UNITS
MEMORY CARE	32 UNITS
TOTAL UNITS	250 UNITS
PARKING PROVIDED	393 spaces, incl 6 HC (82)



REVISIONS:

**PRELIMINARY  
 NOT FOR  
 CONSTRUCTION**  
 Jan 31 2019

PROJECT TITLE:  
 Milwaukie, OR

Bonaventure of Milwaukie  
 X

SHEET TITLE:  
 SIGNAGE

DESIGN BY:	SHEET:
111	
PROJECT:	XX
DATE:	XX
XX	

**Natural Resource Review**  
**Kellogg Creek Senior Living**  
**Milwaukie, Oregon**

(Township 2 South, Range 2 East, Section 6AD,  
Clackamas County, Tax Lots 600, 700, 900, 901)

**Prepared for**

**Bonaventure Senior Housing**

**Attn: Daniel Dobson**

3425 Boone Road SE

Salem, OR 97317

**Prepared by**

Caroline Rim

Craig Tumer

John van Staveren

**Pacific Habitat Services, Inc.**

9450 SW Commerce Circle, Suite 180

Wilsonville, Oregon 97070

(503) 570-0800

(503) 570-0855 FAX

PHS Project Number: 6577

**December 19, 2018**



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## ATTACHMENT A: Figures

- Figure 1: Project Location Map
- Figure 2: Tax Lot Map
- Figure 3: Existing Conditions
- Figure 4: Water Quality Resource and City-Mapped Habitat Conservation Areas
- Figure 5: City-Mapped Wetlands, Habitat Conservation Areas, and Vegetated Corridors
- Figure 6: July 2018 Aerial Photo
- Figure 7: Vegetated Cover and Riparian Habitat Classification Map
- Figure 8: Verified HCA
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- Figure 10: Construction Management Plan
- Figure 10A: Tree Survey and Removal List
- Figure 11: Mitigation Plan
- Figure 11A: Mitigation Planting List
- Figure 12A: Site Plan (Alternative A) with HCA and WQR Impacts
- Figure 12B: Site Plan (Alternative A) with HCA and WQR Impacts

## ATTACHMENT B: Wetland Delineation Concurrence Letter and Wetland Delineation Report

## 1.0 INTRODUCTION

The City of Milwaukie (the “City”) has mapped Water Quality Resource (WQR) and Habitat Conservation Area (HCA) within the proposed Kellogg Creek Senior Living project site. Bonaventure Senior Housing (the “Applicant”) seeks approval for the proposed development through a Type III General Discretionary Review. The following document demonstrates how the proposed project will be in compliance with the applicable development standards that are listed in the Natural Resources (NR) Zoning Code Section 19.402 of the City of Milwaukie Municipal Code (MMC). Pacific Habitat Services, Inc. (PHS) has prepared a Natural Resource Review in accordance with MMC Section 19.402 to support the land use application. The information necessary to process the application is provided in the following sections. Supporting information is included in Attachment A (Figures) and Attachment B (Wetland Delineation Report).

## 2.0 APPLICANT INFORMATION

### 2.1 Applicant

Bonaventure Senior Housing  
Attn: Daniel Dobson  
3425 Boone Road SE  
Salem, OR 97317  
Phone: 503-373-3154  
Email: [DDobson@LiveBSL.com](mailto:DDobson@LiveBSL.com)

### 2.2 Applicant’s Agent

Pacific Habitat Services, Inc.  
Attn: Craig Tumer  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070  
Phone: 503-570-0800  
Email: [ct@pacifichabitat.com](mailto:ct@pacifichabitat.com)

## 3.0 SITE INFORMATION

The following information is for the parcel which is the subject of this natural resource review.

**Site Address:** 13333 SE Rusk Road, Milwaukie, OR 97222  
**Zoning:** Residential R-3 and R-10  
**Legal Description:** Township 2S, Range 2E, Section 6AD, Tax Lots (TL) 600 700, 900, 901, Clackamas County

### 3.1 Site Description

The site is located southwest of Highway 224 (Pacific Highway), north of SE Kellogg Creek Drive, and north and west of SE Rusk Road (Figures 1 and 2). Mt. Scott Creek flows to the west along the northern edge of the study area, and the North Clackamas Park Milwaukie Center borders the western edge. The site is located within a residential area; undeveloped woodland is located immediately to the north and northwest of the site, and the Turning Point Church is located in the southeast corner of the site at 13333 SE Rusk Road. The eastern half of the property, near the church, is relatively level; however, the western half descends abruptly to a lower woodland area. Site elevations range from approximately 80 feet National Geodetic Vertical Datum (NGVD) in the eastern half of the site, to approximately 66 feet NGVD in the lower reaches of the western half of the site. The site has not been subject to recent construction activities; though, it appears that the substrate throughout much of the central and eastern half of the site consists of fill material more than 12 feet thick that is likely associated with the construction of the church, over two decades ago.

On November 21, 2016, PHS identified and delineated one wetland area (Wetland A) and Mt. Scott Creek (south bank only), as well as six artificially created wetland areas (Wetlands B through G). Descriptions of the on-site wetlands and non-wetland waters are provided below, and are further detailed in the Wetland Delineation Report (Attachment B). Figure 3 shows the existing site conditions.

Mt. Scott Creek, a tributary to Kellogg Creek and the Willamette River, is a perennial stream that generally flows to the west along the northern boundary of the study area. The streambanks are well defined and near vertical at the location of the OHW line. The plant community of the riparian area along the creek includes a deciduous overstory of big-leaf maple (*Acer macrophyllum*), Oregon white oak (*Quercus garryana*), Oregon ash (*Fraxinus latifolia*), and red alder (*Alnus rubra*); and a shrub and herbaceous understory composed of species such as snowberry (*Symphoricarpos albus*), Pacific ninebark (*Physocarpus capitatus*), Scouler's willow (*Salix scouleriana*), English hawthorn (*Crataegus monogyna*), Fuller's teasel (*Dipsacus fullonum*), and spreading bentgrass (*Agrostis stolonifera*). Mt. Scott Creek continues outside the project area to the north, west and east.

An approximately 0.70-acre (30,386 square feet) wetland (Wetland A) is located in the low-lying woodland area in the western half of the site, south of Mt. Scott Creek. The plant community within Wetland A is a combination of deciduous woodland bordered by open fields. Dominant species within the woodland include an overstory of Oregon ash and black cottonwood (*Populus balsamifera*), with a woody understory of Oregon ash, black cottonwood, red-osier dogwood (*Cornus alba*), snowberry, and Himalayan blackberry (*Rubus armeniacus*). The open fields include reed canarygrass (*Phalaris arundinacea*), creeping buttercup (*Ranunculus repens*), large-leaf avens (*Geum macrophyllum*), slender rush (*Juncus tenuis*), rough bluegrass (*Poa trivialis*), bitter dock (*Rumex obtusifolius*), and common dandelion (*Taraxacum officinale*).

The adjacent upland areas include Oregon ash, Himalayan blackberry, snowberry, English hawthorn, reed canarygrass, Fuller's teasel, large-leaf avens, bull thistle (*Cirsium vulgare*), fringed willowherb (*Epilobium ciliatum*), Dewey sedge (*Carex deweyana*), common selfheal (*Prunella vulgaris*), Western swordfern (*Polystichum munitum*), lentil vetch (*Vicia tetrasperma*), creeping buttercup, spreading bentgrass, field horsetail (*Equisetum arvense*), narrow-leaf goosefoot (*Chenopodium leptophyllum*), spotted cat's ear (*Hypochaeris radicata*), European centaury (*Centaureum erythraea*), wild carrot (*Daucus carota*), tansy ragwort (*Senecio jacobaea*), and colonial bentgrass (*Agrostis capillaris*).



In addition to Wetland A, six artificially created wetlands (Wetlands B –G) are located in the central portion of the site. These wetlands generally consist of small, shallow, isolated depressions. Table 1 lists the area of each wetland.

**Table 1. Areas of Artificially Created Wetlands**

<b>Wetland</b>	<b>Area (square feet / acres)</b>
B	905 / 0.02
C	176 / 0.004
D	172 / 0.004
E	998 / 0.02
F	301 / 0.007
G	666 / 0.02
<b>Total</b>	<b>3,218 / 0.07</b>

All six of these wetlands are similar in character. The plant communities in both the wetland and upland areas are primarily composed of weedy grasses and herbs; the wetland areas include reed canarygrass, spreading bentgrass, soft rush (*Juncus effusus*), spotted cat’s ear, and oxeye daisy (*Chrysanthemum vulgare*); the adjacent upland areas include wild carrot, curly dock (*Rumex crispus*), colonial bentgrass, bluegrass (*Poa sp.*), common velvet grass (*Holcus lanatus*), tall fescue (*Schedonorus arundinaceus*), yellow glandweed (*Parentucellia viscosa*), and English plantain (*Plantago lanceolata*).

Hydrology within Wetlands B through G primarily consists of surface runoff and precipitation. These wetlands occur on approximately 10 feet of fill material in the central portion of the site, and groundwater was not encountered in the test pits in the vicinity of these wetlands. Therefore, it is reasonable to assume that these wetlands are not hydrologically connected to the water table, and as such, are considered to be non-jurisdictional, artificially created wetlands.

The wetland delineation report was submitted to the Oregon Department of State Lands (DSL) for review and has received approval. On June 8, 2017, DSL conducted a site visit to verify the delineated wetland boundary. During the site visit, DSL took additional data and concluded that it concurred with PHS’s delineated wetland boundary. A copy of the concurrence letter is included with this report (Attachment B).

## **4.0 PROJECT DESCRIPTION**

The applicant, Bonaventure Senior Housing, is proposing a new senior living facility on a site located at 13333 Rusk Road in Milwaukie. The site currently consists of four tax lots, all under the same ownership (Turning Point Church). The total site size is 18.03 acres. The applicant is also requesting a property line adjustment and lot consolidation to reconfigure the site into two lots. One lot will be used for the proposed new development and the other will continue to be the site of the existing Turning Point Church.

The proposed senior living facility will consist of a single, stair-stepped building that would house 170 senior living units on approximately six acres. Specifically, the proposed building will consist of 78 independent living suites, 60 assisted living suites, and 32 memory care suites.

The independent living suites will be one- and two-bedroom suites ranging from 570 to 1,150 square feet. While the residents of these units receive some meals and services such as housekeeping and social programs, these units have complete kitchens and balconies. Approximately 30 percent of these residents are anticipated to keep a car on site.

The assisted living suites will be one- and two-bedroom suites ranging from 500 to 1,130 square feet. The residents of these units are served all meals in a restaurant-style communal dining room; therefore, these suites are equipped with a microwave and refrigerator for snacks only. These residents are not anticipated to drive and tend to receive additional services to assist with activities of daily living.

The memory care suites are in a section of the building, with its own separate and enhanced administrative and care staff. It has a separate serving kitchen, dining room, outdoor area, and common amenities. The memory care units do not have any individual kitchen facilities.

Interior amenities include a large lobby and reception area, café, formal living room/parlor with public computers for resident use, hobby workshop, fitness center, piano lounge, beauty salon, large theater for movies and special events, activity space for cooking/baking programs, and a hospitality bar for meals and social functions.

Outside activity areas include a combination of open and covered patios where staff can engage residents in various scheduled activities and occasional meals in fair weather. Outdoor planting areas are provided for resident use as well as horseshoe pits and other exterior amenity areas.

The proposed development will take access from SE Kellogg Creek Drive, with additional emergency-only access available from SE Rusk Road through the church parking lot. The senior living facility will have on-site parking and drive aisles, but no new public roads are proposed as part of the development. The proposed development also includes five stormwater treatment facilities.

Mt. Scott Creek (a perennial stream) and Wetland A (a Title 3 wetland) are both primary protected water features and have associated water quality resource (WQR) and habitat conservation areas (HCA), as defined in the City's Natural Resources Code (MMC 19.402). As such, the proposed project is subject to discretionary review under MMC Subsections 19.402.8, 19.402.9, 19.402.11, 19.402.12, and 19.402.13I – J. This Natural Resource Review describes the existing WQR and HCA on the site and demonstrates project compliance with the applicable sections of the municipal code.

## 5.0 EXISTING WATER QUALITY RESOURCE AND HABITAT CONSERVATION AREA ON THE PROJECT SITE

As discussed above, Mt. Scott Creek and Wetland A are primary protected water features and have associated WQR and HCA, as shown on the Milwaukie Interactive Zoning Map (<http://milwaukie.maps.arcgis.com/apps/webappviewer/index.html?id=48bf9fc517446f9af954d4d1c4413af>). MMC 19.402.15, Boundary Verification and Map Administration, describes procedures for verifying the location of WQR and HCA on a property. Sections 5.1 and 5.2, below, describe the verification of WQR and HCA on the project site in accordance with the municipal code.

### 5.1 Water Quality Resource (WQR)

Table 19.402.15, Determination of WQR Location, in MMC Subsection 19.402.15 describes the location and extent of the WQR. As described in the table, primary protected water features have an associated vegetated corridor of 50 to 200 feet wide depending on the slopes adjacent to the resource. The slopes adjacent to the south side of Mt. Scott Creek are less than 25 percent, and therefore, the associated vegetated corridor in this area is 50 feet wide. For the same reason, the vegetated corridor along the north, south and west sides of Wetland A are also 50 feet wide. The slopes along a short segment of vegetated corridor adjacent to the eastern edge of Wetland A, however, vary in steepness from less than to greater than 25 percent near the fill slope; therefore, in this area, the width of the vegetated corridor ranges from 50 to 130 feet. The extent of the vegetated corridor on the project site, based on the surveyed boundaries of the wetland and waterway, is depicted on Figure 4. The total area of WQR on the site (not including the stream and wetland) is approximately 103,187 sf (2.37 acres). Section 6.3 of this report describes the condition of the vegetated corridor.

### 5.2 Habitat Conservation Area (HCA) Verification

MMC 19.402.15.A requires verification of the boundaries of designated natural resources on or near a site to determine if the standards of MMC 19.402 apply. The Milwaukie Interactive Zoning Map (Figure 5) shows HCA extending onto the northern and western portions of the site. The City's mapped HCA is depicted on Figure 4. As shown in Figure 4, the City-mapped HCA does not include a portion of Wetland A. Because the City-mapped HCA does not include all of Wetland A, the Applicant proposes to verify HCA on the site using the detailed HCA verification procedures outlined at MMC 19.402.15.A.2.b. The requirements of Subsection 19.402.15.A.2.b are addressed below.

#### *MMC 19.402.15.A.2.b, Detailed Verification of HCAs*

*An applicant who believes that an HCA shown on the NR Administrative Map should be corrected for a reason other than those described in Subsections 19.402.15.A.1.a or b may propose a detailed verification.*

#### *(1) Submittal Requirements*

*The applicant shall submit a report prepared and signed by either a knowledgeable and qualified natural resource professional; such as a wildlife biologist, botanist, or hydrologist; or a civil or environmental engineer registered in Oregon to design public sanitary or storm systems, stormwater facilities, or other similar facilities. The report shall include:*

- (a) A description of the qualifications and experience of all persons that contributed to the report and, for each person that contributed, a description of the elements of the analysis to which the person contributed.*

The applicant is submitting this report, which was prepared and signed by John van Staveren, Craig Tumer, and Caroline Rim. John van Staveren is a Professional Wetland Scientist, as well as the

Natural Resource Review for Kellogg Creek Senior Living, Milwaukie, Oregon / PHS #6577

Pacific Habitat Services, Inc.

President and Senior Scientist at PHS and has over 29 years of experience working in the natural resources field. Craig Turner is a Senior Biologist and Professional Wetland Scientist, who has more than 28 years of experience working in the environmental field. Caroline Rim is a Senior Wetland Scientist and Natural Resource Specialist with Pacific Habitat Services, Inc. and has over 27 years of experience working in the natural resources field. Pacific Habitat Services, Inc. is renowned for its expertise and experience involving environmental and natural resource analyses and projects throughout the Portland Metro Area and the Pacific Northwest. Utilizing on-site observations and ground-truthing, PHS staff members participated in the analysis and comparison of site information pertinent to the City of Milwaukie's Development Code requirements.

***(b) The information described in Subsection 19.402.15.A.1.a.***

The following information is required, as described in Subsection 19.402.15.A.1.a:

***(1) A detailed property description and site plan of the property that includes all existing conditions plans listed on the City's Site Plan Requirements.***

The project site is located at 13333 Rusk Road in Milwaukie, Oregon. The site currently consists of four tax lots, all under the same ownership (Turning Point Church). Those tax lots are Tax Lot 22E06AD00600 (4.05 acres); Tax Lot 22E06AD00700 (1.00 acre); Tax Lot 22E06AD00900 (0.63 acre); and Tax Lot 22E06AD00901 (12.35 acres). The total site size is 18.03 acres.

A plan showing existing site conditions is provided as Figure 3. This figure shows tax lot boundaries; the boundary of PHS's study area (note: the study area boundary shown on figures in this report do not include the portions of tax lots north of Mt. Scott Creek because no development or impacts to natural resources are proposed in that area); existing site improvements such as buildings, roads, and parking areas; natural resources such as trees greater than 6 inches diameter at breast height (dbh), wetlands, and waterways; and existing topography depicted with 1-foot contours. Figure 4 shows the limits of the WQR, City-mapped HCA, and the floodplain boundary, as well as the other existing conditions features shown on Figure 3.

***(2) A copy of the applicable NR Administrative Map section.***

A copy of City mapping showing City-mapped HCA, vegetated corridor, and wetlands, as provided by the online Milwaukie Interactive Zoning Map, is provided as Figure 5.

***(3) The latest available aerial photograph of the property, with lot lines shown, at a scale of at least 1 map inch equal to 50 ft for lots of 20,000 or fewer square feet, and a scale of 1 map inch equal to 100 ft for larger lots.***

A July 2018 aerial photograph of the project site from Google Earth is provided as Figure 6.

***(4) A documented demonstration of the misalignment between the NR Administrative Map and the property's tax lot boundary lines and/or the location of existing legally established development.***

Not applicable. There is no apparent misalignment between the City's mapping and the tax lot boundaries or the location of existing legally established development.

***(5) Any other factual information that the applicant wishes to provide to support boundary verification.***

The floodplain line shown on the project plans differs from the floodplain line shown by the City's GIS mapping. The floodplain line depicted on project plans is based on FEMA 100-year floodplain elevations in the vicinity of the project site and detailed topographic survey of the project site.

- (c) *The information described in Subsection 19.402.15.A.1.b, if the applicant believes such information is relevant to the verification of habitat location on the subject lot or parcel.*

The information described in Subsection 19.402.15.A.1.b is not relevant to the verification of the HCA on the project site.

- (d) *Additional aerial photographs, if the applicant believes they provide better information regarding the property, including documentation of the date and process used to take the photos and an expert's interpretation of the additional information they provide.*

Not applicable.

- (e) *A map showing the topography of the property shown by 2-ft vertical contours in areas of slopes less than 15%, and at 5-ft vertical contours of slopes 15% or greater.*

The site topography shown by 1-foot contour intervals is depicted on all appropriate figures.

- (f) *Any additional information necessary to address each of the detailed verification criteria provided in Subsection 19.402.15.A.2.b(2); a description of where any HCAs are located on the property, based on the application of the detailed verification criteria; and factual documentation to support the analysis.*

No additional information is provided.

## (2) *Approval Criteria*

*A boundary verification request submitted under Subsection 19.402.15.A.2.b shall be evaluated according to the following three-step process:*

### (a) *Verify Boundaries of Inventoried Riparian Habitat*

*Locating habitat and determining the riparian habitat class of the designated natural resource is a four-step process:*

#### (i) *Locate the water feature that is the basis for identifying riparian habitat.*

- *Locate the top of bank of all streams, rivers, and open water within 200 ft of the property.*
- *Locate all flood areas within 100 ft of the property.*
- *Locate all wetlands within 150 ft of the property, based on the NR Administrative Map. Identified wetlands shall be further delineated consistent with methods currently accepted by DSL and the Corps.*

Mt. Scott Creek and Wetland A are the basis for identifying riparian habitat on the project site. PHS located the limits of ordinary high water (OHW) of Mt. Scott Creek at the time of the wetland delineation field work, which roughly corresponds to the “bankful stage” or “top of bank”, as defined on the City code. The surveyed limits of OHW are depicted on Figure 3 and all other appropriate figures.

#### (ii) *Identify the vegetative cover status of all areas on the property that are within 200 ft of the top of bank of streams, rivers, and open water; are wetlands or are within 150 ft of wetlands; and are flood areas and within 100 ft of flood areas.*

- *Vegetative cover status shall be as identified on the latest Metro Vegetative Cover Map (available from the City and/or the Metro Data Resource Center).*
- *The vegetative cover status of a property may be adjusted only if: (1) the property was legally developed prior to September 15, 2011, the effective date of Ordinance #2036 (see Subsection 19.402.15.A.1.b); or (2) an error was made at the time the vegetative cover status was determined. To assert the latter type of error, applicants shall submit an analysis of the vegetative cover on their property, using the aerial photographs on which the latest Metro Vegetative Cover Map is based and the definitions of the different vegetative cover types identified in Table 19.402.15.A.2.b(2)(a)(iv).*

The vegetative cover status, as identified on the latest Metro Vegetative Cover Map, is provided on Figure 7. The vegetative cover status was provided by the City of Milwaukie GIS. As shown on Figure 7, “forest canopy”, defined as “areas that are part of a contiguous grove of trees of 1 acre or larger in area with approximately 60% or greater crown closure, irrespective of whether the entire grove is within 200 ft of the relevant water feature”, is present along Mt. Scott Creek, as well as along the southwestern boundary of the project site. “Low structure vegetation or open soils”, defined as “areas that are part of a contiguous area 1 acre or larger of grass, meadow, croplands, or areas of open soils located within 300 ft of a surface stream,” is mapped in much of the northern portion of the site, south of the forest canopy that borders Mt. Scott Creek, and in the south-central portion of the site.

***(iii) Determine whether the degree that the land slopes upward from all streams, rivers, and open water within 200 ft of the property is greater than or less than 25%, using the methodology outlined in Table 19.402.15.***

The degree that the land slopes upward from Mt. Scott Creek is depicted on Figure 4. Slopes adjacent to south side of Mt. Scott Creek are less than 25% along the entire length of the creek as it flows across the project site.

***(iv) Identify the riparian habitat classes applicable to all areas on the property using Table 19.402.15.A.2.b(2)(a)(iv) and the data identified in Subsections 19.402.15.A.2.b(2)(a)(i) through (iii).***

Riparian habitat classes, as defined in Table 19.402.15.A.2.b(2)(a)(iv), are depicted on Figure 7. In accordance with this table, Mt. Scott, Creek and Wetland A are Class I riparian habitats, as are all areas of floodplain within 300 feet of Mt. Scott Creek and all areas within 50 feet of Mt. Scott Creek. Oregon oak woodlands are regarded as habitats of concern; therefore, the Oregon oak woodland in the southwestern portion of the site is also considered a Class I riparian habitat, as described in Table 19.402.15.A.2.b(2)(a)(iv). Class II riparian habitats include areas mapped as low structure vegetation or open soils on Metro’s Vegetative Cover Map that are within 100 feet of Mt. Scott Creek and within 100 feet of Wetland A. The southern portion of the site outside the vegetative cover classes mapped by Metro are dominated by herbaceous vegetation with scattered trees and shrubs and meet the definition of low structure vegetation; therefore, all such areas within 100 feet of Wetland A are also considered Class II riparian habitats.

***(b) Determine the Property’s Urban Development Value***

***The urban development value of property designated as regionally significant habitat is depicted on the Metro Habitat Urban Development Value Map (available from the Metro Data Resource Center).***

***(i) A property’s urban development value designation shall be adjusted upward if the Metro 2040 Design Type designation for the property lot or parcel has changed from one with a lower urban development value to one with a higher urban development value. 2040 Design Type designations are identified on the Metro 2040 Applied Concept Map (available from the Metro Data Resource Center).***

***(ii) Properties in areas designated on the 2040 Applied Concept Map as Central City, Regional Centers, Town Centers, and Regionally Significant Industrial Areas are considered to be of high urban development value; properties in areas designated as Main Streets, Station Communities, Other Industrial Areas, and Employment Centers are of medium urban development value; and properties in areas designated as Inner and Outer Neighborhoods and Corridors are of low urban development value.***

***(iii) As designated in Title 13 of the UGMFP, properties owned by a regionally significant educational or medical facility are designated as high urban development value.***

The project site is within an area of medium urban development value, as depicted on the Metro Habitat Urban Development Value Map ([ftp://ftp.metro-region.org/dist/gm/fish+wildlife/maps/develop\\_value\\_1097A.pdf](ftp://ftp.metro-region.org/dist/gm/fish+wildlife/maps/develop_value_1097A.pdf)).

*(c) Cross-Reference Habitat Class with Urban Development Value*

*City verification of the locations of HCAs shall be consistent with Table 19.402.15.A.2.b(2)(c).*

Because the site is designated medium urban development value, all Class I and Class II riparian habitats depicted on Figure 7 are HCA as described in Table 19.402.15.A.2.b(2)(c). The limits of the verified HCA on the site are depicted on Figure 8.

## **6.0 COMPLIANCE WITH MILWAUKIE MUNICIPAL CODE**

### **6.1 MMC 19.402.8 – Activities Requiring Type III Review**

As described above, the proposed project is the development of a senior living facility and associated infrastructure. The proposed project includes the subdivision of existing tax lots and will result in impacts to HCA and WQR; therefore, the project is subject to Type III review, as described in MMC 19.402.8.

### **6.2 MMC 19.402.9 – Construction Management Plans**

*B. Construction management plans shall provide the following information:*

- 1. Description of work to be done.*
- 2. Scaled site plan showing a demarcation of WQRs and HCAs and the location of excavation areas for building foundations, utilities, stormwater facilities, etc.*
- 3. Location of site access and egress that construction equipment will use.*
- 4. Equipment and material stockpile areas.*
- 5. Erosion and sediment control measures.*

As stated above in Section 4, the project is the construction of a senior living facility with 170 units, associated parking, roads, utilities, landscaping, and five stormwater treatment facilities. Site preparation will include grubbing and grading. A demarcation of WQRs and HCAs and the location of excavation areas for building foundations, utilities, stormwater facilities, etc. are shown on Figure 9. The site access that construction equipment will use, as well as equipment and material stockpile/staging areas, are shown on the Construction Management Plan (Figure 10). As shown on Figure 10, erosion control fencing will be placed at the limits of disturbance. This fencing will act as a physical barrier and prevent the encroachment of machinery into portions of the WQR and HCA areas that are to remain undisturbed.

The following components of the erosion control plan will protect against erosion, prevent the transport of sediments offsite and into the remaining WQR and HCA areas, and ensure that impacts are minimized.

- Prior to the start of any earth-moving activities, construction fencing will be installed at the limits of the work area, which in this case will be along the outer edge of the proposed development. Sediment fence will be installed inside the construction fencing.
- All base erosion and sediment prevention control measures (including inlet protection, perimeter sediment control, gravel construction entrances, etc.) will be in place, functional, and approved in an initial inspection prior to the start of any construction activities.

- Construction entrances will be installed prior to construction and maintained for the duration of the project.
- Active inlets to stormwater systems will be protected with approved inlet protection measures. All inlet protection measures will be regularly inspected and maintained as necessary. These inlet protection measures will prevent runoff from reaching discharge points.
- Exposed cut and fill areas will be stabilized through the use of temporary seeding and mulching or other appropriate measures.
- Seed used for temporary or permanent seeding will be per specifications.
- Slopes receiving temporary or permanent seeding will have the surface roughened to improve seed bedding and reduce run-off velocities.
- Stockpiled soil or strippings will be placed in an approved, stable location and configuration. During “wet weather” periods, stockpiles will be covered with straw mulch. Sediment fence will be placed around the perimeter of all stockpiles.
- Appropriate dust control measures, including the application of a fine spray of water, straw mulching or other approved measures, will be used in areas subject to wind erosion. Any saturated materials hauled off site will be transported in watertight trucks to prevent the spillage of sediment or sediment-laden water.

The proposed project will have no detrimental impact on resources or functional values of WQR and HCA areas designated to be left undisturbed. The use of construction fencing and erosion and sediment control barriers at the limits of work, as well as other methods described in the Construction Management Plan will prevent direct physical impacts to nearby areas of WQR and HCA to remain undisturbed.

6. *Measures to protect trees and other vegetation located within the potentially affected WQR and/or HCA. A root protection zone shall be established around each tree in the WRQ or HCA that is adjacent to any approved work area. The root protection zone shall extend from the trunk to the outer edge of the tree’s canopy, or as close to the outer edge of the canopy as is practicable for the approved project. The perimeter of the root protection zone shall be flagged, fenced, or otherwise marked and shall remain undisturbed. Material storage and construction access is prohibited within the perimeter. The root protection zone shall be maintained until construction is complete.*

Trees proposed to be removed are shown on the Construction Management Plan (Figure 10), and the accompanying Tree Survey and Removal Table is shown on Figure 10A. Tree protection will be as recommended by a qualified arborist or, at minimum, will include the following protective measures:

- All trees to be protected on the project site and adjacent to the site shall be clearly identified and protective fencing will be installed at the perimeter of the dripline (to avoid soil compaction, removal of vegetation, and/or tree branches) prior to any grubbing, clearing, grading, parking, preparation or storage of materials or machinery, or other construction activity on the site. The fencing will be secured and consist of a material that cannot be easily moved, removed, or broken during construction activities;
- No machinery repair, cleaning or fueling will be performed within 10 feet of the dripline of any of trees identified for protection;



- There will be no digging of trenches for placement of public or private utilities or other structure within the critical root zones of trees to be protected;
- If required by the City, a consulting arborist or other qualified biologist will be present during construction or grading activities that may affect the dripline of the trees to be protected.

### **6.3 MMC 19.402.11 – Development Standards**

#### ***A. Protection of Natural Resources During Site Development***

*During development of any site containing a designated natural resource, the following standards shall apply:*

- 1. Work areas shall be marked to reduce potential damage to the WQR and/or HCA.***

In addition to erosion and sediment control measures, previously discussed in the Construction Management section, work areas shall be marked to reduce potential damage to the WQR and/or HCA.

- 2. Trees in WQRs or HCAs shall not be used as anchors for stabilizing construction equipment.***

No trees within the WQR or HCA will be used as anchors for stabilizing construction equipment.

- 3. Native soils disturbed during the development shall be conserved on the property.***

Native soils disturbed during development will be conserved on the property.

- 4. An erosion and sediment control plan is required and shall be prepared in compliance with requirements set forth in the City's Public Works Standards.***

The erosion and sediment control plan is shown on the Construction Management Plan (Figure 10), was discussed in the previous section, Construction Management Plan, and was prepared in compliance with requirements set forth in the City's Public Works Standards.

- 5. Site preparation and construction practices shall be followed that prevent drainage of hazardous materials or erosion, pollution, or sedimentation to any WQR adjacent to the project area.***

As discussed above in the Construction Management Plans section, Best Management Practices (BMPs) will be implemented during site preparation and construction in order to prevent drainage of hazardous materials or erosion, pollution, or sedimentation to any WQR adjacent to the project area.

- 6. Stormwater flows that result from proposed development within and to natural drainage courses shall not exceed predevelopment flows.***

The primary purpose of the stormwater management plan is to effectively treat the stormwater runoff from the new development while maintaining pre-development hydrologic inputs. Key components of the stormwater management plan will include treating and detaining stormwater in five vegetated stormwater treatment facilities.

- 7. Prior to construction, the WQR and/or HCA that is to remain undeveloped shall be flagged, fenced, or otherwise marked and shall remain undisturbed. Such markings shall be maintained until construction is complete.***

As discussed above in the Construction Management Plans section, prior to construction, construction fencing, sediment fencing, and other erosion and sediment control barriers will be installed at the limits of work, in order to prevent impacts to nearby areas of WQR and HCA to remain undisturbed.

8. *The construction phase of the development shall be done in such a manner as to safeguard the resource portions of the site that have not been approved for development.*

As discussed above in the Construction Management Plans section, BMPs will be implemented and erosion and sediment control methods will be in place prior to construction in such a manner as to safeguard the resource portions of the site that have not been approved for development.

9. *Where practicable, lights shall be placed so that they do not shine directly into any WQR and/or HCA location. The type, size, and intensity of lighting shall be selected so that impacts to habitat functions are minimized.*

Where practicable, lights will be placed so that they do not shine directly into the WQR and/or HCA. The type, size, and intensity of lighting will be selected so that impacts to habitat functions are minimized.

10. *All work on the property shall conform to a construction management plan prepared according to Subsection 19.402.9.*

All work on the property will conform to a construction management plan, as previously discussed.

#### **B. General Standards for Required Mitigation**

*Where mitigation is required by Section 19.402 for disturbance to WQRs and/or HCAs, the following general standards apply:*

##### **1. Disturbance**

- a. *Designated natural resources that are affected by temporary disturbances shall be restored, and those affected by permanent disturbances shall be mitigated, in accordance with the standards provided in Subsection 19.402.11.C for WQRs and Subsection 19.402.D.2 for HCAs, as applicable.*

Designated natural resources that are affected by temporary disturbances will be restored. The proposed site plan will unavoidably result in permanent disturbances to both WQR and HCA areas, and as such, the areas of permanent disturbances will be mitigated in accordance with the standards provided in Subsections 19.402.11.C and 19.402.D.2, respectively. See Figure 11 - Mitigation Plan.

##### **2. Required Plants**

*Unless specified elsewhere in Section 19.402, all trees, shrubs, and ground cover planted as mitigation shall be native plants, as identified on the Milwaukie Native Plant List. Applicants are encouraged to choose particular native species that are appropriately suited for the specific conditions of the planting site; e.g., shade, soil type, moisture, topography, etc.*

All proposed mitigation plants will consist of native species as identified on the Milwaukie Native Plant List. Plants will be chosen for: 1) their suitability to the soils and hydrology of the site, 2) their natural occurrence in the area, 3) their wildlife habitat enhancement value, and 4) their local availability. The table on Figure 11A shows species to be planted.

##### **3. Plant Size**

*Replacement trees shall average at least a ½-in caliper – measured at 6 in above the ground level for field-grown trees or above the soil line for container-grown trees – unless they are oak or madrone, which may be 1-gallon size. Shrubs shall be at least 1-gallon size and 12 in high.*

#### **4. Plant Spacing**

*Trees shall be planted between 8 and 12 ft on center. Shrubs shall be planted between 4 and 5 ft on center or clustered in single-species groups of no more than 4 plants, with each cluster planted between 8 and 10 ft on center. When planting near existing trees, the dripline of the existing tree shall be the starting point for plant spacing measurements.*

#### **5. Plant Diversity**

*Shrubs shall consist of at least 2 different species, If 10 trees or more are planted, then no more than 50% of the trees shall be of the same genus.*

Mitigation plant size, spacing and diversity will be in accordance with the requirements stated in items 3 – 5, above (See table on Figure 11A).

#### **6. Location of Mitigation Area**

##### **a. On-Site Mitigation**

*All mitigation vegetation shall be planted on the applicant’s site within the designated natural resource that is disturbed, or in an area contiguous to the resource area; however, if the vegetation is planted outside of the resource area, the applicant shall preserve the contiguous planting area by executing a deed restriction such as a restrictive covenant.*

All mitigation vegetation will be planted on-site and within the designated natural resource that is disturbed or in an area contiguous to the resource area. The mitigation area (118,073 square feet / 2.71 acres) proposed for planting are shown in Figure 11. The mitigation plantings will improve the native plant community, vegetation structure and diversity – all of which will improve the overall quality of wildlife habitat on the site.

#### **7. Invasive Vegetation**

*Invasive nonnative or noxious vegetation shall be removed within the mitigation area prior to planting, including, but not limited to, species identified as nuisance plants on the Milwaukie Native Plant List.*

Invasive nonnative or noxious vegetation, and nuisance plants will be removed from the mitigation area prior to planting.

#### **8. Ground Cover**

*Bare or open soil areas remaining after the required tree and shrub plantings shall be planted or seeded to 100% surface coverage with grasses or other ground cover species identified as native on the Milwaukie Native Plant List. Revegetation shall occur during the next planting season following the site disturbance.*

Following the installation of the required tree and shrub plantings, remaining bare/open soil areas will be planted or seeded to 100% surface coverage with a native grass seed mix or other ground cover species during the next planting season following the site disturbance.

#### **9. Tree and Shrub Survival**

*A minimum of 80% of the trees and shrubs planted shall remain alive on the second anniversary of the date that the mitigation planting is completed.*

##### **a. Required Practices**

*To enhance survival of the mitigation plantings, the following practices are required:*

- (1) Mulch new plantings to a minimum of 3-in depth and 18-in diameter to retain moisture and discourage weed growth.*
- (2) Remove or control nonnative or noxious vegetation throughout the maintenance period.*

**b. Recommended Practices**

*To enhance survival of tree replacement and vegetation plantings, the following practices are recommended:*

- (1) Plant bare root trees between December 1 and April 15; plant potted plants between October 15 and April 30.*
- (2) Use plant sleeves or fencing to protect trees and shrubs against wildlife browsing and the resulting damage to plants.*
- (3) Water new plantings at a rate of 1 in per week between June 15 and October 15 for the first two years following planting.*

In order to meet the minimum of 80% tree and shrub survival of the mitigation plantings on the second anniversary of the date that the mitigation planting is completed, the applicant will follow the “Required” and “Recommended” planting and maintenance practices, as described above in Items a and b.

**c. Monitoring and Reporting**

*Monitoring of the mitigation site is the ongoing responsibility of the property owner. Plants that die shall be replaced in kind as needed to ensure the minimum 80% survival rate. The Planning Director may require a maintenance bond to cover the continued health and survival of all plantings. A maintenance bond shall not be required for land use applications related to owner-occupied single-family residential projects. An annual report on the survival rate of all plantings shall be submitted for 2 years.*

An annual monitoring site visit will be conducted and a report will be prepared and submitted to the City for two years after planting. The report will allow an analysis of the survival rate of the mitigation plantings and what corrective measures, if any, are needed to ensure the minimum 80% required survival rate for woody plantings at the end of the second monitoring season.

**10. Light Impacts**

*Where practicable, lights shall be placed so that they do not shine directly into any WQR and/or HCA location. The type, size, and intensity of lighting shall be selected so that impacts to habitat functions are minimized.*

Where practicable, lights will be placed so that they do not shine directly into the WQR and/or HCA. The type, size, and intensity of lighting will be selected so that impacts to habitat functions are minimized.

**C. Mitigation Requirements for Disturbance within WQRs**

- 1. The requirements for mitigation vary depending on the existing condition of the WQR on the project site at the time of application. The existing condition of the WQR shall be assessed in accordance with the categories established in Table 19.402.11.C.*

Plant communities within the vegetated corridor include a mixture of wooded and non-wooded communities. PHS identified two separate plant communities within the on-site vegetated corridor based on the predominance of woody species in the community. South of Mt. Scott Creek, and along the western property boundary to the north and south of the west end of Wetland A, the vegetated corridor has a well-developed forest canopy; while along the eastern and southern edges of Wetland A, the vegetated corridor has only a few scattered trees. PHS took seven sample points to characterize the plant communities; two along the south side of the creek, two along the northeast side of Wetland A, one along the south side of Wetland A, and two near the western property boundary to the north and south of Wetland A. A brief description and an evaluation of the condition of each of the communities are provided below (See Figure 4 for location of sample points).

## South of Mt. Scott Creek

The WQR south of Mt. Scott Creek contains a moderately dense canopy predominantly composed of red alder (*Alnus rubra*), Oregon white oak (*Quercus garryana*), black cottonwood (*Populus balsamifera*), and big-leaf maple (*Acer macrophyllum*). Common species in the understory include English hawthorn (*Crataegus monogyna*), snowberry (*Symphoricarpos alba*), Pacific willow (*Salix lasiandra*), Scouler's willow (*Salix scouleriana*), Pacific ninebark (*Physocarpus capitatus*), red-osier dogwood (*Cornus alba*), clustered rose (*Rosa pisocarpa*), twinberry honeysuckle (*Lonicera involucrata*), Himalayan blackberry (*Rubus armeniacus*), and beaked hazel (*Corylus cornuta*). The groundcover contains a diverse mixture of native and non-native species, including Pacific dewberry (*Rubus ursinus*), Fuller's teasel (*Dipsacus sylvestris*), Watson's willow-herb (*Epilobium watsonii*), nipplewort (*Lapsana communis*), common velvetgrass (*Holcus lanatus*), colonial bentgrass (*Agrostis capillaris*), fringecup (*Tellima grandiflora*), brome (*Bromus sp.*), and Western swordfern (*Polystichum munitum*). Tables 2 and 3 summarize the species composition at two sample points within the plant community.

**Table 2. Plant Community South of Mt. Scott, Characterized by Sample Point 1**

Botanical Name	Common Name	♦Cover (%)
<b>Trees</b>		<b>55</b>
<i>Alnus rubra</i>	Red alder	30
<i>Fraxinus latifolia</i>	Oregon ash	5
<i>Salix scouleriana</i>	Scouler's willow	7
<i>Salix lasiandra</i>	Pacific willow	2
<i>Acer macrophyllum</i>	Big-leaf maple	1
<i>Crataegus monogyna</i>	English hawthorn	10
<b>Shrubs and Saplings</b>		<b>60</b>
<i>Populus balsamifera</i>	Black cottonwood	5
<i>Symphoricarpos albus</i>	Common snowberry	5
<i>Rosa pisocarpa</i>	Clustered rose	13
<i>Oregon white oak</i>	<i>Quercus garryana</i>	10
<i>Rubus armeniacus</i> ***	Himalayan blackberry	2
<i>Physocarpus capitatus</i>	Pacific ninebark	15
<i>Crataegus monogyna</i>	English hawthorn	5
<i>Corylus cornuta</i>	Beaked hazelnut	3
<i>Cornus alba</i>	Red-osier dogwood	2
<b>Groundcover</b>		<b>100</b>
<i>Rubus ursinus</i>	California dewberry	5
<i>Dipsacus sylvestris</i> **	Fuller's teasel	25
<i>Epilobium watsonii</i>	Watson's willow-herb	30
<i>Lapsana communis</i> **	Nipplewort	10
<i>Holcus lanatus</i>	Common velvetgrass	5
<i>Agrostis capillaris</i>	Colonial bentgrass	20
<i>Tellima grandiflora</i>	Fringecup	2
<i>Bromus sp.</i>	Common brome	3

\*Invasive species or noxious weed (Oregon Dept. of Agriculture (ODA))

\*\*Nuisance Plant List (Milwaukie Plant List/Portland Plant List)

♦Absolute Percent Cover

**Table 3. Plant Community South of Mt. Scott, Characterized by Sample Point 2**

Botanical Name	Common Name	♦Cover (%)
<b>Trees</b>		<b>80</b>
<i>Alnus rubra</i>	Red alder	20
<i>Quercus garyana</i>	Oregon white oak	40
<i>Salix scouleriana</i>	Scouler's willow	5
<i>Populus balsamifera</i>	Black cottonwood	10
<i>Acer macrophyllum</i>	Big-leaf maple	5
<b>Shrubs and Saplings</b>		<b>67</b>
<i>Lonicera involucrate</i>	Twinberry honeysuckle	2
<i>Symphoricarpos albus</i>	Common snowberry	30
<i>Rosa pisocarpa</i>	Clustered rose	5
<i>Oregon white oak</i>	<i>Quercus garryana</i>	5
<i>Populus balsamifera</i>	Black cottonwood	5
<i>Physocarpus capitatus</i>	Pacific ninebark	10
<i>Crataegus monogyna</i>	English hawthorn	5
<i>Corylus cornuta</i>	Beaked hazelnut	3
<i>Cornus alba</i>	Red-osier dogwood	2
<b>Groundcover</b>		<b>53</b>
<i>Rubus ursinus</i>	California dewberry	5
<i>Dipsacus sylvestris</i> **	Fuller's teasel	2
<i>Polystichum munitum</i>	Western swordfern	3
<i>Lapsana communis</i> **	Nipplewort	3
<i>Holcus lanatus</i>	Common velvetgrass	3
<i>Agrostis capillaris</i>	Colonial bentgrass	10
<i>Tellima grandiflora</i>	Fringecup	5
<i>Bromus sp.</i>	Common brome	22

\*Invasive species or noxious weed (Oregon Dept. of Agriculture (ODA))

\*\*Nuisance Plant List (Milwaukie Plant List/Portland Plant List)

♦Absolute Percent Cover

The plant community south of Mt. Scott Creek has a moderately dense tree canopy with coverage that varies from 50 to 80 percent. Canopy coverage across the entire plant community exceeds 50 percent. The combined tree, shrub and groundcover layers provide coverage that exceeds 80 percent. As such, the existing condition of the WQR south of Mt. Scott Creek meets the definition of a Class A (“Good”) WQR, as defined in Table 19.402.11.C of the municipal code.

### **Northeast of Wetland A**

A few scattered trees are present within the vegetated corridor northeast of Wetland A; however, the plant community in this area generally lacks a canopy layer and is predominantly composed of reed canarygrass (*Phalaris arundinacea*) and other grasses and various groundcover. Tables 4 and 5 summarize the species composition within the plant community east of Wetland A.

**Table 4. Plant Community Northeast of Wetland A, Characterized by Sample Point 3**

Botanical Name	Common Name	♦Cover (%)
<b>Trees</b>		<b>50</b>
<i>Salix scouleriana</i>	Scouler's willow	20
<i>Crataegus monogyna</i>	English hawthorn	20
<i>Fraxinus latifolia</i>	Oregon ash	5
<i>Populus balsamifera</i>	Black cottonwood	5
<b>Shrubs and Saplings</b>		<b>60</b>
<i>Salix scouleriana</i>	Scouler's willow	20
<i>Rosa pisocarpa</i>	Clustered rose	10
<i>Crataegus monogyna</i>	English hawthorn	20
<i>Corylus cornuta</i>	Beaked hazelnut	5
<i>Rubus armeniacus</i> * **	Himalayan blackberry	5
<b>Groundcover</b>		<b>135</b>
<i>Phalaris arundinacea</i> **	Reed canarygrass	60
<i>Dipsacus sylvestris</i> **	Fuller's teasel	40
<i>Tanacetum vulgare</i> **	Common tansy	15
<i>Epilobium watsonii</i>	Watson's willow-herb	15
<i>Cirsium arvense</i>	Canada thistle	5

\*Invasive species or noxious weed (Oregon Dept. of Agriculture (ODA))

\*\*Nuisance Plant List (Milwaukie Plant List/Portland Plant List)

♦Absolute Percent Cover

**Table 5. Plant Community Northeast of Wetland A, Characterized by Sample Point 4**

Botanical Name	Common Name	♦Cover (%)
<b>Trees</b>		<b>5</b>
<i>Acer macrophyllum</i>	Big-leaf maple	5
<b>Shrubs and Saplings</b>		<b>25</b>
<i>Acer macrophyllum</i>	Big-leaf maple	10
<i>Rosa pisocarpa</i>	Clustered rose	10
<i>Rubus armeniacus</i> * **	Himalayan blackberry	5
<b>Groundcover</b>		<b>115</b>
<i>Phalaris arundinacea</i> **	Reed canarygrass	100
<i>Dipsacus sylvestris</i> **	Fuller's teasel	15

\*Invasive species or noxious weed (Oregon Dept. of Agriculture (ODA))

\*\*Nuisance Plant List (Milwaukie Plant List/Portland Plant List)

♦Absolute Percent Cover

As described above and shown by Sample Points 3 and 4, the plant community northeast of Wetland A has little to no tree canopy coverage. The combined tree, shrub and groundcover layers provide coverage that exceeds 80 percent; however, tree canopy coverage is less than 25 percent. Therefore, the existing condition of the WQR east of Wetland A meets the definition of a Class C ("Poor") WQR, as defined in Table 19.402.11.C of the municipal code.

**South of Wetland A**

Similar to the vegetated corridor along the northeast side of Wetland A, the area to the south of Wetland A also has a few scattered trees present. The plant community south of Wetland A also generally lacks a canopy layer and is primarily composed of reed canarygrass and a few other species of grasses and various groundcover. Table 6 summarizes the species composition within the plant community south of Wetland A.

**Table 6. Plant Community South of Wetland A, Characterized by Sample Point 5**

Botanical Name	Common Name	♦Cover (%)
<b>Trees</b>		<b>5</b>
<i>Crataegus monogyna</i>	English hawthorn	5
<b>Shrubs and Saplings</b>		<b>25</b>
<i>Quercus garyana</i>	Oregon white oak	10
<i>Rubus laciniatus</i> **	Cut-leaf blackberry	5
<i>Rubus armeniacus</i> ** **	Himalayan blackberry	10
<b>Groundcover</b>		<b>150</b>
<i>Phalaris arundinacea</i> **	Reed canarygrass	90
<i>Dipsacus sylvestris</i> **	Fuller’s teasel	40
<i>Epilobium watsonii</i>	Watson’s willow-herb	10
<i>Cirsium arvense</i> ** **	Canada thistle	10

\*Invasive species or noxious weed (Oregon Dept. of Agriculture (ODA))

\*\*Nuisance Plant List (Milwaukie Plant List/Portland Plant List)

♦Absolute Percent Cover

As described above and shown by Sample Point 5, the plant community south of Wetland A has almost no tree canopy coverage. The combined tree, shrub and groundcover layers provide coverage that exceeds 80 percent; however, tree canopy coverage is less than 25 percent. Therefore, the existing condition of the WQR south of Wetland A meets the definition of a Class C (“Poor”) WQR, as defined in Table 19.402.11.C of the municipal code.

**West of Wetland A**

The WQR west of Wetland A contains a canopy predominantly composed of Oregon ash and Oregon white oak. Common species in the understory include English hawthorn, snowberry, Himalayan blackberry, bald-hip rose (*Rosa gymnocarpa*), and clustered rose. The groundcover contains a diverse mixture of native and non-native species, including Pacific dewberry, English ivy (*Hedera helix*), Fuller’s teasel, Watson’s willow-herb, nipplewort, Western swordfern, big-leaf avens (*Geum macrophyllum*), and common dandelion (*Taraxacum officinale*). Tables 7 and 8 summarize the species composition at two sample points within the plant community.



**Table 7. Plant Community West of Wetland A. Characterized by Sample Point 6**

Botanical Name	Common Name	♦Cover (%)
<b>Trees</b>		<b>55</b>
<i>Fraxinus latifolia</i>	Oregon ash	25
<i>Quercus garyana</i>	Oregon white oak	30
<b>Shrubs and Saplings</b>		<b>75</b>
<i>Symphoricarpos albus</i>	Common snowberry	50
<i>Rubus armeniacus</i> ***	Himalayan blackberry	10
<i>Crataegus monogyna</i>	English hawthorn	15
<b>Groundcover</b>		<b>100</b>
<i>Rubus ursinus</i>	California dewberry	15
<i>Geum macrophyllum</i>	Big-leaf avens	20
<i>Epilobium watsonii</i>	Watson's willow-herb	5
<i>Lapsana communis</i> **	Nipplewort	35
<i>Taraxacum officinale</i>	Common dandelion	15
<i>Polystichum munitum</i>	Western swordfern	5
<i>Hedera helix</i> **	English ivy	5

\*Invasive species or noxious weed (Oregon Dept. of Agriculture (ODA))

\*\*Nuisance Plant List (Milwaukie Plant List/Portland Plant List)

♦Absolute Percent Cover

**Table 8. Plant Community West of Wetland A, Characterized by Sample 7**

Botanical Name	Common Name	♦Cover (%)
<b>Trees</b>		<b>15</b>
<i>Fraxinus latifolia</i>	Oregon ash	10
<i>Quercus garyana</i>	Oregon white oak	5
<b>Shrubs and Saplings</b>		<b>110</b>
<i>Symphoricarpos albus</i>	Common snowberry	50
<i>Rosa gymnocarpa</i>	Bald-hip rose	10
<i>Rosa pisocarpa</i>	Clustered rose	10
<i>Crataegus monogyna</i>	English hawthorn	40
<b>Groundcover</b>		<b>145</b>
<i>Rubus ursinus</i>	California dewberry	60
<i>Geum macrophyllum</i>	Big-leaf avens	40
<i>Epilobium watsonii</i>	Watson's willow-herb	10
<i>Dipsacus sylvestris</i> **	Fuller's teasel	20
<i>Polystichum munitum</i>	Western swordfern	15

\*Invasive species or noxious weed (Oregon Dept. of Agriculture (ODA))

\*\*Nuisance Plant List (Milwaukie Plant List/Portland Plant List)

♦Absolute Percent Cover

The plant community southwest of Wetland A has a tree canopy greater than 50 percent, as characterized by Sample Point 6. The community northwest of Wetland A has a tree canopy less than 25 percent, as characterized by Sample Point 7. The combined tree, shrub and groundcover layers provide coverage that exceeds 80 percent at both sample points. As such, the existing condition of the WQR southwest of Wetland A meets the definition of a Class A (“Good”) WQR, as defined in Table 19.402.11.C of the municipal code, and the existing condition of the WQR northwest of Wetland A meets the definition of Class C (“Poor”).

## 6.4 MMC 19.402.12 - General Discretionary Review

### A. Impact Evaluation and Alternatives Analysis

*An impact evaluation and alternatives analysis is required to determine compliance with the approval criteria for general discretionary review and to evaluate development alternatives for a particular property. A report presenting this evaluation and analysis shall be prepared and signed by a knowledgeable and qualified natural resource professional, such as a wildlife biologist, botanist, or hydrologist. At the Planning Director’s discretion, the requirement to provide such a report may be waived for small projects that trigger discretionary review but can be evaluated without professional assistance.*

*The alternatives shall be evaluated on the basis of their impact on WQRs and HCAs, the ecological functions provided by the resource on the property, and off-site impacts within the subwatershed (6th Field Hydrologic Unit Code) where the property is located. The evaluation and analysis shall include the following:*

1. *Identification of the ecological functions of riparian habitat found on the property, as described in Subsection 19.402.1.C.2.*

Subsection 19.402.1.C.2 of the MMC identifies seven functions and values that contribute to water quality and to fish and wildlife habitat in urban streamside areas. Descriptions of the functions and values provided by the riparian habitat on the project site are provided below.

Vegetated corridors to separate protected water features from development – With exception of the southeast corner of the site, at the location of the church, the site is undeveloped. The vegetation south of Mt. Scott Creek provides a buffer that separates the existing development in the southeast corner of the site from the primary protected water features. The moderately dense tree cover and the dense shrub and herbaceous vegetation along the south side of the creek provide wildlife habitat and water quality benefits to the stream.

Microclimate and shade – Trees within the WQR provide shade to the stream and help to regulate the microclimate within the riparian corridor.

Streamflow moderation and water storage – The floodplain on the south side of Mt. Scott Creek is vegetated with a mixture of trees, shrubs and herbaceous vegetation. During high flow events, vegetation within the floodplain helps to slow floodwaters and reduce downstream flooding. Although much of the floodplain south of the creek predominantly consists of non-woody vegetation, the stream gradient within the site is relatively gradual, and therefore, the riparian corridor within the project area provides limited streamflow moderation and water storage functions.

Water filtration, infiltration, and natural purification – Vegetation within the riparian corridor along Mt. Scott Creek slows runoff from adjacent areas and filters sediments and other pollutants from the runoff before it reaches the stream. By slowing the runoff, the vegetation also increases the potential for water to infiltrate into the soil before reaching the stream; however, the predominantly clay loam soils within the project area reduces the ability of the water to infiltrate into the soil.

Bank stabilization and sediment and pollution control – Streambanks within the project area are generally well-vegetated with trees, shrubs and herbaceous vegetation. This vegetation helps to stabilize the banks, and no evidence of active bank erosion within the project site was observed.

Large wood recruitment and retention and natural channel dynamics – Within the project area, trees occur on both the north and south sides of Mt. Scott Creek. These trees have the potential to become large woody material. When these trees fall into the stream, they have the potential to affect the natural channel dynamics; however, because of the relatively small size of the stream, any large woody material that falls into the stream is likely to remain on the project site rather than be carried downstream.

Organic material resources –Vegetation within the riparian corridor provides organic material that serves as the basis for the aquatic food web. Under the existing conditions, the riparian corridor within the project site is vegetated with a mixture of trees, shrubs, and herbaceous species, which contribute organic materials to the stream.

2. *An inventory of vegetation, sufficient to categorize the existing condition of the WQR per Table 19.402.11.C, including the percentage of ground and canopy coverage materials within the WQR.*

An inventory of vegetation, sufficient to categorize the existing condition of the WQR per Table 19.402.11.C, including the percentage of ground and canopy coverage materials within the WQR, was provided earlier in this document in Subsection 19.402.11.C “Mitigation Requirements for Disturbance within WQRs” of the Development Standards.

3. *An assessment of the water quality impacts related to the development, including sediments, temperature and nutrients, sediment control, and temperature control, or any other condition with the potential to cause the protected water feature to be listed on DEQ’s 303(d) list.*

The proposed project will result in impacts to WQR and HCA associated with Mt. Scott Creek and Wetland A. A senior living facility will be constructed in the central portion of the site. Construction of the facility will include five stormwater facilities. These features will result in impacts to 69,551 sf (1.60 acres) of HCA; approximately 23,437 sf (0.54 acre) of the affected HCA is also WQR. The WQR impact also includes approximately 171 sf (0.004acre) of wetland impact. The wetland proposed for impact is of low quality, lacking vegetated structure, and primarily composed of a monoculture of reed canarygrass. Required permits from the State (Department of State Lands (DSL)) and Federal (U.S. Army Corps of Engineers (COE)) agencies for the proposed wetland impacts, and associated wetland mitigation plan, will be obtained, and upon receipt, the Applicant will provide a copy to the City for its files.

The proposed project is not anticipated to have any adverse impacts to water quality. The use of erosion and sediment controls during construction will prevent sediment-related impacts to water quality. The proposed project is not anticipated to result in additional nutrient inputs to the stream, and the restoration of the floodplain/ on the south side of Mt. Scott Creek will increase shade on the stream as the riparian plantings mature, helping to reduce water temperatures in the stream.

4. *An alternatives analysis, providing an explanation of the rationale behind choosing the alternative selected, listing measures that will be taken to avoid and/or minimize adverse impacts to designated natural resources, and demonstrating that:*
  - a. *No practicable alternatives to the requested development exist that will not disturb the WQR or HCA.*

Because of the location, size and orientation of the resources within the site, and the existing development/church, and limited access points from SE Kellogg Creek Drive, impacts to the WQR and HCA are unavoidable.

The applicant considered two alternative site plans utilizing two-story buildings with associated access roads and parking; Alternative A and Alternative B are depicted on Figures 12A and 12B, respectively. As shown on Figure 12A, Alternative A would result in impacts to 57,495 sf (1.32 ac) of WQR and 112,588 sf (2.58 ac) of HCA. Alternative B would result in impacts to 44,417 sf (1.02 ac) of WQR and 119,630 sf (2.75 ac) of HCA, as shown on Figure 12B. To minimize impacts to WQR and HCA, the Applicant re-designed the proposed senior living facility to use three- and four-story buildings to reduce the project footprint. This proposed site plan has significantly less adverse effects to the water resources than the alternative designs.

- b. Development in the WQR and/or HCA has been limited to the area necessary to allow for the proposed use.*

Development within the WQR and HCA has been limited to the area necessary to allow for the proposed use. The development has been designed taking into consideration the City's building, design, and development requirements, while avoiding and minimizing resource impacts to the greatest extent practicable, and still allowing the project to be financially feasible. As such, development in the WQR and HCA has been limited to the outer portions of each, in areas that are of lowest quality.

- c. If disturbed, the WQR can be restored to an equal or better condition in accordance with Table 19.402.11.C; and the HCA can be restored consistent with the mitigation requirements of Subsection 19.402.11.D.2.*

Restoration and mitigation for impacts to the WQR and HCA will be done in accordance with Table 19.402.11.C and Subsection 19.402.11.D.2, respectively. Details of the restoration and mitigation are described in more detail below in Subsection 19.402.12.A.6.b.

It should be noted that the DSL and COE requirement for mitigation for the wetland impact will be met and details will be discussed in the permit, which upon receipt, the Applicant will provide to the City.

- d. Road crossings will be minimized as much as possible.*

The road on the west side of the proposed building is located as close to the building as possible to minimize impacts to the maximum extent practicable.

- 5. Evidence that the applicant has done the following, for applications proposing routine repair and maintenance, alteration, and/or total replacement of existing structures located within the WQR:**

- a. Demonstrated that no practicable alternative design or method of development exists that would have a lesser impact on the WQR than the one proposed. If no such practicable alternative design or method of development exists, the project shall be conditioned to limit its disturbance and impact on the WQR to the minimum extent necessary to achieve the proposed repair/maintenance, alteration, and/or replacement.*
- b. Provided mitigation to ensure that impacts to the functions and values of the WQR will be mitigated or restored to the extent practicable.*

Not applicable. The proposed project does not include routine repair and maintenance, alteration, and/or total replacement of existing structures within the WQR.

6. *A mitigation plan for the designated natural resource that contains the following information:*

a. *A description of adverse impacts that will be caused as a result of development.*

The proposed project will result in impacts to WQR and HCA associated with Mt. Scott Creek and Wetland A. A senior living facility will be constructed in the central portion of the site. Construction of the facility will include five stormwater facilities. These features will result in impacts to 69,551 sf (1.60 acres) of HCA; approximately 23,437 sf (0.54 acre) of the affected HCA is also WQR. The WQR impact also includes approximately 171 sf (0.004acre) of wetland impact.

b. *An explanation of measures that will be taken to avoid, minimize, and/or mitigate adverse impacts to the designated natural resource; in accordance with, but not limited to, Table 19.402.11.C for WQRs and Subsection 19.402.11.D.2 for HCAs.*

As discussed above, impacts to the WQR and HCA are unavoidable. Adverse effects to the resources have been minimized by constructing buildings that are predominantly three- and four-story structures and reducing the development footprint, as compared to the originally proposed two-story buildings.

Mitigation for the unavoidable impacts will be provided through the inventory of man-made debris and noxious materials that might be present within the WQR and the removal of any such material present; the implementation of a stormwater plan that meets City requirements for runoff rates and water quality; the removal of non-native, invasive plants from the riparian corridor along the south side of Mt. Scott Creek; and the installation of tree and shrub plantings within the remaining WQR and HCA areas, the floodplain storage area, and three additional enhancement areas to restore a diverse, native plant community. Compliance with the mitigation requirements outlined in Table 19.402.11.C and Subsection 19.402.11.D.2 to compensate for proposed impacts to the WQR and HCA are described below.

As depicted on Figure 4, the existing condition of WQR along the south side of Mt. Scott Creek and the west edge of the property, north and south of Wetland A, is Class A (“Good”); the existing condition of the WQR along the northeast and south sides of Wetland A is Class C (“Poor”). Mitigation requirements for disturbance in a Class A and Class C WQR, as listed in Table 19.402.11.C, are listed below, as are the components of the project design that have been incorporated to insure compliance with the mitigation requirements.

- *Submit a plan for mitigating water quality impacts related to the development, including: sediments, temperature, nutrients, or any other condition that may have caused the protected water feature to be listed on DEQ’s 303(d) list.*

DOWL prepared a Preliminary Drainage Report (dated November 30, 2018) demonstrating that the proposed stormwater management facilities treat runoff to meet the City of Milwaukie’s water quality requirements and detain post-development runoff at or below pre-development release rates. The Preliminary Drainage Report was submitted to the City as part of the land-use application package.

- ***Inventory and remove debris and noxious materials.***

At the time of site construction, the Applicant will identify man-made debris and noxious materials that may be present within the WQR. Any such debris or materials will be removed from the WQR. This will occur within mitigation area, as shown on Figure 11.

Mitigation requirements for disturbance in a Class C WQR, as listed in Table 19.402.11.C, are listed below, as are the components of the project design that have been incorporated to insure compliance with the mitigation requirements.

- ***Restore and mitigate disturbed areas with native species from the Milwaukie Native Plant List, using a City-approved plan developed to represent the vegetative composition that would naturally occur on the site.***

All disturbed areas within the WQR and HCA will be restored with native trees and shrubs and reseeded with a native seed mix. Trees and shrubs will be planted within the mitigation and restoration areas on the south side of Mt. Scott Creek to restore a native plant community within the WQR and HCA areas.

The number of trees and shrubs to be planted was determined in accordance with MMC Subsection 19.402.11.D.2. Thirty-three trees (some with multiple trunks) will be removed from the HCA, as shown on Figure 10. As prescribed by Table 19.402.11.D.2.a, 146 trees and 240 shrubs would be required to mitigate for the trees to be removed under Mitigation Option 1. Under Mitigation Option 2, 696 trees (69,551 sf impact area x 5 trees per 500 sf of impact area = 696 trees) and 3,478 shrubs (69,551 sf impact area x 25 shrubs per 500 sf of impact area = 3,478 shrubs) would be planted to mitigate for the 86,347 sf of impacts to the WQR and HCA. Because Mitigation Option 2 results in more tree plantings, Mitigation Option 2 was used to determine the number of trees and shrubs to be planted in accordance with MMC Subsection 19.402.11.D.2. A list of trees and shrubs proposed for planting is provided in Table 9 below, and on Figure 11A – Planting Lists.

These mitigation plantings meet the requirements of MMC Subsection 19.402.11.D, as follows:

- All areas temporarily disturbed will be restored and permanent impacts will be mitigated by the tree and shrub plantings, as described above.
- All species proposed for planting are native species, as identified on the Milwaukie Native Plant List.
- Trees to be planted will average at least a ½-in caliper (measured at 6 inches above the ground level for field-grown trees or above the soil line for container-grown trees). Shrubs shall be at least 1-gallon size and 12 inches high.
- Trees will be planted between 8 and 12 feet on center. Shrubs will be planted between 4 and 5 feet on center or clustered in single-species groups of no more than 4 plants, with each cluster planted between 8 and 10 feet on center. When planting near existing trees, the dripline of the existing tree shall be the starting point for plant spacing measurements.

- More than two species of shrubs are proposed, and not more than 50 percent of the trees to be planted are of the same genus.
- All mitigation will occur on site.
- Invasive non-native or noxious vegetation will be removed within the mitigation area prior to planting, including, but not limited to, species identified as nuisance plants on the Milwaukie Native Plant List.
- Bare or open soil areas remaining after the required tree and shrub plantings will be seeded to 100% surface coverage with grasses or other groundcover species identified as native on the Milwaukie Native Plant List. Revegetation will occur during the next planting season following the site disturbance.

**Table 9. Mitigation Area A Planting List**

Species	Common Name	Quantity	Stock Type	Plant Size
<b>Trees</b>				
<i>Alnus rubra</i>	Red alder	139	Container or field-grown	½ in caliper
<i>Crataegus suksdorfii</i>	Black hawthorn	140	Container or field grown	½ in caliper
<i>Fraxinus latifolia</i>	Oregon ash	139	Container or field grown	½ in caliper
<i>Quercus garryana</i>	Oregon white oak	139	Container or field-grown	½ in caliper
<i>Salix scouleriana</i>	Scouler's willow	139	Container or field-grown	½ in caliper
<b>Total</b>		<b>696</b>		
<b>Shrubs</b>				
<i>Cornus alba</i>	Red-osier dogwood	580	1 gal.	12 in
<i>Rosa pisocarpa</i>	Clustered rose	579	1 gal.	12 in
<i>Malus fusca</i>	Western crabapple	579	1 gal	12 in
<i>Physocarpus capitatus</i>	Pacific ninebark	580	1 gal.	12 in
<i>Sambucus racemosa</i>	Red elderberry	580	1 gal.	12 in
<i>Symphoricarpos albus</i>	Snowberry	580	1 gal.	12 in
<b>Total</b>		<b>3,478</b>		
<b>Herbaceous seed mix</b>				
<i>Agrostis exarata</i>	Spike bentgrass	2.0 lbs/ac	Seed	n/a
<i>Bromus carinatus</i>	California brome	2.0 lbs/ac	Seed	n/a
<i>Deschampsia cespitosa</i>	Tufted hairgrass	3.0 lbs/ac	Seed	n/a
<i>Elymus glaucus</i>	Blue wildrye	3.0 lbs/ac	Seed	n/a
<i>Hordeum brachyantherum</i>	Meadow barley	2.0 lbs/ac	Seed	n/a
<i>Lupinus rivularis</i>	Riverbank lupine	3.5 lbs/ac	Seed	n/a

The types of plants to be installed were chosen from the Milwaukie Native Plant List and by the suitability to site conditions and the types of native species that were observed on the site. The tree and shrub plantings will improve vegetation structure and diversity, and thereby, enhance wildlife habitat, in areas that presently consist of a monoculture of reed canarygrass.

- ***Plant and/or seed all bare areas to provide 100% surface coverage.***

All disturbed soil surfaces will be seeded with a native seed mix, as described in Table 9, above. Areas temporarily disturbed for the construction of stormwater outfalls and due to the removal of invasive plant species will be seeded with this seed mix.

- ***Inventory and remove debris and noxious materials.***

At the time of site construction, the Applicant will identify man-made debris and noxious materials that may be present within the WQR. Any such debris or materials will be removed from the WQR. This will occur within the mitigation area, as shown on Figure 11.

- c. ***Sufficient description to demonstrate how the following standards will be achieved:***

- (1) ***Where existing vegetation has been removed, the site shall be revegetated as soon as practicable.***

Following the completion of the construction of the proposed stormwater outfalls, disturbed soils will be reseeded with the native seed mix described in Table 9, above. Within the mitigation area, soils disturbed as a result of the removal of non-native invasive plants will be seeded with the native seed mix described in Table 9 as soon as practicable following the removal of the invasive plants. Woody material will be planted in the mitigation area in the fall/winter immediately following construction to maximize the survival of the plantings.

- (2) ***Where practicable, lights shall be placed so that they do not shine directly into any WQR and/or HCA location. The type, size, and intensity of lighting shall be selected so that impacts to habitat functions are minimized.***

Lights will be placed so that they do not shine directly into the WQR and/or HCA. The type, size, and intensity of lighting will be selected so that impacts to habitat functions are minimized.

- (3) ***Areas of standing trees, shrubs, and natural vegetation will remain connected or contiguous; particularly along natural drainage courses, except where mitigation is approved; so as to provide a transition between the proposed development and the designated natural resource and to provide opportunity for food, water, and cover for animals located within the WQR.***

With the exception of the removal of invasive plants from the proposed mitigation area, existing trees, shrubs, and natural vegetation within the WQR will remain undisturbed during the proposed construction.

- d. ***A map showing where the specific mitigation activities will occur. Off-site mitigation related to WQRs shall not be used to meet the mitigation requirements of Section 19.402.***

Figure 11 depicts the location of proposed mitigation activities. No mitigation is proposed to occur off-site.

- e. ***An implementation schedule; including a timeline for construction, mitigation, mitigation maintenance, monitoring, and reporting; as well as a contingency plan. All in-stream work in fish-bearing streams shall be done in accordance with the allowable windows for in-water work as designated by ODFW.***

Construction of the proposed project is anticipated to begin in the June/July of 2019. Activities associated with the WQR/HCA mitigation are anticipated to begin in summer 2019. Removal of any existing man-made debris and noxious materials from the WQR will occur in summer 2019, as will the removal of invasive plants from the mitigation area (Figure 11). Plantings will be installed in the mitigation area in late fall/winter of 2019/2020.



Monitoring of the mitigation area will be conducted in the summer of 2020. An annual monitoring report documenting the survival of the mitigation plantings will be submitted to the City of Milwaukie by December 31 of each monitoring year. Plants that die shall be replaced in kind as needed to ensure the minimum 80% survival rate.

No in-stream work is proposed to occur as part of this project.

**B. Approval Criteria**

**1. Unless specified elsewhere in Section 19.402, applications subject to the discretionary review process shall demonstrate how the proposed activity complies with the following criteria:**

**a. Avoid**

***The proposed activity avoids the intrusion of development into the WQR and/or HCA to the extent practicable. The proposed activity shall have less detrimental impact to the designated natural resource than other practicable alternatives, including significantly different practicable alternatives that propose less development within the resource area.***

The proposed project avoids development within the WQR and HCA to the extent practicable, given site constraints. As discussed earlier in this document, the alternative site designs (Figures 12A and 12B) have greater impacts to the WQR, HCA and wetlands, and therefore, the proposed site design is the optimal alternative for site development that would meet the City's minimum density requirements while also avoiding and minimizing impacts to natural resources on the site to the extent practicable.

**b. Minimize**

***If the applicant demonstrates that there is no practicable alternative that will avoid disturbance of the designated natural resource, then the proposed activity within the resource area shall minimize detrimental impacts to the extent practicable.***

***(1) The proposed activity shall minimize detrimental impacts to ecological functions and loss of habitat, consistent with uses allowed by right under the base zone, to the extent practicable.***

Implementation of the proposed mitigation will ensure the proposed project minimizes adverse effects to the ecological functions of the WQR and loss of habitat, as follows:

- The minimization of areal impacts as well as the proposed plantings to restore native plant communities on the south side of Mt. Scott Creek, along the northeast and south sides of Wetland A, and within the floodplain storage area will ensure that the WQR continues to provide vegetated corridors that separate protected water features from development.
- As the proposed tree and shrub plantings south of Mt. Scott Creek, around Wetland A, and within the floodplain storage area mature, they will increasingly provide microclimate regulation and shade for the stream and wetland, and provide better microclimate regulation and shade as compared to the existing plant communities.
- As the proposed tree and shrub plantings south of Mt. Scott Creek, around Wetland A, and the floodplain storage area mature, they will provide more effective streamflow moderation during high flow events than the herbaceous plant community, predominantly composed of reed canarygrass, that is present under existing conditions.
- The diverse plant community within the WQR, HCA and floodplain storage area will continue to provide water filtration, infiltration, and natural purification functions. The proposed project will not adversely affect these functions.

- The proposed mitigation plantings and the resulting diverse plant community within the WQR, HCA and floodplain storage area will continue to provide bank stabilization and sediment and pollution control functions. The proposed project will not adversely affect these functions.
  - Trees will remain within the vegetated corridor following construction, and therefore, the WQR will continue to provide the potential for large wood recruitment and retention functions. No impacts are proposed for the creek, and therefore, there will be no adverse impact on channel dynamics.
  - Because the WQR will continue to be vegetated with a diverse plant community, the proposed project will not adversely affect the resource's ability to provide organic inputs to the stream and riparian area.
- (2) *To the extent practicable within the designated natural resource, the proposed activity shall be designed, located, and constructed to:*
- (a) *Minimize grading, removal of native vegetation, and disturbance and removal of native soils; by using the approaches described in Subsection 19.402.11.A, reducing building footprints, and using minimal excavation foundation systems (e.g., pier, post, or piling foundation).*

In accordance with MMC Subsection 19.402.11.A, the following measures will be implemented to minimize impacts to the WQR on the site:

- Work areas will be marked to reduce potential damage to the WQR.
- Trees in the WQR will not be used as anchors for stabilizing construction equipment.
- Native soils disturbed during development shall be conserved on the property.
- The Applicant has prepared a preliminary grading and erosion control plan. Prior to the start of any construction activities, the applicant will apply for a grading and erosion control permit, consistent with the standards required by the City's Public Works Department.
- The Applicant will implement best management practices on site to prevent the drainage of hazardous materials, erosion, pollution or sedimentation within the resources and the vegetative corridors.
- The Applicant has prepared a preliminary stormwater detention and water quality plan for the project which has been designed to prevent flows within and to natural drainage courses which might exceed pre-developed conditions.
- Prior to construction, the WQR and HCA that are to remain undeveloped will be flagged, fenced, or otherwise marked and shall remain undisturbed. Such markings will be maintained until construction is complete.
- The construction phase of the development shall be done in such a manner as to safeguard the resource portions of the site that have not been approved for development.
- Lights will be placed so that they do not shine directly into the WQR and/or HCA.
- The Applicant has prepared a construction management plan which will conform to the requirements of 19.402.9. The Final Construction management plan will be provided to the City's Engineering Department prior to the commencement of construction activities.

(b) *Minimize adverse hydrological impacts on water resources.*

The implementation of the proposed stormwater management plan, which detains post-development runoff at or below pre-development release rates will ensure that hydrologic impacts to the water resources are minimized. No work is proposed in the stream; therefore, no hydraulic impacts to the stream channel are anticipated.

*(c) Minimize impacts on wildlife corridors and fish passage.*

No work is proposed in the stream, which will ensure the project avoids impacts to fish passage along this reach of Mt. Scott Creek. Restoration with a diverse native plant community within the riparian corridor will ensure that impacts to wildlife habitat are minimized.

*(d) Allow for use of other techniques to further minimize the impacts of development in the resource area; such as using native plants throughout the site (not just in the resource area), locating other required landscaping adjacent to the resource area, reducing light spill-off into the resource area from development, preserving and maintaining existing trees and tree canopy coverage, and/or planting trees where appropriate to maximize future tree canopy coverage.*

Impacts to the on-site resources have been minimized to the extent practicable.

*c. Mitigate*

*If the applicant demonstrates that there is no practicable alternative that will avoid disturbance of the designated natural resource, then the proposed activity shall mitigate for adverse impacts to the resource area. All proposed mitigation plans shall meet the following standards:*

*(1) The mitigation plan shall demonstrate that it compensates for detrimental impacts to the ecological functions of resource areas, after taking into consideration the applicant's efforts to minimize such detrimental impacts.*

As described above, implementation of the proposed mitigation will ensure the proposed project minimizes adverse effects to the ecological functions of the WQR and loss of habitat, as follows:

- The minimization of areal impacts as well as the proposed plantings to restore a native plant community on the south side of Mt. Scott Creek, around Wetland A, and within the floodplain storage area will ensure that the WQR continues to provide a vegetated corridor that separates protected water features from development.
- As the proposed tree and shrub plantings south of Mt. Scott Creek; around Wetland A, and within the floodplain storage area mature, they will increasingly provide microclimate regulation and shade for the stream, and provide better microclimate regulation and shade as compared to the existing plant community on the south side of the creek.
- As the proposed tree and shrub plantings south of Mt. Scott Creek, around Wetland A, and within the floodplain storage area mature, they will provide more effective streamflow moderation during high flow events than the predominantly reed canarygrass herbaceous plant community that is present under existing conditions.
- The diverse plant community within the WQR, HCA and floodplain storage area will continue to provide water filtration, infiltration, and natural purification functions. The proposed project will not adversely affect these functions.
- The proposed restoration plantings and the resulting diverse plant community within the WQR, HCA and floodplain storage area will continue to provide bank stabilization and sediment and pollution control functions. The proposed project will not adversely affect these functions.

- Trees will remain within the vegetated corridor following construction, and therefore, the WQR will continue to provide the potential for large wood recruitment and retention functions. No impacts are proposed for the creek, and therefore, there will be no adverse impact on channel dynamics.
- Because the WQR will continue to be vegetated with a diverse plant community, the proposed project will not adversely affect the resource's ability to provide organic inputs to the stream and riparian area.

*(2) Mitigation shall occur on the site of the disturbance, to the extent practicable. Off-site mitigation for disturbance of WQRs shall not be approved. Off-site mitigation for disturbance of HCAs shall be approved if the applicant has demonstrated that it is not practicable to complete the mitigation on-site and if the applicant has documented that they can carry out and ensure the success of the off-site mitigation as outlined in Subsection 19.402.11.B.5.*

*In addition, if the off-site mitigation area is not within the same subwatershed (6th Field Hydrologic Unit Code) as the related disturbed HCA, the applicant shall demonstrate that it is not practicable to complete the mitigation within the same subwatershed and that, considering the purpose of the mitigation, the mitigation will provide more ecological functional value if implemented outside of the subwatershed.*

All mitigation will occur on site.

*(3) All revegetation plantings shall use native plants listed on the Milwaukie Native Plant List.*

Only native species will be installed in the revegetation plantings. A list of species to be planted is provided on Figure 11A.

*(4) All in-stream work in fish-bearing streams shall be done in accordance with the allowable windows for in-water work as designated by ODFW.*

No in-stream work is proposed to occur with this project.

*(5) A mitigation maintenance plan shall be included and shall be sufficient to ensure the success of the planting. Compliance with the plan shall be a condition of development approval.*

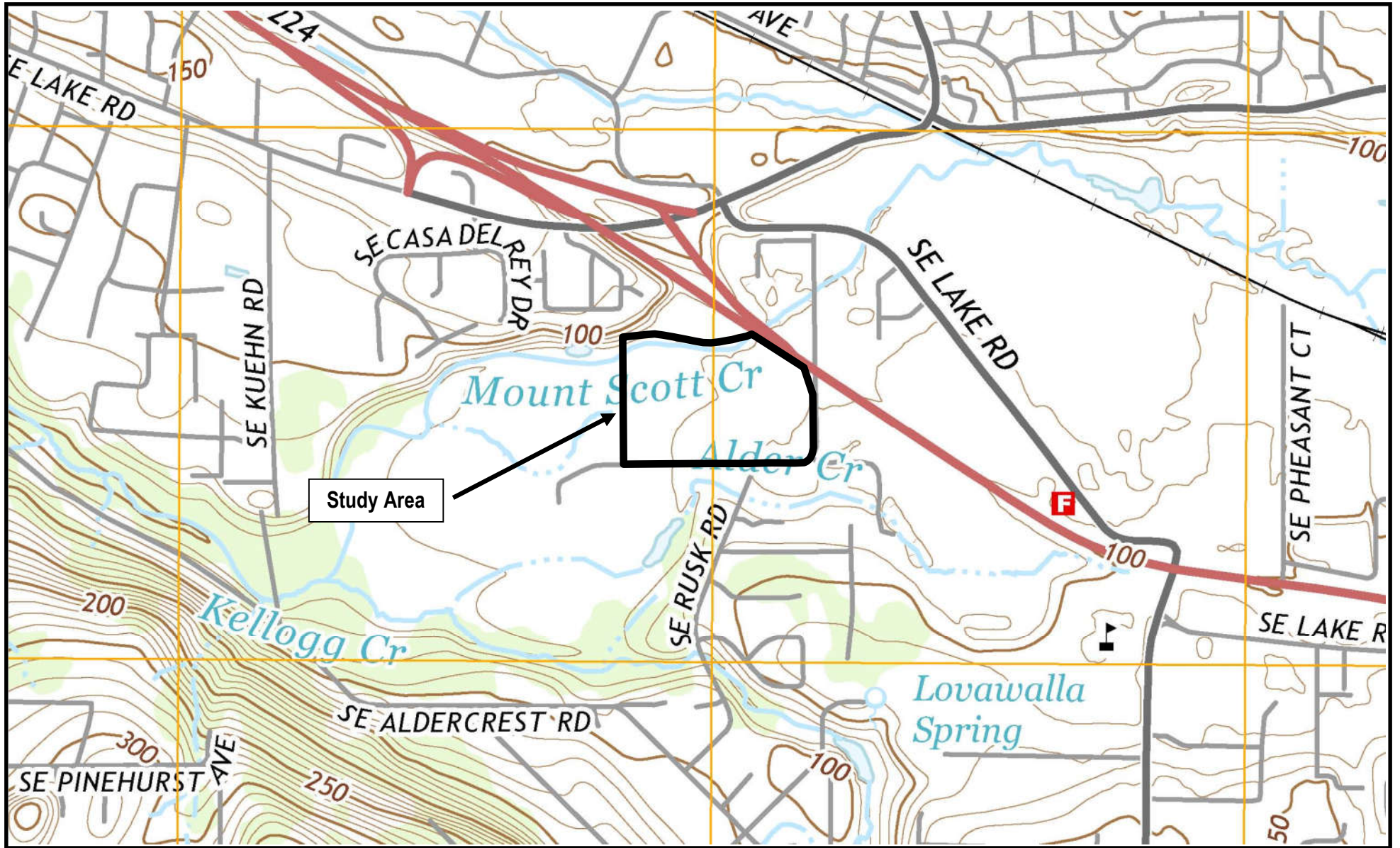
The Applicant will undertake the following mitigation maintenance measures to ensure a minimum of 80 percent of the trees and shrubs planted remain alive two years after the mitigation planting is completed.

- New plantings will be mulched to a minimum of 3-inch depth and 18-inch diameter to retain moisture and discourage weed growth.
- Non-native or noxious vegetation will be removed or controlled throughout the maintenance period.
- Plant sleeves or fencing will be used to protect trees and shrubs against wildlife browsing and the resulting damage to plants.
- New plantings will be watered at a rate of 1 inch per week between June 15 and October 15 for the first two years following planting.

# Attachment A

## Figures





5975  
1/16/2017

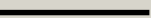



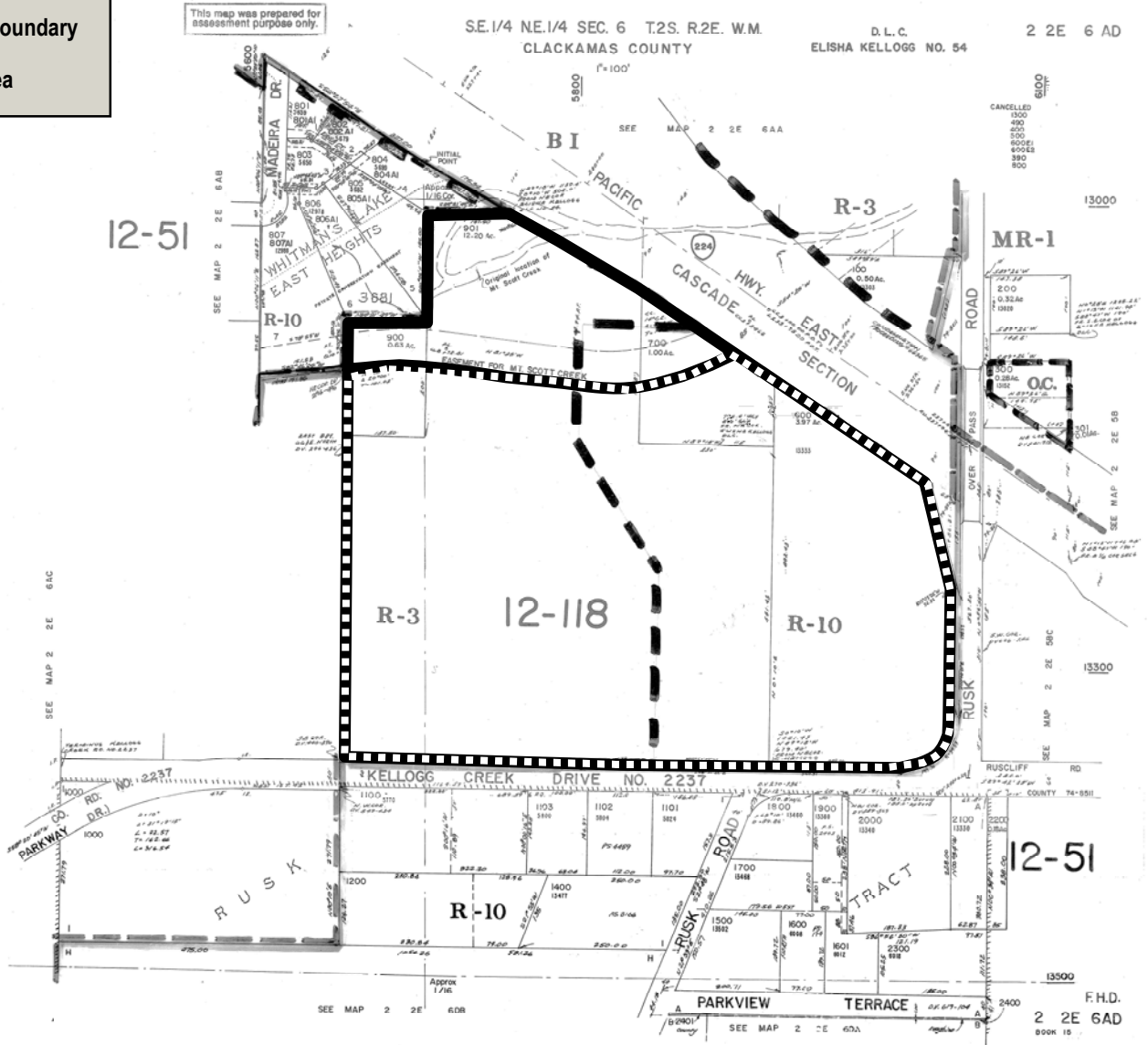
Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

General Location and Topography  
SE Kellogg Creek Drive - Milwaukie, Oregon  
United States Geological Survey (USGS), Gladstone, Oregon, 7.5 Quadrangle, 2014  
(viewer/nationalmap.gov/basic)

FIGURE

1

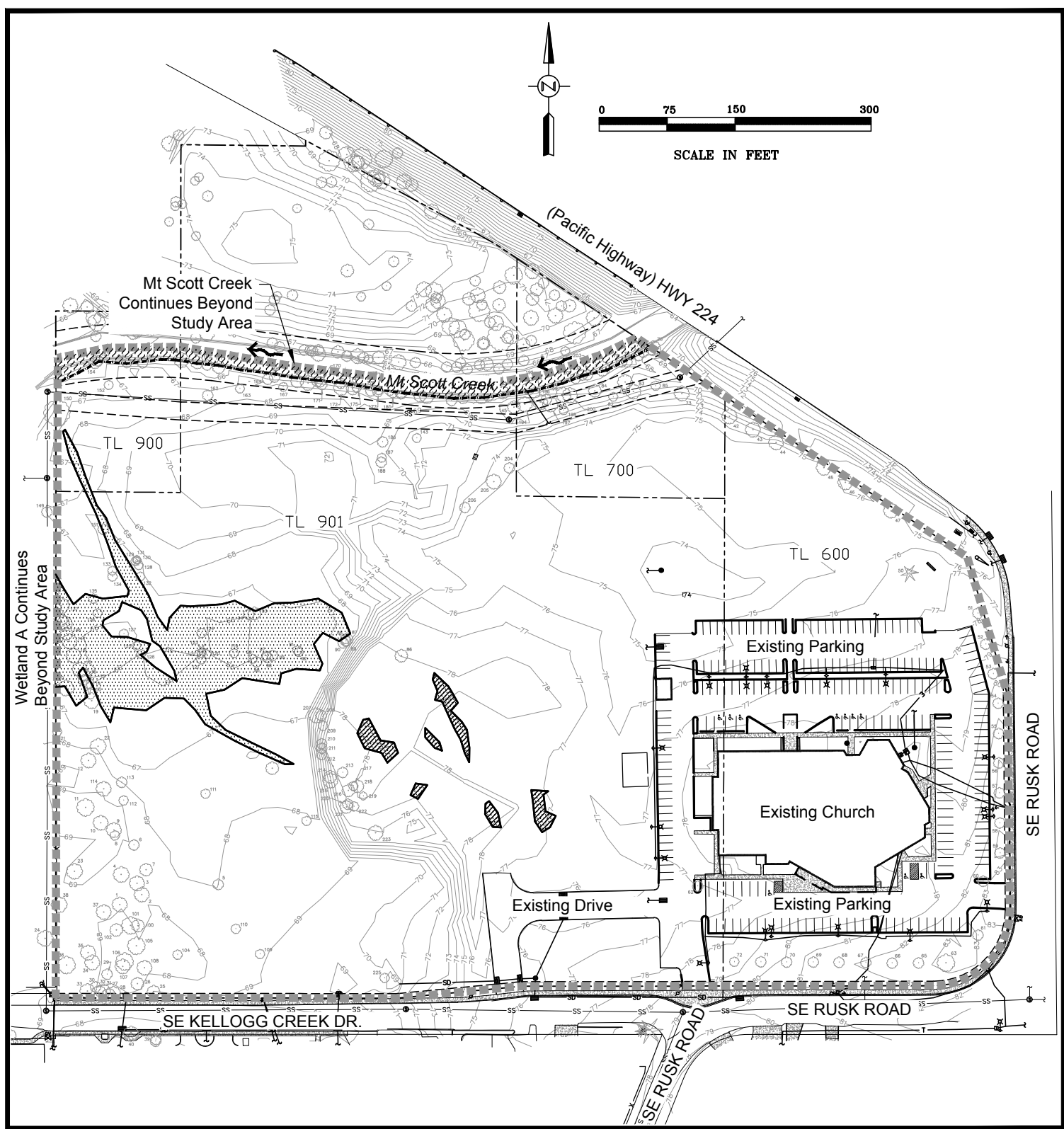
 Tax Lot Boundary  
 Study Area



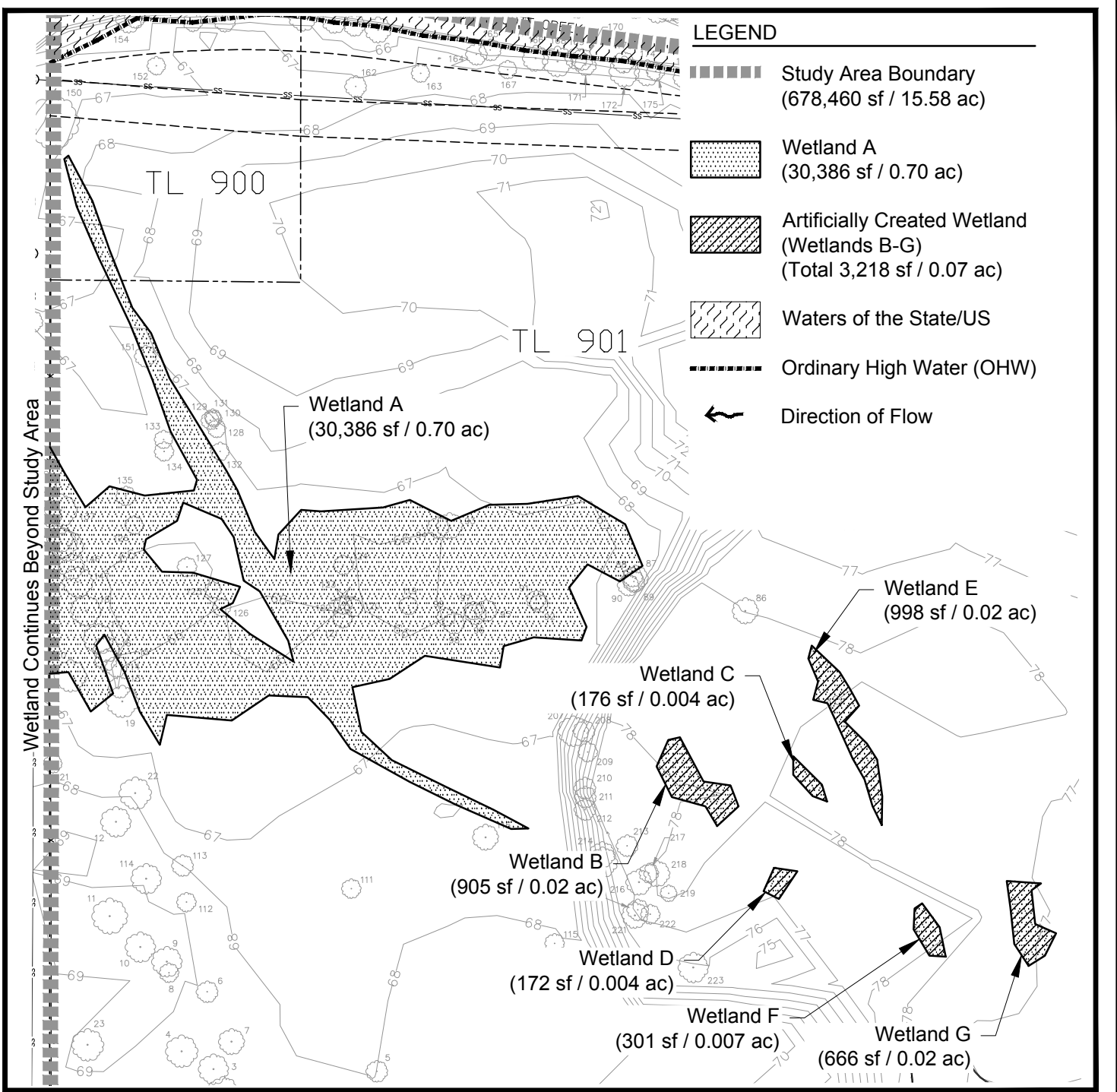
5975  
 12/21/2016  
  
 Pacific Habitat Services, Inc.  
 9450 SW Commerce Circle, Suite 180  
 Wilsonville, OR 97070

Tax Lot Map  
 SE Kellogg Creek Drive - Milwaukie, Oregon  
 The Oregon Map (ormap.net)

FIGURE  
 2



TAX LOT OVERVIEW



SCALE IN FEET



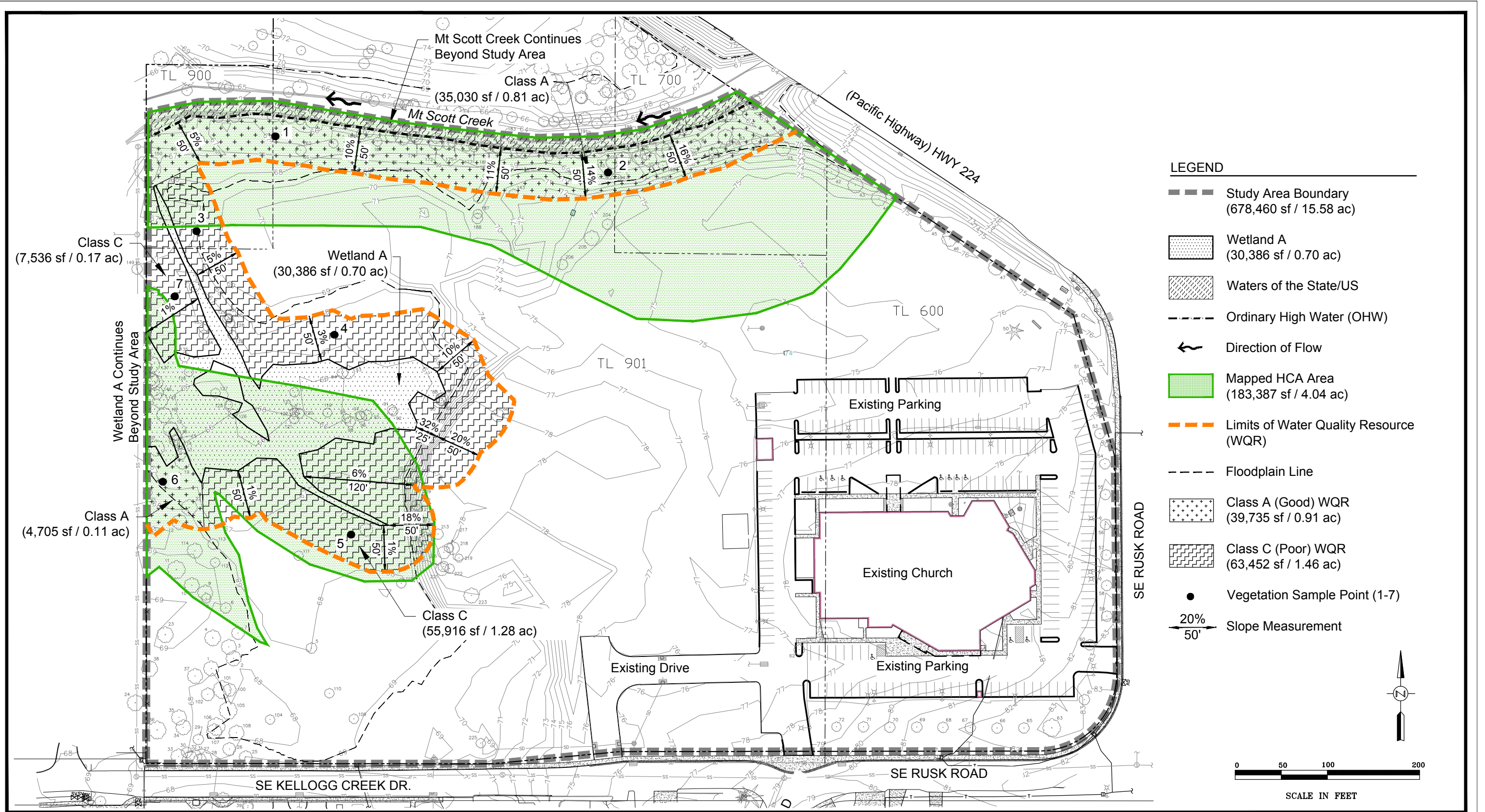
Survey provided by  
TerraCalc Land Surveying, Inc., 2016  
Survey accuracy is sub-centimeter and  
Sample Point accuracy is ± 3 feet.

Existing Conditions  
Kellogg Creek Senior Living - Milwaukie, Oregon

FIGURE  
3

12-7-2017





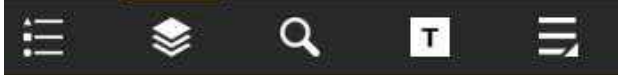
Survey provided by  
 TerraCalc Land Surveying, Inc., 2016.

Water Quality Resource (WQR) and Mapped Habitat Conservation Area (HCA)  
 Kellogg Creek Senior Living - Milwaukie, Oregon

FIGURE  
**4**

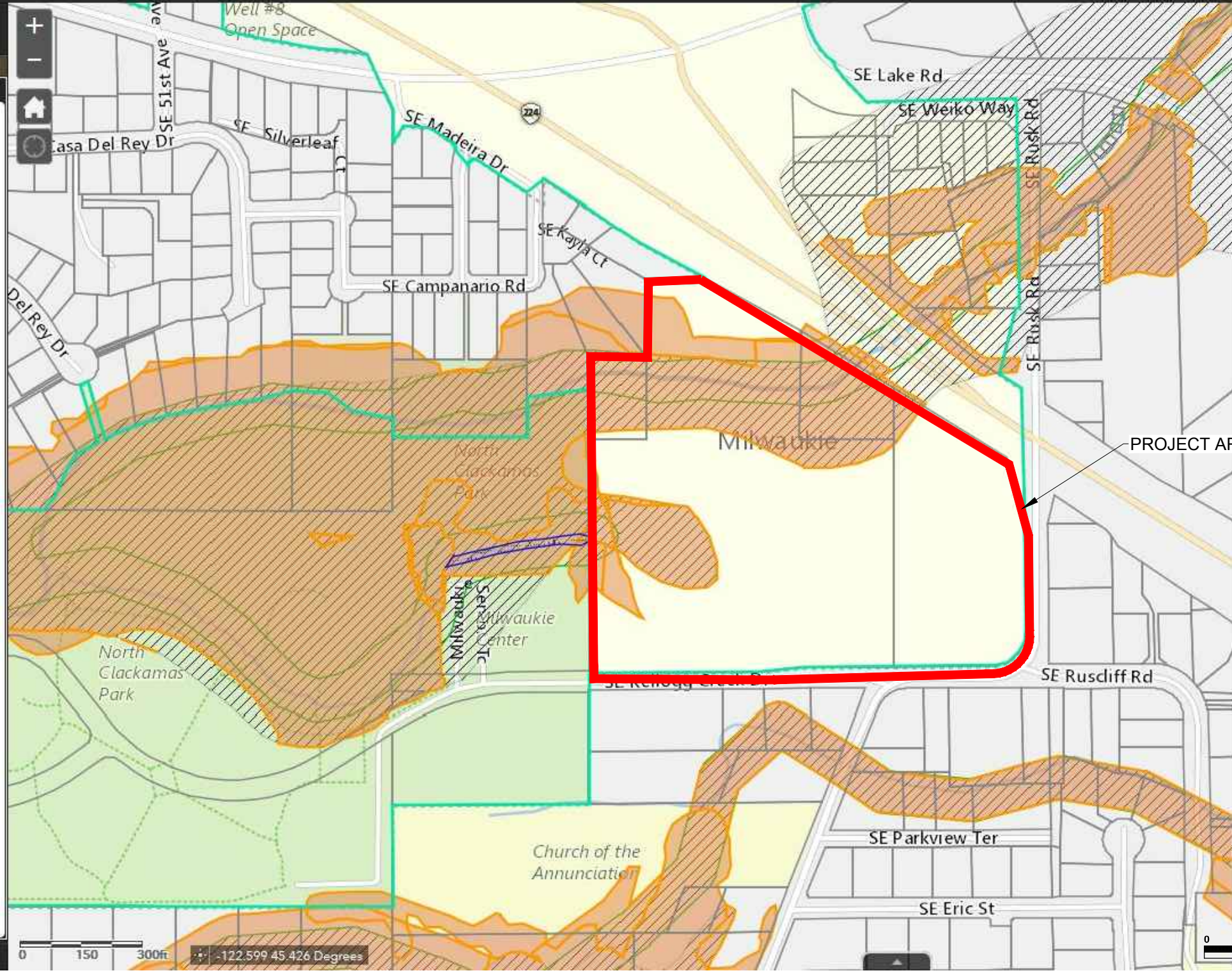
11-1-2018

# Milwaukie Zoning

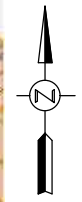


## Layer List

- Layers
- Milwaukie City Limits
- Taxlots
- Addresses
- Flex Space Overlay
- Wetlands
- Historic Resources
- Habitat Conservation Areas
- Vegetated Corridors
- Willamette Greenway
- Floodplain
- NR\_100ft\_Compliance
- Milwaukie Zoning
- baseAnno



PROJECT AREA



0 150 300 600

SCALE IN FEET

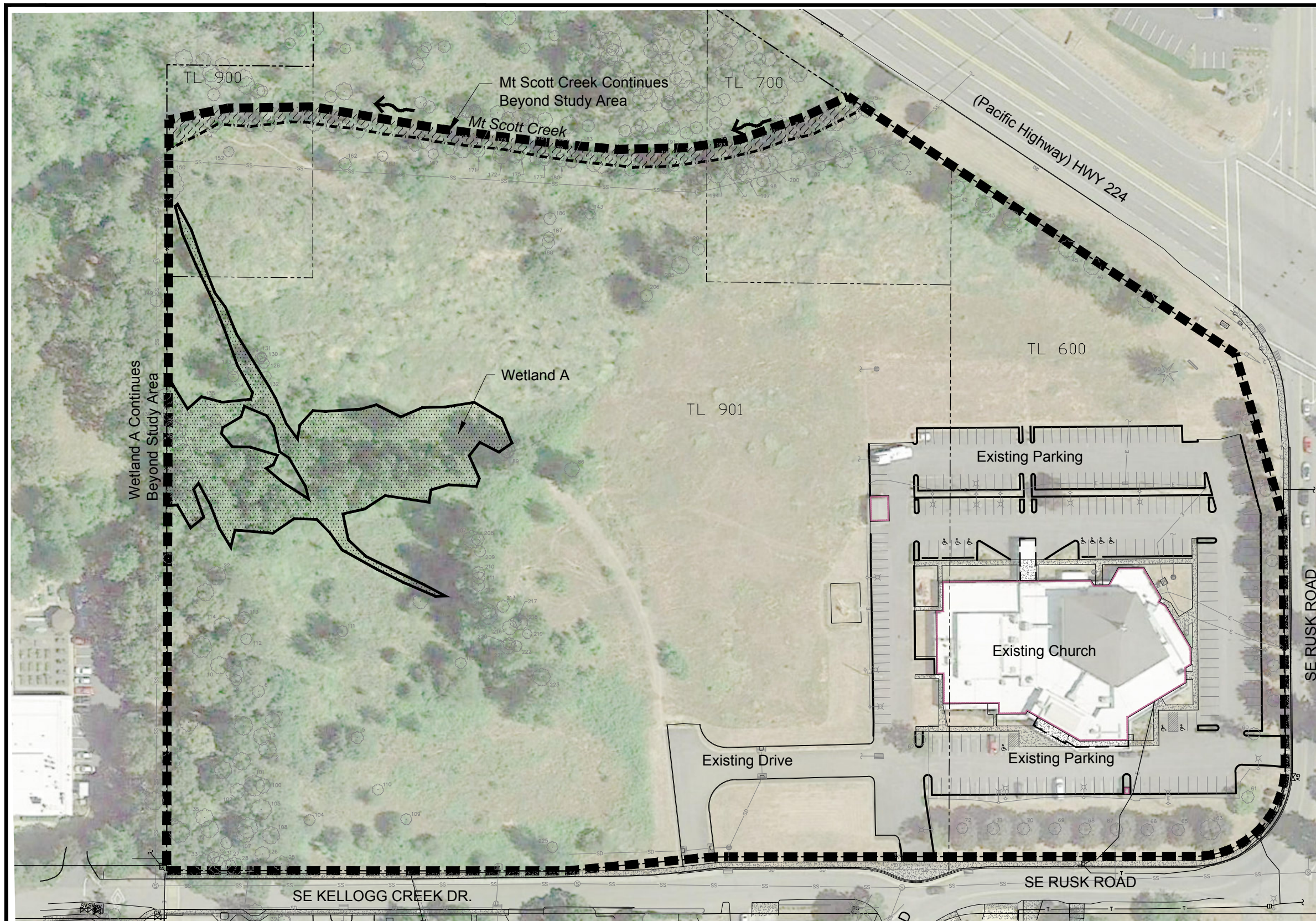


Map Source: City of Milwaukie GIS

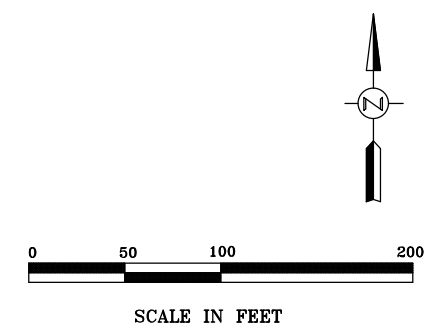
City Mapped Wetlands, Habitat Conservation Areas, and Vegetated Corridors  
Kellogg Creek Senior Living - Milwaukie, Oregon

FIGURE  
**5**

12-18-2018



- LEGEND**
- Study Area Boundary (678,460 sf / 15.58 ac)
  - Wetland A
  - Waters of the State/US
  - Ordinary High Water (OHW)
  - Direction of Flow
  - Tax Lot Line

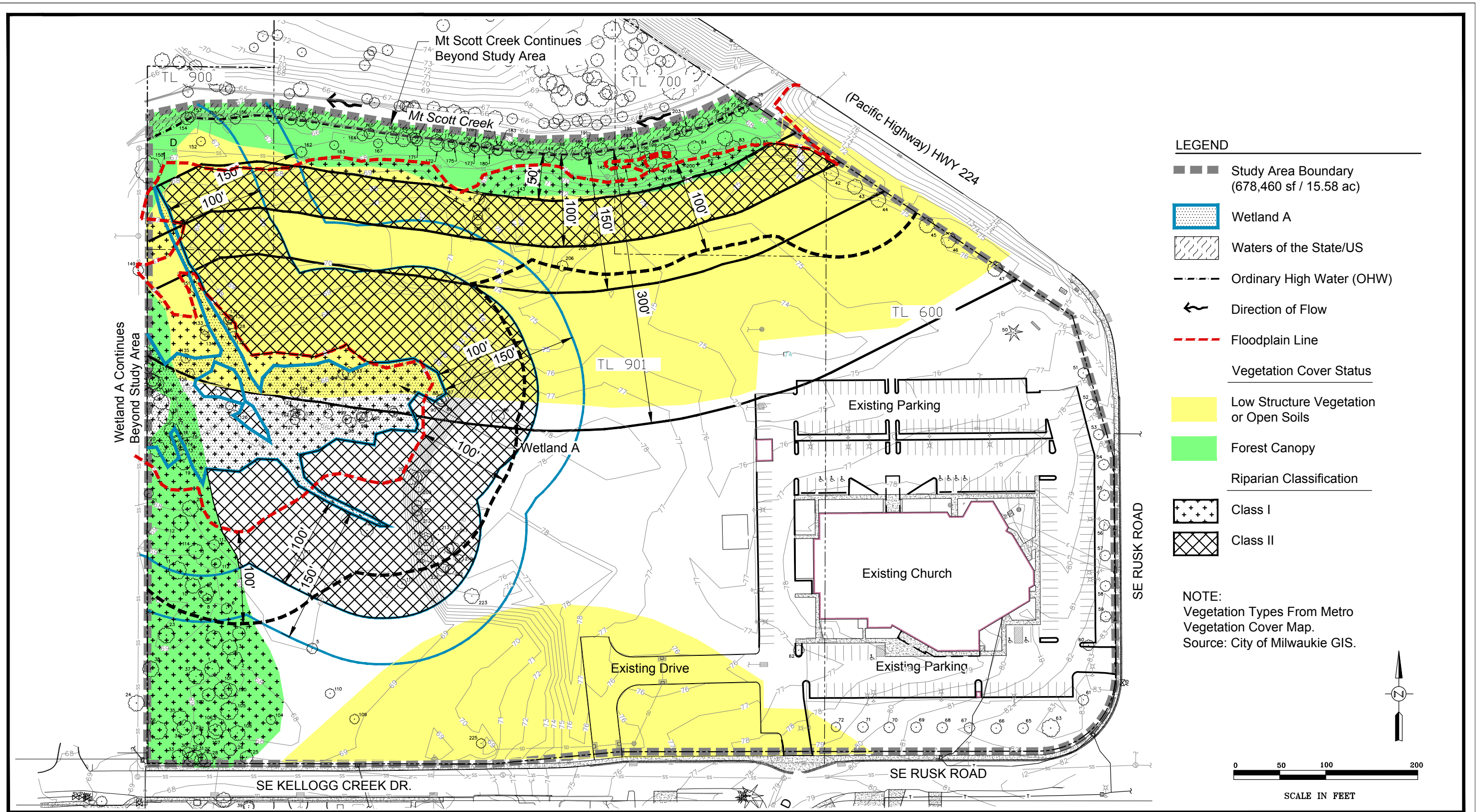


Survey provided by  
TerraCalc Land Surveying, Inc., 2016.  
Aerial Photo source: Google Earth July 2018

July 2018 Aerial Photo  
Kellogg Creek Senior Living - Milwaukie, Oregon

**FIGURE**  
**6**

12-18-2018



**LEGEND**

- ■ ■ Study Area Boundary (678,460 sf / 15.58 ac)
- ▨ Wetland A
- ▨ Waters of the State/US
- Ordinary High Water (OHW)
- ← Direction of Flow
- - - Floodplain Line

**Vegetation Cover Status**

- Low Structure Vegetation or Open Soils
- Forest Canopy

**Riparian Classification**

- ▨ Class I
- ▨ Class II

**NOTE:**  
Vegetation Types From Metro Vegetation Cover Map.  
Source: City of Milwaukie GIS.

0 50 100 200  
SCALE IN FEET

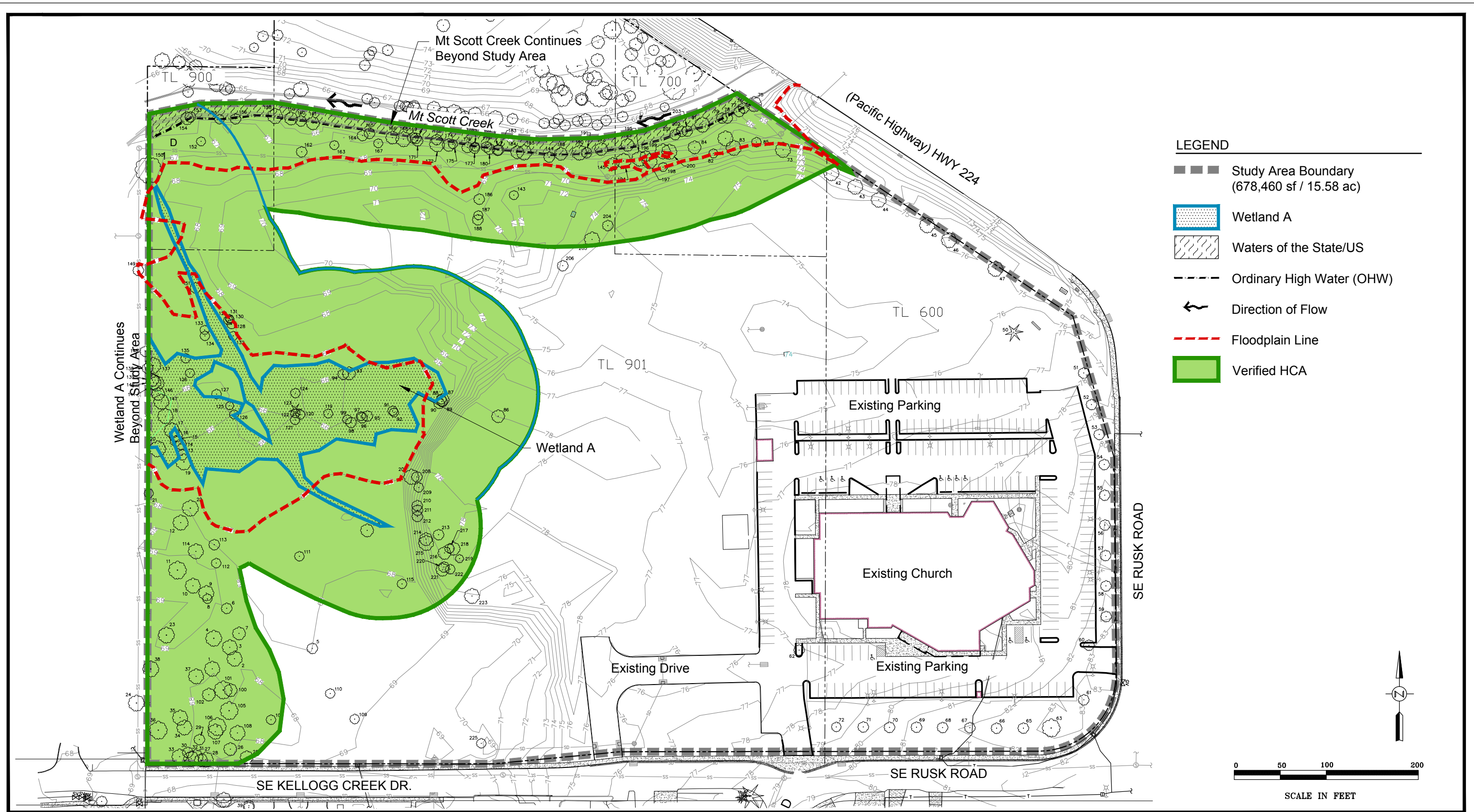


Survey provided by  
TerraCalc Land Surveying, Inc., 2016.

Vegetated Cover and Riparian Habitat Classification Map  
Kellogg Creek Senior Living - Milwaukie, Oregon

FIGURE  
7

12-18-2018

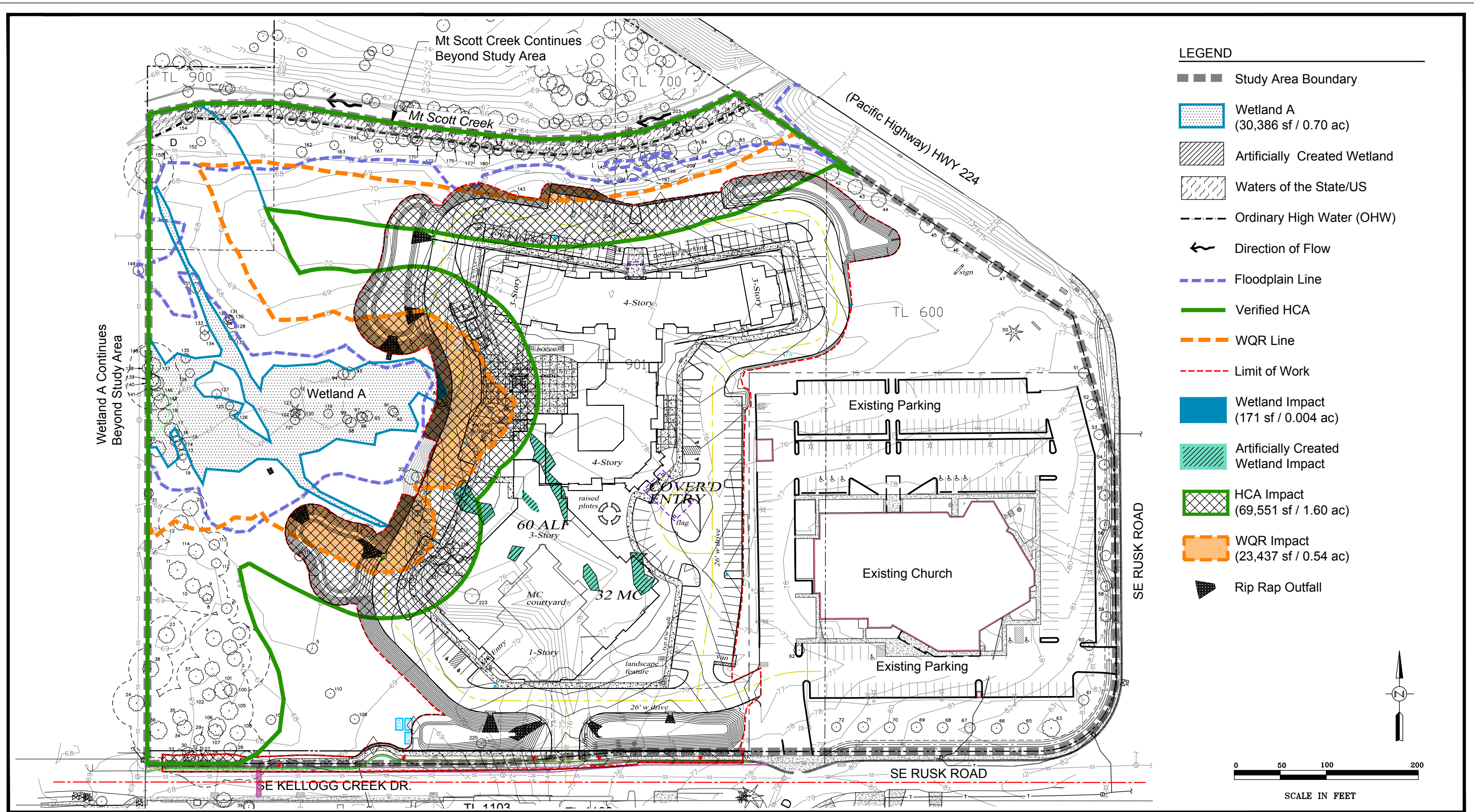


Survey provided by  
TerraCalc Land Surveying, Inc., 2016.

Verified Habitat Conservation Area (HCA)  
Kellogg Creek Senior Living - Milwaukie, Oregon

FIGURE  
8

12-18-2018

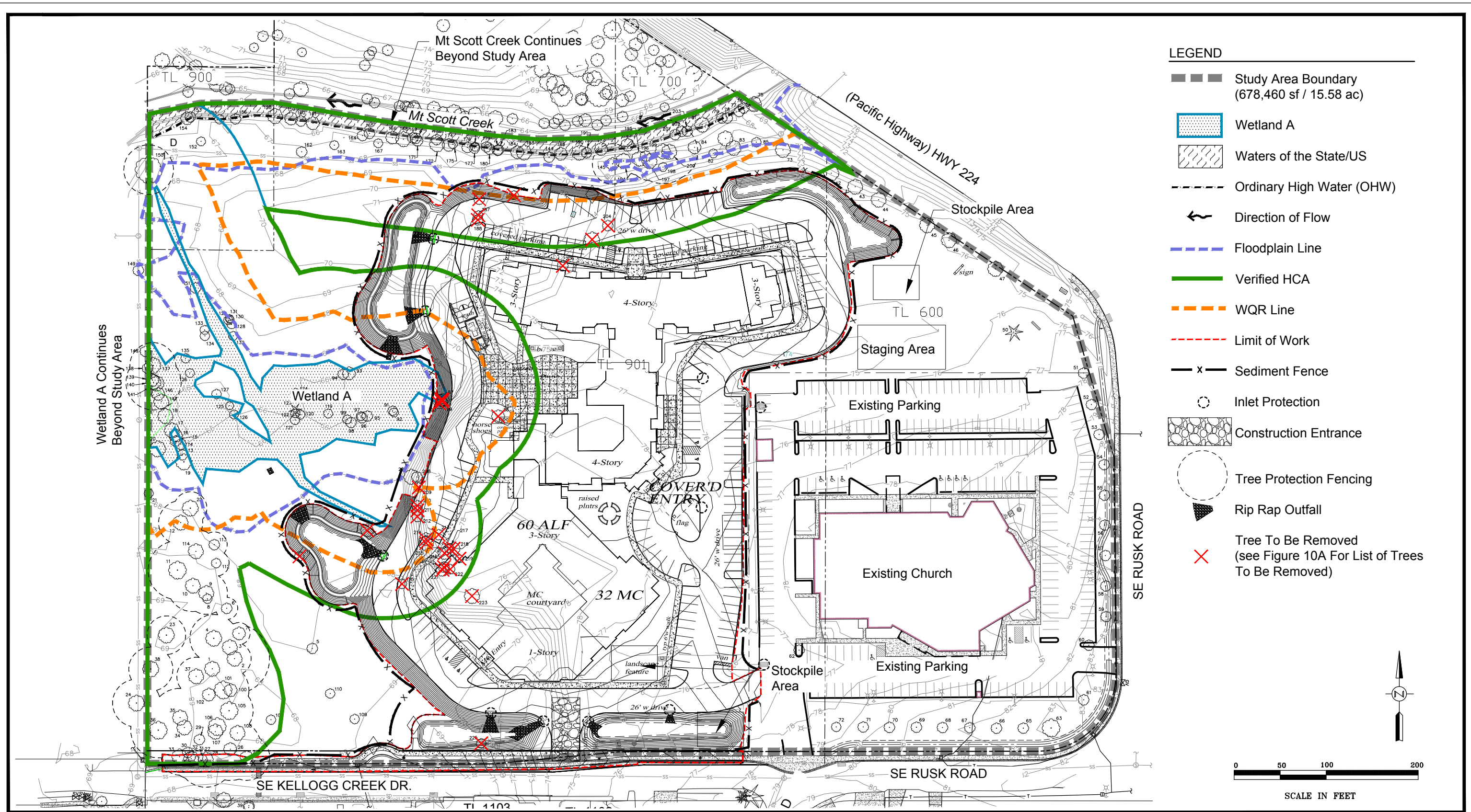


Survey provided by  
TerraCalc Land Surveying, Inc., 2016.

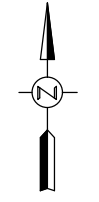
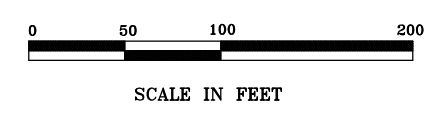
Site Plan With Habitat Conservation Area (HCA) and Water Quality Resource (WQR) Impacts  
Kellogg Creek Senior Living - Milwaukie, Oregon

FIGURE  
9

12-18-2018



- LEGEND**
- Study Area Boundary (678,460 sf / 15.58 ac)
  - ▨ Wetland A
  - ▨ Waters of the State/US
  - - - Ordinary High Water (OHW)
  - ← Direction of Flow
  - - - Floodplain Line
  - Verified HCA
  - - - WQR Line
  - - - Limit of Work
  - x - Sediment Fence
  - Inlet Protection
  - ▨ Construction Entrance
  - Tree Protection Fencing
  - ▲ Rip Rap Outfall
  - ✗ Tree To Be Removed (see Figure 10A For List of Trees To Be Removed)



Survey provided by  
TerraCalc Land Surveying, Inc., 2016.

Construction Management Plan  
Kellogg Creek Senior Living - Milwaukie, Oregon

FIGURE  
**10**

12-18-2018

Number	Dia (in)	Remove (Y/N)
1	18	N
2	18	N
3	22	N
4	28	Y
5	12	N
6	12	N
7	14	N
8	10	N
9	28	N
10	20	N
11	38	N
12	24	N
13	12	N
14	15	N
15	12	N
16	2x14	N
17	16	N
18	2x16	N
19	24	N
20	24	N
21	8	N
22	23	N
23	22	N
24	28	N
25	22	N
26	2x16	N
27	14	N

Number	Dia (in)	Remove (Y/N)
28	22	N
29	18	N
30	12	N
31	22	N
32	21	N
33	18	N
34	18	N
35	2x20	N
36	36	N
37	26	N
38	29	N
41	18	N
42	22	N
43	21	N
44	18	N
45	18	N
46	18	N
47	21	N
48	12	Y
49	12	Y
50	2x16	N
51	14	N
52	14	N
53	16	N
54	13	N
55	19	N
56	12	N

Number	Dia (in)	Remove (Y/N)
57	14	N
58	15	N
59	14	N
60	12	N
61	12	N
62	14	N
63	19	N
64	12	N
65	15	N
66	20	N
67	17	N
68	15	N
69	14	N
70	17	N
71	14	N
72	10	N
73	18	N
74	10	N
75	16	N
76	3x12	N
77	12	N
78	12	N
79	12	N
80	20	N
81	21	N
82	8	N
83	18	N

Number	Dia (in)	Remove (Y/N)
84	14	N
85	8	N
86	14	Y
87	2x14	Y
88	10	Y
89	12	Y
90	12	Y
91	10	N
92	8	N
93	14	N
94	12	N
95	12	N
96	12	N
97	8	N
98	12	N
99	12	N
100	17	N
101	28	N
102	6x8	N
103	16	N
104	10	N
105	26	N
106	24	N
107	18	N
108	2x16	N
109	10	N
110	10	N

Number	Dia (in)	Remove (Y/N)
111	5x10	Y
112	10	N
113	12	N
114	24	N
115	8x10	Y
116	14	Y
117	12	N
118	12	N
119	2x8	N
120	8	N
121	10	N
122	8	N
123	6	N
124	2x10	N
125	6	N
126	8	N
127	10	N
128	8	N
129	8	N
130	6	N
131	6	N
132	8	N
133	8	N
134	10	N
135	10	N
136	2x8	N
137	20	N

Number	Dia (in)	Remove (Y/N)
138	14	N
139	14	N
140	18	N
141	16	N
143	8	Y
144	12	N
145	2x14	N
146	14	N
147	16	N
148	10	N
149	10	N
150	48	N
151	12	N
152	8	N
153	12	N
154	14	N
155	2x10	N
156	12	N
157	14	N
158	16	N
159	14	N
160	3x8	N
161	14	N
162	10	N
163	2x8	N
164	12	N
165	12	N

Number	Dia (in)	Remove (Y/N)
166	12	N
167	8	N
168	18	N
169	12	N
170	12	N
171	12	N
172	10	N
173	12	N
174	11	N
175	8	N
176	12	N
177	10	N
178	8	N
179	2x10	N
180	10	N
181	14	N
182	10	N
183	10	N
184	2x14	N
185	18	N
186	3x12	Y

Number	Dia (in)	Remove (Y/N)
187	2x8	Y
188	2x10	Y
189	2x14	N
190	14	N
191	12	N
192	2x12	N
193	14	N
194	20	N
195	20	N
196	12	N
197	16	N
198	8	N
199	23	N
200	23	N
201	12	N
202	12	N
203	2x10	N
204	16	Y
205	2x18	Y
206	4x12	Y
207	16	N

Number	Dia (in)	Remove (Y/N)
208	2x12	N
209	9x10	Y
210	12	Y
211	12	Y
212	12	Y
213	12	Y
214	14	Y
215	16	Y
216	14	Y
217	10	Y
218	14	Y
219	3x6	Y
220	12	Y
221	14	Y
222	10	Y
223	2x16	Y
225	3x8	Y

NOTES:

1. TOTAL TREES TO BE REMOVED 33
2. TREES THAT ARE NOT NUMBERED HAVE NOT BEEN EVALUTATED BY THE ABORIST.

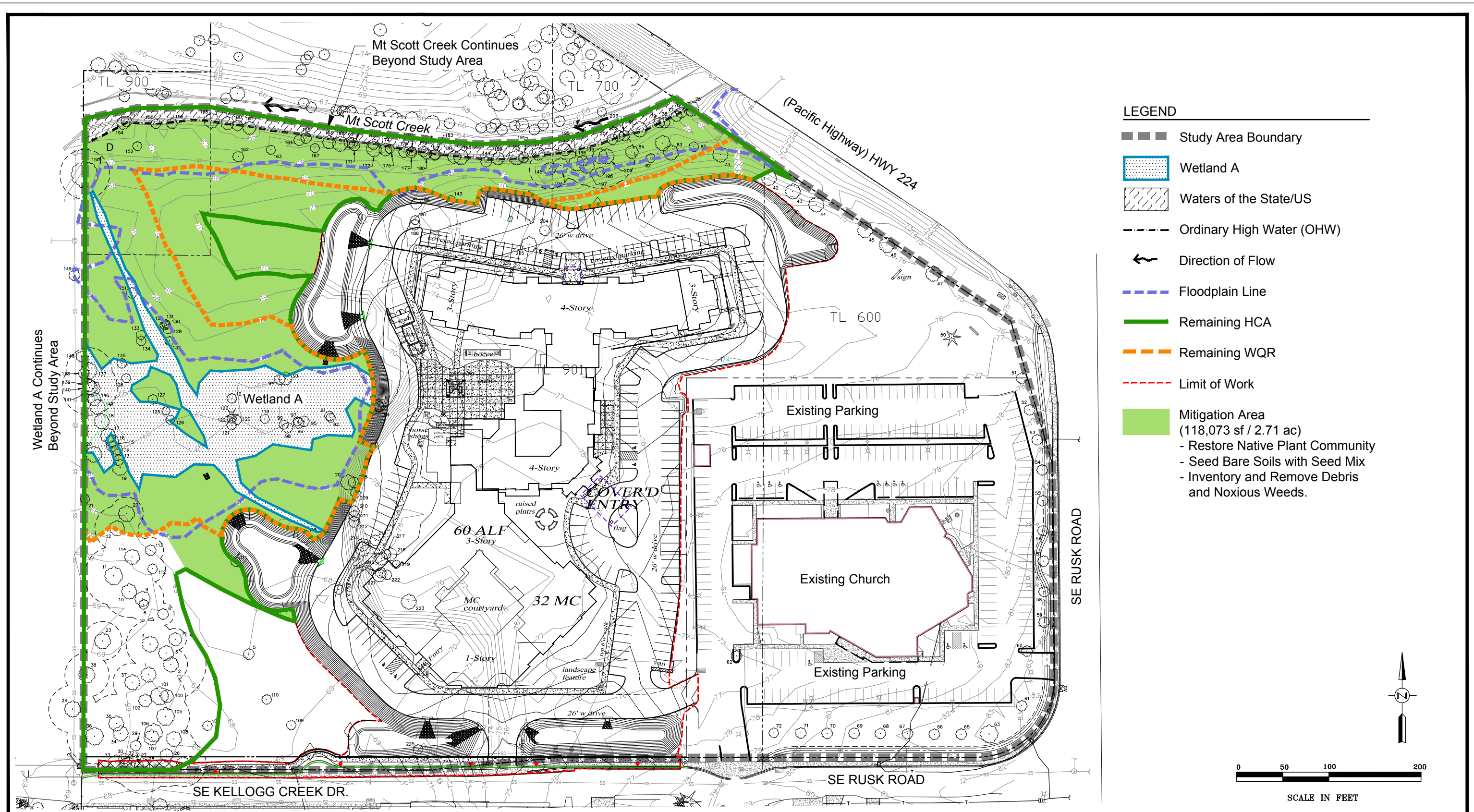


Survey provided by  
TerraCalc Land Surveying, Inc., 2016.  
Aerial Photo source: Google Earth July 2018

Tree Survey and Removal Table  
Kellogg Creek Senior Living - Milwaukie, Oregon

FIGURE  
**10A**





Survey provided by  
TerraCalc Land Surveying, Inc., 2016.

Mitigation Plan  
Kellogg Creek Senior Living - Milwaukie, Oregon

FIGURE  
**11**

12-18-2018

**Mitigation Planting List**

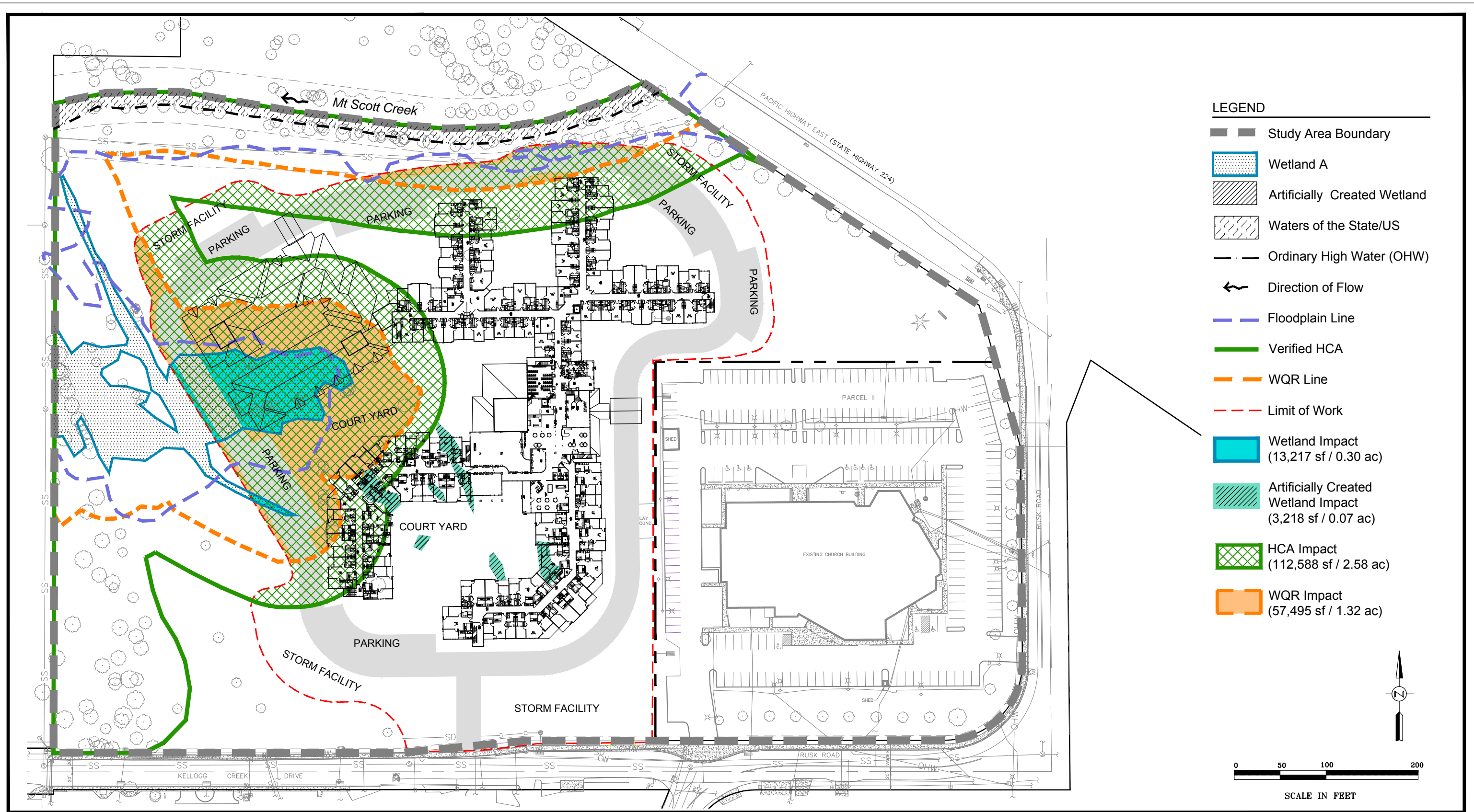
Species	Common Name	Quantity	Stock Type	Plant Size
<b>Trees</b>				
<i>Alnus rubra</i>	Red alder	139	Container or field-grown	½ in caliper
<i>Crataegus suksdorfii</i>	Black hawthorn	140	Container or field grown	½ in caliper
<i>Fraxinus latifolia</i>	Oregon ash	139	Container or field grown	½ in caliper
<i>Quercus garryana</i>	Oregon white oak	139	Container or field-grown	½ in caliper
<i>Salix scouleriana</i>	Scouler's willow	139	Container or field-grown	½ in caliper
<b>Total</b>		<b>696</b>		
<b>Shrubs</b>				
<i>Cornus alba</i>	Red-osier dogwood	580	1 gal.	12 in
<i>Rosa pisocarpa</i>	Clustered rose	579	1 gal.	12 in
<i>Malus fusca</i>	Western crabapple	579	1 gal.	12 in
<i>Physocarpus capitatus</i>	Pacific ninebark	580	1 gal.	12 in
<i>Sambucus racemosa</i>	Red elderberry	580	1 gal.	12 in
<i>Symphoricarpos albus</i>	Snowberry	580	1 gal.	12 in
<b>Total</b>		<b>3,478</b>		
<b>Herbaceous Seed Mix</b>				
<i>Agrostis exarata</i>	Spike bentgrass	2.0 lbs/ac	Seed	n/a
<i>Bromus carinatus</i>	California brome	2.0 lbs/ac	Seed	n/a
<i>Deschampsia cespitosa</i>	Tufted hairgrass	3.0 lbs/ac	Seed	n/a
<i>Elymus glaucus</i>	Blue wildrye	3.0 lbs/ac	Seed	n/a
<i>Hordeum brachyantherum</i>	Meadow barley	2.0 lbs/ac	Seed	n/a
<i>Lupinus rivularis</i>	Riverbank lupine	3.5 lbs/ac	Seed	n/a



Mitigation Planting Table  
 Kellogg Creek Subdivision - Milwaukie, Oregon

FIGURE  
**11A**

12-21-2018

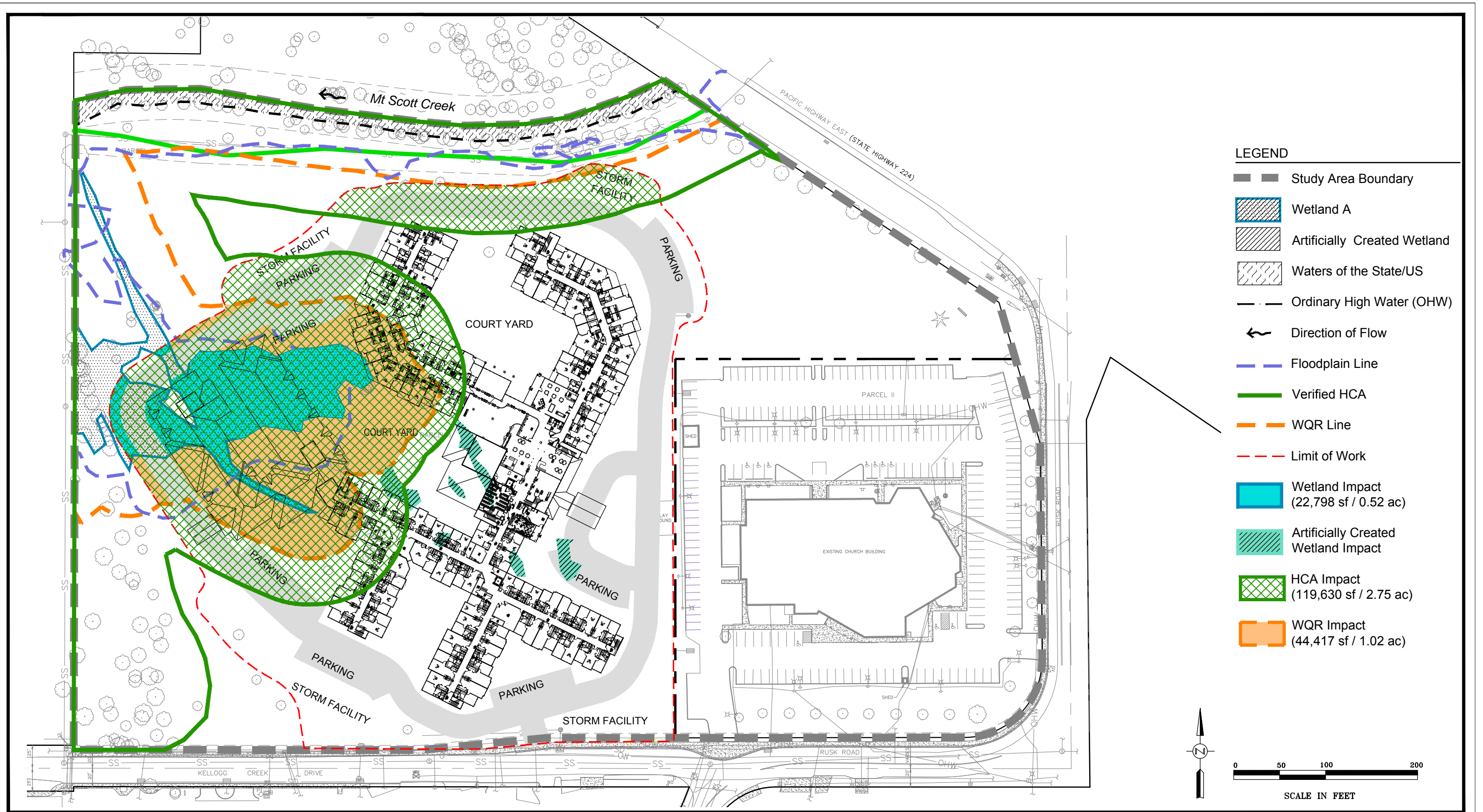


Survey provided by  
 TerraCalc Land Surveying, Inc., 2016.

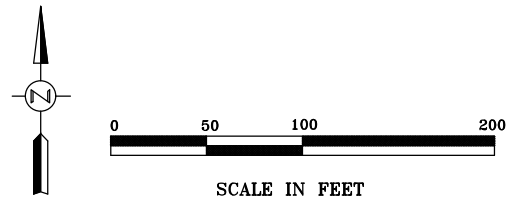
Site Plan (Alternative A) With HCA and WQR Impacts  
 Kellogg Creek Senior Living - Milwaukie, Oregon

FIGURE  
**12A**

12-18-2018



- LEGEND**
- Study Area Boundary
  - ▨ Wetland A
  - ▨ Artificially Created Wetland
  - ▨ Waters of the State/US
  - Ordinary High Water (OHW)
  - ← Direction of Flow
  - Floodplain Line
  - Verified HCA
  - WQR Line
  - - - Limit of Work
  - Wetland Impact (22,798 sf / 0.52 ac)
  - ▨ Artificially Created Wetland Impact
  - ▨ HCA Impact (119,630 sf / 2.75 ac)
  - WQR Impact (44,417 sf / 1.02 ac)



Survey provided by  
TerraCalc Land Surveying, Inc., 2016.

Site Plan (Alternative B) With HCA and WQR Impacts  
Kellogg Creek Senior Living - Milwaukie, Oregon

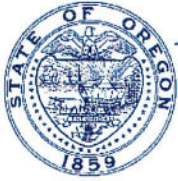
FIGURE  
**12B**

12-18-2018

# Attachment B

## Wetland Delineation Concurrence Letter and Wetland Delineation Report





# Oregon

Kate Brown, Governor

## Department of State Lands

775 Summer Street NE, Suite 100

Salem, OR 97301-1279

(503) 986-5200

FAX (503) 378-4844

[www.oregon.gov/dsl](http://www.oregon.gov/dsl)

**State Land Board**

Kate Brown

Governor

May 2, 2017

Brownstone Development, Inc.

Attn: Randy Myers

P.O. Box 2375

Lake Oswego, OR 97035

Re: WD # 2017-0054 Wetland Delineation Report for the  
Proposed Kellogg Creek Subdivision  
Clackamas County; T2S R2E Sec. 6AD, Tax lot 600 and  
Portions of Tax Lots 700, 900 and 901  
App. # 60166

Dennis Richardson

Secretary of State

Tobias Read

State Treasurer

Dear Mr. Myers:

The Department of State Lands has reviewed the wetland delineation report prepared by Pacific Habitat Services for the site referenced above. Please note that the study area includes only a portion of the tax lots described above (see the attached maps). Based upon the information presented in the report, we concur with the wetland and waterway boundaries as mapped in Figure 6 of the report. Within the study area, seven wetlands and a segment of Mt. Scott Creek were identified.

One of the seven wetlands (Wetland A, totaling approximately 0.7 acres) and the creek are subject to the permit requirements of the state Removal-Fill Law. The remaining six wetlands (Wetlands B through G) are exempt per OAR 141-085-0515 (6); therefore, they are not subject to these permit requirements. In addition, normally a state permit is required for cumulative fill or annual excavation of 50 cubic yards or more in wetlands or below the ordinary high water line (OHWL) of a waterway (or the 2 year recurrence interval flood elevation if OHWL cannot be determined). However, Mt. Scott Creek is an essential salmonid stream; therefore, fill or removal of any amount of material below its OHWL or within hydrologically-connected wetlands (Wetland A) may require a state permit.

This concurrence is for purposes of the state Removal-Fill Law only. Federal or local permit requirements may apply as well. This concurrence is based on information provided to the agency. The jurisdictional determination is valid for five years from the date of this letter unless new information necessitates a revision. Circumstances under which the Department may change a determination are found in OAR 141-090-0045 (available on our web site or upon request). In addition, laws enacted by the legislature and/or rules adopted by the Department may result in a change in jurisdiction; individuals and applicants are subject to the regulations that are in effect at the time of the removal-fill activity or complete permit application. The applicant, landowner, or

agent may submit a request for reconsideration of this determination in writing within six months of the date of this letter.

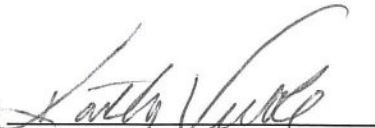
Thank you for having the site evaluated. Please phone me at 503-986-5232 if you have any questions.

Sincerely,



Peter Ryan, PWS  
Jurisdiction Coordinator

Approved by



Kathy Verble, CPSS  
Aquatic Resource Specialist

Enclosures

ec: Caroline Rim, Pacific Habitat Services  
Clackamas County Planning Department  
Dominic Yballe, Corps of Engineers  
Melinda Butterfield, DSL

**WETLAND DELINEATION / DETERMINATION REPORT COVER FORM**

This form must be included with any wetland delineation report submitted to the Department of State Lands for review and approval. A wetland delineation report submittal is not "complete" unless the fully completed and signed report cover form and the required fee are submitted. Attach this form to the front of an unbound report or include a hard copy of the completed form with a CD/DVD that includes a single PDF file of the report cover form and report (minimum 300 dpi resolution) and submit to: **Oregon Department of State Lands, 775 Summer Street NE, Suite 100, Salem, OR 97301-1279**. A single PDF attachment of the completed cover form and report may be e-mailed to [Wetland\\_Delineation@dsl.state.or.us](mailto:Wetland_Delineation@dsl.state.or.us). For submittal of PDF files larger than 10 MB, e-mail instructions on how to access the file from your ftp or other file sharing website. Fees can be paid by check or credit card. Make the check payable to the Oregon Department of State Lands. To pay the fee by credit card, call 503-986-5200.

<input checked="" type="checkbox"/> Applicant <input type="checkbox"/> Owner Name, Firm and Address: <b>Brownstone Development, Inc.</b> Attn: Randy Myers PO Box 2375 Lake Oswego, OR 97035	Business phone # (503) 358-4460 Mobile phone # (optional) E-mail: <a href="mailto:Randy@brownstonehomes.net">Randy@brownstonehomes.net</a>
<input type="checkbox"/> Authorized Legal Agent, Name and Address:	Business phone # Mobile phone # E-mail:

RECEIVED FEB 02 2017

RECEIVED \$ 419.00  
DEPARTMENT OF STATE LANDS  
#2968

I either own the property described below or I have legal authority to allow access to the property. I authorize the Department to access the property for the purpose of confirming the information in the report, after prior notification to the primary contact.  
 Typed/Printed Name: Randy Myers Signature: \_\_\_\_\_  
 Date: 1/23/2017 Special instructions regarding site access: \_\_\_\_\_

**Project and Site Information** (using decimal degree format for lat/long, enter centroid of site or start & end points of linear project)

Project Name: <b>Kellogg Creek Subdivision</b>	Latitude: <b>45.427379°</b>	Longitude: <b>-122.603487°</b> ✓
Proposed Use: <b>Residential Subdivision</b>	Tax Map # <b>2S 2E 6AD</b>	
Project Street Address (or other descriptive location): <b>13333 SE Rusk Road</b>	Township <b>2S</b> Range <b>2E</b> Section <b>6</b> QQ <b>AD</b> Tax Lot(s) <b>600 and portions of 700, 900 and 901</b>	
City: <b>Milwaukie</b> County: <b>Clackamas</b>	Waterway: <b>Mt. Scott Creek</b> River Mile: NWI Quad(s): <b>Gladstone, OR</b>	

**Wetland Delineation Information**

Wetland Consultant Name, Firm and Address: <b>Pacific Habitat Services</b> Attn: <b>Caroline Rim</b> 9450 SW Commerce Circle, Suite 180 Wilsonville, OR 97070	Phone # <b>503-570-0800</b> Mobile phone # <b>503-804-2281</b> E-mail: <a href="mailto:cr@pacifichabitat.com">cr@pacifichabitat.com</a>
---	---

The information and conclusions on this form and in the attached report are true and correct to the best of my knowledge.  
 Consultant Signature: *Caroline Rim* Date: 1/23/2017

Primary Contact for report review and site access is  Consultant  Applicant/Owner  Authorized Agent  
 Wetland/Waters Present?  Yes  No Study Area size: acre 15.58 Total Wetland Acreage: 0.70

<b>Check Box Below if Applicable:</b>	<b>Fees:</b>
<input type="checkbox"/> R-F permit application submitted	<input checked="" type="checkbox"/> Fee payment submitted \$419
<input type="checkbox"/> Mitigation bank site	<input type="checkbox"/> Fee (\$100) for resubmittal of rejected report
<input type="checkbox"/> Wetland restoration/enhancement project (not mitigation)	<input type="checkbox"/> No fee for request for reissuance of an expired report
<input type="checkbox"/> Industrial Land Certification Program Site	
<input type="checkbox"/> Reissuance of a recently expired delineation	
Previous DSL # _____ Expiration date _____	

**Other Information:**

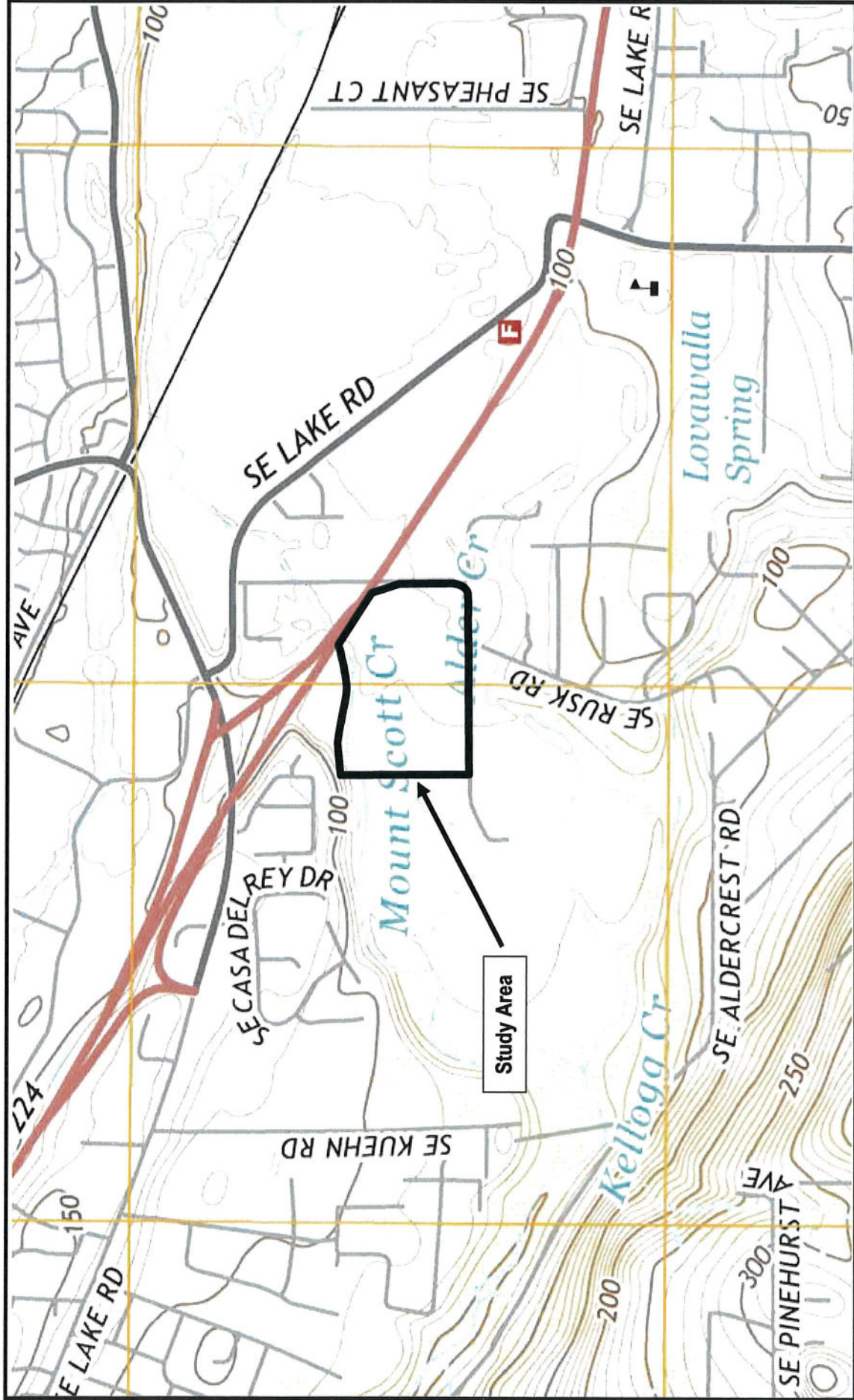
Has previous delineation/application been made on parcel?	Y N	
	<input type="checkbox"/> <input checked="" type="checkbox"/>	If known, previous DSL # _____
Does LWI, if any, show wetland or waters on parcel?	<input type="checkbox"/> <input checked="" type="checkbox"/>	No LWI

**For Office Use Only**

DSL Reviewer: <u>PR</u>	Fee Paid Date: <u>2 / 2 / 17</u>	DSL WD # <u>2017-0054</u>
Date Delineation Received: <u>2 / 2 / 17</u>	DSL Project # <u>58533</u>	DSL Site # _____
Scanned: <input checked="" type="checkbox"/> Final Scan: <input type="checkbox"/>	DSL WN # _____	DSL App. # <u>60166</u>



WA2017-0054



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1/16/2017



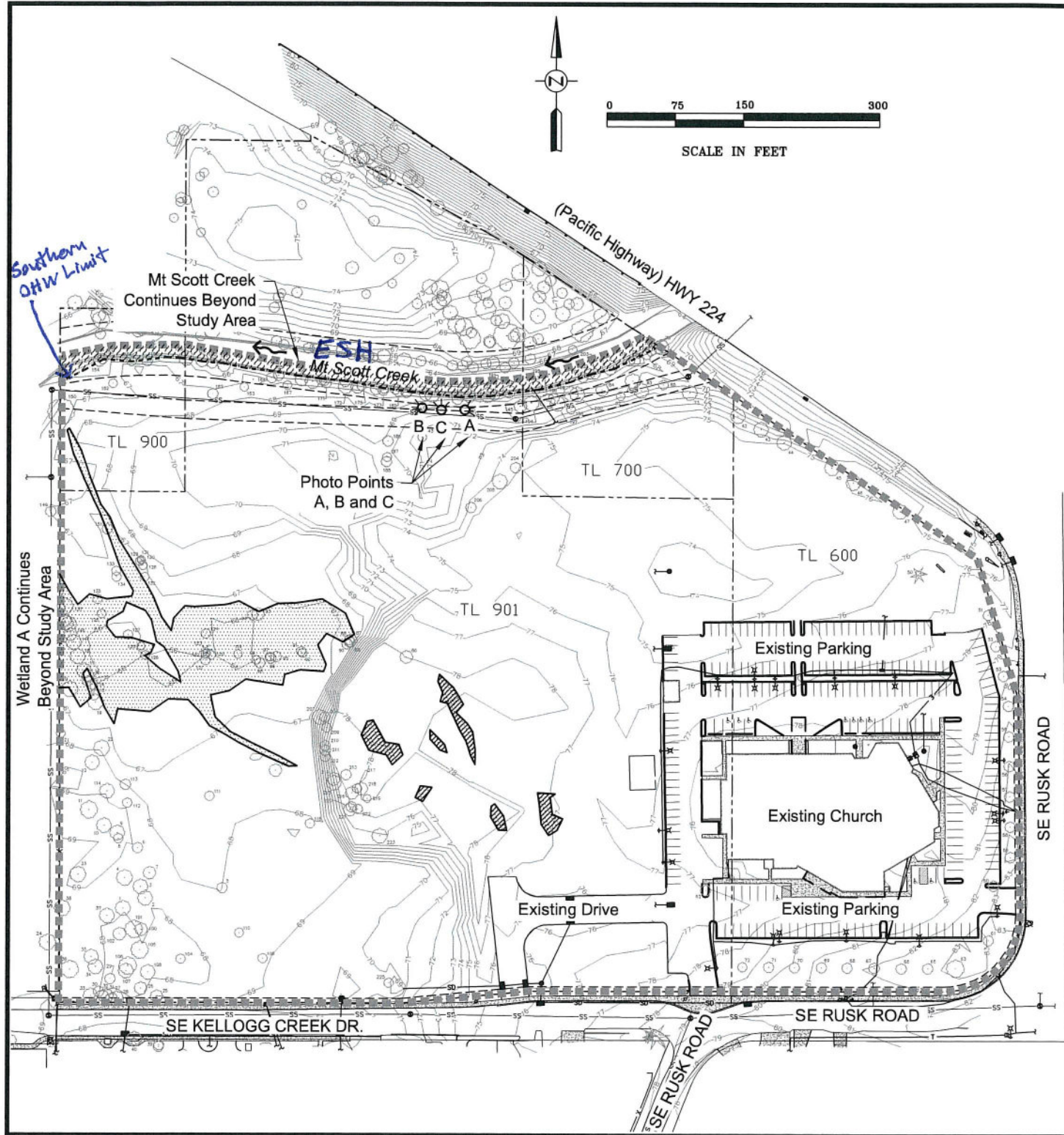
Pacific Habitat Services, Inc.  
 9450 SW Commerce Circle, Suite 180  
 Wilsonville, OR 97070

General Location and Topography  
 SE Kellogg Creek Drive - Milwaukie, Oregon  
 United States Geological Survey (USGS), Gladstone, Oregon, 7.5 Quadrangle, 2014  
 (viewer/nationalmap.gov/basic)

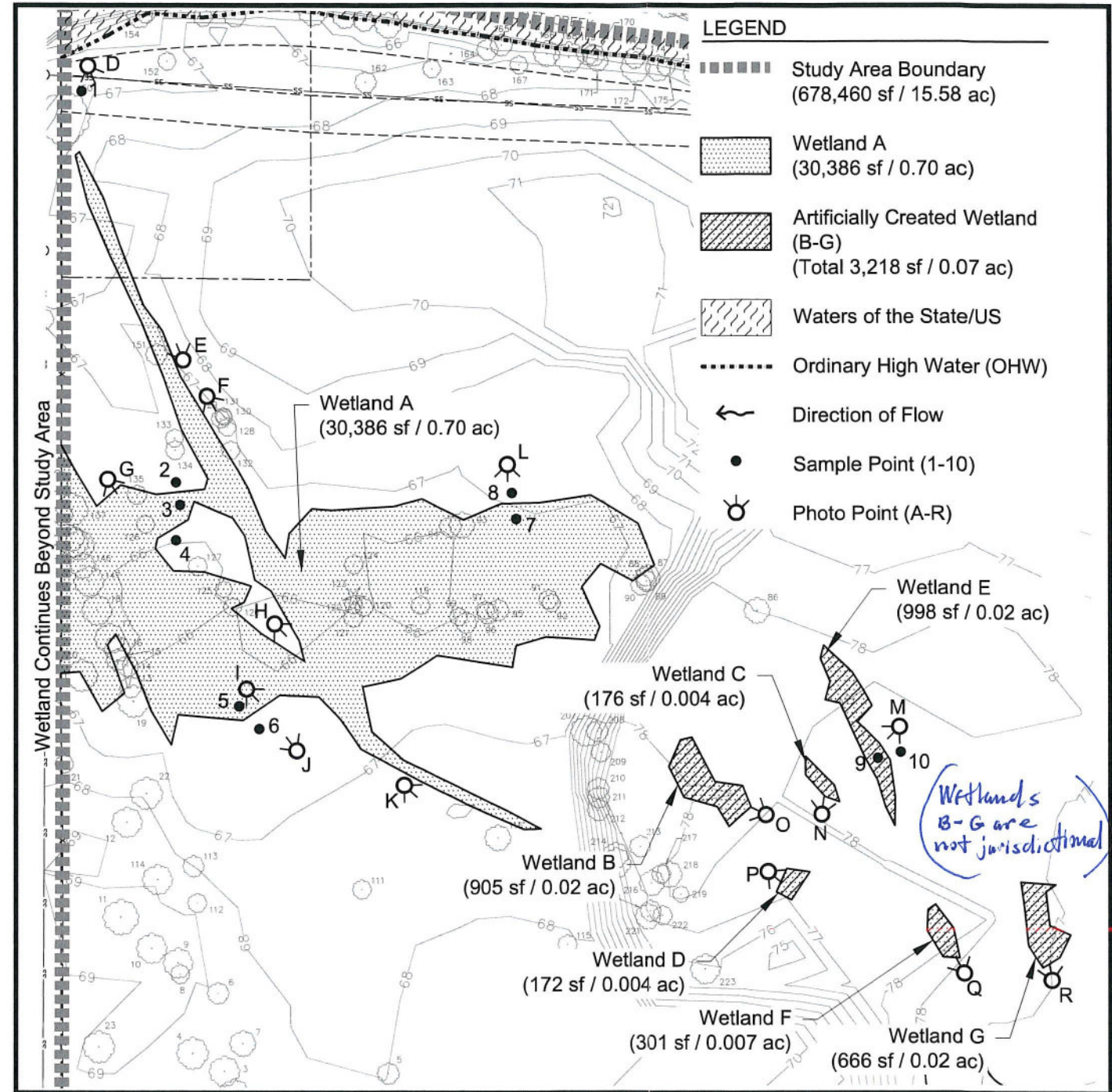
FIGURE

1





TAX LOT OVERVIEW



SCALE IN FEET



Survey provided by  
TerraCalc Land Surveying, Inc., 2016  
Survey accuracy is sub-centimeter and  
Sample Point accuracy is ± 3 feet.

DSL WD # 2017-0054  
Approval Issued 5/2/2017  
Approval Expires 5/2/2022

Wetland Delineation  
SE Kellogg Creek Drive - Milwaukie, Oregon

FIGURE  
**6**

1-18-2017

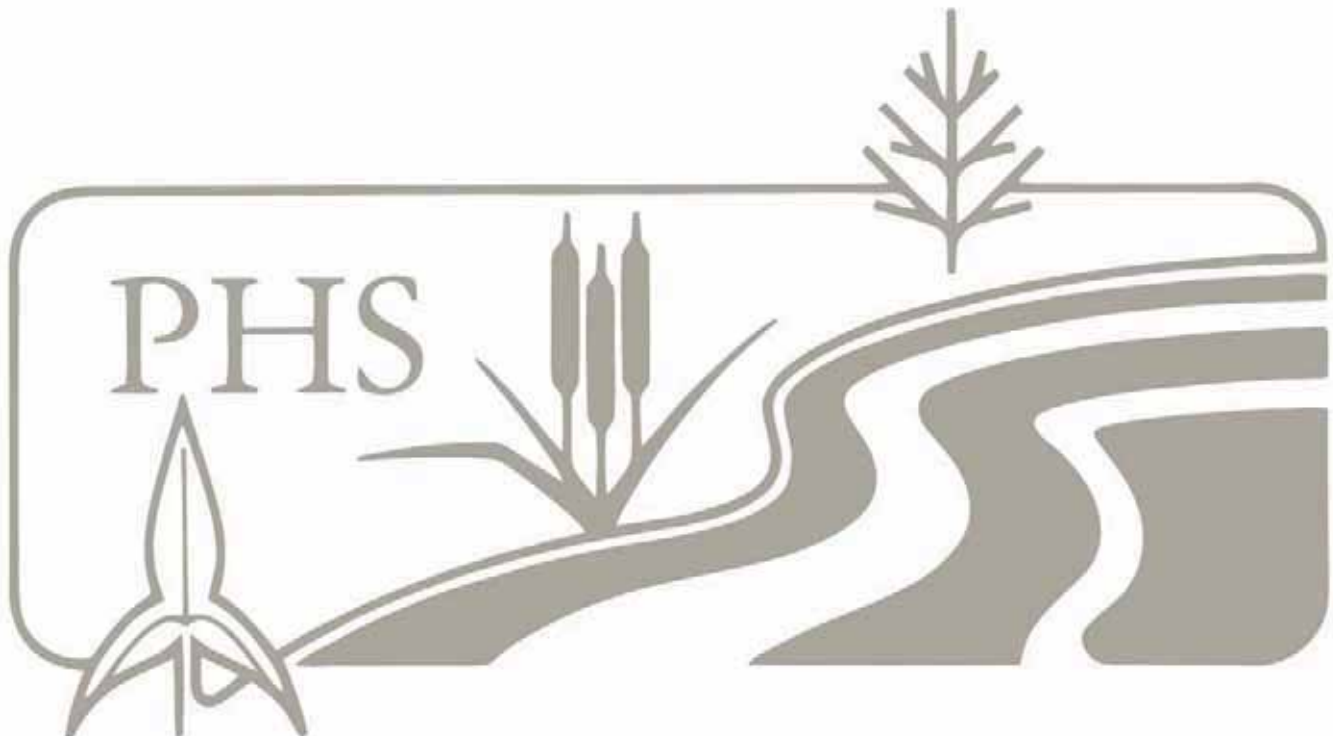
**Wetland Delineation**  
**for a Proposed Development Site**  
**North of SE Kellogg Creek Drive**  
**in Milwaukie, Clackamas County, Oregon**  
(Township 2 South, Range 2 East, Section 6AD,  
TL 600 and Portions of 700, 900 and 901)

**Prepared for**  
**Brownstone Development, Inc.**  
**Attn: Randy Myers**  
PO Box 2375  
Lake Oswego, OR 97035

**Prepared by**  
Caroline Rim, Craig Tumer  
John van Staveren  
**Pacific Habitat Services, Inc.**  
9450 SW Commerce Circle, Suite 180  
Wilsonville, Oregon 97070  
(503) 570-0800  
(503) 570-0855 FAX

PHS Project Number: 5975

**January 16, 2017**



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## **I. INTRODUCTION**

Pacific Habitat Services, Inc. (PHS) conducted a wetland delineation on a proposed development site located north of SE Kellogg Creek Drive in Milwaukie, Clackamas County, Oregon (Township 2 South, Range 2 East, Section 6AD, Tax Lot 600 and portions of Tax Lots 700, 900, 901). The study area consists of approximately 15.58 acres.

This report presents the results of PHS's field work. Figures, including a map depicting the location of wetlands within the study area, are located in Appendix A. Data sheets documenting on-site conditions are provided in Appendix B. Ground-level photos of the study area are in Appendix C. Historic aerial photographs are in Appendix D. The geotechnical evaluation report for the site is included in Appendix E. A discussion of the methodology is provided in Appendix F for the client.

## **II. RESULTS AND DISCUSSION**

### **A. Landscape Setting and Land Use**

The site is located southwest of Highway 224 (Pacific Highway); north of SE Kellogg Creek Drive, and north and west of SE Rusk Road. Mt. Scott Creek flows to the west along the northern edge of the study area, and the North Clackamas Park Milwaukie Center borders the western edge. The site is located within a residential area; undeveloped woodland is located immediately to the north and northwest of the study area, and the Turning Point Church is located in the southeast corner of the site at 13333 SE Rusk Road. The eastern half of the property, near the church, is relatively level; however, the western half descends abruptly to a lower woodland area. Site elevations range from approximately 80 feet National Geodetic Vertical Datum (NGVD) in the eastern half of the site, to approximately 66 feet NGVD in the lower reaches of the western half of the site.

### **B. Site Alterations**

The site has not been subject to recent construction activities; however, it appears that the substrate throughout much of the central and eastern half of the site consists of fill material, likely associated with the construction of the church, over two decades ago.

### **C. Precipitation Data and Analysis**

Table 1 compares the average monthly precipitation to the observed monthly precipitation at the Portland International Airport National Weather Service Station in the three months prior to PHS's wetland delineation field work. Table 1 also compares the observed precipitation to be within the normal precipitation range, as identified in the NRCS WETS table for the Oregon City station.

As shown in Table 1, observed precipitation was below normal and normal range in August. Observed precipitation was above normal but within normal range in September; however, in October observed precipitation was considerably above normal and normal range. It should be noted that the observed precipitation total for November in Table 1 is the amount of precipitation recorded in the first 20 days of the month, prior to the day of PHS's wetland delineation field work.

**Table 1. Comparison of Average and Observed Precipitation for the Three Months Prior to the Wetland Delineation Field Work**

Month	Average Precipitation <sup>a</sup> (in.)	30% Chance Will Have		Observed Precipitation <sup>b</sup> (in.)	Percent of Normal
		Less Than Average <sup>a</sup>	More Than Average <sup>a</sup>		
August	1.00	0.21	1.16	0.09	13
September	1.93	0.86	2.41	1.69	115
October	3.48	1.85	4.25	8.31	277
November	6.79	4.43	8.16	2.79 <sup>c</sup>	50 <sup>d</sup>

- Notes:
- a. Source: NRCS WETS Table for Oregon City WETS station
  - b. Observed precipitation is the precipitation recorded at the Portland International Airport weather station. Source: National Weather Service.
  - c. Observed precipitation is for the period November 1-20, 2016, prior to PHS’s November 21, 2016 field work.
  - d. The percent of normal precipitation is for the first twenty days in November prior to PHS’s November 21, 2016 field work. This estimate assumes that precipitation is spread evenly across the month and that the average precipitation in the first twenty days of November is 2.79 inches.

Precipitation in the months preceding PHS’s wetland delineation field work fluctuated widely. However, based on this and other observations of hydrologic conditions during the site visit, it is PHS’s opinion that the drier than normal conditions in August and the wetter than normal conditions in September and October did not affect the hydrological indicators observed at the time of PHS’s wetland delineation field work.

#### **D. Methods**

PHS conducted the wetland investigation and data collection on November 21, 2016. PHS identified jurisdictional wetlands in the study area based on the presence of wetland hydrology, hydric soils, and hydrophytic vegetation, in accordance with the Routine On-site Determination, as described in the *Corps of Engineers Wetland Delineation Manual, Wetlands Research Program Technical Report Y-87-1* (“The 1987 Manual”) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*.

PHS delineated the limits of ordinary high water (OHW) along the south bank of Mt. Scott Creek based on an evaluation of observed physical characteristics, as described in the U.S. Army Corps of Engineers’ Regulatory Guidance Letter No. 05-05 (December 7, 2005). PHS flagged the limits of OHW with blue flags placed at the limits of the OHW, as indicated by the point below which woody vegetation is absent and at the break in the slope angle of the bank.

#### **E. Description of All Wetlands and Other Non-Wetland Waters**

PHS identified and delineated one potential wetland area (Wetland A) and Mt. Scott Creek (south bank only), as well as six potentially, artificially created wetland areas (Wetlands B through G). Brief descriptions of the on-site wetlands and non-wetland waters are provided below.

## **Mt. Scott Creek**

Mt. Scott Creek, a tributary to Kellogg Creek and the Willamette River, is a perennial stream that generally flows to the west along the northern boundary of the study area. The stream banks are relatively well defined and near vertical at the location of the OHW line. The plant community of the riparian area along the creek includes a deciduous overstory of big-leaf maple (*Acer macrophyllum*, FACU), Oregon white oak (*Quercus garryana*, FACU), Oregon ash (*Fraxinus latifolia*, FACW), and red alder (*Alnus rubra*, FAC); and a shrub and herbaceous understory composed of species such as snowberry (*Symphoricarpos albus*, FACU), Pacific ninebark (*Physocarpus capitatus*, FACW), Scouler's willow (*Salix scouleriana*, FAC), English hawthorn (*Crataegus monogyna*, FAC), Fuller's teasel (*Dipsacus fullonum*, FAC), and spreading bentgrass (*Agrostis stolonifera*, FAC). The Cowardin Classification for Mt. Scott Creek is Riverine Upper Perennial Unconsolidated Bottom Permanently Flooded (R3UBH) and Riverine Unknown Perennial Unconsolidated Bottom Permanently Flooded (R5UBH). The Hydrogeomorphic (HGM) Classification is Riverine Flow-Through. Mt. Scott Creek continues outside the study area to the north, west and east.

## **Wetland A**

Wetland A consists of approximately 30,386 square feet (0.70 acre) located in the western half of the site, south of Mt. Scott Creek. The plant community within Wetland A (characterized by Sample Points 3, 5, 7) is a combination of deciduous woodland bordered by open fields. Dominant species within the woodland include an overstory of Oregon ash and black cottonwood (*Populus balsamifera*, FAC), with a woody understory of Oregon ash, black cottonwood, red-osier dogwood (*Cornus alba*, FACW), snowberry, and Himalayan blackberry (*Rubus armeniacus*, FAC). The open fields include reed canarygrass (*Phalaris arundinacea*, FACW), creeping buttercup (*Ranunculus repens*, FAC), big leaf avens (*Geum macrophyllum*, FAC), slender rush (*Juncus tenuis*, FAC), rough bluegrass (*Poa trivialis*, FAC), bitter dock (*Rumex obtusifolius*, FAC), and common dandelion (*Taraxacum officinale*, FACU).

The adjacent upland areas (characterized by Sample Points 2, 6, 8) include Oregon ash, Himalayan blackberry, snowberry, English hawthorn, reed canarygrass, Fuller's teasel, large leaf avens, bull thistle (*Cirsium vulgare*, FACU), fringed willowherb (*Epilobium ciliatum*, FACW), Dewey sedge (*Carex deweyana*, FAC), common selfheal (*Prunella vulgaris*, FACU), Western swordfern (*Polystichum munitum*, FACU), lentil vetch (*Vicia tetrasperma*, NOL), creeping buttercup, spreading bentgrass, field horsetail (*Equisetum arvense*, FAC), narrow-leaf goosefoot (*Chenopodium leptophyllum*, FACU), spotted cat's ear (*Hypochaeris radicata*, FACU), European centaury (*Centaureum erythraea*, FAC), wild carrot (*Daucus carota*, FACU), tansy ragwort (*Senecio jacobaea*, FACU), and colonial bentgrass (*Agrostis capillaris*, FAC).

Hydrology within Wetland A is likely supported by a seasonally high groundwater table, surface runoff and precipitation. At the time of PHS's wetland delineation field work, the soils in Wetland A were typically saturated to the surface or within twelve inches of the surface, with free water observed at four inches below the soil surface or at the surface; inundation was also commonly present within Wetland A. The low-chroma matrix of the soil with contrasting redox concentrations meets the redox dark surface indicator for hydric soils. The Cowardin Classification for Wetland A is Palustrine Emergent, Persistent, Seasonally Flooded/Saturated (PEM1E). The HGM Classification is Slope. Wetland A continues outside the study area to the west.



## **Wetlands B – G (Artificially Created Wetlands)**

Wetlands B through G generally consist of small, shallow, isolated depressions. Table 2 lists the area of each wetland.

<b>Wetland</b>	<b>Area (square feet / acres)</b>
B	905 / 0.02
C	176 / 0.004
D	172 / 0.004
E	998 / 0.02
F	301 / 0.007
G	666 / 0.02
<b>Total</b>	<b>3,218 / 0.07</b>

All six of these wetlands are similar in character, and therefore, a representative pair of wetland/upland sample points (9 and 10, respectively) were taken at Wetland E. These wetlands are located in the central portion of the site, west of the church and several feet above the lower woodland area further to the west. The plant communities in both the wetland and upland areas are primarily composed of weedy grasses and herbs; the wetland areas include reed canarygrass, spreading bentgrass, soft rush (*Juncus effusus*, FACW), spotted cat's ear, and oxeye daisy (*Chrysanthemum vulgare*, FACU), and the adjacent upland areas include wild carrot, curly dock (*Rumex crispus*, FAC), colonial bentgrass, bluegrass (*Poa sp.*, FAC), common velvet grass (*Holcus lanatus*, FAC), tall fescue (*Schedonorus arundinaceus*, FAC), yellow glandweed (*Parentucellia viscosa*, FAC), and English plantain (*Plantago lanceolata*, FACU).

Hydrology within Wetlands B through G primarily consists of surface runoff and precipitation. As discussed in the *Subsurface Conditions* section of the geotechnical evaluation report (Appendix E), fill material on the site ranges in thickness up to more than 12 feet, with approximately 10 feet in the central portion of the site, and groundwater was not encountered in the test pits in the vicinity of these wetlands. Therefore, it is reasonable to assume that these artificially created wetlands are not hydrologically connected to the water table. At the time of PHS's wetland delineation field work, the soils within these wetlands were typically saturated to the surface, with free water observed at or near the surface, and included some areas of inundation, which likely was perched on compacted substrate resulting in diminished permeability. The redox dark surface indicator for hydric soils was met with low-chroma matrix soils with contrasting redox concentrations. The Cowardin Classification for Wetlands B through G is Palustrine Emergent, Nonpersistent, Seasonally Flooded/Saturated (PEM2E). The HGM Classification is Slope.

As mentioned previously in Section B, *Site Alterations*, it appears that the substrate throughout much of the central and eastern half of the site consists of fill material, likely associated with the construction of the church. In addition, based on a review of historic aerial photographs (Appendix D), it appears that Wetlands B through G have been artificially created on compacted fill material resulting from activities associated with construction of the church and on-going activities associated with the church property over the years.

## F. Deviation from LWI or NWI

With the exception of Mt. Scott Creek, which the US Fish and Wildlife Service’s National Wetlands Inventory (NWI) maps as Riverine Upper Perennial Unconsolidated Bottom Permanently Flooded (R3UBH) and Riverine Unknown Perennial Unconsolidated Bottom Permanently Flooded (R5UBH) wetland, it does not indicate the presence of any wetlands on the site. NWI maps are generated primarily through the interpretation of color infrared aerial photographs (scale of 1:58,000), with limited “ground truthing” to confirm the interpretations. The canopy cover over much of Wetland A, the small size of Wetlands B through G, and the scale of the aerial photographs used to prepare the NWI maps are likely reasons for the discrepancy between the wetlands mapping and the existing on-site conditions. In addition, as Wetlands B through G appear to be artificially created, their presence and absence over the years are likely to have been dependent upon the construction and various activities on the church property, which have varied over the period of time in which the aerial photographs were taken.

## G. Mapping Method

PHS flagged the wetland boundaries and limits of OHW with blue flagging. Sample points were flagged with lime green surveyor’s tape. The wetland boundary and OHW flagging were survey-located by TerraCalc Land Surveying, Inc. Sample points were GPS-located by PHS, which subsequently transferred this information onto a base map provided by TerraCalc Land Surveying. The estimated survey accuracy is sub-centimeter and the sample point accuracy is approximately +/- 3 feet.

## H. Additional Information

None

## I. Results and Conclusions

Within the study area, PHS identified and delineated a total of approximately 0.70 acres of potentially jurisdictional wetland, approximately 0.07 acres of potentially artificially created wetland, and the OHW line along the south bank of Mt. Scott Creek, as detailed in Table 3.

**Table 3: Summary of Potentially Jurisdictional and Artificially Created Wetland, and Other Waters within the Study Area**

Resource	Area (square feet/acreage)	Cowardin Class	HGM Class
Wetland A	30,386 / 0.70	PEM1E	Slope
Wetland B (Artificially Created)	905 / 0.02	PEM2E	Slope
Wetland C (Artificially Created)	176 / 0.004	PEM2E	Slope
Wetland D (Artificially Created)	172 / 0.004	PEM2E	Slope

<b>Resource</b>	<b>Area (square feet/acreage)</b>	<b>Cowardin Class</b>	<b>HGM Class</b>
Wetland E (Artificially Created)	998 / 0.02	PEM2E	Slope
Wetland F (Artificially Created)	301 / 0.007	PEM2E	Slope
Wetland G (Artificially Created)	666 / 0.02	PEM2E	Slope
Mt. Scott Creek (OHW line south bank only)	-	R3UBH R5UBH	Riverine Flow-Through
<b>Total (Potentially Jurisdictional Wetland)</b>	<b>30,386 (0.70 acres)</b>		
<b>Total (Potentially Artificially Created Wetland)</b>	<b>3,218 (0.07 acres)</b>		

## **J. Required Disclaimer**

This report documents the investigation, best professional judgment and conclusions of the investigators. It is correct and complete to the best of our knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters and used at your own risk unless it has been reviewed and approved in writing by the Oregon Department of State Lands in accordance with OAR 141-090-0005 through 141-090-0055.

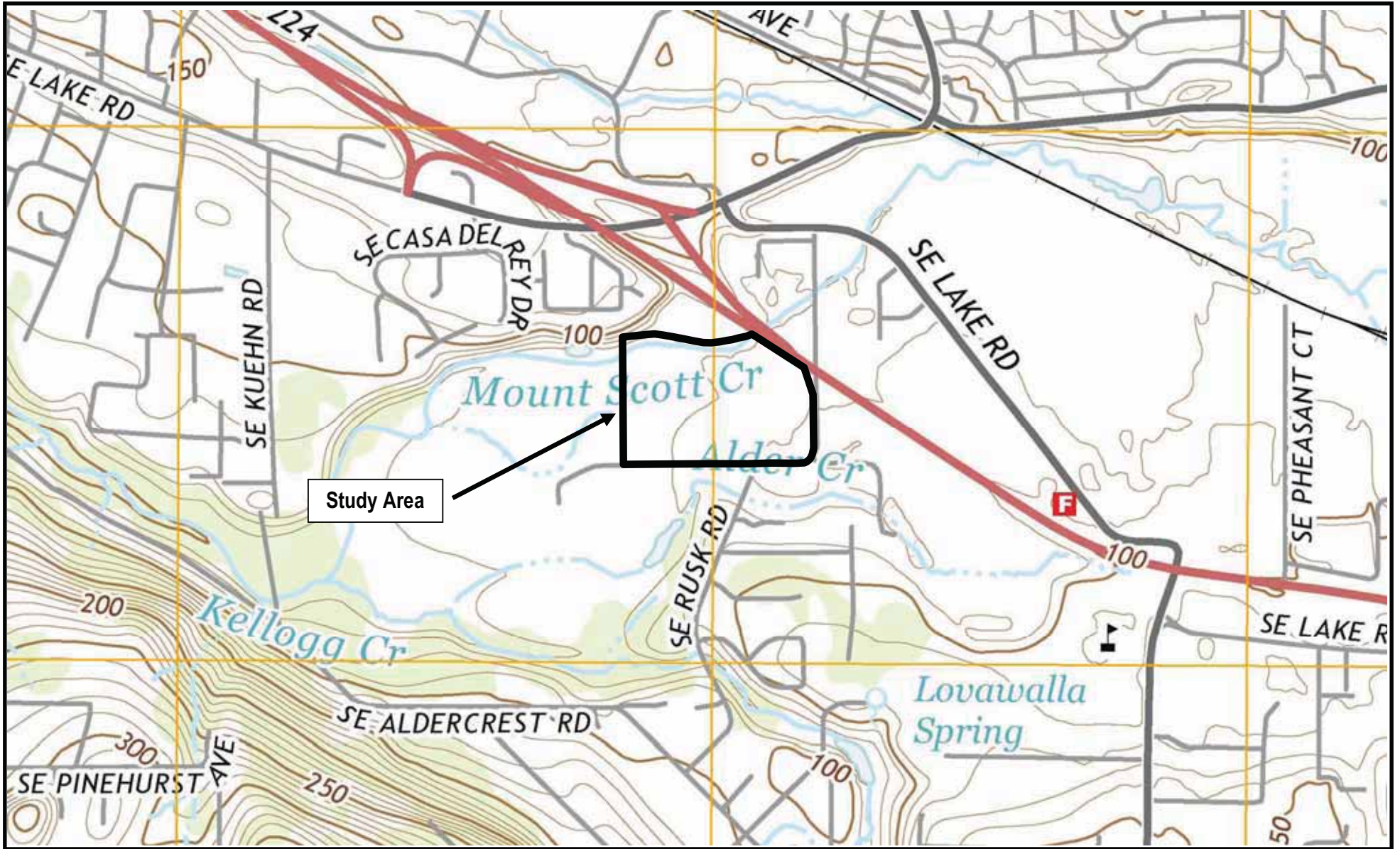
### III. REFERENCES

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[http://rsgisias.crrel.usace.army.mil/nwpl\\_static/data/DOC/lists\\_2016/States/pdf/OR\\_2016v1.pdf](http://rsgisias.crrel.usace.army.mil/nwpl_static/data/DOC/lists_2016/States/pdf/OR_2016v1.pdf)
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# Appendix A

## Figures





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1/16/2017



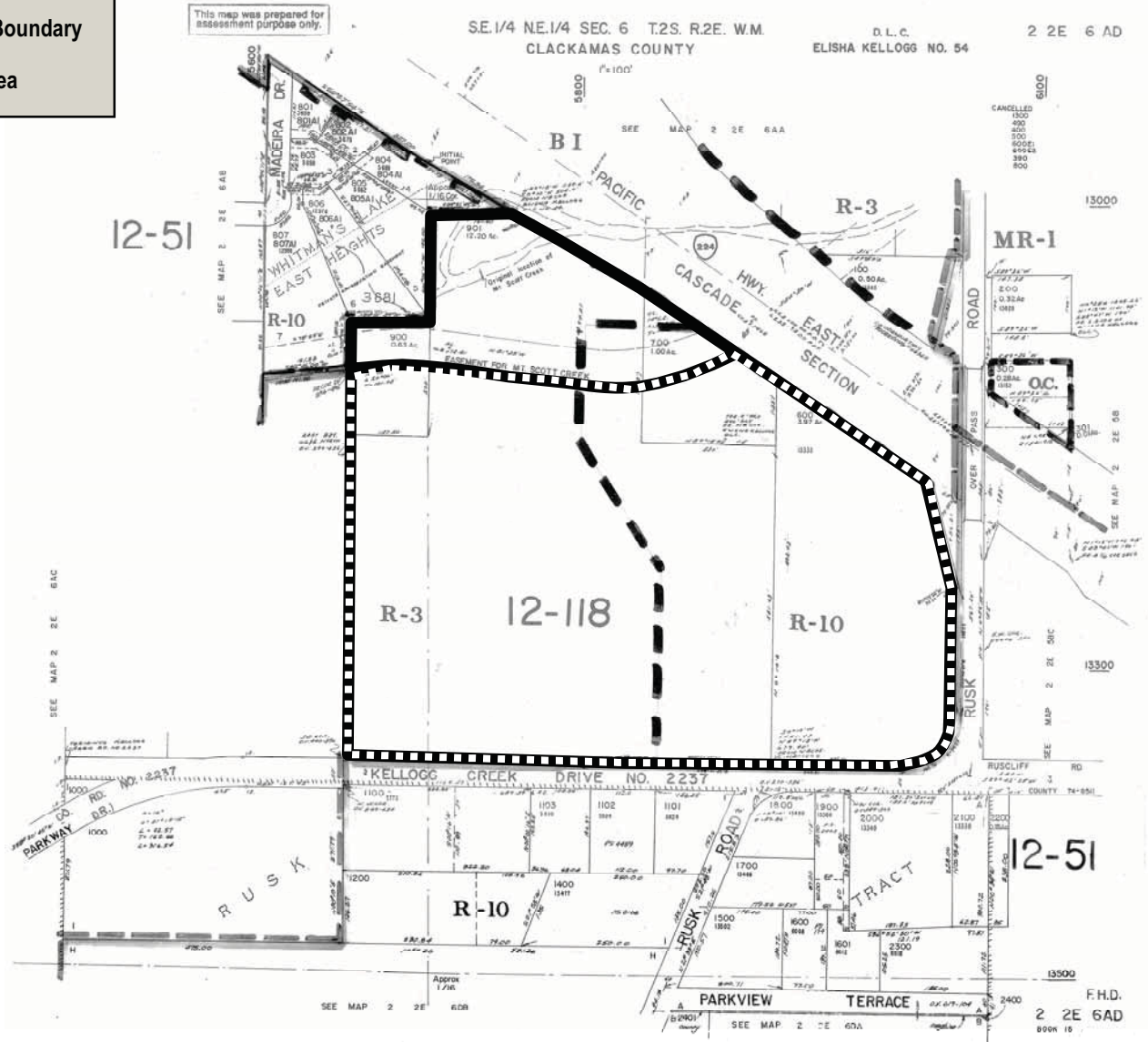
Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

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SE Kellogg Creek Drive - Milwaukie, Oregon  
United States Geological Survey (USGS), Gladstone, Oregon, 7.5 Quadrangle, 2014  
(viewer/nationalmap.gov/basic)

FIGURE

1

Tax Lot Boundary  
 Study Area



5975  
12/21/2016

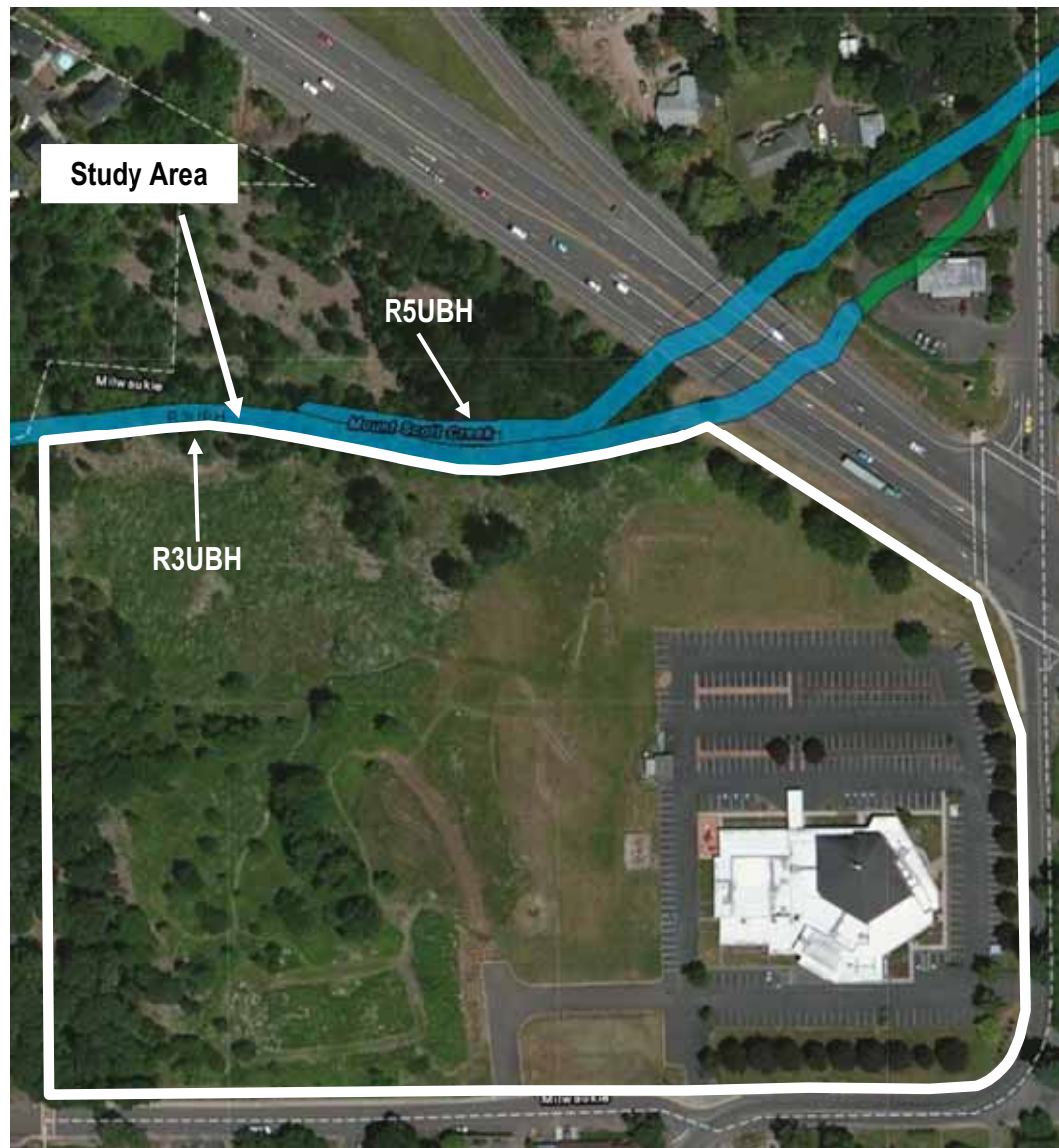


Pacific Habitat Services, Inc.  
 9450 SW Commerce Circle, Suite 180  
 Wilsonville, OR 97070

Tax Lot Map  
 SE Kellogg Creek Drive - Milwaukie, Oregon  
 The Oregon Map (ormap.net)

FIGURE  
 2









+



LEGEND

Wetlands

Wetlands

-  Estuarine and Marine Deepwater
-  Estuarine and Marine Wetland
-  Freshwater Emergent Wetland
-  Freshwater Forested/Shrub Wetland
-  Freshwater Pond
-  Lake
-  Other
-  Riverine

**R3UBH:** Riverine Upper Perennial Unconsolidated Bottom Permanently Flooded

**R5UBH:** Riverine Unknown Perennial Unconsolidated Bottom Permanently Flooded

5975  
12/21/2016



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National Wetlands Inventory Map  
SE Kellogg Creek Drive - Milwaukie, Oregon  
U.S. Fish and Wildlife Service, Online Wetland Mapper V2, 2016

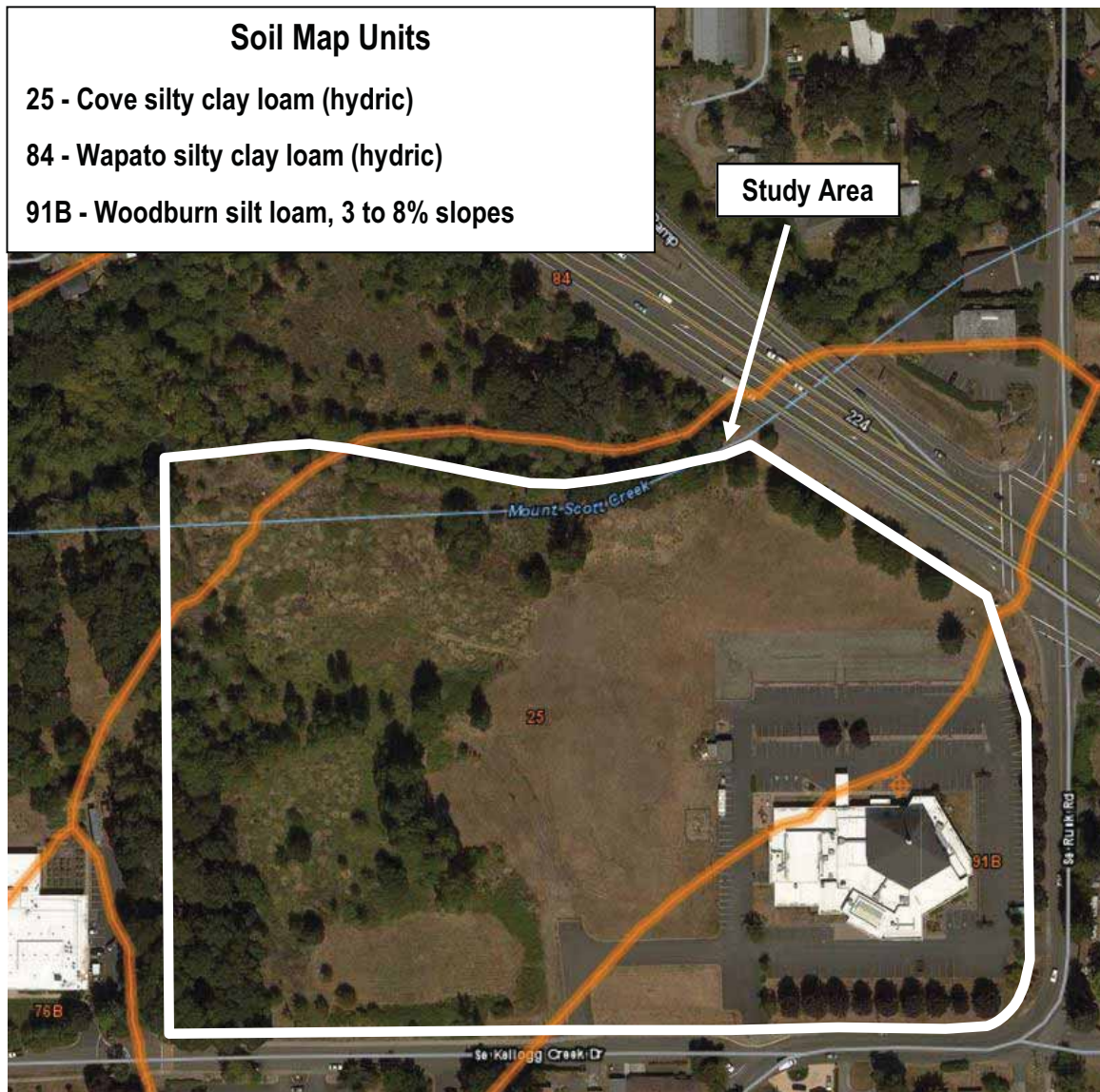
FIGURE

3



### Soil Map Units

- 25 - Cove silty clay loam (hydric)
- 84 - Wapato silty clay loam (hydric)
- 91B - Woodburn silt loam, 3 to 8% slopes



5975  
12/21/2016



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Soils Map  
SE Kellogg Creek Drive - Milwaukie, Oregon  
Natural Resources Conservation Services, Web Soil Survey, 2016

(websoilsurvey.sc.egov.usda.gov)

FIGURE

4



5975  
12/21/2016

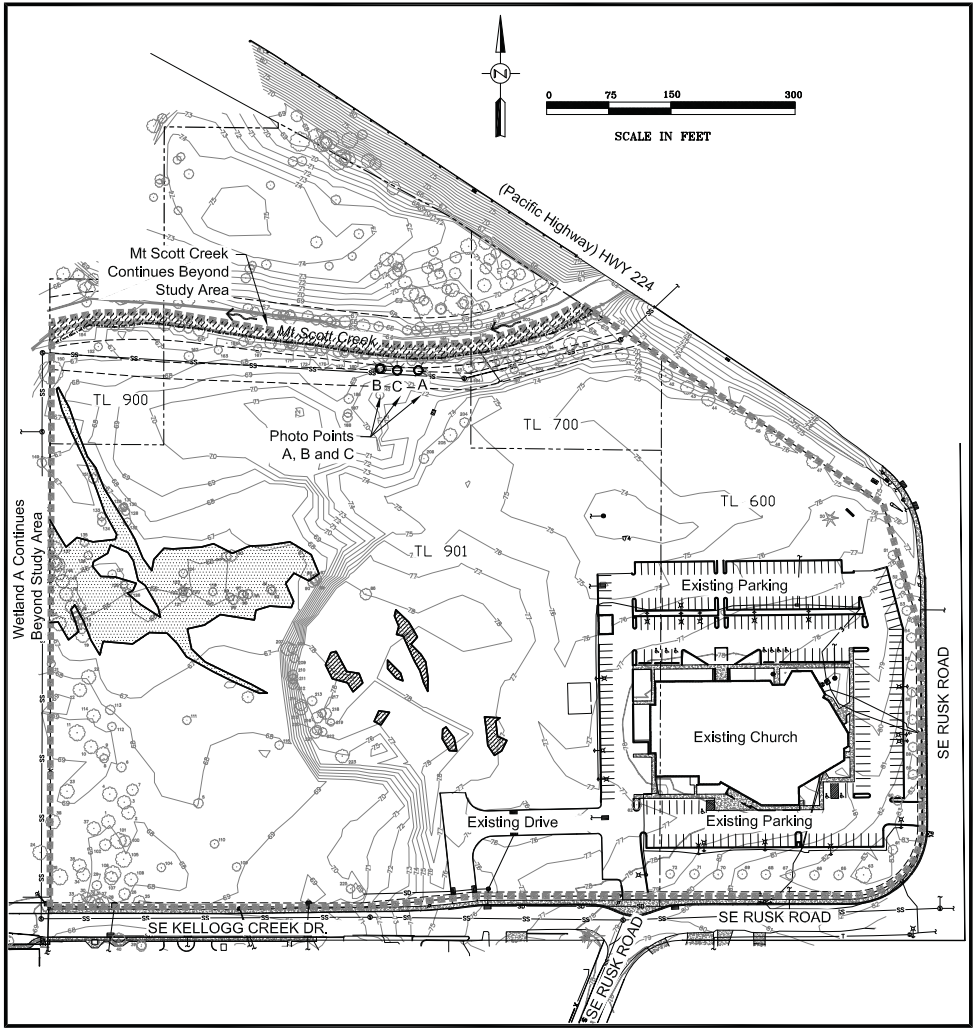


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Wilsonville, OR 97070

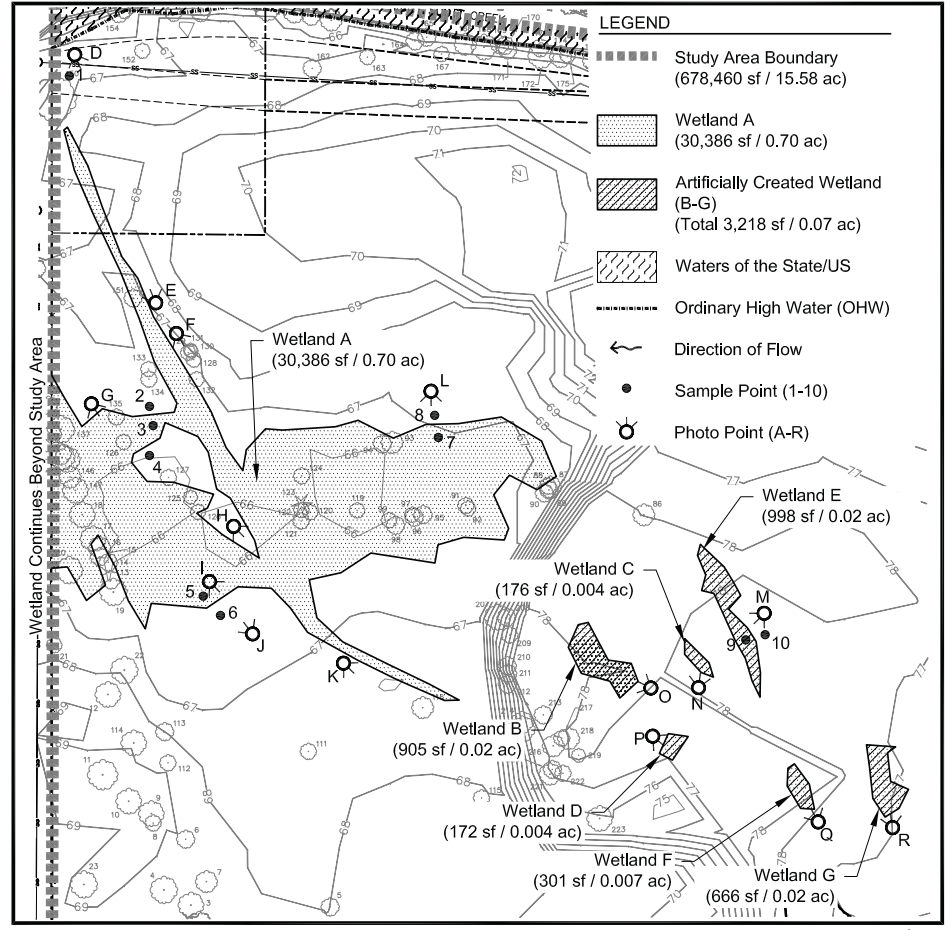
Aerial Photo  
SE Kellogg Creek Drive - Milwaukie, Oregon  
Google Earth, 2016

FIGURE

5



TAX LOT OVERVIEW



- LEGEND**
- Study Area Boundary (678,460 sf / 15.58 ac)
  - Wetland A (30,386 sf / 0.70 ac)
  - Artificially Created Wetland (B-G) (Total 3,218 sf / 0.07 ac)
  - Waters of the State/US
  - Ordinary High Water (OHW)
  - Direction of Flow
  - Sample Point (1-10)
  - Photo Point (A-R)

SCALE IN FEET



Survey provided by  
 TerraCalc Land Surveying, Inc., 2016  
 Survey accuracy is sub-centimeter and  
 Sample Point accuracy is ± 3 feet.

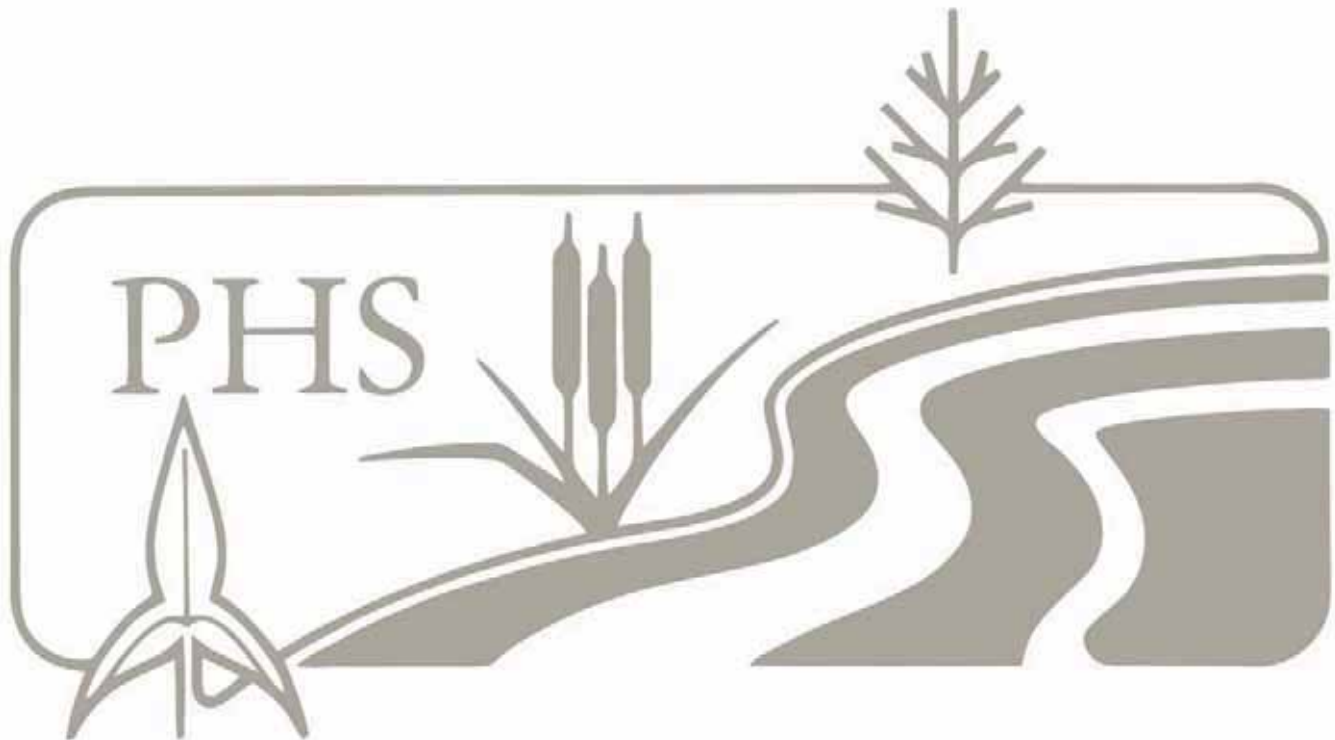
Wetland Delineation  
 SE Kellogg Creek Drive - Milwaukie, Oregon

FIGURE  
**6**

1-18-2017

# Appendix B

## Wetland Delineation Data Sheets



WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: SE Kellogg Creek Drive City/County: Milwaukie/Clackamas Sampling Date: 11/21/2016  
 Applicant/Owner: Brownstone Development, Inc. State: OR Sampling Point: 1  
 Investigator(s): Caroline R./Craig T. Section, Township, Range: Section 6AD, T 2S, R 2E  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR): LRRA Lat: 45.427379 Long: -122.603487 Datum: WGS 84  
 Soil Map Unit Name: Wapato silty clay loam NWI Classification: None  
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (if no, explain in Remarks)  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? (Y/N) Y  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ naturally problematic? If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No _____	

Remarks:  
**Floodplain adjacent to Mt. Scott Creek.**

**VEGETATION - Use scientific names of plants.**

Tree Stratum (plot size: <u>30</u> )	absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That are OBL, FACW, or FAC: <u>4</u> (A)  Total Number of Dominant Species Across All Strata: <u>6</u> (B)  Percent of Dominant Species That are OBL, FACW, or FAC: <u>67%</u> (A/B)
1 <u>Quercus garryana</u>	<u>30</u>	<u>X</u>	<u>FACU</u>	
2 _____	_____	_____	_____	
3 _____	_____	_____	_____	
4 _____	_____	_____	_____	
	<u>30</u>	= Total Cover		
Sapling/Shrub Stratum (plot size: <u>5</u> )	absolute % cover	Dominant Species?	Indicator Status	Prevalence Index Worksheet: Total % Cover of _____ Multiply by: OBL Species _____ x 1 = <u>0</u> FACW species _____ x 2 = <u>0</u> FAC Species _____ x 3 = <u>0</u> FACU Species _____ x 4 = <u>0</u> UPL Species _____ x 5 = <u>0</u> Column Totals <u>0</u> (A) <u>0</u> (B)  Prevalence Index =B/A = <u>#DIV/0!</u>
1 <u>Salix sitchensis</u>	<u>15</u>	<u>X</u>	<u>FACW</u>	
2 <u>Fraxinus latifolia</u>	<u>5</u>	<u>X</u>	<u>FACW</u>	
3 <u>Rubus armeniacus</u>	<u>5</u>	<u>X</u>	<u>FAC</u>	
4 _____	_____	_____	_____	
5 _____	_____	_____	_____	
	<u>25</u>	= Total Cover		
Herb Stratum (plot size: <u>5</u> )	absolute % cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: _____ 1- Rapid Test for Hydrophytic Vegetation <u>X</u> 2- Dominance Test is >50% _____ 3-Prevalence Index is ≤ 3.0 <sup>1</sup> _____ 4-Morphological Adaptations <sup>1</sup> (provide supporting data in Remarks or on a separate sheet) _____ 5- Wetland Non-Vascular Plants <sup>1</sup> _____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
1 <u>Rumex crispus</u>	<u>5</u>	_____	<u>FAC</u>	
2 <u>Carex deweyana</u>	<u>5</u>	_____	<u>FAC</u>	
3 <u>Taraxacum officinale</u>	<u>2</u>	_____	<u>FACU</u>	
4 <u>Dipsacus fullonum</u>	<u>6</u>	_____	<u>FAC</u>	
5 <u>Geum macrophyllum</u>	<u>3</u>	_____	<u>FAC</u>	
6 <u>Agrostis stolonifera</u>	<u>15</u>	<u>X</u>	<u>FAC</u>	
7 <u>Lapsana communis</u>	<u>10</u>	<u>X</u>	<u>FACU</u>	
8 <u>Leucanthemum vulgare</u>	<u>2</u>	_____	<u>FACU</u>	
	<u>48</u>	= Total Cover		
Woody Vine Stratum (plot size: _____)	absolute % cover	Dominant Species?	Indicator Status	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. <b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____
1 _____	_____	_____	_____	
2 _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>40</u>				

Remarks:

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Table with columns: Depth (Inches), Matrix (Color (moist), %), Redox Features (Color (moist), %, Type, Loc), Texture, Remarks. Row 1: 0-12, 10YR 3/2, 100, Sandy Loam.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils3:

Table listing hydric soil indicators (Histosol, Histic Epipedon, etc.) and problematic hydric soil indicators (2 cm Muck, Red Parent Material, etc.) with checkboxes.

3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Compacted rock/gravel/cobble
Depth (inches): 12"

Hydric Soil Present? Yes No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

Table listing primary and secondary wetland hydrology indicators (Surface Water, High Water Table, etc.) with checkboxes.

Field Observations:

Surface Water Present? Yes No X
Water Table Present? Yes No X
Saturation Present? Yes No X
Depth (inches): > 12

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: SE Kellogg Creek Drive City/County: Milwaukie/Clackamas Sampling Date: 11/21/2016  
 Applicant/Owner: Brownstone Development, Inc. State: OR Sampling Point: 2  
 Investigator(s): Caroline R./Craig T. Section, Township, Range: Section 6AD, T 2S, R 2E  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR): LRRRA Lat: 45.427379 Long: -122.603487 Datum: WGS 84  
 Soil Map Unit Name: Cove silty clay loam NWI Classification: None  
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (if no, explain in Remarks)  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? (Y/N) Y  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ naturally problematic? If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			
Remarks:					

**VEGETATION - Use scientific names of plants.**

Tree Stratum (plot size: _____)	absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1 <u>Fraxinus latifolia</u>	<u>10</u>	<u>X</u>	<u>FACW</u>	Number of Dominant Species That are OBL, FACW, or FAC:	<u>4</u> (A)
2 _____	_____	_____	_____	Total Number of Dominant Species Across All Strata:	<u>4</u> (B)
3 _____	_____	_____	_____	Percent of Dominant Species That are OBL, FACW, or FAC:	<u>100%</u> (A/B)
4 _____	_____	_____	_____	Prevalence Index Worksheet:	
5 _____	<u>10</u>	= Total Cover		Total % Cover of	Multiply by:
Sapling/Shrub Stratum (plot size: _____)				OBL Species	x 1 = <u>0</u>
1 <u>Fraxinus latifolia</u>	<u>5</u>	<u>X</u>	<u>FACW</u>	FACW species	x 2 = <u>0</u>
2 <u>Prunus sp.</u>	<u>1</u>	_____	<u>(FAC)</u>	FAC Species	x 3 = <u>0</u>
3 <u>Rubus armeniacus</u>	<u>5</u>	<u>X</u>	<u>FAC</u>	FACU Species	x 4 = <u>0</u>
4 _____	_____	_____	_____	UPL Species	x 5 = <u>0</u>
5 _____	<u>11</u>	= Total Cover		Column Totals	<u>0</u> (A) <u>0</u> (B)
Herb Stratum (plot size: _____)				Prevalence Index = B/A =	<u>#DIV/0!</u>
1 <u>Phalaris arundinacea</u>	<u>70</u>	<u>X</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators:	
2 <u>Dipsacus fullonum</u>	<u>15</u>	_____	<u>FAC</u>	_____	1- Rapid Test for Hydrophytic Vegetation
3 <u>Geum macrophyllum</u>	<u>2</u>	_____	<u>FAC</u>	<u>X</u>	2- Dominance Test is >50%
4 <u>Cirsium vulgare</u>	<u>1</u>	_____	<u>FACU</u>	_____	3-Prevalence Index is ≤ 3.0 <sup>1</sup>
5 <u>Epilobium ciliatum</u>	<u>1</u>	_____	<u>FACW</u>	_____	4-Morphological Adaptations <sup>1</sup> (provide supporting data in Remarks or on a separate sheet)
6 _____	_____	_____	_____	_____	5- Wetland Non-Vascular Plants <sup>1</sup>
7 _____	_____	_____	_____	_____	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
8 _____	<u>89</u>	= Total Cover		<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Woody Vine Stratum (plot size: _____)				Hydrophytic Vegetation Present?	Yes <u>X</u> No _____
1 _____	_____	_____	_____		
2 _____	_____	_____	_____		
	<u>0</u>	= Total Cover			
% Bare Ground in Herb Stratum _____					
Remarks:					

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Table with columns: Depth (Inches), Matrix (Color (moist), %), Redox Features (Color (moist), %, Type, Loc), Texture, Remarks. Row 1: 0-18, 10YR 3/2, 100, Silty Clay Loam.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils3:

Table listing hydric soil indicators (Histosol, Histic Epipedon, etc.) and problematic hydric soil indicators (2 cm Muck, Red Parent Material, etc.) with checkboxes.

3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: \_\_\_\_\_
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

Table listing primary and secondary wetland hydrology indicators (Surface Water, High Water Table, etc.) with checkboxes.

Field Observations:

Surface Water Present? Yes \_\_\_\_\_ No X
Water Table Present? Yes \_\_\_\_\_ No X
Saturation Present? Yes \_\_\_\_\_ No X
Depth (inches): \_\_\_\_\_

Wetland Hydrology Present?
Yes \_\_\_\_\_ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



**WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region**

Project/Site: SE Kellogg Creek Drive City/County: Milwaukie/Clackamas Sampling Date: 11/21/2016  
 Applicant/Owner: Brownstone Development, Inc. State: OR Sampling Point: 3  
 Investigator(s): Caroline R./Craig T. Section, Township, Range: Section 6AD, T 2S, R 2E  
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR): LRR A Lat: 45.427379 Long: -122.603487 Datum: WGS 84  
 Soil Map Unit Name: Cove silty clay loam NWI Classification: None  
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (if no, explain in Remarks)  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? (Y/N) Y  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ naturally problematic? If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	<b>Is Sampled Area within a Wetland?</b>	Yes <u>X</u>	No _____
Hydric Soil Present? Yes <u>X</u> No _____		Yes <u>X</u>	No _____
Wetland Hydrology Present? Yes <u>X</u> No _____			
Remarks:			

**VEGETATION - Use scientific names of plants.**

	absolute % cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (plot size: _____)				<b>Dominance Test worksheet:</b>
1 <u>Fraxinus latifolia</u>	<u>5</u>	<u>X</u>	<u>FACW</u>	Number of Dominant Species That are OBL, FACW, or FAC: <u>5</u> (A)
2 _____				Total Number of Dominant Species Across All Strata: <u>5</u> (B)
3 _____				Percent of Dominant Species That are OBL, FACW, or FAC: <u>100%</u> (A/B)
4 _____				
	<u>5</u>	= Total Cover		
<b>Sapling/Shrub Stratum</b> (plot size: _____)				<b>Prevalence Index Worksheet:</b>
1 <u>Fraxinus latifolia</u>	<u>15</u>	<u>X</u>	<u>FACW</u>	Total % Cover of _____ Multiply by: _____
2 <u>Rubus armeniacus</u>	<u>5</u>	<u>X</u>	<u>FAC</u>	OBL Species _____ x 1 = <u>0</u>
3 _____				FACW species _____ x 2 = <u>0</u>
4 _____				FAC Species _____ x 3 = <u>0</u>
5 _____				FACU Species _____ x 4 = <u>0</u>
	<u>20</u>	= Total Cover		UPL Species _____ x 5 = <u>0</u>
				Column Totals <u>0</u> (A) <u>0</u> (B)
<b>Herb Stratum</b> (plot size: _____)				Prevalence Index =B/A = <u>#DIV/0!</u>
1 <u>Phalaris arundinacea</u>	<u>50</u>	<u>X</u>	<u>FACW</u>	<b>Hydrophytic Vegetation Indicators:</b> _____ 1- Rapid Test for Hydrophytic Vegetation <u>X</u> 2- Dominance Test is >50% _____ 3-Prevalence Index is ≤ 3.0 <sup>1</sup> _____ 4-Morphological Adaptations <sup>1</sup> (provide supporting data in Remarks or on a separate sheet) _____ 5- Wetland Non-Vascular Plants <sup>1</sup> _____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. <b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____
2 <u>Ranunculus repens</u>	<u>30</u>	<u>X</u>	<u>FAC</u>	
3 <u>Geum macrophyllum</u>	<u>1</u>		<u>FAC</u>	
4 _____				
5 _____				
6 _____				
7 _____				
8 _____				
	<u>81</u>	= Total Cover		
<b>Woody Vine Stratum</b> (plot size: _____)				
1 _____				
2 _____				
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum _____				
Remarks:				

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Table with columns: Depth (Inches), Matrix (Color (moist), %), Redox Features (Color (moist), %, Type, Loc), Texture, Remarks. Rows include 0-8 and 8-18 depth intervals with soil characteristics like 10YR 3/1, 100, Silty Clay Loam, 10YR 2/1, 98, 10YR 4/4, 2, C, M, Clay.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils3:

Table listing hydric soil indicators (Histosol, Histic Epipedon, Black Histic, Hydrogen Sulfide, Depleted Below Dark Surface, Thick Dark Surface, Sandy Mucky Mineral, Sandy Gleyed Matrix) and problematic hydric soil indicators (Sandy Redox, Stripped Matrix, Loamy Mucky Mineral, Loamy Gleyed Matrix, Depleted Matrix, Redox Dark Surface, Depleted Dark Surface, Redox Depressions, 2 cm Muck, Red Parent Material, Very Shallow Dark Surface, Other).

3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: \_\_\_\_\_
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes X No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

Table listing primary indicators (Surface Water, High Water Table, Saturation, Water Marks, Sediment Deposits, Drift Deposits, Algal Mat or Crust, Iron Deposits, Surface Soil Cracks, Inundation Visible on Aerial Imagery, Sparsely Vegetated Concave Surface) and secondary indicators (Water stained Leaves, Drainage Patterns, Dry-Season Water Table, Saturation Visible on Aerial Imagery, Geomorphic Position, Shallow Aquitard, Fac-Neutral Test, Raised Ant Mounds, Frost-Heave Hummocks).

Field Observations:

Surface Water Present? Yes No X Depth (inches):
Water Table Present? Yes X No Depth (inches): 8
Saturation Present? Yes X No Depth (inches): 10

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region**

Project/Site: SE Kellogg Creek Drive City/County: Milwaukie/Clackamas Sampling Date: 11/21/2016  
 Applicant/Owner: Brownstone Development, Inc. State: OR Sampling Point: 4  
 Investigator(s): Caroline R./Craig T. Section, Township, Range: Section 6AD, T 2S, R 2E  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR): LRRRA Lat: 45.427379 Long: -122.603487 Datum: WGS 84  
 Soil Map Unit Name: Cove silty clay loam NWI Classification: None  
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (if no, explain in Remarks)  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? (Y/N) Y  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ naturally problematic? If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			

Remarks: \_\_\_\_\_

**VEGETATION - Use scientific names of plants.**

	absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
Tree Stratum (plot size: <u>30</u> )				Number of Dominant Species	
1 <u>Fraxinus latifolia</u>	<u>3</u>		<u>FACW</u>	That are OBL, FACW, or FAC: <u>3</u> (A)	
2 _____				Total Number of Dominant Species Across All Strata: <u>7</u> (B)	
3 _____				Percent of Dominant Species That are OBL, FACW, or FAC: <u>43%</u> (A/B)	
4 _____				Prevalence Index Worksheet:	
5 _____	<u>3</u>	= Total Cover		Total % Cover of _____ Multiply by:	
Sapling/Shrub Stratum (plot size: <u>5</u> )				OBL Species _____ x 1 = <u>0</u>	
1 <u>Fraxinus latifolia</u>	<u>3</u>		<u>FACW</u>	FACW species _____ x 2 = <u>0</u>	
2 <u>Rubus armeniacus</u>	<u>20</u>	<u>X</u>	<u>FAC</u>	FAC Species _____ x 3 = <u>0</u>	
3 <u>Crataegus monogyna</u>	<u>10</u>	<u>X</u>	<u>FAC</u>	FACU Species _____ x 4 = <u>0</u>	
4 <u>Rubus laciniatus</u>	<u>15</u>	<u>X</u>	<u>FACU</u>	UPL Species _____ x 5 = <u>0</u>	
5 _____				Column Totals <u>0</u> (A) <u>0</u> (B)	
	<u>48</u>	= Total Cover		Prevalence Index =B/A = <u>#DIV/0!</u>	
Herb Stratum (plot size: <u>5</u> )				Hydrophytic Vegetation Indicators:	
1 <u>Geum macrophyllum</u>	<u>5</u>	<u>X</u>	<u>FAC</u>	_____ 1- Rapid Test for Hydrophytic Vegetation	
2 <u>Lapsana communis</u>	<u>10</u>	<u>X</u>	<u>FACU</u>	_____ 2- Dominance Test is >50%	
3 <u>Polystichum munitum</u>	<u>5</u>	<u>X</u>	<u>FACU</u>	_____ 3-Prevalence Index is ≤ 3.0 <sup>1</sup>	
4 _____				_____ 4-Morphological Adaptations <sup>1</sup> (provide supporting data in Remarks or on a separate sheet)	
5 _____				_____ 5- Wetland Non-Vascular Plants <sup>1</sup>	
6 _____				_____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
7 _____				_____	
8 _____				_____	
	<u>20</u>	= Total Cover		<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Woody Vine Stratum (plot size: _____)				<b>Hydrophytic Vegetation Present?</b> Yes _____ No <u>X</u>	
1 <u>Rubus ursinus</u>	<u>60</u>	<u>X</u>	<u>FACU</u>		
2 <u>Solanum dulcamara</u>	<u>5</u>		<u>FAC</u>		
	<u>65</u>	= Total Cover			
% Bare Ground in Herb Stratum _____					

Remarks: \_\_\_\_\_

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Table with columns: Depth (Inches), Matrix (Color (moist), %), Redox Features (Color (moist), %, Type, Loc), Texture, Remarks. Row 1: 0-16, 10YR 3/2, 100, Sandy Loam.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils3:

Table listing various soil indicators such as Histosol (A1), Sandy Redox (S5), 2 cm Muck (A10), etc.

3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: \_\_\_\_\_
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

Table listing primary and secondary indicators for wetland hydrology, such as Surface Water (A1), Water stained Leaves (B9), etc.

Field Observations:

Surface Water Present? Yes \_\_\_\_\_ No X
Water Table Present? Yes \_\_\_\_\_ No X
Saturation Present? Yes \_\_\_\_\_ No X

Wetland Hydrology Present? Yes \_\_\_\_\_ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region**

Project/Site: SE Kellogg Creek Drive City/County: Milwaukie/Clackamas Sampling Date: 11/21/2016  
 Applicant/Owner: Brownstone Development, Inc. State: OR Sampling Point: 5  
 Investigator(s): Caroline R./Craig T. Section, Township, Range: Section 6AD, T 2S, R 2E  
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR): LRR A Lat: 45.427379 Long: -122.603487 Datum: WGS 84  
 Soil Map Unit Name: Cove silty clay loam NWI Classification: None  
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (if no, explain in Remarks)  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? (Y/N) Y  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ naturally problematic? If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	<b>Is Sampled Area within a Wetland?</b>	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks:					

**VEGETATION - Use scientific names of plants.**

	absolute % cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (plot size: _____)				<b>Dominance Test worksheet:</b> Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That are OBL, FACW, or FAC: <u>100%</u> (A/B)
1	<u>60</u>	<u>X</u>	<u>FACW</u>	
2				
3				
4				
	<u>60</u>	= Total Cover		
<b>Sapling/Shrub Stratum</b> (plot size: _____)				
1	<u>5</u>	<u>X</u>	<u>FACW</u>	
2	<u>1</u>		<u>FACW</u>	
3	<u>1</u>		<u>FACU</u>	
4				
5				
	<u>7</u>	= Total Cover		
<b>Herb Stratum</b> (plot size: _____)				<b>Prevalence Index Worksheet:</b> Total % Cover of _____ Multiply by: OBL Species _____ x 1 = <u>0</u> FACW species _____ x 2 = <u>0</u> FAC Species _____ x 3 = <u>0</u> FACU Species _____ x 4 = <u>0</u> UPL Species _____ x 5 = <u>0</u> Column Totals <u>0</u> (A) <u>0</u> (B)  Prevalence Index =B/A = <u>#DIV/0!</u>
1	<u>30</u>	<u>X</u>	<u>FAC</u>	
2	<u>2</u>		<u>FAC</u>	
3	<u>1</u>		<u>FAC</u>	
4	<u>1</u>		<u>FAC</u>	
5	<u>1</u>		<u>FACU</u>	
6				
7				
8				
	<u>35</u>	= Total Cover		
<b>Woody Vine Stratum</b> (plot size: _____)				
1				
2				
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum _____				
Remarks:				

- Hydrophytic Vegetation Indicators:**
- \_\_\_\_\_ 1- Rapid Test for Hydrophytic Vegetation
  - X 2- Dominance Test is >50%
  - \_\_\_\_\_ 3-Prevalence Index is ≤ 3.0<sup>1</sup>
  - \_\_\_\_\_ 4-Morphological Adaptations<sup>1</sup> (provide supporting data in Remarks or on a separate sheet)
  - \_\_\_\_\_ 5- Wetland Non-Vascular Plants<sup>1</sup>
  - \_\_\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No \_\_\_\_\_

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Table with columns: Depth (Inches), Matrix (Color (moist), %), Redox Features (Color (moist), %, Type, Loc), Texture, Remarks. Rows include 1-6, 6-8, and 8-18 inch depths with soil characteristics like 10YR 3/1, 10YR 2/1, 10YR 4/4, and textures like Silty Clay Loam and Clay.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils3:

Table listing hydric soil indicators (Histosol, Histic Epipedon, Black Histic, Hydrogen Sulfide, Depleted Below Dark Surface, Thick Dark Surface, Sandy Mucky Mineral, Sandy Gleyed Matrix) and problematic hydric soil indicators (Sandy Redox, Stripped Matrix, Loamy Mucky Mineral, Loamy Gleyed Matrix, Depleted Matrix, Redox Dark Surface, Depleted Dark Surface, Redox Depressions, 2 cm Muck, Red Parent Material, Very Shallow Dark Surface, Other).

3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: \_\_\_\_\_
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes X No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

Table listing primary indicators (Surface Water, High Water Table, Saturation, Water Marks, Sediment Deposits, Drift Deposits, Algal Mat or Crust, Iron Deposits, Surface Soil Cracks, Inundation Visible on Aerial Imagery, Sparsely Vegetated Concave Surface) and secondary indicators (Water stained Leaves, Drainage Patterns, Dry-Season Water Table, Saturation Visible on Aerial Imagery, Geomorphic Position, Shallow Aquitard, Fac-Neutral Test, Raised Ant Mounds, Frost-Heave Hummocks).

Field Observations:

Surface Water Present? Yes No X Depth (inches):
Water Table Present? Yes X No Depth (inches): 4
Saturation Present? Yes X No Depth (inches): 9

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: SE Kellogg Creek Drive City/County: Milwaukie/Clackamas Sampling Date: 11/21/2016  
 Applicant/Owner: Brownstone Development, Inc. State: OR Sampling Point: 6  
 Investigator(s): Caroline R./Craig T. Section, Township, Range: Section 6AD, T 2S, R 2E  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR): LRRRA Lat: 45.427379 Long: -122.603487 Datum: WGS 84  
 Soil Map Unit Name: Cove silty clay loam NWI Classification: None  
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (if no, explain in Remarks)  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? (Y/N) Y  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ naturally problematic? If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			
Remarks:					

**VEGETATION - Use scientific names of plants.**

Tree Stratum (plot size: <u>30</u> )	absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1 <u>Fraxinus latifolia</u>	<u>50</u>	<u>X</u>	<u>FACW</u>	
2 _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3 _____	_____	_____	_____	Percent of Dominant Species That are OBL, FACW, or FAC: <u>100%</u> (A/B)
4 _____	_____	_____	_____	Prevalence Index Worksheet:
5 _____	<u>50</u>	= Total Cover		
Sapling/Shrub Stratum (plot size: <u>5</u> )				OBL Species _____ x 1 = <u>0</u>
1 <u>Fraxinus latifolia</u>	<u>20</u>	<u>X</u>	<u>FACW</u>	FACW species _____ x 2 = <u>0</u>
2 <u>Symphoricarpos albus</u>	<u>5</u>	_____	<u>FACU</u>	FAC Species _____ x 3 = <u>0</u>
3 <u>Crataegus monogyna</u>	<u>15</u>	<u>X</u>	<u>FAC</u>	FACU Species _____ x 4 = <u>0</u>
4 <u>Rubus armeniacus</u>	<u>2</u>	_____	<u>FAC</u>	UPL Species _____ x 5 = <u>0</u>
5 _____	_____	_____	_____	Column Totals <u>0</u> (A) <u>0</u> (B)
	<u>42</u>	= Total Cover		Prevalence Index =B/A = <u>#DIV/0!</u>
Herb Stratum (plot size: <u>5</u> )				Hydrophytic Vegetation Indicators:
1 <u>Carex deweyana</u>	<u>70</u>	<u>X</u>	<u>FAC</u>	
2 <u>Prunella vulgaris</u>	<u>3</u>	_____	<u>FACU</u>	<u>X</u> 2- Dominance Test is >50%
3 <u>Polystichum munitum</u>	<u>3</u>	_____	<u>FACU</u>	3-Prevalence Index is ≤ 3.0 <sup>1</sup>
4 <u>Vicia tetrasperma</u>	<u>5</u>	_____	<u>(NOL)</u>	4-Morphological Adaptations <sup>1</sup> (provide supporting data in Remarks or on a separate sheet)
5 <u>Ranunculus repens</u>	<u>10</u>	_____	<u>FAC</u>	5- Wetland Non-Vascular Plants <sup>1</sup>
6 <u>Dipsacus fullonum</u>	<u>3</u>	_____	<u>FAC</u>	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
7 <u>Agrostis stolonifera</u>	<u>10</u>	_____	<u>FAC</u>	
8 <u>Equisetum arvense</u>	<u>1</u>	_____	<u>FAC</u>	
	<u>105</u>	= Total Cover		
Woody Vine Stratum (plot size: _____)				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1 _____	_____	_____	_____	
2 _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum _____				Hydrophytic Vegetation Present? Yes <u>X</u> No _____
Remarks:				

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-10	10YR 3/2	100					Sandy Loam	
6-16	10YR 3/2	60					Sandy Clay Loam	
	10YR 3/1	20					Sandy Clay Loam	
	10YR 4/3	20					Sandy Clay Loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)		

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks: \_\_\_\_\_

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water stained Leaves (B9) (Except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water stained Leaves (B9) (MLRA1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> Fac-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): > 16

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): > 16  
(includes capillary fringe)

Wetland Hydrology Present? Yes \_\_\_\_\_ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: \_\_\_\_\_



**WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region**

Project/Site: SE Kellogg Creek Drive City/County: Milwaukie/Clackamas Sampling Date: 11/21/2016  
 Applicant/Owner: Brownstone Development, Inc. State: OR Sampling Point: 7  
 Investigator(s): Caroline R./Craig T. Section, Township, Range: Section 6AD, T 2S, R 2E  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR): LRRRA Lat: 45.427379 Long: -122.603487 Datum: WGS 84  
 Soil Map Unit Name: Cove silty clay loam NWI Classification: None  
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (if no, explain in Remarks)  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? (Y/N) Y  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ naturally problematic? If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	<b>Is Sampled Area within a Wetland?</b>	Yes <u>X</u>	No _____
Hydric Soil Present? Yes <u>X</u> No _____		Yes <u>X</u>	No _____
Wetland Hydrology Present? Yes <u>X</u> No _____			
Remarks: _____			

**VEGETATION - Use scientific names of plants.**

	absolute % cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (plot size: _____)				<b>Dominance Test worksheet:</b> Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That are OBL, FACW, or FAC: <u>100%</u> (A/B)
1 <u>Populus balsamifera</u>	<u>10</u>	<u>X</u>	<u>FAC</u>	
2 _____				
3 _____				
4 _____				
	<u>10</u>	= Total Cover		
<b>Sapling/Shrub Stratum</b> (plot size: _____)				
1 <u>Populus balsamifera</u>	<u>15</u>	<u>X</u>	<u>FAC</u>	
2 _____				
3 _____				
4 _____				
5 _____				
	<u>15</u>	= Total Cover		
<b>Herb Stratum</b> (plot size: _____)				<b>Prevalence Index Worksheet:</b> Total % Cover of _____ Multiply by: OBL Species _____ x 1 = <u>0</u> FACW species _____ x 2 = <u>0</u> FAC Species _____ x 3 = <u>0</u> FACU Species _____ x 4 = <u>0</u> UPL Species _____ x 5 = <u>0</u> Column Totals <u>0</u> (A) <u>0</u> (B) Prevalence Index =B/A = <u>#DIV/0!</u>
1 <u>Phalaris arundinacea</u>	<u>100</u>	<u>X</u>	<u>FACW</u>	
2 _____				
3 _____				
4 _____				
5 _____				
6 _____				
7 _____				
8 _____				
	<u>100</u>	= Total Cover		
<b>Woody Vine Stratum</b> (plot size: _____)				
1 _____				
2 _____				
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum _____				
Remarks: _____				

- Hydrophytic Vegetation Indicators:**
- \_\_\_\_\_ 1- Rapid Test for Hydrophytic Vegetation
  - X 2- Dominance Test is >50%
  - \_\_\_\_\_ 3-Prevalence Index is ≤ 3.0<sup>1</sup>
  - \_\_\_\_\_ 4-Morphological Adaptations<sup>1</sup> (provide supporting data in Remarks or on a separate sheet)
  - \_\_\_\_\_ 5- Wetland Non-Vascular Plants<sup>1</sup>
  - \_\_\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No \_\_\_\_\_

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
<b>0-4</b>	<b>10YR 3/2</b>	<b>100</b>					<b>Silty Clay Loam</b>	
<b>4-7</b>	<b>10YR 3/2</b>	<b>95</b>	<b>7.5YR 4/6</b>	<b>5</b>	<b>C</b>	<b>M</b>	<b>Silty Clay Loam</b>	
<b>7-18</b>	<b>10YR 2/2</b>	<b>98</b>	<b>10YR 3/4</b>	<b>2</b>	<b>C</b>	<b>M</b>	<b>Clay</b>	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)		

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks: \_\_\_\_\_

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water stained Leaves (B9) (Except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water stained Leaves (B9) (MLRA1, 2, 4A, and 4B)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> Fac-Neutral Test (D5)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)			
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 2

Water Table Present? Yes  No  Depth (inches): 0

Saturation Present? Yes  No  Depth (inches): 0  
(includes capillary fringe)

Wetland Hydrology Present? Yes  No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

\_\_\_\_\_

Remarks:

**Small ponded area in ~5% of plot**

WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region

Project/Site: SE Kellogg Creek Drive City/County: Milwaukie/Clackamas Sampling Date: 11/21/2016  
 Applicant/Owner: Brownstone Development, Inc. State: OR Sampling Point: 8  
 Investigator(s): Caroline R./Craig T. Section, Township, Range: Section 6AD, T 2S, R 2E  
 Landform (hillslope, terrace, etc.): Fill Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR): LRRRA Lat: 45.427379 Long: -122.603487 Datum: WGS 84  
 Soil Map Unit Name: Cove silty clay loam NWI Classification: None  
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (if no, explain in Remarks)  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? (Y/N) Y  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ naturally problematic? If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			
Remarks:					

**VEGETATION - Use scientific names of plants.**

	absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
<b>Tree Stratum</b> (plot size: _____)				Number of Dominant Species	
1	_____	_____	_____	That are OBL, FACW, or FAC: <u>1</u> (A)	
2	_____	_____	_____	Total Number of Dominant	
3	_____	_____	_____	Species Across All Strata: <u>3</u> (B)	
4	_____	_____	_____	Percent of Dominant Species	
	<u>0</u>	= Total Cover		That are OBL, FACW, or FAC: <u>33%</u> (A/B)	
<b>Sapling/Shrub Stratum</b> (plot size: _____)				<b>Prevalence Index Worksheet:</b>	
1	_____	_____	_____	Total % Cover of _____ Multiply by: _____	
2	_____	_____	_____	OBL Species _____ x 1 = <u>0</u>	
3	_____	_____	_____	FACW species _____ x 2 = <u>0</u>	
4	_____	_____	_____	FAC Species _____ x 3 = <u>0</u>	
5	_____	_____	_____	FACU Species _____ x 4 = <u>0</u>	
	<u>0</u>	= Total Cover		UPL Species _____ x 5 = <u>0</u>	
<b>Herb Stratum</b> (plot size: <u>5</u> )				Column Totals <u>0</u> (A) <u>0</u> (B)	
1	<u>20</u>	<u>X</u>	<u>FACW</u>	Prevalence Index =B/A = <u>#DIV/0!</u>	
2	<u>25</u>	<u>X</u>	<u>FACU</u>	<b>Hydrophytic Vegetation Indicators:</b>	
3	<u>10</u>	_____	<u>FAC</u>	_____ 1- Rapid Test for Hydrophytic Vegetation	
4	<u>5</u>	_____	<u>FAC</u>	_____ 2- Dominance Test is >50%	
5	<u>10</u>	_____	<u>FACU</u>	_____ 3-Prevalence Index is ≤ 3.0 <sup>1</sup>	
6	<u>5</u>	_____	<u>FAC</u>	_____ 4-Morphological Adaptations <sup>1</sup> (provide supporting	
7	<u>15</u>	<u>X</u>	<u>FACU</u>	data in Remarks or on a separate sheet)	
8	<u>10</u>	_____	<u>FACU</u>	_____ 5- Wetland Non-Vascular Plants <sup>1</sup>	
	<u>105</u>	= Total Cover		_____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
<b>Woody Vine Stratum</b> (plot size: _____)				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless	
1	_____	_____	_____	disturbed or problematic.	
2	_____	_____	_____	<b>Hydrophytic</b>	
	<u>0</u>	= Total Cover		<b>Vegetation</b> Yes _____ No <u>X</u>	
% Bare Ground in Herb Stratum _____				<b>Present?</b>	
Remarks:					
<b>Herb Stratum also contains: Agrostis capillaris (FAC) 5%</b>					

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 3/3	100					Sandy Loam	
4-8	10YR 4/4	60					Sandy Loam	
	10YR 3/2	40					Sandy Loam	
8-16	10YR 3/1	100					Sandy Loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)		

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks:  
**0-16" - a jumble of mixed disturbed fill, rocks and gravel throughout**

**HYDROLOGY**

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water stained Leaves (B9) (Except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water stained Leaves (B9) (MLRA1, 2, 4A, and 4B)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Plowed Soils (C6)	<input type="checkbox"/> Fac-Neutral Test (D5)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)			
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			

**Field Observations:**

Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_

Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): > 16

Saturation Present? Yes \_\_\_\_\_ No X Depth (inches): > 16  
 (includes capillary fringe)

**Wetland Hydrology Present?** Yes \_\_\_\_\_ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region**

Project/Site: SE Kellogg Creek Drive City/County: Milwaukie/Clackamas Sampling Date: 11/21/2016  
 Applicant/Owner: Brownstone Development, Inc. State: OR Sampling Point: 9  
 Investigator(s): Caroline R./Craig T. Section, Township, Range: Section 6AD, T 2S, R 2E  
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR): LRR A Lat: 45.427379 Long: -122.603487 Datum: WGS 84  
 Soil Map Unit Name: Cove silty clay loam NWI Classification: None  
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (if no, explain in Remarks)  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? (Y/N) Y  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ naturally problematic? If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	<b>Is Sampled Area within a Wetland?</b>	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			

Remarks: \_\_\_\_\_

**VEGETATION - Use scientific names of plants.**

	absolute % cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b>	
<b>Tree Stratum</b> (plot size: _____)				Number of Dominant Species	
1	_____	_____	_____	That are OBL, FACW, or FAC: <u>2</u> (A)	
2	_____	_____	_____	Total Number of Dominant	
3	_____	_____	_____	Species Across All Strata: <u>2</u> (B)	
4	_____	_____	_____	Percent of Dominant Species	
	<u>0</u>	= Total Cover		That are OBL, FACW, or FAC: <u>100%</u> (A/B)	
<b>Sapling/Shrub Stratum</b> (plot size: _____)				<b>Prevalence Index Worksheet:</b>	
1	_____	_____	_____	Total % Cover of _____ Multiply by: _____	
2	_____	_____	_____	OBL Species _____ x 1 = <u>0</u>	
3	_____	_____	_____	FACW species _____ x 2 = <u>0</u>	
4	_____	_____	_____	FAC Species _____ x 3 = <u>0</u>	
5	_____	_____	_____	FACU Species _____ x 4 = <u>0</u>	
	<u>0</u>	= Total Cover		UPL Species _____ x 5 = <u>0</u>	
<b>Herb Stratum</b> (plot size: _____)				Column Totals <u>0</u> (A) <u>0</u> (B)	
1	<u>25</u>	<u>X</u>	<u>FACW</u>	Prevalence Index =B/A = <u>#DIV/0!</u>	
2	<u>40</u>	<u>X</u>	<u>FAC</u>		
3	<u>10</u>		<u>FACW</u>		
4	<u>10</u>		<u>FACU</u>		
5	<u>5</u>		<u>FACU</u>		
6	_____	_____	_____		
7	_____	_____	_____		
8	_____	_____	_____		
	<u>90</u>	= Total Cover			
<b>Woody Vine Stratum</b> (plot size: _____)				<b>Hydrophytic Vegetation Indicators:</b>	
1	_____	_____	_____	_____ 1- Rapid Test for Hydrophytic Vegetation	
2	_____	_____	_____	<u>X</u> 2- Dominance Test is >50%	
	<u>0</u>	= Total Cover		_____ 3-Prevalence Index is ≤ 3.0 <sup>1</sup>	
% Bare Ground in Herb Stratum _____				_____ 4-Morphological Adaptations <sup>1</sup> (provide supporting data in Remarks or on a separate sheet)	
Remarks: _____				_____ 5- Wetland Non-Vascular Plants <sup>1</sup>	
				_____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____	

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Table with columns: Depth (Inches), Matrix (Color (moist), %), Redox Features (Color (moist), %, Type, Loc), Texture, Remarks. Rows include 0-6 and 6-14 inch depths.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils3:

Table listing various soil indicators such as Histosol (A1), Sandy Redox (S5), 2 cm Muck (A10), etc., with checkboxes for presence.

3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: \_\_\_\_\_
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes X No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

Table listing primary and secondary hydrology indicators such as Surface Water (A1), High Water Table (A2), Water Stained Leaves (B9), etc., with checkboxes.

Field Observations:

Surface Water Present? Yes X No
Water Table Present? Yes X No
Saturation Present? Yes X No

Wetland Hydrology Present? Yes X No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

**WETLAND DETERMINATION DATA FORM - Western Mountains, Valleys, and Coast Region**

Project/Site: SE Kellogg Creek Drive City/County: Milwaukie/Clackamas Sampling Date: 11/21/2016  
 Applicant/Owner: Brownstone Development, Inc. State: OR Sampling Point: 10  
 Investigator(s): Caroline R./Craig T. Section, Township, Range: Section 6AD, T 2S, R 2E  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): \_\_\_\_\_ Slope (%): \_\_\_\_\_  
 Subregion (LRR): LRRRA Lat: 45.427379 Long: -122.603487 Datum: WGS 84  
 Soil Map Unit Name: Cove silty clay loam NWI Classification: None  
 Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No \_\_\_\_\_ (if no, explain in Remarks)  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? (Y/N) Y  
 Are vegetation \_\_\_\_\_ Soil \_\_\_\_\_ or Hydrology \_\_\_\_\_ naturally problematic? If needed, explain any answers in Remarks.)

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			

Remarks: \_\_\_\_\_

**VEGETATION - Use scientific names of plants.**

	absolute % cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
<b>Tree Stratum</b> (plot size: _____)				Number of Dominant Species	
1 _____	_____	_____	_____	That are OBL, FACW, or FAC: <u>2</u> (A)	
2 _____	_____	_____	_____	Total Number of Dominant	
3 _____	_____	_____	_____	Species Across All Strata: <u>4</u> (B)	
4 _____	_____	_____	_____	Percent of Dominant Species	
	<u>0</u>	= Total Cover		That are OBL, FACW, or FAC: <u>50%</u> (A/B)	
<b>Sapling/Shrub Stratum</b> (plot size: _____)				<b>Prevalence Index Worksheet:</b>	
1 _____	_____	_____	_____	Total % Cover of _____ Multiply by: _____	
2 _____	_____	_____	_____	OBL Species _____ x 1 = <u>0</u>	
3 _____	_____	_____	_____	FACW species _____ x 2 = <u>0</u>	
4 _____	_____	_____	_____	FAC Species _____ x 3 = <u>0</u>	
5 _____	_____	_____	_____	FACU Species _____ x 4 = <u>0</u>	
	<u>0</u>	= Total Cover		UPL Species _____ x 5 = <u>0</u>	
<b>Herb Stratum</b> (plot size: <u>5</u> )				Column Totals <u>0</u> (A) <u>0</u> (B)	
1 <u>Daucus carota</u>	<u>25</u>	<u>X</u>	<u>FACU</u>	Prevalence Index =B/A = <u>#DIV/0!</u>	
2 <u>Chenopodium leptophyllum</u>	<u>20</u>	<u>X</u>	<u>FACU</u>	<b>Hydrophytic Vegetation Indicators:</b>	
3 <u>Agrostis capillaris</u>	<u>20</u>	<u>X</u>	<u>FAC</u>	_____ 1- Rapid Test for Hydrophytic Vegetation	
4 <u>Hypochaeris radicata</u>	<u>15</u>	_____	<u>FACU</u>	_____ 2- Dominance Test is >50%	
5 <u>Holcus lanatus</u>	<u>10</u>	_____	<u>FAC</u>	_____ 3-Prevalence Index is ≤ 3.0 <sup>1</sup>	
6 <u>Bromus sp.</u>	<u>20</u>	<u>X</u>	<u>(FAC)</u>	_____ 4-Morphological Adaptations <sup>1</sup> (provide supporting	
7 <u>Parentucellia viscosa</u>	<u>10</u>	_____	<u>FAC</u>	data in Remarks or on a separate sheet)	
8 <u>Plantago lanceolata</u>	<u>15</u>	_____	<u>FACU</u>	_____ 5- Wetland Non-Vascular Plants <sup>1</sup>	
	<u>160</u>	= Total Cover		_____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
<b>Woody Vine Stratum</b> (plot size: _____)				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless	
1 _____	_____	_____	_____	disturbed or problematic.	
2 _____	_____	_____	_____	<b>Hydrophytic</b>	
	<u>0</u>	= Total Cover		<b>Vegetation</b> Yes _____ No <u>X</u>	
% Bare Ground in Herb Stratum _____				<b>Present?</b>	
Remarks: _____					
<b>Herb Stratum also contains: Poa sp. (FAC) 10%, Rumex crispus (FAC) 5%, Cirsium arvense (FAC) 5%, Schedonorus arundinaceus, FAC 5%</b>					

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Table with columns: Depth (Inches), Matrix (Color (moist), %), Redox Features (Color (moist), %, Type, Loc), Texture, Remarks. Rows include 0-3, 3-16 depths with matrix and texture descriptions like 'Sandy Loam'.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils3:

Table listing various soil indicators such as Histosol (A1), Sandy Redox (S5), 2 cm Muck (A10), etc., with checkboxes for presence.

3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: \_\_\_\_\_
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks:

0-16 - jumble of mixed/disturbed fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

Secondary Indicators (2 or more required)

Table listing primary and secondary hydrology indicators such as Surface Water (A1), Water stained Leaves (B9), etc., with checkboxes.

Field Observations:

Surface Water Present? Yes \_\_\_\_\_ No X
Water Table Present? Yes \_\_\_\_\_ No X
Saturation Present? Yes \_\_\_\_\_ No X

Wetland Hydrology Present?
Yes \_\_\_\_\_ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# Appendix C

## Site Photos





**Photo A**

Looking east along south bank of Mt. Scott Creek

**Photo B**

Looking west along south bank of Mt. Scott Creek



#5975  
11/22/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Photodocumentation  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Both photos taken on October 18, 2016

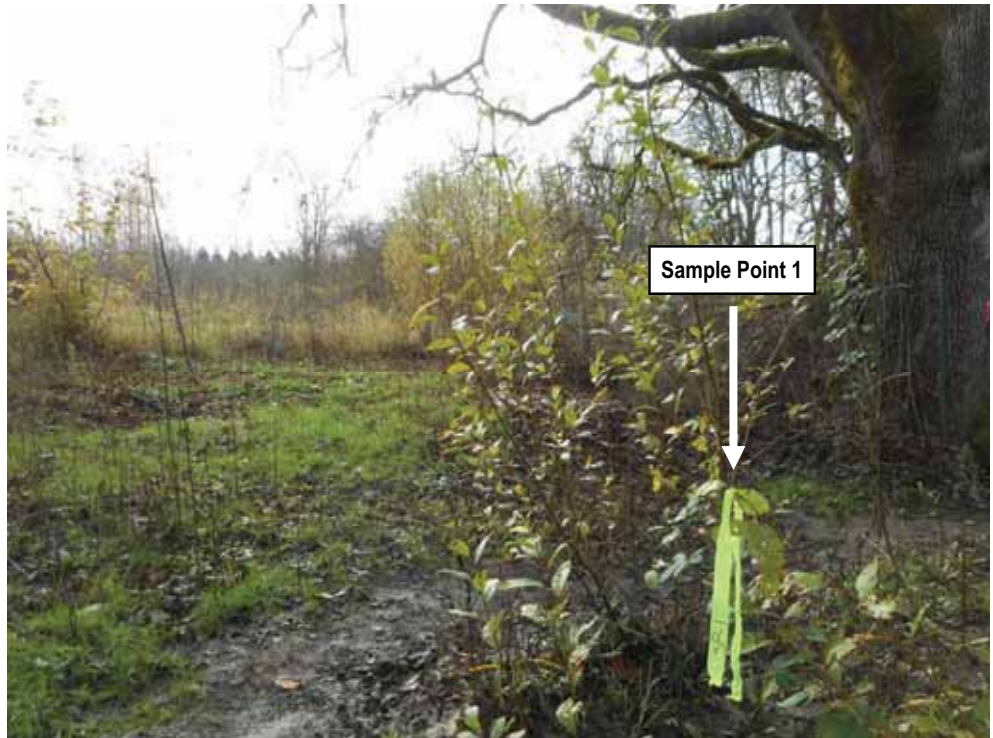


**Photo C**

Looking north across  
Mt. Scott Creek

**Photo D**

Looking southeast toward  
Wetland A



Sample Point 1

#57975  
711/22/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Photodocumentation  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Photo C taken on October 18, 2016, Photo D taken on November 21, 2016



**Photo E**

Looking northwest  
toward north end of  
Wetland A

**Photo F**

Looking southeast toward center  
of Wetland A

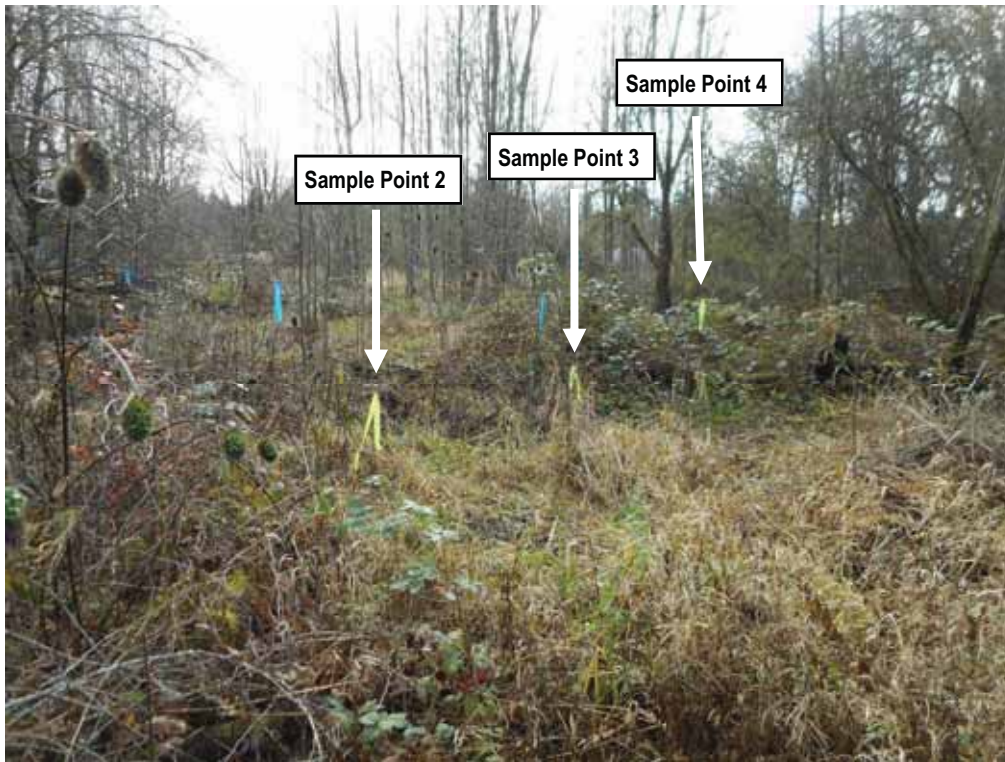


#5975  
11/22/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Photodocumentation  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Both photos taken on November 17, 2016



**Photo G**

Looking southeast toward upland island (Sample Point 4) and center of Wetland A

**Photo H**

Looking southeast toward southern portion of Wetland A from south end of upland island

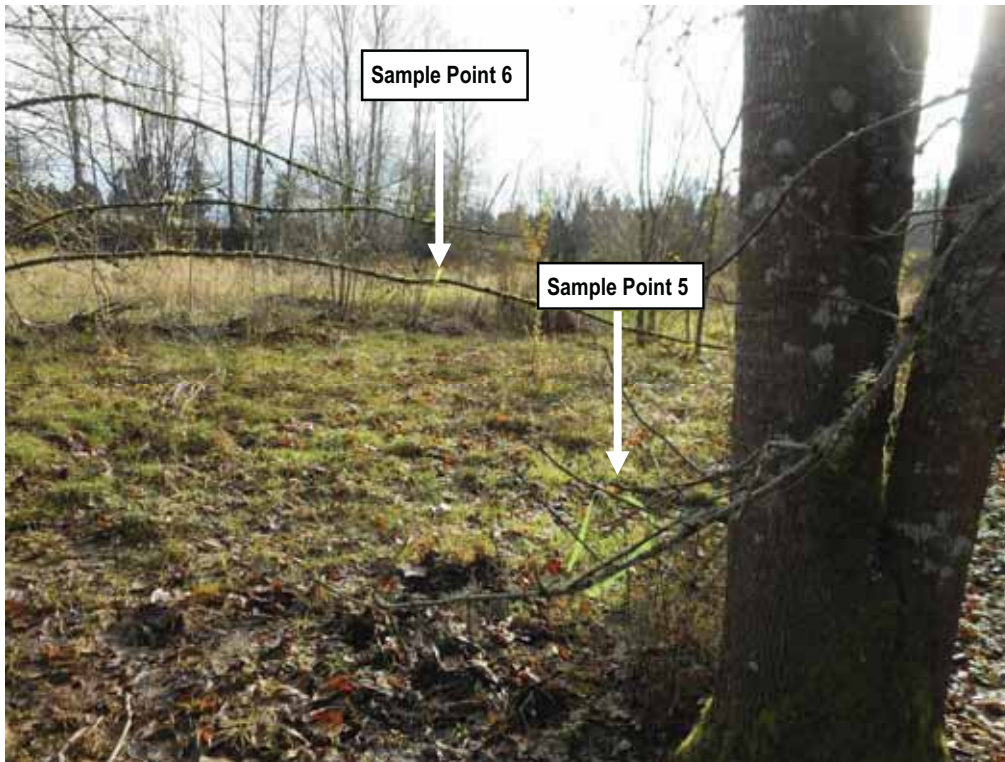


#5975  
11/22/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Photodocumentation  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Both photos taken on November 21, 2016

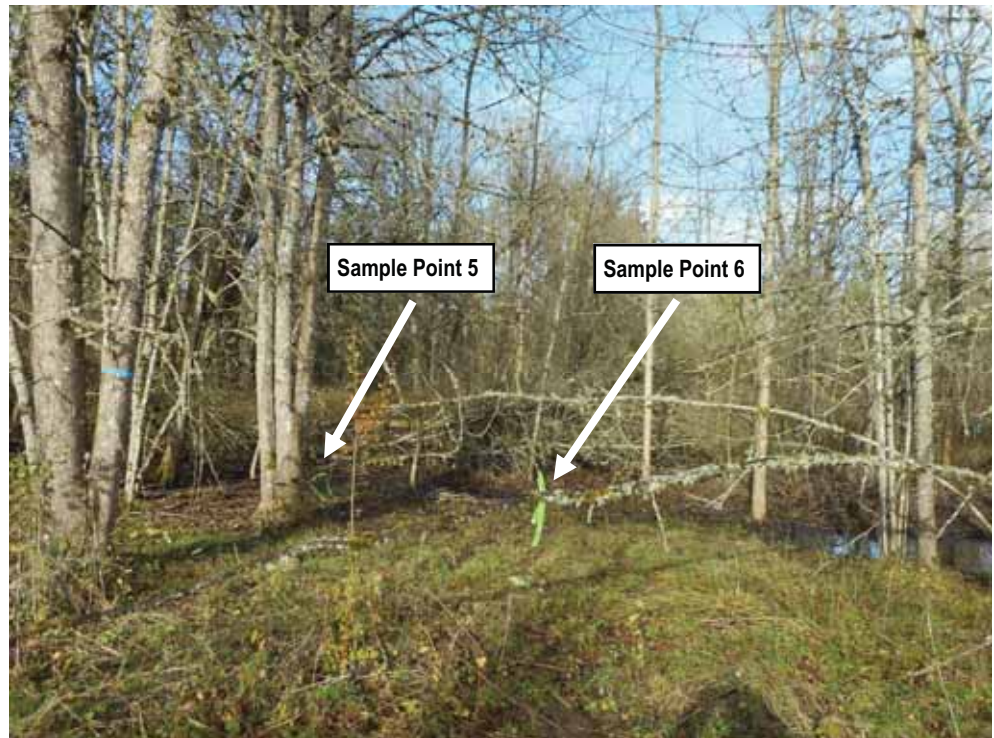


**Photo I**

Looking southeast toward southern boundary of Wetland A

**Photo J**

Looking toward the northwest portion of Wetland A from its southern boundary.



#5975  
11/22/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Photodocumentation  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Both photos taken on November 21, 2016

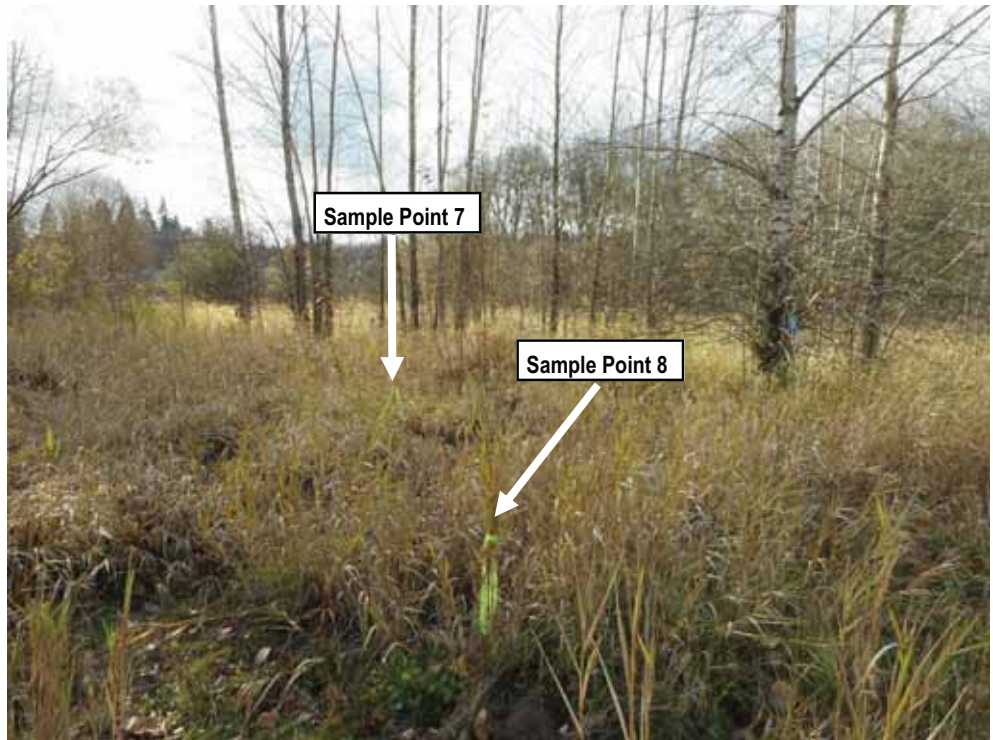


**Photo K**

Looking southeast at  
south end of Wetland A

**Photo L**

Looking south at eastern portion  
of Wetland A

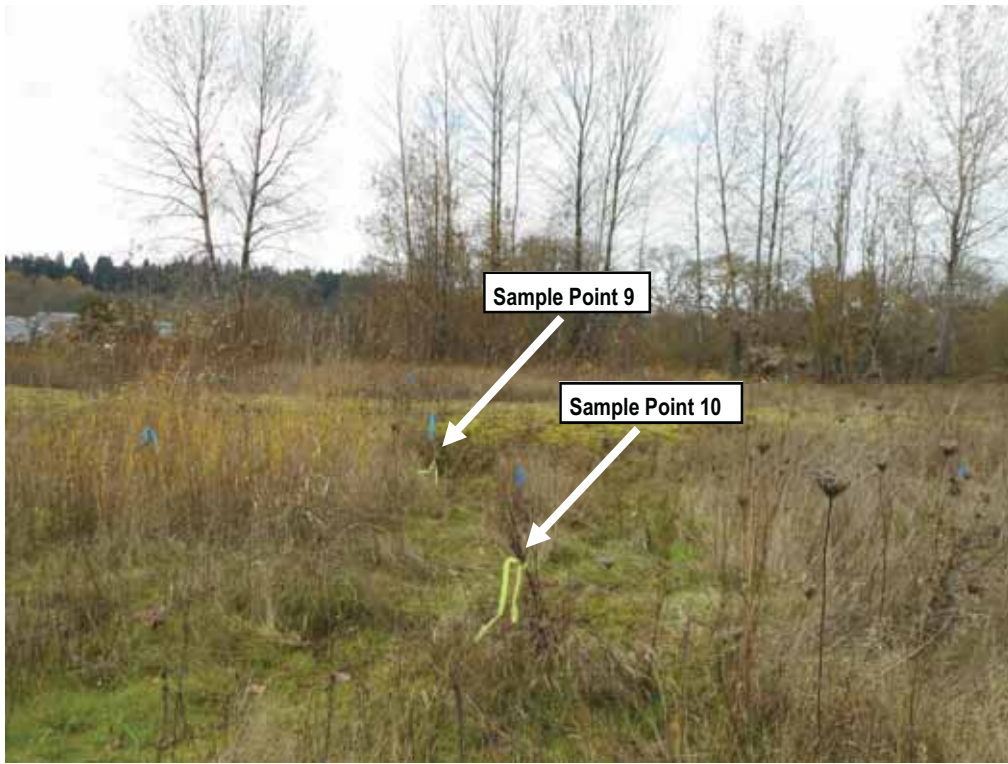


#5975  
11/22/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Photodocumentation  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Both photos taken on November 21, 2016



**Photo M**

Looking southwest  
across Wetland E

**Photo N**

Looking north at Wetland C



#5975  
11/22/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Photodocumentation  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Both photos taken on November 21, 2016





**Photo O**

Looking northwest at  
Wetland B

**Photo P**

Looking southeast at Wetland D



#5975  
11/22/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Photodocumentation  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Both photos taken on November 21, 2016



**Photo Q**

Looking northwest at  
Wetland F

**Photo R**

Looking north at Wetland G



#5975  
11/22/2016



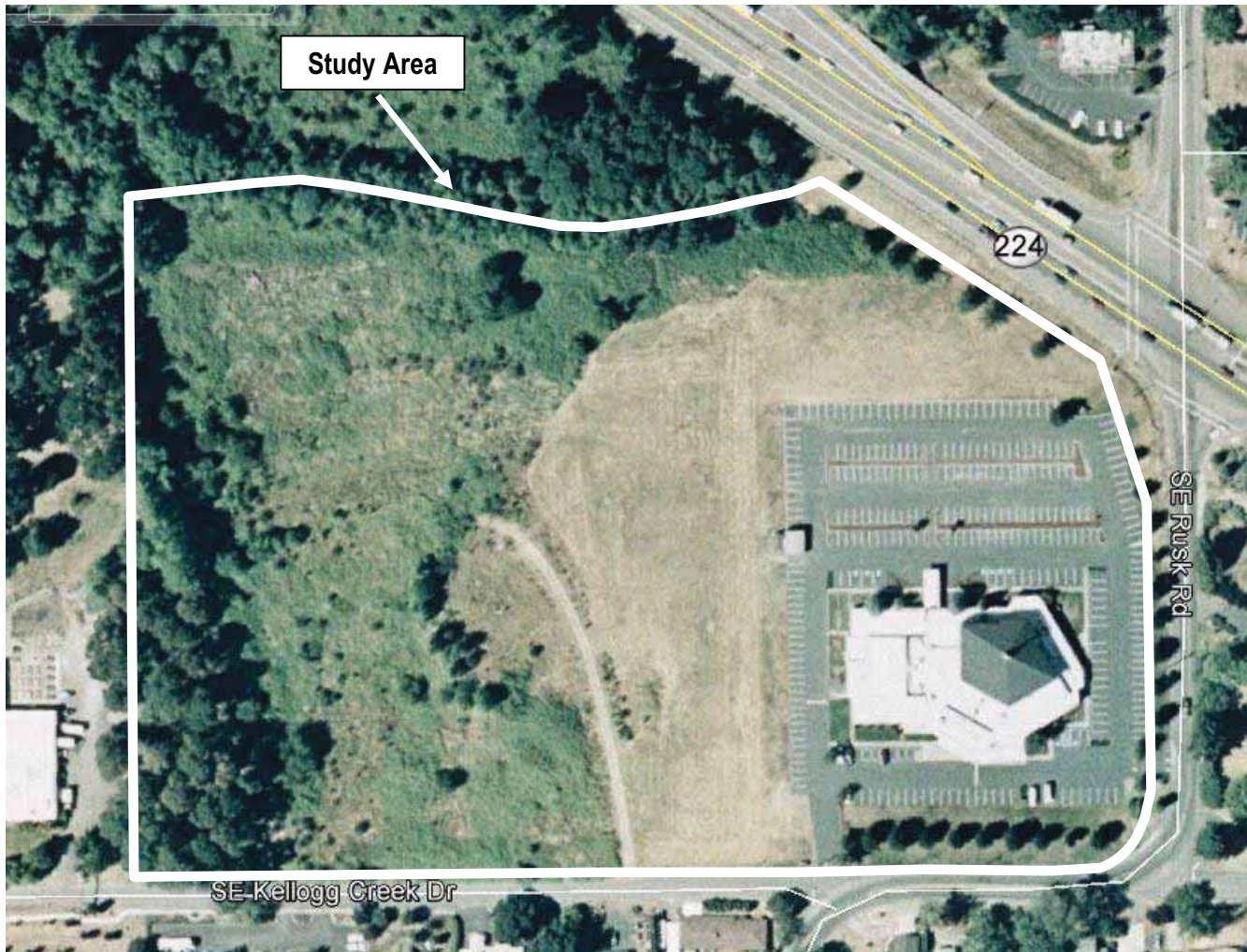
Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Photodocumentation  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Both photos taken on November 21, 2016

# Appendix D

## Historic Aerial Photographs



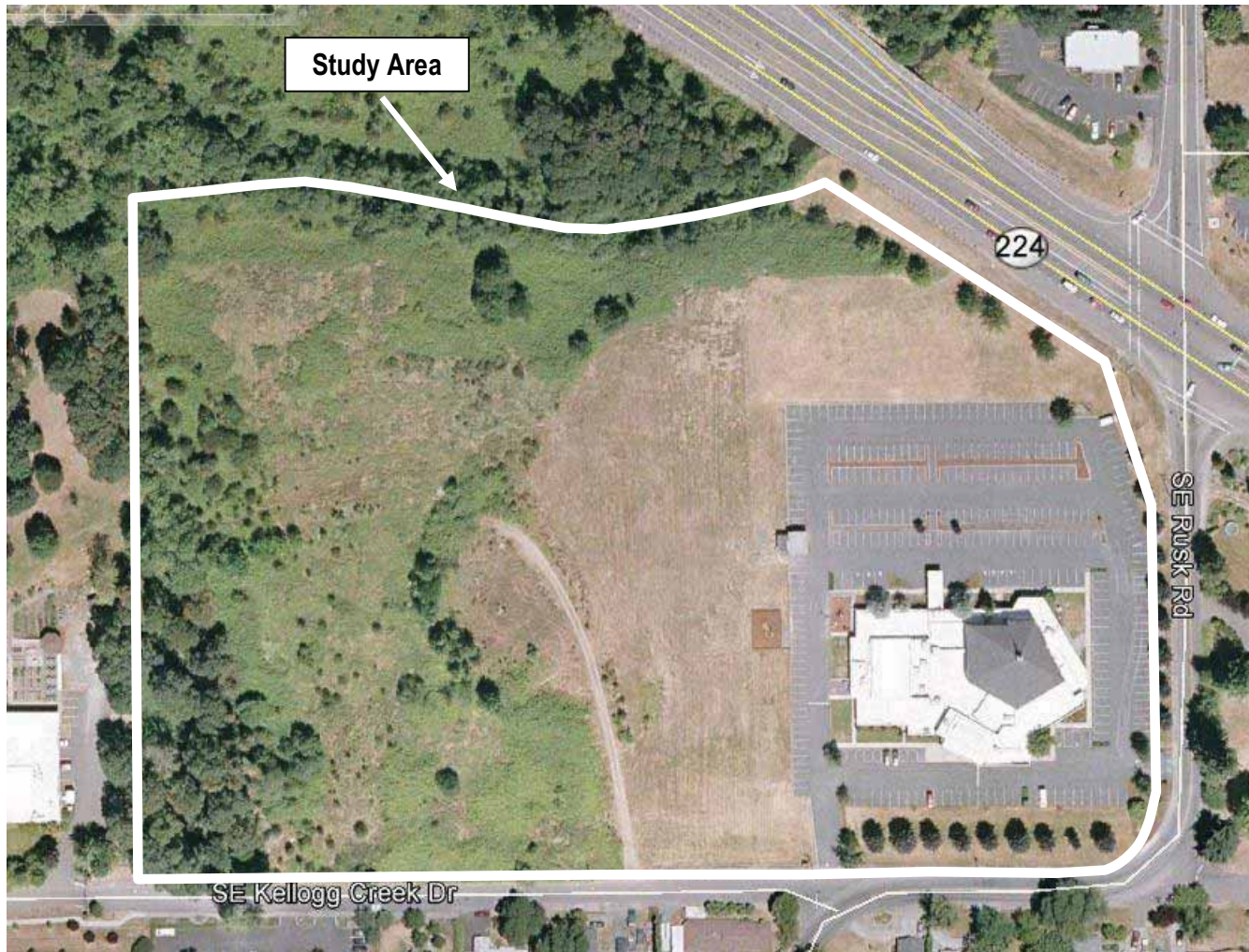


5975  
12/21/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Historic Aerial Photo  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Google Earth, August 14, 2002

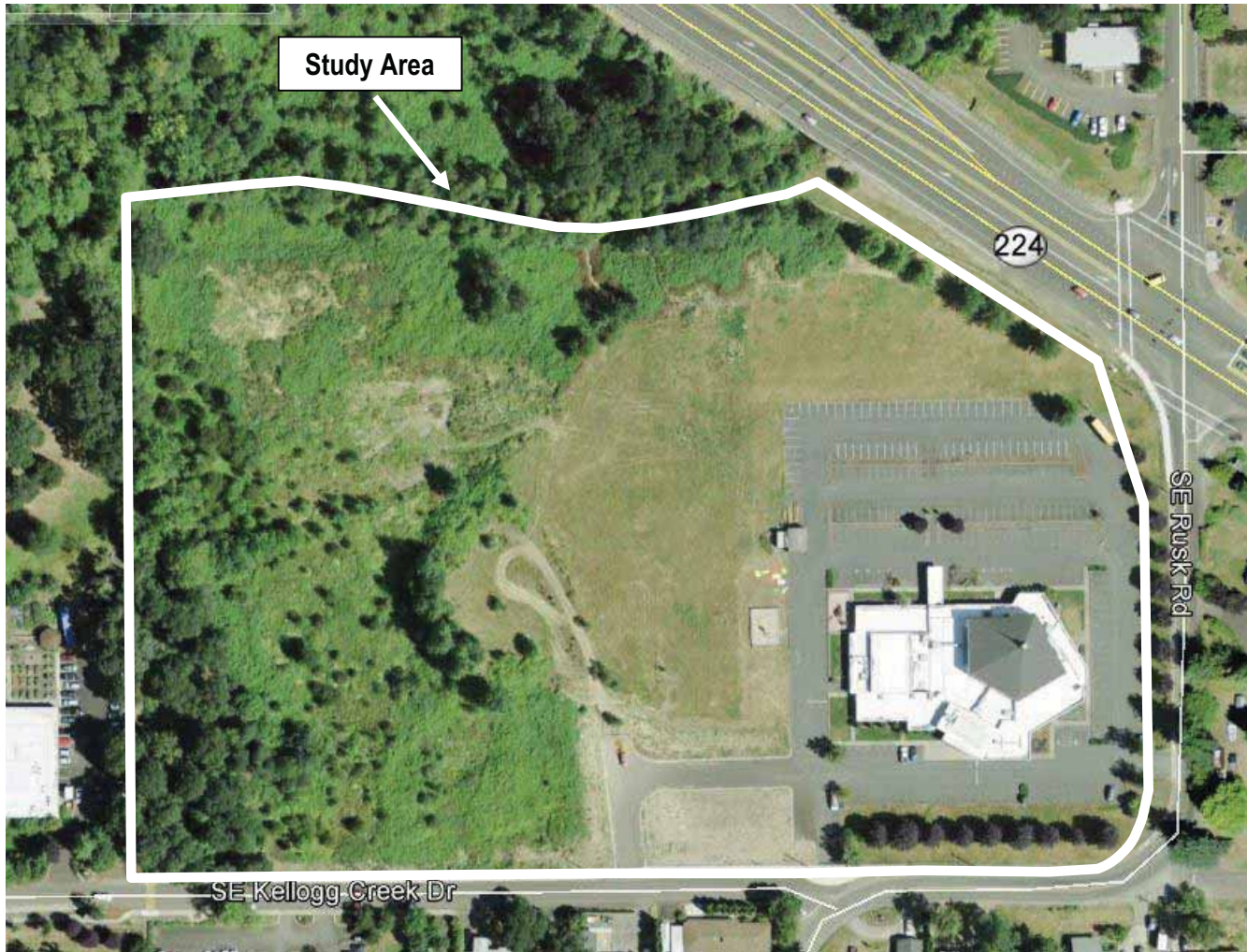


5975  
12/21/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Historic Aerial Photo  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Google Earth, July 2003

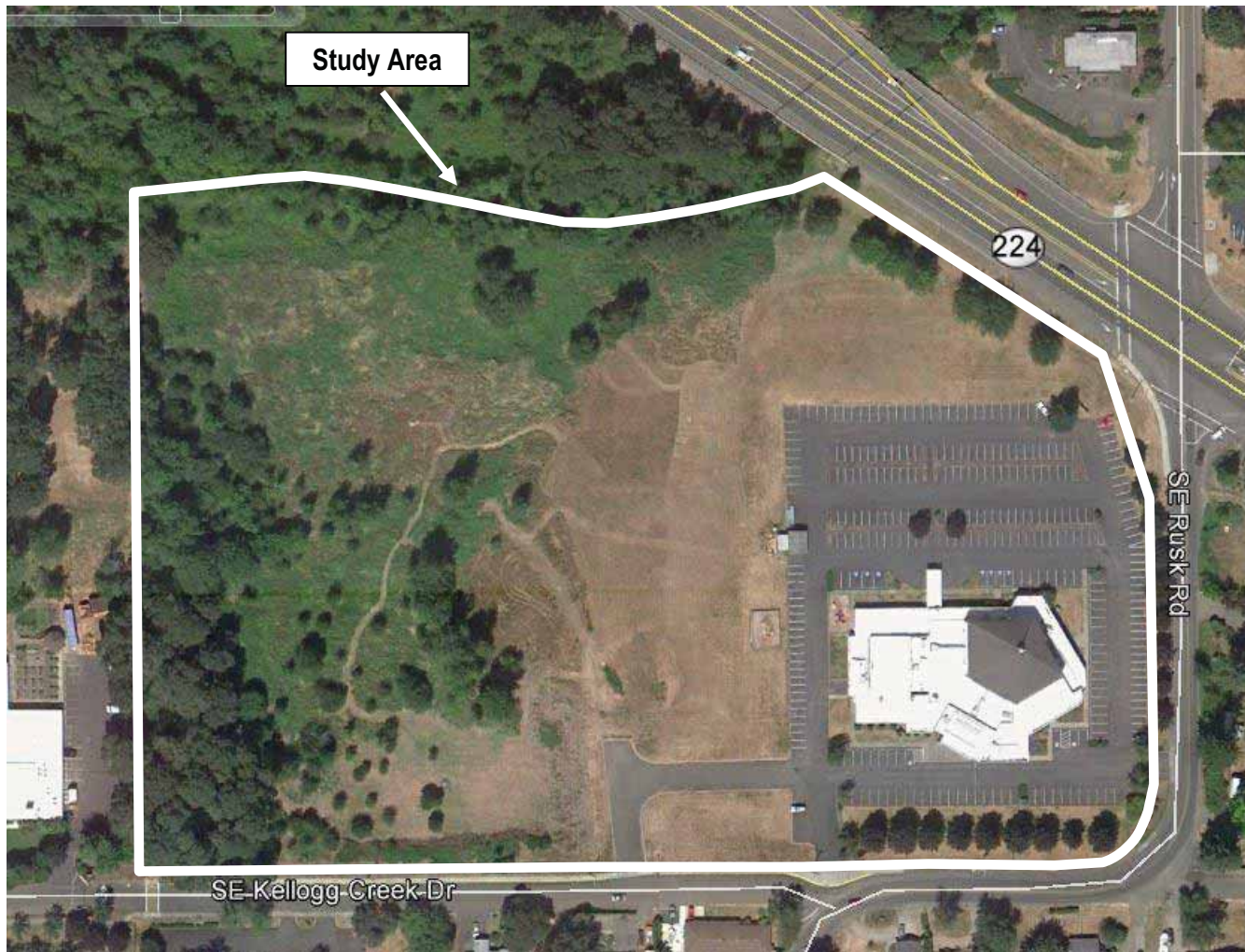


5975  
12/21/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Historic Aerial Photo  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Google Earth, July 2007



5975  
12/21/2016



Pacific Habitat Services, Inc.  
9450 SW Commerce Circle, Suite 180  
Wilsonville, OR 97070

Historic Aerial Photo  
SE Kellogg Creek Drive, Milwaukie, Oregon  
Google Earth, August 2010

# Appendix E

## Wetland Definitions, Methodology, and References





# **WATERS OF THE STATE AND WETLAND DEFINITION AND CRITERIA**

## **Regulatory Jurisdiction**

Wetlands and water resources in Oregon are regulated by the Oregon Department of State Lands (DSL) under the Removal-Fill Law (ORS 196.800-196.990) and by the U.S. Army Corps of Engineers (COE) through Section 404 of the Clean Water Act.

The primary source document for wetland delineations within Oregon is the *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1* (Environmental Laboratory 1987) which is recognized by both DSL and COE.

## **Waters of the State and Wetland Definition**

Waters of the State are defined as “natural waterways including all tidal and nontidal bays, intermittent streams, constantly flowing streams, lakes, wetlands and other bodies of water in this state, navigable and nonnavigable...”. “Natural waterways” is further defined as waterways created naturally by geological and hydrological processes, waterways that would be natural but for human-caused disturbances (e.g. channelized or culverted streams, impounded waters, partially drained wetlands or ponds created in wetlands)...”(DSL, 2001).

Wetlands are defined as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (DSL, 2001).

## **Wetland Criteria**

Based on the above definition, three major factors characterize a wetland: hydrology, substrate, and biota.

### **Wetland Hydrology**

Wetland hydrology is related to duration of saturation, frequency of saturation, and critical depth of saturation. The 1987 manual defines wetland hydrology as inundation or saturation within a major portion of the root zone (usually above 12 inches), typically for at least 12.5% of the growing season. The wetland hydrology criterion can be met, however, if saturation within the major portion of the root zone is present for only 5% of the growing season, depending on other evidence.

The growing season is defined as the portion of the year when soil temperatures at 19.7 inches below the soil surface are higher than biological zero (41 degrees Fahrenheit, 5 degrees Celsius), but also allows approximation from frost free days, based on air temperature. The growing season for any given site or location is determined from US Natural Resources Conservation Service, (formerly Soil Conservation Service) data and information.

Wetland hydrologic indicators include the following: visual observation of inundation or saturation, watermarks, drift lines, sediment deposits, drainage pattern, and/or oxidized rhizospheres with living roots. Oxidized rhizospheres are defined as yellowish-red zones around the roots and rhizomes of some plants that grow in frequently saturated soils.

## Wetland Substrate (Soils)

Most wetlands are characterized by hydric soils. Hydric soils are those that are ponded, flooded, or saturated for long enough during the growing season to develop anaerobic conditions. Periodic saturation of soils causes alternation of reduced and oxidized conditions, which leads to the formation of redoximorphic features (gleying and mottling). Mineral hydric soils will be either gleyed or will have bright mottles and/or low matrix chroma. The redoximorphic feature known as gley is a result of greatly reduced soil conditions, which result in a characteristic grayish, bluish or greenish soil color. The term mottling is used to describe areas of contrasting color within a soil matrix. The soil matrix is the portion of the soil layer that has the predominant color. Soils that have brightly colored mottles and a low matrix chroma are indicative of a fluctuating water table.

Hydric soil indicators include: organic content of greater than 50% by volume, sulfidic material or “rotten egg” odor, and/or presence of redoximorphic features and dark soil matrix, as determined by the use of a Munsell Soil Color Chart. This chart establishes the chroma, value and hue of soils based on comparison with color chips. Mineral hydric soils usually have a matrix chroma of 2 or less in mottled soils, or a matrix chroma of 1 or less in unmottled soils.

## Wetland Biota (Vegetation)

Wetland biota is defined as hydrophytic vegetation. A hydrophyte is a plant species that is capable of growing in substrates that are periodically deficient in oxygen as a result of saturated soil conditions. The U.S. Fish and Wildlife Service, in the *National List of Plant Species that Occur in Wetlands*, has established five basic groups of vegetation based on their frequency of occurrence in wetlands. These categories, referred to as the "wetland indicator status", are as follows: obligate wetland plants (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and obligate upland (UPL). Table 1 gives a definition of the plant indicator codes.

**Table 1. Description of Wetland Plant Indicator Status Codes**

Indicator Code	Status
OBL	Obligate wetland. Estimated to occur almost exclusively in wetlands (>99%)
FACW	Facultative wetland. Estimated to occur 67-99% of the time in wetlands.
FAC	Facultative. Occur equally in wetlands and non-wetlands (34-66%).
FACU	Facultative upland. Usually occur in non-wetlands (67-99%).
UPL	Obligate upland. Estimated to occur almost exclusively in non-wetlands (>99%). If a species is not assigned to one of the four groups described above it is assumed to be obligate upland.
NI	Has not yet received a wetland indicator status, but is probably not obligate upland.

Observations of hydrology, soils, and vegetation, were made using the "Routine On-site" delineation method as defined in the 1987 manual for areas that were not currently in agricultural production. One-foot diameter soil pits were excavated to 16 inches and soil profiles were examined for hydric soil and wetland hydrology field indicators. In addition, a visual percent-

cover estimate of the dominant species of the plant community was performed using soil pit locations as a center of reference. Dominant plant species are based on estimates of percent cover for herbaceous, woody vine, and shrub species within a 5 foot radius of the sample point, and basal area cover for tree species within a 30 foot radius of the sample point. Plant species in each vegetative layer, which are estimated at less than 20%, are not considered to be dominant. The wetland indicator status is then used to determine if there is an overall dominance (greater than 50%) of wetland or upland plant species.

During data collection, the soil profiles were examined for hydric soil and wetland hydrology field indicators. Plant species and cover were recorded. Data was recorded on standard data sheets which contain the information specified in the 1987 Corps manual.

# **BONAVENTURE SENIOR HOUSING**

## **Milwaukie, Oregon**

A Land Use Application for:

### **Property Line Adjustment**

### **Lot Consolidation**

Applicant:

**Bonaventure Senior Housing**

Submitted:

**December 2018**

Prepared by:



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## **I. PROJECT TEAM**

### **Applicant**

#### **Bonaventure Senior Housing**

3425 Boone Road SE  
Salem, OR 97317  
Contact: Daniel Dobson  
503.373.3154  
ddobson@liveBSL.com

### **Property Owner**

#### **Turning Point Church**

13333 Rusk Road  
Milwaukie, OR 97222  
Contact: Pastor Bob Mihuc  
503.305.8704  
bob@turningpointcares.org

### **Planning/Civil Engineering**

#### **DOWL**

720 SW Washington Street, Suite 750  
Portland, OR 97221  
Contact: Serah Breakstone, AICP  
503.280.8661  
sbreakstone@dowl.com

## II. INTRODUCTION

### Summary of Proposal

Bonaventure Senior Living (the applicant) is proposing a lot consolidation and property line adjustment that impacts the four tax lots listed below. As shown in Figure 1 below, tax lot 600 currently contains a church and associated parking area. Tax lot 901 also contains a portion of the church parking area. The applicant is proposing to make several adjustments to the property lines of these four properties:

1. Consolidate tax lots 700, 900 and 901.
2. Adjust the property lines of tax lot 600 as follows:
  - a. Shift the western property line of tax lot 600 to the west, beyond the existing church parking lot.
  - b. Shift the northern property line of tax lot 600 south, just above the existing church parking lot.

The new church parcel will be 3.72 acres and the consolidated parcel will be 13.83 acres. Sheet C200 in Exhibit A shows the location of existing and proposed tax lot boundaries.

This consolidation and property line adjustment will allow development to occur on the new consolidated tax lot while establishing the church on a separate property with boundaries that coincide with existing improvements on the lot.

### Tax Lot Information

Tax Lot Number	Size (acres)	Zoning Designation
22E 06AD 600	3.84	R-10
22E 06AD 901	12.26	R-3 and R-10
22E 06AD 900	0.63	R-3
22E 06AD 700	0.98	R-10

Figure 1: Vicinity Map



<b>Legend</b>		<b>Vicinity Map</b> <b>Kellogg Creek</b> <b>Milwaukie, Oregon</b>	
Site			
taxlots City Limits			Project # 2322.1414258.01



### III. PROPERTY LINE ADJUSTMENT CRITERIA & STANDARDS

This section provides responses to demonstrate that the proposed lot consolidation and property line adjustment are consistent with approval criteria in Title 17 Land Divisions of the Milwaukie code.

#### **17.12.030 APPROVAL CRITERIA FOR LOT CONSOLIDATION, PROPERTY LINE ADJUSTMENT, AND REPLAT**

##### *A. Approval Criteria*

*The approval authority may approve, approve with conditions, or deny a lot consolidation, property line adjustment, and/or replat based on the following approval criteria. The applicant for a lot consolidation, property line adjustment, or replat shall demonstrate the following:*

*1. Compliance with this title and Title 19 of this code.*

**Response:** The proposed lot line adjustment is consistent with Title 19 of the Milwaukie code, as demonstrated on Sheet C200 in Exhibit A. The elements of Title 19 that will be impacted by the proposed adjustment are:

- Lot size and setbacks for the church development per the R-10 base zone. The minimum lot size in the R-10 zone is 10,000 square feet. The newly-created lots will be 3.72 acres and 13.83 acres, both of which exceed the minimum requirement. The side yard requirement for the R-10 zone is 10 feet. The church development currently encroaches into this required side yard. With the proposed adjustment, the church development will meet the side yard standard. The rear yard requirement for the R-10 zone is 20 feet, which will also be met with the proposed property line adjustment. The front yard will not be impacted by the proposed property line adjustment.
- Perimeter landscape strip for the church parking lot per Section 19.606.2. The church parking lot is required to have a minimum 6-foot wide landscape buffer where it abuts another property (western property line). As shown on Sheet C200, a minimum 6-foot wide buffer area will be maintained on the church property where the parking lot abuts the newly-created lot to the west.

*2. The boundary change will allow reasonable development of the affected lots and will not create the need for a variance of any land division or zoning standard.*

**Response:** The proposed boundary change will allow development of the larger consolidated lot to occur while maintaining the church site as a separate property. The change will not create the need for a variance of any land division or zoning standard.

*3. Boundary changes shall not reduce residential density below minimum density requirements of the zoning district in which the property is located. (Ord. 1907 (Attach. 1), 2002)*

**Response:** The proposed boundary change will not reduce residential density below minimum requirements.

**Exhibit A**  
**Sheet C200 Property Line Adjustment**



September 25, 2018

**Subject: Notice of a proposed development at 13333 Rusk Road**

Dear Property Owner:

You are cordially invited to attend a neighborhood meeting on **Tuesday, October 9 at 6:00 PM.**

The purpose of this meeting is to discuss a proposed new development located at 13333 SE Rusk Road adjacent to the Turning Point Church. The subject tax lots are: 22E 06AD 600, 700, 900 and 901. The site is approximately 18 acres and is zoned R-3 and R-10 by the City of Milwaukie. A vicinity map showing the site location is attached to this letter.

The proposal is for a new senior housing development that will have approximately 165 units, including independent living, assisted living and memory care units. Interior amenities will include a large and gracious lobby and reception area, café bistro, formal living room/parlor, and a wide range of entertainment and activities for residents. Outside areas will include a combination of open and covered patios, planting areas and other exterior amenity areas. Associated parking, drive aisles and site landscaping will also be included.

The Turning Point Church will remain in place, and natural resources that exist on the site will be preserved.

A preliminary site plan is attached to this letter.

The purpose of this meeting is to provide an opportunity for the applicant and surrounding property owners to meet and discuss the proposal, including any potential concerns.

The meeting is scheduled for:

**Tuesday, October 9, 2018**  
**6:00 – 7:30 PM**  
**Milwaukie Center, Trillium Room**  
**5440 SE Kellogg Creek Drive**  
**Milwaukie, OR 97222**

Please note that this is an informational meeting on preliminary plans. These plans may change slightly before the application is submitted to the city. We look forward to discussing this proposal with you. Please feel free to contact me at 971.280.8661 or [sbreakstone@dowl.com](mailto:sbreakstone@dowl.com) if you have questions.

Sincerely,

Serah Breakstone, AICP  
DOWL Senior Planner

Attachment(s): Vicinity Map and Preliminary Site Plan

BONAVENTURE SENIOR HOUSING NEIGHBORHOOD MEETING -  
 INVITE LIST  
 PROPERTIES WITHIN 500 FEET

TAX LOT ID	OWNER	ADDRESS	CITY	STATE	ZIP
22E05B 01000	SECHAN NEIL TRUSTEE	101 SCENIC DR	ASHLAND	OR	97520
22E05B 01100	RANDALL INVESTMENT GROUP LLC	2 CENTERPOINTE DR STE 210	LAKE OSWEGO	OR	97035
22E05B 01200	RANDALL INVESTMENT GROUP LLC	2 CENTERPOINTE DR STE 210	LAKE OSWEGO	OR	97035
22E05B 01603	LAKE ROAD MEDICAL BUILDING LLC	6542 SE LAKE RD STE 104	MILWAUKIE	OR	97222
22E05B 02600	ROBERTSON RANDALL W	12972 SE RUSK RD	MILWAUKIE	OR	97222
22E05B 02602	KIRCHEM JONATHAN D	13012 SE RUSK RD	MILWAUKIE	OR	97222
22E05B 02603	HANCEY TREVOR	12992 SE RUSK RD	MILWAUKIE	OR	97222
22E05B 02700	NBL PROPERTIES LIMITED	PO BOX 1741	LAKE OSWEGO	OR	97035
22E05BC00100	HOVIS DAVID S	13440 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC00101	COOK DAVID K & DAWN R	13398 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC00102	CLIFFORD ROBERT C & MARTHA L	13436 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC00103	HOWARD TIMOTHY C & HOLLY M	13444 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC00104	GERTON JUDITH A & RONALD E	13446 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC00200	JACKSON RICHARD L & SHERI R	13420 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC00300	JOHNSON CAMERON & CHRISTA	13410 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC00400	STATE OF OREGON	TRANSPORTATION BLDG	SALEM	OR	97310
22E05BC00500	RANDOLPH BENJAMIN & JENNIFER	13240 SE RUSK RD	MILWAUKIE	OR	97222
22E05BC00600	LUSTGRAAF JOY E & DARELL A	13312 SE RUSK RD	MILWAUKIE	OR	97222
22E05BC00700	PASTOR JOAQUIN P & GABRIELA N	13400 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC00800	MARKWART KEITH A & A K	13430 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC01000	MOODY DAVID ALLAN & NORMA JEAN	13387 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC01100	JIMINEZ R M II & V	13389 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC01200	VAN BOCKEL DOROTHEA A & JEBEDIAH	13391 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC01300	BLACKBURN GLORIA R CO-TRUSTEE	13465 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC01400	MILLWARD G RICHARD A	13485 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E05BC01500	GREEN-HITE JOHN & TERESA	13575 SE BRIARFIELD CT	MILWAUKIE	OR	97222
22E05BC01600	JOHNS LANA S TRUSTEE	7222 SE 29TH	PORTLAND	OR	97202
22E05BC01700	ANDRUS SONIA L & STEVEN R	16897 SE TONG RD	DAMASCUS	OR	97089
22E05BC01800	BRODERICK KIRBY	6109 SE ERIC ST	MILWAUKIE	OR	97222
22E05BC01900	PAYNE STEVEN REEVES RIGGINS	13555 SE BRIARFIELD CT	MILWAUKIE	OR	97222
22E05BC02100	BRODERICK KIRBY & BRONWEN	6109 SE ERIC ST	MILWAUKIE	OR	97222

BONAVENTURE SENIOR HOUSING NEIGHBORHOOD MEETING -  
 INVITE LIST  
 PROPERTIES WITHIN 500 FEET

TAX LOT ID	OWNER	ADDRESS	CITY	STATE	ZIP
22E05CB00303	HENNEBECK CAITLIN	13450 SE RUSCLIFF RD	MILWAUKIE	OR	97222
22E06AA00300	MILLER SUSAN & PHIL	5800 SE WEIKO WAY	MILWAUKIE	OR	97222
22E06AA00400	HSBC BANK USA NA TRUSTEE	8950 CYPRESS WATERS BLVD	COPPELL	TX	75019
22E06AA00401	MILLER SUSAN & PHIL	5800 SE WEIKO WAY	MILWAUKIE	OR	97222
22E06AA00402	MILLER SUSAN & PHIL	5800 SE WEIKO WAY	MILWAUKIE	OR	97222
22E06AA00501	TIEN FRANK & KAREN	9249 SE HUNTERS BLUFF AVE	HAPPY VALLEY	OR	97086
22E06AA00502	SATIS PROPERTIES LLC	5939 SE IRIS CT	MILWAUKIE	OR	97267
22E06AA00504	TIEN FRANK & KAREN	9249 SE HUNTERS BLUFF AVE	HAPPY VALLEY	OR	97086
22E06AA00600	MASSEY TERRY	8625 SE JENNINGS AVE	MILWAUKIE	OR	97267
22E06AA00601	OFFICE OF OVERSEER & HIS	PO BOX 821166	VANCOUVER	WA	98682
22E06AA00700	KING TONY C	12951 SE RUSK RD	MILWAUKIE	OR	97222
22E06AA00800	CITY OF MILWAUKIE	6101 SE JOHNSON CREEK BLVD	PORTLAND	OR	97206
22E06AA00900	BRUNEAU CAROLINE J TRUSTEE	12942 SE RUSK RD	MILWAUKIE	OR	97222
22E06AB00610	OLEARY MICHAEL J & MARY JEAN	5440 SE CAMPANARIO RD	MILWAUKIE	OR	97222
22E06AB00616	SILVERLEAF HOMEOWNERS	5246 CAMPANARIO RD	MILWAUKIE	OR	97222
22E06AB00617	NORTH CLACKAMAS PARK & REC DIST	150 BEAVERCREEK RD	OREGON CITY	OR	97045
22E06AB00703	NOREN JOHN A & DONNA	12935 SE CARRIE LYN LN	MILWAUKIE	OR	97222
22E06AB00704	BRUNNING VINCENT C & GEORGIANNE	12963 SE CARRIE LYN LN	MILWAUKIE	OR	97222
22E06AB00705	MCKEE GEORGE A TRUSTEE	5535 SE CAMPANARIO RD	MILWAUKIE	OR	97222
22E06AB00706	PERRY MICHAEL A	5455 SE CAMPANARIO RD	MILWAUKIE	OR	97222
22E06AB00707	ROGERS SALLY M	5454 SE CAMPANARIO RD	MILWAUKIE	OR	97222
22E06AB00708	HEINICHEN RICHARD J & CINDY I	5502 SE CAMPANARIO RD	MILWAUKIE	OR	97222
22E06AB00709	SAENZ SAMUEL & ROSIE	5550 SE CAMPANARIO RD	MILWAUKIE	OR	97222
22E06AB00710	LEFRANC YVES & GINA MCMENAMIN	5606 SE CAMPANARIO RD	MILWAUKIE	OR	97222
22E06AB00711	JONES SCOTT & TIFFANY	5648 SE CAMPANARIO RD	MILWAUKIE	OR	97222
22E06AB00712	CHANEY DALE S & T	5649 SE CAMPANARIO RD	MILWAUKIE	OR	97222
22E06AB00713	SLOBODA VASILY & TAMARA	12988 SE CARRIE LYN LN	MILWAUKIE	OR	97222
22E06AB00714	BAILEY ARLENE F	12936 SE CARRIE LYN LN	MILWAUKIE	OR	97222
22E06AB00715	CHRISTIANSON JOHN W & LOU ANN	5586 SE LAKE RD	MILWAUKIE	OR	97222
22E06AB00716	NORTH CLACKAMAS PARKS & REC DIST	150 BEAVERCREEK RD	OREGON CITY	OR	97045
22E06AC00100	CITY OF MILWAUKIE	10722 SE MAIN ST	MILWAUKIE	OR	97222

BONAVENTURE SENIOR HOUSING NEIGHBORHOOD MEETING -  
 INVITE LIST  
 PROPERTIES WITHIN 500 FEET

TAX LOT ID	OWNER	ADDRESS	CITY	STATE	ZIP
22E06AD00100	HACMAC PROPERTIES LLC	6026 SE EASTBROOK DR	MILWAUKIE	OR	97222
22E06AD00200	THORPE JAMES STEVEN	13020 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD00300	GOFF DONALD EUGENE CO-TRUSTEE	14980 SE RIVER FOREST DR	MILWAUKIE	OR	97267
22E06AD00301	STATE OF OREGON	TRANSPORTATION BLDG	SALEM	OR	97310
22E06AD00600	TURNING POINT CHURCH	13333 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD00700	TURNING POINT CHURCH	13333 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD00801	PROUD GROUND	5288 N INTERSTATE	PORTLAND	OR	97217
22E06AD00802	PROUD GROUND	5288 N INTERSTATE	PORTLAND	OR	97217
22E06AD00803	GESIK CHARLIE	5650 SE KAYLA CT	MILWAUKIE	OR	97222
22E06AD00804	PROUD GROUND	5288 N INTERSTATE	PORTLAND	OR	97217
22E06AD00805	PROUD GROUND	5288 N INTERSTATE	PORTLAND	OR	97217
22E06AD00806	HANSEN LAURA R A	12978 SE MADEIRA DR	MILWAUKIE	OR	97222
22E06AD00807	PROUD GROUND	5288 N INTERSTATE	PORTLAND	OR	97217
22E06AD00900	TURNING POINT CHURCH	13333 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD00901	TURNING POINT CHURCH	13333 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD01000	CITY OF MILWAUKIE	10722 SE MAIN ST	MILWAUKIE	OR	97222
22E06AD01100	KRE TIGER DEERFIELD LLC	19119 NORTH CREEK PKWY	BOTHELL	WA	98011
22E06AD01101	BROWN WALLACE D & SARAH M RONALD	5824 SE KELLOGG CREEK DR	MILWAUKIE	OR	97222
22E06AD01102	SHERLEY JUDY E	5804 SE KELLOGG CREEK DR	MILWAUKIE	OR	97222
22E06AD01103	ROHAN ROXANA S TRUSTEE	5800 SE KELLOGG CREEK DR	MILWAUKIE	OR	97222
22E06AD01200	KRE TIGER DEERFIELD LLC	19119 NORTH CREEK PKWY	BOTHELL	WA	98011
22E06AD01400	JOHNSON GARY C & SHERRIE L	13477 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD01500	BERESFORD TERRY	13502 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD01600	RIVELLI JOSEPH P & SUSAN M	6008 SE PARKVIEW TER	MILWAUKIE	OR	97222
22E06AD01601	KEAGBINE ANTHONY TRUSTEE	6012 SE PARKVIEW TER	MILWAUKIE	OR	97222
22E06AD01700	PIPER RONALD D & LINDA L	13468 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD01800	URSU IOAN	13460 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD01900	NEALEIGH DOUGLAS E	13360 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD02000	ALDRIDGE FAMILY TRUST	13340 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD02100	TANDY STEPHEN DOUGLAS & KAREN	13330 SE RUSK RD	MILWAUKIE	OR	97222
22E06AD02200	TANDY STEPHEN DOUGLAS & KAREN	13330 SE RUSK RD	MILWAUKIE	OR	97222

BONAVENTURE SENIOR HOUSING NEIGHBORHOOD MEETING -  
 INVITE LIST  
 PROPERTIES WITHIN 500 FEET

TAX LOT ID	OWNER	ADDRESS	CITY	STATE	ZIP
22E06AD02300	BRINKMAN GARRY D	6041 SE PARKVIEW TER	MILWAUKIE	OR	97222
22E06AD02400	KEAGBINE ANTHONY TRUSTEE	6012 SE PARKVIEW TER	MILWAUKIE	OR	97222
22E06AD02401	CLACKAMAS COUNTY	902 ABERNETHY RD	OREGON CITY	OR	97045
22E06DA00100	BRODERICK KIRBY & BRONWEN	6109 SE ERIC ST	MILWAUKIE	OR	97222
22E06DA00200	ELLS RICHARD H	6037 SE ERIC ST	MILWAUKIE	OR	97222
22E06DA00300	WINTER JILL J TRUSTEE	6025 SE ERIC ST	MILWAUKIE	OR	97222
22E06DA00400	SANDERS KELLI	6011 SE ERIC ST	MILWAUKIE	OR	97222
22E06DA00500	BARNES SUSAN P & ABEDNEGO	5959 SE ERIC ST	MILWAUKIE	OR	97222
22E06DA00600	PEREIRA MICHELLE M & JARROD A	5915 SE ERIC ST	MILWAUKIE	OR	97222
22E06DA03601	PROVOST ERIC J & HOLLY M	6135 SE ERIC ST	MILWAUKIE	OR	97222
22E06DB00400	EASTERN ORTHDX CH ANNUNCTN	PO BOX 22048	MILWAUKIE	OR	97269

**Kellogg Creek Senior Housing Project**  
**Neighborhood Meeting – October 9, 2018**

**AGENDA**

**6:00 – 7:30 PM**

- 1. INTRODUCTIONS**
- 2. PROJECT SITE OVERVIEW**
- 3. LAND USE APPLICATIONS**
- 4. PROJECT DESCRIPTION - SITE DETAILS**
- 5. PROJECT DESCRIPTION – BUILDING DETAILS**
- 6. LAND USE PROCESS**
- 7. QUESTIONS?**

**Kellogg Creek Senior Housing Project – Information Sheet**

<b>Site Address</b>	13333 Rusk Road, Milwaukie
<b>Site Zoning</b>	R-3 and R-10 split zoning, residential Natural Resource overlay on part of the site
<b>Project Proposal</b>	A new senior living facility with 76 independent living suites, 57 assisted living suites, and 32 memory care units.
<b>Developer/Applicant</b>	Bonaventure Daniel Dobson, Director of Business Development
<b>Land Use/Civil</b>	DOWL Serah Breakstone, Senior Planner 971.280.8661 sbreakstone@dowl.com
<b>Land Use Applications</b>	Type III Conditional Use (independent and assisted living units) Type III Community Service Use (memory care units) Type III Variance (for building height) Type II Transportation Facility Review (to review traffic impacts) Type II Natural Resource Review (to adjust the HCA boundary) Type I Property Line Adjustment/Lot Consolidation
<b>Land Use Timeline</b>	Submit applications mid-November 30 days for completeness review About 4-5 months for review process Public hearing (Planning Commission) – early 2019
<b>Public Input Opportunities</b>	Neighborhood meeting (today) Public comment period (20 days prior to hearing), City will send notice to property owners within 300 feet. Public hearing before the Planning Commission





## Neighborhood Meeting Sign-in Sheet

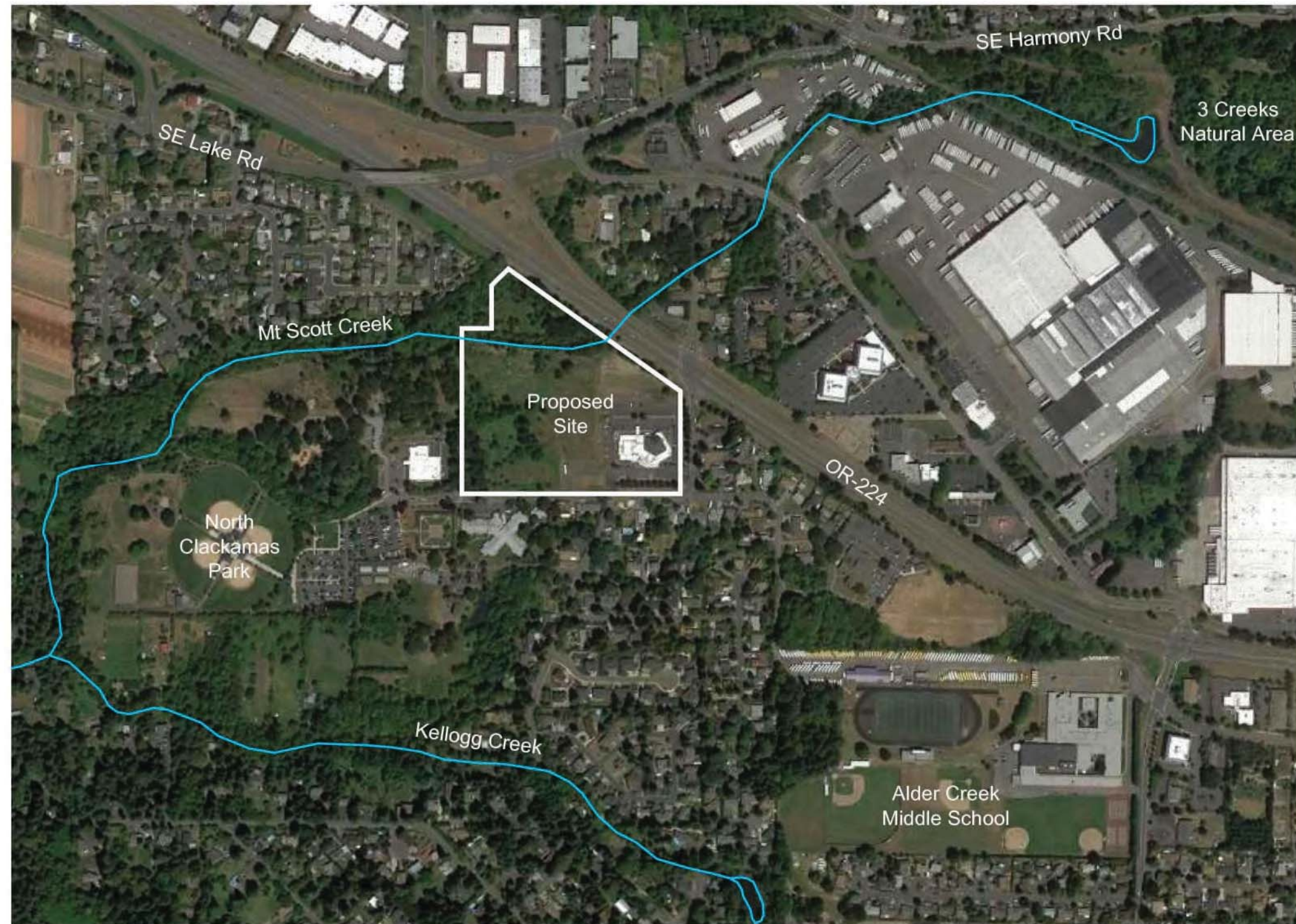
Project: BONAVENTURE SENIOR HOUSING      Date: OCT 9, 2018

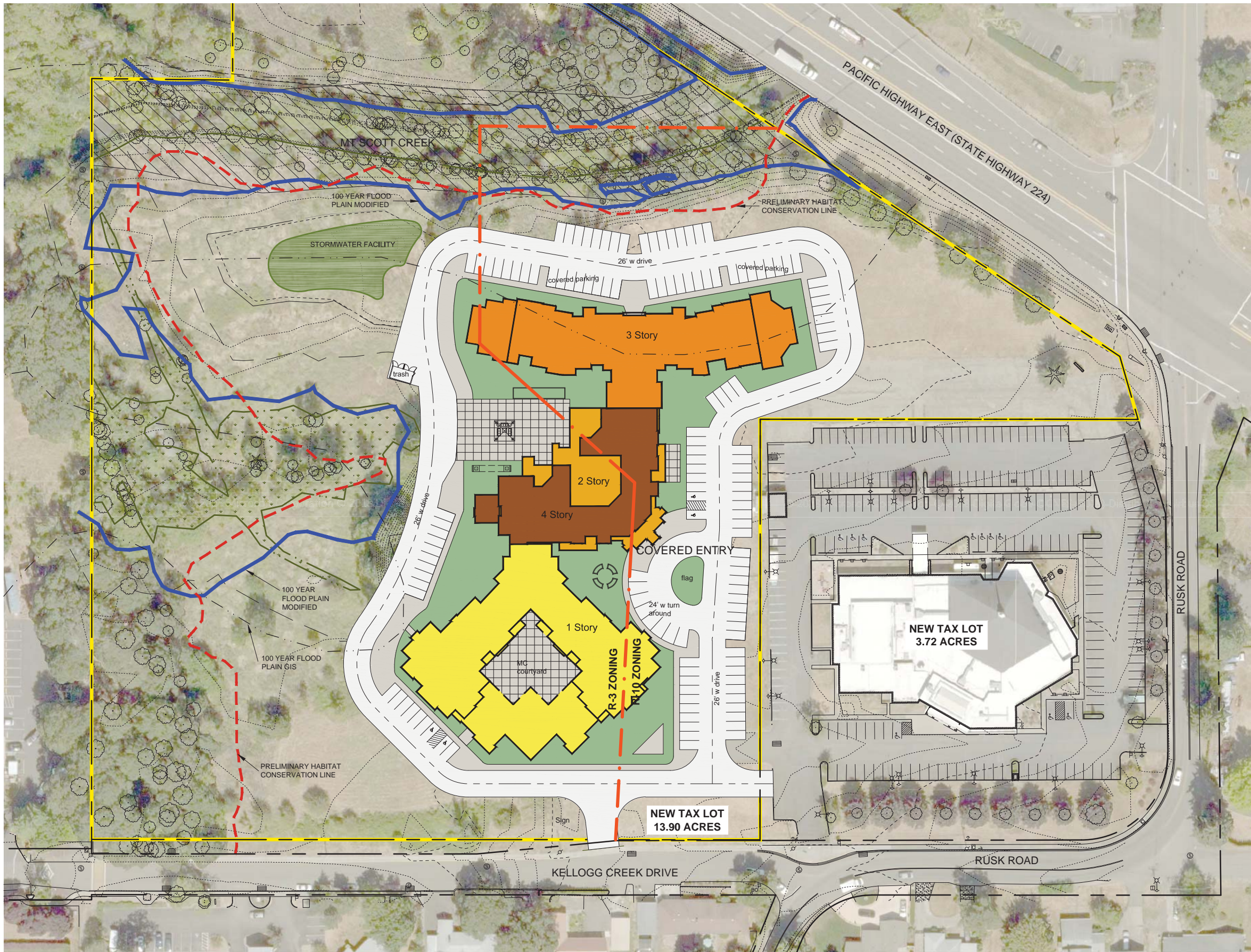
Location: MILWAUKIE CENTER

Name	Mailing Address
Darell & Joy Lustgraaf (Jody A Matlock)	13312 SE Rusk Rd Milwaukie, Or 97222
Domy Van Bockel	13391 SE Ruscliffe 97222
Wallace Brown	5824 SE Kellogg Creek Rd. Milwaukie OR 97222
Neil Schulman nerl@ncuwa.org	2416 SE Lake Rd, milwaukie OR 97222
Donna & G. F. F.	13521 SE Rusk Rd 97221
Joe Hayes	11215 SE 60 <sup>th</sup> 97222
Karen & Steve Tandy	13330 SE Rusk Rd 97222
* Sally & Nick Shook	4815 SE Casa del Rey Mtl 97222
Bob Bokannon	13732 SE LAURIE MILW 97222
Chris Runyard	2325 NE 32 <sup>nd</sup> Ct Portland 97212

→ dick.sally.shook@juno.com

# PROJECT SITE





**Development Information**

<b>Total Net Area</b>	
Gross Area	= 14.05 ac
ROW Dedication	= - 0.15 ac
New Tax Lot	= 13.90 ac

**Development Standards:** City of Milwaukie  
**Zoning Base:** Residential (R3) & (R10)

<b>Proposed Development:</b>	
Independent Living	= 76 units
Assisted Living	= 57 units
Memory Care	= 32 units
<b>Total Units</b>	<b>= 165 units</b>

Parking Provided = 135 spaces (incl 6 ADA) (0.81)

**Legend**

- Project Boundary
- Existing Property Lines
- Existing Contours - 1' Interval
- Existing Wetland
- 100 yr FEMA Floodplain - Modified
- 100 yr Floodplain - GIS
- Preliminary Habitat Conservation Area
- Residential Zoning Boundary R3 / R10



10/9/2018



720 SW Washington Street, #750  
 Portland, Oregon 97205  
 971-280-8641  
 Project No. 2322.14497.01  
 Contact: Scott Emmens, PE

**Kellogg Creek Senior Living**







**MILWAUKIE PLANNING**  
6101 SE Johnson Creek Blvd  
Milwaukie OR 97206  
503-786-7630  
planning@milwaukieoregon.gov

# Submittal Requirements

**For all Land Use Applications  
(except Annexations and Development Review)**

All land use applications must be accompanied by a signed copy of this form (see reverse for signature block) and the information listed below. The information submitted must be sufficiently detailed and specific to the proposal to allow for adequate review. Failure to submit this information may result in the application being deemed incomplete per the Milwaukie Municipal Code (MMC) and Oregon Revised Statutes.

Contact Milwaukie Planning staff at 503-786-7630 or [planning@milwaukieoregon.gov](mailto:planning@milwaukieoregon.gov) for assistance with Milwaukie's land use application requirements.

1. **All required land use application forms and fees**, including any deposits.  
*Applications without the required application forms and fees will not be accepted.*
2. **Proof of ownership or eligibility to initiate application** per MMC Subsection 19.1001.6.A.  
*Where written authorization is required, applications without written authorization will not be accepted.*
3. **Detailed and comprehensive description** of all existing and proposed uses and structures, including a summary of all information contained in any site plans.  
*Depending upon the development being proposed, the description may need to include both a written and graphic component such as elevation drawings, 3-D models, photo simulations, etc. Where subjective aspects of the height and mass of the proposed development will be evaluated at a public hearing, temporary onsite "story pole" installations, and photographic representations thereof, may be required at the time of application submittal or prior to the public hearing.*
4. **Detailed statement** that demonstrates how the proposal meets the following:
  - A. All applicable development standards (listed below):
    1. **Base zone standards** in Chapter 19.300.
    2. **Overlay zone standards** in Chapter 19.400.
    3. **Supplementary development regulations** in Chapter 19.500.
    4. **Off-street parking and loading standards and requirements** in Chapter 19.600.
    5. **Public facility standards and requirements**, including any required street improvements, in Chapter 19.700.
  - B. All applicable application-specific approval criteria (check with staff).  
*These standards can be found in the MMC, here: [www.qcode.us/codes/milwaukie/](http://www.qcode.us/codes/milwaukie/)*
5. **Site plan(s), preliminary plat, or final plat** as appropriate.  
*See Site Plan, Preliminary Plat, and Final Plat Requirements for guidance.*
6. **Copy of valid preapplication conference report**, when a conference was required.

**APPLICATION PREPARATION REQUIREMENTS:**

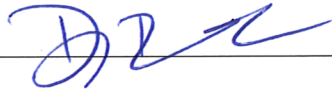
- Five hard copies of all application materials are required at the time of submittal. Staff will determine how many additional hard copies are required, if any, once the application has been reviewed for completeness.
- All hard copy application materials larger than 8½ x 11 in. must be folded and be able to fit into a 10- x 13-in. or 12- x 16-in. mailing envelope.
- All hard copy application materials must be collated, including large format plans or graphics.

**ADDITIONAL INFORMATION:**

- Neighborhood District Associations (NDAs) and their associated Land Use Committees (LUCs) are important parts of Milwaukie's land use process. The City will provide a review copy of your application to the LUC for the subject property. They may contact you or you may wish to contact them. Applicants are strongly encouraged to present their proposal to all applicable NDAs prior to the submittal of a land use application and, where presented, to submit minutes from all such meetings. NDA information: [www.milwaukieoregon.gov/citymanager/what-neighborhood-district-association](http://www.milwaukieoregon.gov/citymanager/what-neighborhood-district-association).
- Submittal of a full or partial electronic copy of all application materials is strongly encouraged.

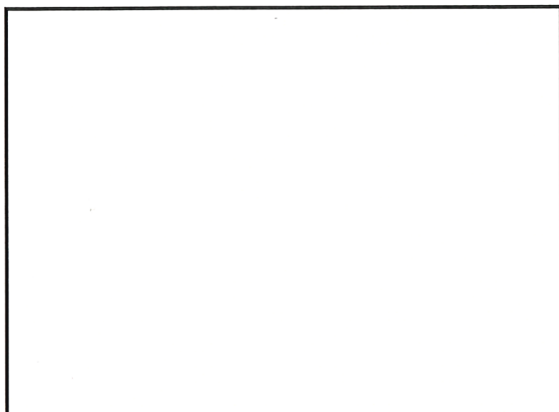
As the authorized applicant I, (print name) Dan Dobson, attest that all required application materials have been submitted in accordance with City of Milwaukie requirements. I understand that any omission of required items or lack of sufficient detail may constitute grounds for a determination that the application is incomplete per MMC Subsection 19.1003.3 and Oregon Revised Statutes 227.178. I understand that review of the application may be delayed if it is deemed incomplete.

Furthermore, I understand that, if the application triggers the City's sign-posting requirements, I will be required to post signs on the site for a specified period of time. I also understand that I will be required to provide the City with an affidavit of posting prior to issuance of any decision on this application.

Applicant Signature:   
Date: 11/30/18

**Official Use Only**

Date Received (date stamp below):





**PLANNING DEPARTMENT**  
 6101 SE Johnson Creek Blvd  
 Milwaukie OR 97206  
 503-786-7630  
 planning@milwaukieoregon.gov

# Application for Land Use Action

Master File #: \_\_\_\_\_

Review type\*:  I  II  III  IV  V

**CHOOSE APPLICATION TYPE(S):**

- Community Service Use
- Conditional Use
- Parking: Quantity Determination
- Natural Resource Review
- Variance: Variance

**Use separate application forms for:**

- Annexation and/or Boundary Change
- Compensation for Reduction in Property Value (Measure 37)
- Daily Display Sign
- Appeal

**RESPONSIBLE PARTIES:**

<b>APPLICANT</b> (owner or other eligible applicant—see reverse): Bonaventure Senior Housing c/o Dan Dobson	
Mailing address: 3425 Boone Road SE, Salem, OR	Zip: 97317
Phone(s): 503.373.3154	Email: ddobsonliveBSL.com
<b>APPLICANT'S REPRESENTATIVE</b> (if different than above): DOWL c/o Serah Breakstone	
Mailing address: 720 SW Washington St, Suite 750, Portland, OR	Zip: 97205
Phone(s): 971.280.8661	Email: sbreakstone@dowl.com

**SITE INFORMATION:**


Address: 13333 Rusk Road	Map & Tax Lot(s): 22E06AD 600, 700, 900, 901
Comprehensive Plan Designation: ...	Zoning: ...      Size of property: 14.00 Acres
Split zoning R-3 and R-10	

**PROPOSAL (describe briefly):**

Applicant proposes a new senior living facility and associated parking, landscaping and other improvements.

**SIGNATURE:**

**ATTEST:** I am the property owner or I am eligible to initiate this application per Milwaukie Municipal Code (MMC) Subsection 19.1001.6.A. If required, I have attached written authorization to submit this application. To the best of my knowledge, the information provided within this application package is complete and accurate.

Submitted by:  Date: 11/30/18

**IMPORTANT INFORMATION ON REVERSE SIDE**

\*For multiple applications, this is based on the highest required review type. See MMC Subsection 19.1001.6.B.1.



**WHO IS ELIGIBLE TO SUBMIT A LAND USE APPLICATION** (excerpted from MMC Subsection 19.1001.6.A):

**Type I, II, III, and IV** applications may be initiated by the property owner or contract purchaser of the subject property, any person authorized in writing to represent the property owner or contract purchaser, and any agency that has statutory rights of eminent domain for projects they have the authority to construct.

**Type V** applications may be initiated by any individual.

**PREAPPLICATION CONFERENCE:**

A preapplication conference may be required or desirable prior to submitting this application. Please discuss with Planning staff.

**REVIEW TYPES:**

This application will be processed per the assigned review type, as described in the following sections of the Milwaukie Municipal Code:

- Type I: Section 19.1004
- Type II: Section 19.1005
- Type III: Section 19.1006
- Type IV: Section 19.1007
- Type V: Section 19.1008

**THIS SECTION FOR OFFICE USE ONLY:**

FILE TYPE	FILE NUMBER	FEE AMOUNT*	PERCENT DISCOUNT	DISCOUNT TYPE	DEPOSIT AMOUNT	DATE STAMP
Master file		\$			\$	
Concurrent application files		\$			\$	
		\$			\$	
		\$			\$	
		\$			\$	
SUBTOTALS		\$			\$	
TOTAL AMOUNT RECEIVED: \$			RECEIPT #:		RCD BY:	
Associated application file #s (appeals, modifications, previous approvals, etc.):						
Neighborhood District Association(s):						
Notes:						

\*After discount (if any)



**PLANNING DEPARTMENT**  
 6101 SE Johnson Creek Blvd  
 Milwaukie OR 97206  
 503-786-7630  
 planning@milwaukieoregon.gov

# Application for Land Use Action

Master File #: \_\_\_\_\_

Review type\*:  I  II  III  IV  V

**CHOOSE APPLICATION TYPE(S):**

Land Division: Property Line Adjustment

Land Division: Lot Consolidation

...

...

...

- Use separate application forms for:**
- Annexation and/or Boundary Change
  - Compensation for Reduction in Property Value (Measure 37)
  - Daily Display Sign
  - Appeal

**RESPONSIBLE PARTIES:**

**APPLICANT** (owner or other eligible applicant—see reverse): Bonaventure Senior Housing c/o Dan Dobson

Mailing address: 3425 Boone Road SE, Salem, OR Zip: 97317

Phone(s): 503.373.3154 Email: ddobsonliveBSL.com

**APPLICANT'S REPRESENTATIVE** (if different than above): DOWL c/o Serah Breakstone

Mailing address: 720 SW Washington St, Suite 750, Portland, OR Zip: 97205

Phone(s): 971.280.8661 Email: sbreakstone@dowl.com

**SITE INFORMATION:**

Address: 13333 Rusk Road Map & Tax Lot(s): 22E06AD 600, 700, 900, 901

Comprehensive Plan Designation: ... Zoning: ... Size of property: 14.00 Acres


Split zoning R-3 and R-10

**PROPOSAL (describe briefly):**

Applicant proposes a lot consolidation and property line adjustment to facilitate development of a senior living facility on the site.

**SIGNATURE:**

**ATTEST:** I am the property owner or I am eligible to initiate this application per Milwaukie Municipal Code (MMC) Subsection 19.1001.6.A. If required, I have attached written authorization to submit this application. To the best of my knowledge, the information provided within this application package is complete and accurate.

Submitted by:  Date: 11/30/18

**IMPORTANT INFORMATION ON REVERSE SIDE**

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		\$			\$	
		\$			\$	
		\$			\$	
SUBTOTALS		\$			\$	
TOTAL AMOUNT RECEIVED: \$			RECEIPT #:		RCD BY:	
Associated application file #s (appeals, modifications, previous approvals, etc.):						
Neighborhood District Association(s):						
Notes:						

\*After discount (if any)



# Oregon

Kate Brown, Governor

ATTACHMENT 4

**Department of Transportation**

Region 1 Headquarters  
123 NW Flanders Street  
Portland, Oregon 97209  
(503) 731.8200  
FAX (503) 731.8259

January 29<sup>th</sup>, 2018

ODOT #8828

## ODOT Response

<b>Project Name:</b> Bonaventure Senior Housing	<b>Applicant:</b> Bonaventure Senior Living
<b>Jurisdiction:</b> City of Milwaukie	<b>Jurisdiction Case #:</b> CU-2018-003
<b>Site Address:</b> 13333 SE Rusk Rd, Milwaukie, OR 90367	<b>State Highway:</b> OR 224

The site of this proposed land use action is adjacent to OR 224. ODOT has permitting authority for this facility and an interest in ensuring that this proposed land use is compatible with its safe and efficient operation. **Please direct the applicant to the District Contact indicated below to determine permit requirements and obtain application information.**

### COMMENTS/FINDINGS

ODOT supports the Traffic Impact Analysis recommendation that, “The Applicant should collaborate with the City of Milwaukie to construct a northbound right turn lane on SE Rusk Road at OR 224 in conjunction with the site development.” The installation of a northbound right turn lane will improve operations at the SE Rusk Rd and OR 224 intersection for this development as well as future growth in the area.

### ODOT RECOMMENDED LOCAL CONDITIONS OF APPROVAL

#### Permits and Agreements to Work in State Right of Way

- An ODOT Miscellaneous Permit must be obtained for all work in the highway right of way.

**Please send a copy of the Notice of Decision including conditions of approval to:**

ODOT Region 1 Planning  
Development Review  
123 NW Flanders St  
Portland, OR 97209

[Region1\\_DEVREV\\_Applications@odot.state.or.us](mailto:Region1_DEVREV_Applications@odot.state.or.us)

Development Review Planner: Marah Danielson	503.731.8258, marah.b.danielson@odot.state.or.us
Traffic Contact: Avi Tayar, P.E.	503.731.8221
District Contact: D2BUP@odot.state.or.us	



# memorandum

date February 8, 2019  
to Brett Kelper, AICP  
from Sarah Hartung, Senior Biologist  
subject Natural Resource Review for Bonaventure Senior Housing

This memorandum summarizes our technical review of land use application materials relating to site natural resources regulated by Milwaukie's Municipal Code, including floodplains, Habitat Conservation Areas (HCAs) and Water Quality Resources (WQRs). Our responses to specific technical review tasks are identified in *italics*.

1. Review the work we did in 2017 for the Planned Development Project (land-use file #PD-2017-001).

*Response: We reviewed our past responses with the aim to provide consistent input.*

2. Visit the site to assess existing conditions and verify that the applicant's presentation of existing conditions in the Natural Resource Review report is accurate and thorough.

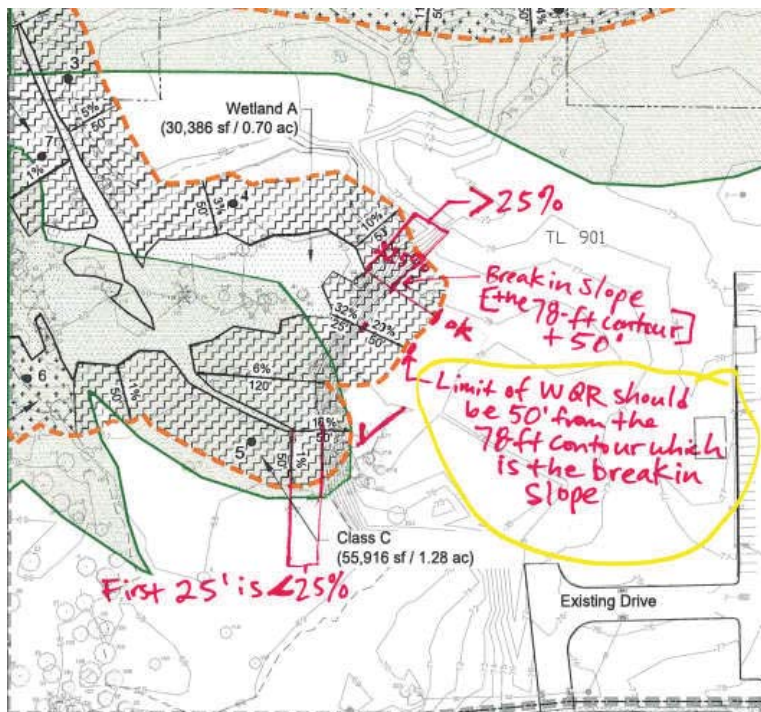
*Response: ESA personnel (Sarah Hartung and Roman Gutierrez) visited the project site on January 22, 2019 to confirm the description of existing site conditions in the application. We generally concur with the presentation of existing conditions. Tree canopy cover appears to be somewhat exaggerated at sample plots 1 and 2, but this could be due to observer variation. For future applications involving large sites, we request that the applicant stake the sample plot in the field with bright pin flagging and tape so that we can easily locate the area that was assessed for the application.*

*We observed an increase in cover of nuisance plants such as reed canarygrass, teasel and poison hemlock throughout the western half of the project area compared with the cover estimates collected in the fall of 2016. This increase in cover is to be expected for nuisance plants, but indicates that a robust approach to controlling weeds is needed for a successful mitigation plan.*

3. Comment on the following aspects of the applicant's Natural Resources Review report:
  - a. WQR & HCA Boundaries:

- Confirm the applicant’s demarcation of the WQR boundary, particularly with respect to steep slopes and the measurement of the vegetated corridor (see Figure 4 in the report).

*Response:* The demarcation of the WQR boundary seems generally correct. There appears to be a minor error along the east side of Wetland A where steep slopes abut the wetland. It appears that the 50-foot buffer is set back from the 75-foot contour instead of the break-in slope, which is the 78-foot contour. This would result in a minor shift outward of the WQR, but it’s a very small shift that would not significantly affect the application. See the snippet below.



- Review the applicant’s detailed boundary verification for the HCA to confirm the accuracy of the proposed adjustments to the City’s Natural Resource Administrative Map (according to the procedures outlined in MMC Subsection 19.402.15.A.2.b)—see Figure 8.

*Response:* The applicant’s boundary verification appears accurate according to MMC Subsection 19.402.15.A.2.b. The applicant correctly identified Class I and Class II riparian habitat according to Metro’s vegetation cover map and Table 19.402.15.A.2.b(2)(a)(iv). We confirmed that no HCAs should be mapped beyond 100 feet of Mount Scott Creek and 0-100’ from the edge of the flood area in terrain that is also not within 100 feet of wetland. These areas do not qualify because they have low structure vegetation/open soils and do not have slopes greater than 25% (in the case of surface streams per the table).

- b. Impacts: Consider and comment on the proposal to fill a small portion of Wetland A—how will the fill affect the wetland’s ecological function? In addition, how will the proposed steep slopes along the northeastern edges of Wetland A and elsewhere within the WQR and HCA affect the ecological function and value of the natural resource areas?

*Response: The response to this question is similar as for the previous application for the site, except that the current application further reduces wetland impacts, 0.004 acre compared with 0.08 acre from the previous development project. The fill is very minor – less than 1% of the total wetland acreage on-site. The fill will require the removal of 3 trees at the edge of the wetland boundary, but the mitigation plan will offset the proposed tree removal. No adverse impacts to the wetland are expected from the minor fill.*

*Steep slopes are currently located along the eastern edge of Wetland A and were created from past land clearing and filling. The proposed project would result in a shift of the steep slopes to the west by 15 to 20 feet. From a buffering or wetland protection standpoint, the proposed steep slopes are expected to act as a barrier to prevent human intrusion, and thus reduce disturbance to Wetland A.*

*Signage along the western and northern edges of the proposed development is proposed to reduce foot traffic in the natural areas. An example of possible message is as follows: “Protected Natural Area; Do Not Disturb; Contact the City of Milwaukie Regarding Uses, Restrictions, and Opportunities for Stewardship.”*

c. Alternatives Analysis

- Are the applicant’s estimates of the various alternatives impacts to the WQR and HCA reasonable?

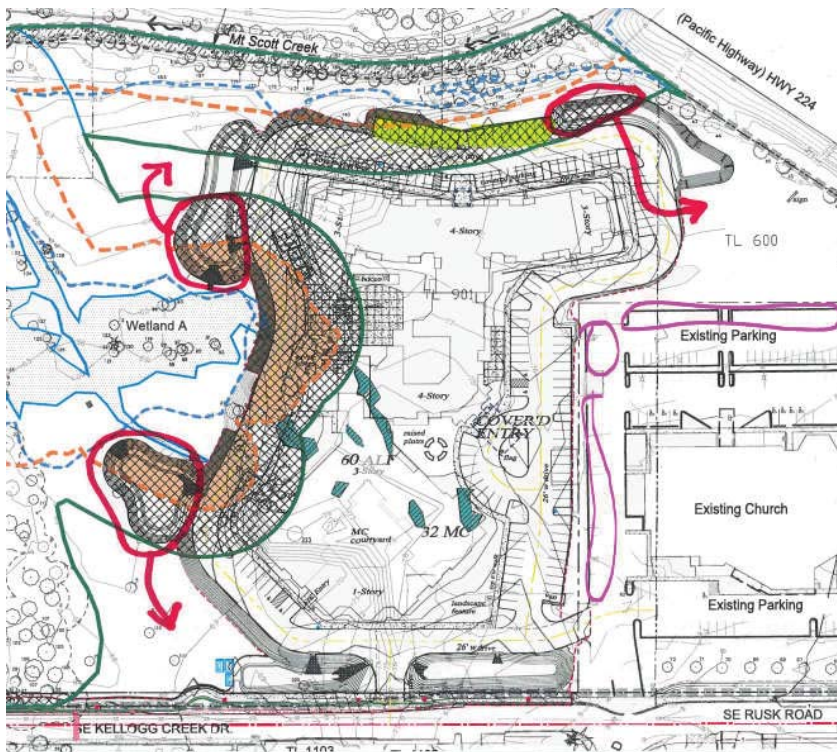
*Response: The estimates look accurate as shown on figures 9, 12A and 12B. These figures clearly show wetland, WQR and HCA impacts. It would also be helpful to show and discuss the acreage of floodplain fill per alternative and how cut/fill balance would be achieved on-site.*

- Are there additional obvious alternatives that should be considered?

*Response: Additional analysis should explain why the preferred alternative could not further reduce impacts to natural resources by maximizing use of non-regulated areas in the northeast corner and the southwest corner off of Southeast Kellogg Creek Drive. While impacts to natural resources from the preferred alternative are substantially less than the 2.58 and 2.75 acres proposed for Alternatives A and B respectively, the 1.6 acres proposed is still a sizable amount of impacts to WQR and HCA. The geometry of the remaining non-natural resource areas on-site is asymmetrical and generally lacking in right angles, but minor shifts in location of stormwater treatment could reduce intrusion into the regulated natural areas. Refer to the snippet below. Areas circled in red are proposed stormwater*

treatment within regulated natural resources that could potentially be shifted to non-regulated areas with minor changes to the design.

The project proposes 139 parking stalls which is within the acceptable range of 119 to 153 stalls required by the city. The 20 stalls highlighted in yellow below that intrude into the regulated resource is could be omitted to reduce impacts to natural resources, resulting in 119 parking stalls which meets the minimum standard. Or, the 20 stalls highlighted in yellow could be shifted to the northeast to tax lot 600. While the orientation and geometry of tax lot 600 might not be ideal, it is set back from protected natural resources and still within a reasonable walking distance to the proposed facility. Alternatively, the applicant could look into shared parking spaces at the adjacent church which has approximately 200 parking stalls. See the pink areas highlighted below for possible shared parking spots.



Alternative B would result in 0.52 acre of wetland impact and approximately 0.75 acre (visually estimated from Figure 12B) of floodplain fill, which would be very challenging to permit and not likely to hold-up to scrutiny by the City, Department of State Lands and the US Army Corps of Engineers. The level of wetland impact – just over half an acre – would not fit under a single Nationwide permit (a programmatic permit) which would make it difficult to approve at the federal level. Similarly, DSL has robust requirements for alternatives analysis that would make it difficult to approve Alternative B. Therefore, Alternative B doesn't seem like a viable alternative.

d. Mitigation

- Review the proposed mitigation plan (Figure 11). Is the proposed mitigation sufficient to reestablish forested canopy within the WQR and HCA in a way that meets ecological



functions and values outlined in MMC Subsection 19.402.1? Are the numbers in species the proposed mitigation planting sufficient and appropriate for the proposed impacts?

*Response: Mitigation option 2 is required because the disturbance area is greater than 1 acre. All native species in multiple vegetation layers are proposed. No conifers would be removed from the site and no conifers are proposed in the planting plan.*

*The overall concept of the mitigation plan appears sufficient to reestablish forested canopy per the code; however, due to the size and complexity of the site, the mitigation plan could benefit from more detail, especially with respect to establishing and managing oaks on site. The site is part of a former oak/ash forested floodplain and several oak saplings (4-6 ft. high) are located near sample plots 1, 2 and 4 in the proposed mitigation area.*

*Requested additional information:*

- *Identify areas for oak plantings and how new plantings will accommodate existing oaks on-site. Please provide a typical planting scheme for installing proposed trees and shrubs with respect to existing vegetation.*
- *Methods for removing nuisance plants should be described in detail. For example, reed canarygrass, a city nuisance plant, is found throughout Wetland A and adjacent areas. Reed canarygrass control requires a multi-year approach with adaptive management and contingency planning. Control methods typically include a combination of herbicide treatment, mowing, and disking. The mitigation plan should list by species which nuisance plants will be targeted for removal, methods for control, and a performance standard of cover for the collective nuisance species.*

- Overall, is the proposed mitigation sufficient to restore the disturbed WQR and HCA to an equal or better condition?

*Response: This question would be better answered with a typical planting scheme that considers tree plantings adjacent to existing oaks and with more details on which nuisance plants will be controlled and how.*

- e. Provide a simple assessment of how the ecological function and value of the WQR and HCA in their current states will be affected by the proposed project (including the proposed mitigation) by choosing one of the three following responses:
  - Improved
  - Unchanged
  - Degraded

*Response: The project would impact 1.6 acres of HCA/WQR including areas of “good” riparian habitat along Mount Scott Creek. The preferred alternative presented in the application would have the least amount of impact to HCA/WQR; however, 1.6 acres is a sizable loss of habitat in an increasingly urbanized area. The trade-off for the loss of 1.6 acres is a densely planted mitigation area, but without*

*more details on the control of nuisance species, it is difficult to conclude whether the project would result in improved habitat.*

4. If any deficiencies in the application are noted, please indicate whether you believe the deficiency (1) needs to be resolved with revised application materials prior to issuance of a decision, (2) can be resolved through adding a condition of approval, or (3) does not impact the overall review of the proposal.

*Response: The following deficiencies are recommended to be resolved with revised application materials prior to the issuance of a decision:*

- *Shift extra parking and stormwater treatment outside of protected natural areas as shown in the snippet above, or provide detailed justification for why that is not feasible.*
- *Provide more details on which nuisance species will be targeted for removal, methods of removal and if any substantial earthwork would be needed to control reed canarygrass for example.*
- *Identify areas for oak plantings and how new plantings will accommodate existing oaks on-site.*
- *Please provide a typical planting scheme for installing proposed trees and shrubs with respect to existing vegetation.*
- *Describe temporary impacts as well as methods to minimize and restore temporarily disturbed areas. Areas between the sediment fence and limits of grading are presumed to have temporary impacts unless otherwise noted.*
- *Update Figure 10 Construction Management Plan to show construction fencing at the outer limits of all work proposed including staging and stockpile areas. Construction fencing is described in the narrative but not shown on the plan.*
- *Update Figures 9 and 10 to more accurately show tree protection fencing. It's not clear why trees at the far west property boundary need to be fenced, but trees at the eastern edge of Wetland A will not be protected with fencing. The fencing is also shown to extend below ordinary high water mark, which does not seem practical.*

Thank you for the opportunity to review the Bonaventure project. Please let me know if you have any questions or would like to discuss any of the information presented in this memorandum.

## Brett Kelter

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**From:** Edward Hacmac <ehacmac@hotmail.com>  
**Sent:** Saturday, February 09, 2019 9:43 PM  
**To:** Brett Kelter  
**Subject:** Re: Senior housing proposal for 13333 SE Rusk Rd (Turning Point Church site)

### My Public Comments

This seems like a good use of the property. Senior housing is needed.

This development will not affect the school system, positively or negatively.

This development **will seriously impact** the local roads and traffic, as many trips will occur daily by the necessarily large staff, the likely huge amount of visitors coming and going while visiting residents, the residents who still have personal vehicles and the heavy traffic of delivery and service trucks, emergency vehicles and other support vehicles. I see no evidence in the plans to properly deal with this. I believe the Rusk Rd / Ruscliff and Rusk Rd / Kellogg Creek Drive intersections need significant reconfiguration to allow for safe and easy transition through the bottleneck all this extra traffic will create, on top of the park, Milwaukie Center, residential and commuter daily and/or seasonal trips.

A road configuration that includes a round-a-bout at Rusk / Kellogg Creek and conversion of the street frontage of the church property to a travel lane would make the most sense to me. The addition of the right turn lane at Rusk and 224 is critical, but so is widening the road all the way back to the Kellogg Creek Drive intersection. It makes sense to me that disturbing the church frontage rather than the properties on the County side of Rusk Road would be more just to local landowners and plain easier as it's in the jurisdiction of the City, the Church is the only local property owner that is profiting from this development significantly and there would not be a disturbance to old trees and established property fixtures on the east side of Rusk. I certainly am not a roadway engineer, but please consider this design idea from a practical layman's perspective.

Did I miss the Traffic Impact Study?

Edward Hacmac, DC 13033 SE Rusk Rd. Milwaukie, OR 503.936.4838

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**From:** Brett Kelter <KelterB@milwaukieoregon.gov>  
**Sent:** Thursday, February 7, 2019 5:47 PM  
**To:** Brett Kelter  
**Subject:** Senior housing proposal for 13333 SE Rusk Rd (Turning Point Church site)

## Brett Kelter

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**From:** George McKee <george\_mckee@comcast.net>  
**Sent:** Monday, February 11, 2019 2:58 PM  
**To:** Brett Kelter  
**Subject:** re; public hearing for proposed Rusk Rd. development

Hello Brett, We spoke by phone on Feb. 11, 2019. My concern with a development at this location is that no equipment, such as air conditioning, heating etc that could add to adverse noise to surrounding areas, especially residential, not be allowed. There already is noise pollution in the area from existing businesses, commercial roadways etc and any further noise from new development would hinder the overall quality to existing housing developments. Thank you, george mckee 971-285-7163, george\_mckee@comcast.net



**DAN JOHNSON**  
DIRECTOR

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

DEVELOPMENT SERVICES BUILDING

150 BEAVERCREEK ROAD OREGON CITY, OR 97045

## MEMORANDUM

TO: Brett Kelper, City of Milwaukie  
FROM: Kenneth Kent, Senior Planner, Clackamas County Engineering  
DATE: February 13, 2019  
RE: CU-2018-003 Bonaventure Senior Housing

This office has the following comments pertaining to this proposal:

### **FACTS AND FINDINGS**

1. The proposed land use application for a 170-unit senior living facility is located within the City of Milwaukie, with frontage on SE Kellogg Creek Drive which is a county roadway. The subject site includes the Turning Point Church in the southeast portion of the property with frontage on SE Rusk Road, which is also a county roadway. As discussed in the project narrative, a property line adjustment is proposed to modify the existing lots of record and separate the church from the senior living facility site. A minor modification of the Community Service Use approval for the church is proposed to address changes to the church site. Access and improvements along the frontage of SE Kellogg Creek Drive and SE Rusk Road requires approval by Clackamas County.
2. The proposed senior facility site has approximately 654 feet of frontage on the northerly side of SE Kellogg Creek Drive. Clackamas County has designated SE Kellogg Creek Drive a local roadway. Clackamas County has adopted roadway standards that pertain to the structural section, right-of-way width, construction characteristics, and access standards for local roadways. The standard improvement for a local roadway includes a right-of-way width of 54 feet, with a 32-foot wide curb to curb roadway, 5-foot wide landscape strip with street trees, and a 5-foot wide sidewalk. The existing improvements include curb-tight sidewalk and a total road width of 28-32 feet. The existing right-of-way width appears to be 40 to 50 feet. There is existing sidewalk on the south side of SE Kellogg Creek Drive toward the westerly end of the project site that extends for approximately 325 feet. The remainder of the south side of Kellogg Creek Drive to the east does not have curb or sidewalk. Based on the zoning of the remaining parcels on the south side of SE Kellogg Creek Drive, redevelopment is not likely. The applicant will be required to provide a minimum total road width of 32 feet along the entire site frontage, allowing for parking on both sides of the roadway.
3. The preliminary plans include a proposal to end the sidewalk approximately 130 feet from the west project property line and provide a mid-block crossing to the existing sidewalk on the south side of SE Kellogg Creek Drive. As noted in the project narrative, the design is proposed to protect the resource area in the southwest corner of the project

site, which includes a grouping of White Oak trees. Modifying this portion of the roadway to include sidewalk on one side only is acceptable to preserve existing natural features, provided a suitable pedestrian route is provided on the south side of the roadway.

4. The preliminary plans identify a striped bike lane along the frontage of SE Kellogg Creek Drive. The county does not provide striped bike lanes on local roads. Wayfinding signs may be a suitable alternative.
5. Clackamas County requires that roadways and intersections serving subdivisions have adequate capacity to handle the additional traffic generated by the development and will continue to operate during the mid-day one hour peak and first and second hours of the PM peaks at acceptable volume to capacity (v/c) ratios, below the maximums which are 0.90 and 0.99 respectively. The applicant has submitted a traffic impact study prepared by Kittelson & Associates, Inc. dated November 8, 2018 evaluating the roadways and intersections within the influence area of the proposed development. The proposed development is projected to generate 408 total daily vehicle trips, with 35 AM peak trips, 35 mid-day peak trips and 36 evening peak trips. The study concludes that capacity of the roadways and intersections serving the project site will operate within the volume to capacity ratios. Therefore, the county's intersection capacity requirements as they relate to the transportation system are met by the applicant's proposal.
6. The traffic impact study recommends modification of the Turning Point Church driveway onto SE Rusk Road to emphasize that it is an entrance only. The recommendation includes signage and narrowing of the driveway throat to a single lane width. The functional classification of SE Rusk Road is a collector roadway, which generally has limited access when access to a lower functional class roadway is available. The church has an existing full access to SE Kellogg Creek Driveway and will continue to have access with the proposed development. The county's preference is to close the SE Rusk Road driveway. However, if the city determines it is not something that can be required through the modification on church's land use approval, then at a minimum the operation of the driveway should be limited to right-in only movements.
7. The traffic impact study indicates that there is an existing need for additional storage for the northbound right-turn lane on SE Rusk Road at Highway 224. The applicant will be required to increase the length of the right turn lane to at least 100 feet.
8. A separated bike path is proposed along the SE Rusk Road frontage, extending from SE Kellogg Creek Drive to Highway 224. The site plan indicates a proposed width of 5 feet. Because there are no other bike lanes on SE Rusk Road, the bike path will operate with two-way travel. A width of 10 feet is recommended for the proposed path. The minimum width for a two-way path is 8 feet. The county would not maintain the proposed bike path. It will be necessary for the city to enter into an IGA with the county addressing maintenance of the bike path.
9. Prior to commencement of site work, a Development Permit and a Utility Placement Permit are required and must be obtained from Clackamas County for all work performed in the SE Kellogg Creek Drive right-of-way.

## CONCLUSION

If the City of Milwaukie approves the request, the following conditions of approval are recommended. If the applicant is advised to or chooses to modify the proposal in terms of access location and/or design following the preparation of these comments this office requests an opportunity to review and comment on such changes prior to a decision being made.

1. All frontage improvements in, or adjacent to Clackamas County right-of-way, shall be in compliance with *Clackamas County Roadway Standards*.
2. The applicant shall dedicate a minimum of approximately 7 feet of right-of-way along the entire site frontage of SE Kellogg Creek Drive as necessary to accommodate the public improvements, and shall verify by survey that there is a minimum 27-foot wide one-half right-of-way width.
3. The applicant shall grant an 8-foot wide public utility easement adjacent to the public right-of-way along the entire site frontage of SE Kellogg Creek Drive.
4. The bike path along the north and west side of SE Rusk Road shall be located within public right-of-way or suitable public easement. The path shall be designed to accommodate two-way bike traffic. The minimum width of the path shall be 10 feet. The City of Milwaukie shall maintain the path and shall enter into an intergovernmental agreement (IGA) with the county. The path shall extend to a point west of the bulb-out and ramp down to the pavement of SE Kellogg Creek Drive. A design shall be provided for east bound bikes on SE Kellogg Creek Drive to safely cross to the north side of the road and enter the bike path at or prior to the SE Kellogg Creek Drive/SE Rusk Road intersection.
5. The applicant shall design and construct improvements along the entire site frontage of SE Kellogg Creek Drive in accordance with the *Clackamas County Roadway Standards*.

These improvements shall consist of:

- a. A minimum 16-foot wide one half-street improvement for a local roadway. The applicant shall widen SE Kellogg Creek Drive so that the minimum total road width along the site frontage is 32 feet. The structural section for SE Kellogg Creek Drive improvements shall consist of 4 inches of asphalt concrete, per Clackamas County Roadway Standards Standard Drawing C100.
- b. The proposed half street improvement, modifying the shed section to a crown section shall comply with Section 250.7.5 of the Clackamas County Roadway Standards, including, but not limited to a maximum cross slope grade break of 2%.
- c. The off-site taper shall be provided per Section 250.6.4 of the Clackamas County Roadway Standards. The full road width shall extend to the westerly project property line, with the pavement taper beginning at that point.
- d. Standard curb, or curb and gutter if curblin slope is less than one percent.

- e. Adjacent to the curb, a 5-foot landscape strip, including street trees shall be constructed along the entire site frontage.
  - f. A minimum 5-foot wide unobstructed sidewalk shall be constructed along the SE Kellogg Creek site frontage, per Standard Drawing S960. Where sidewalk does not connect to sidewalk on adjacent property, the end of the sidewalk include a concrete ADA accessible ramp, providing a transition from the new sidewalk to the edge of the pavement.
  - g. The Mid-block crossing shall include pavement markings that are continental style, per Section 280.2 of the Clackamas County Roadway Standards. Pedestrian crossing signs and advanced warning signs shall be installed. Curb ramps shall be constructed per applicable ODOT Standard Drawings (RD755, RD756 and RD757). The applicant shall upgrade if necessary and verify that the sidewalk on the south side of SE Kellogg Creek Drive meets ADA standards from the proposed crossing west to the point where the current crossing is located near the park entrance. The existing crossing shall be removed, including pavement makings and ADA ramps, which shall be removed and replaced with curb and sidewalk to match.
  - h. Bike lane striping shall not be provided on SE Kellogg Creek Drive.
  - i. Drainage facilities in conformance Clackamas County Roadway Standards, Chapter 4. Storm water detention facilities shall not be located within the public right-of-way.
6. The Turning Point Church driveway on SE Rusk Road shall be reduced to a single lane width of 12 feet and shall include channelization to facilitate the right-in only maneuver. Signs shall be provided in accordance with MUTCD indicating entrance only.
7. Prior to commencement of site work the applicant shall obtain a Development Permit from the Clackamas County Engineering Division for design and construction of required improvements to SE Kellogg Creek Drive and SE Rusk Road. To obtain the Permit, the applicant shall submit plans prepared and stamped by an Engineer registered in the State of Oregon, provide a Performance Guarantee, and pay an Inspection Fee. The Performance Guarantee is 125% of the approved Engineer's cost estimate for the required improvements.
8. Prior to commencement of utility work within the SE Kellogg Creek Drive or SE Rusk Road rights-of-way, a Utility Placement Permit shall be obtained from the Clackamas County Engineering Division.



## Brett Kelter

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**From:** Kent, Ken <KenKen@co.clackamas.or.us>  
**Sent:** Thursday, February 14, 2019 12:37 PM  
**To:** Brett Kelter  
**Subject:** RE: CU-2018-003 Application Referral

Brett,

See my responses below.

Thanks,

Ken

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**From:** Brett Kelter [mailto:KelterB@milwaukieoregon.gov]  
**Sent:** Thursday, February 14, 2019 10:01 AM  
**To:** Kent, Ken <KenKen@co.clackamas.or.us>  
**Cc:** Dalton Vodden <VoddenD@milwaukieoregon.gov>; Alex Roller <RollerA@milwaukieoregon.gov>; Dennis Egner <EgnerD@milwaukieoregon.gov>  
**Subject:** RE: CU-2018-003 Application Referral

Ken,

A couple follow-up questions for you on the County comments:

- I know that Kellogg Creek Dr is still under County jurisdiction, though my memory of the recent Planned Development proposal was that there had perhaps been some agreement that it would be acceptable for the City to require the standards it would put in place once the road is annexed and under City jurisdiction. Do you recall whether there was past discussion about the City being allowed to require its standards instead of the County ones, at least with respect to the bike lane?

If a city has a wider street section, that is usually fine because it exceeds our minimum, and we assume it will eventually become a city street. When it comes to maintenance standards, access and safety, we are usually requiring county standards. Certain situations like manhole spacing or types of water quality facilities are tied to our ability to maintain those improvements. Striping is a maintenance issue since we do not stripe local roads. If the city prefers the striping, we could enter in to an IGA to so the city takes on that maintenance.

- Regarding the separated bike path on the west and north sides of Rusk Rd, why would the County not want to maintain that facility, since Rusk Rd is under County jurisdiction and I would assume that Rusk Rd is designated to have some kind of bike facility? Or is the rationale that the County still plans to put bike lanes on both sides of Rusk Rd?

My initial discussion with the Assistant Director assumed an asphalt surface and if wasn't clear if the path is within right-of-way or not, so I can discuss it further. I will need to verify this, but if the path is located within public right-of-way, with a concrete surface and at least 10 feet in width, then the County might maintain the path. Our CIP has a long term project that calls for ped on one side and bike facilities on both sides on Rusk from 224 to Aldercrest. But if this path is constructed, we would not construct an additional bike facility on that portion of Rusk.

- I appreciate the note about needing to see a design for eastbound bikes on Kellogg Creek Dr to cross the street to access the bike path. It's probably also true that northbound bikes on Rusk Rd would also need to have a safe way to cross over to access the path—is that correct, or is there an assumption that bikes would simply continue north on Rusk Rd in a bike lane to be established by the County later?

It makes sense to look at how a northbound bike would access the path at this time. When a bike lane is constructed on Rusk additional improvements would be needed at that time for the crossing. I'm assuming bike would be directed to use the path and a bike lane would not be constructed on Rusk from that point out to Highway 224.

- Did you have any issues with the bulb-type of turnaround area near the west end of Kellogg Creek Dr?

We're fine with the turnaround. The only concern we would have is that the radii going in and out are large enough for a street sweeper. Our current standard is 18 feet and it looks like the preliminary plans meet that requirement.

Thanks again for sending the comments.

BRETT KELVER  
Associate Planner

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**From:** Kent, Ken <[KenKen@co.clackamas.or.us](mailto:KenKen@co.clackamas.or.us)>  
**Sent:** Wednesday, February 13, 2019 5:42 PM  
**To:** Brett Kelter <[KelterB@milwaukieoregon.gov](mailto:KelterB@milwaukieoregon.gov)>  
**Subject:** RE: CU-2018-003 Application Referral

Brett,

Here are comments for the CU-2018-003.

Thanks,

Ken

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# Clackamas County Fire District #1

## Fire Prevention Office



### E-mail Memorandum

To: City of Milwaukie Planning Department  
From: Izak Hamilton, Fire Inspector, Clackamas Fire District #1  
Date: 2/15/2019  
Re: CU-2018-003, 13333 SE Rusk Rd, Milwaukie,OR

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This review is based upon the current version of the Oregon Fire Code (OFC), as adopted by the Oregon State Fire Marshal's Office. The scope of review is typically limited to fire apparatus access and water supply, although the applicant must comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the fire code official. The following items should be addressed by the applicant:

**A Fire Access and Water Supply plan is required for subdivisions and commercial buildings over 1000 square feet in size or when required by Clackamas Fire District #1. The plan shall show fire apparatus access, fire lanes, fire hydrants, fire lines, available fire flow, FDC location (if applicable), building square footage, and type of construction. The applicant shall provide fire flow tests per NFPA 291, and shall be no older than 12 months. Work to be completed by experienced and responsible persons and coordinated with the local water authority.**

**Emergency responder radio coverage must be tested or provided due to the following:**

- 1. Any building 50,000 square feet in size or larger.**

#### **Access:**

1. Provide address numbering that is clearly visible from the street.
2. No part of the building may be more than 150 from an approved fire department access road.
3. The inside turning radius and outside turning radius for a 20' wide road shall not be less than 28' and 48', measured from the same center point.
4. Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20' (26' adjacent to fire hydrants) and an unobstructed vertical clearance of not less than 13' 6".

5. Fire apparatus access roads must support a 75,000 lb. fire apparatus.
6. Buildings exceeding 30' in height shall require extra width and proximity provisions for aerial apparatus.
7. Provide at least two approved means of fire apparatus access to developments with more than 30 detached dwellings, or more than 100 multi-family dwelling units. **Installation of fire sprinkler systems in all structures** may exempt this requirement.
8. Access streets between 26 feet and less than 32 feet in width must have parking restricted to one side of the street. Access streets less than 26 feet in width must have parking restricted on both sides of the street. No parking restrictions for access roads 32 feet wide or more

### **Water Supply**

1. **Fire Hydrants Commercial Buildings:** Where a portion of the building is more than 400 feet from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the building, on-site fire hydrants and mains shall be provided.

Note: This distance may be increased to 600 feet for buildings equipped throughout with an approved automatic sprinkler system.

2. All new buildings shall have a firefighting water supply that meets the fire flow requirements of the Fire Code. Maximum spacing between hydrants on street frontage shall not exceed 500 feet. Additional private on-site fire hydrants may be required for larger buildings. Fire sprinklers may reduce the water supply requirements. Please visit the website below for access to our fire flow worksheet and requirements:  
<http://www.clackamasfire.com/fire-prevention/new-construction-resources/>
3. Prior to the start of combustible construction required fire hydrants shall be operational and accessible.
4. The fire department connection (FDC) for any fire sprinkler system shall be placed as near as possible to the street, and within 100 feet of a fire hydrant.

## MEMORANDUM

**TO:** Community Development Department  
**THROUGH:** Kelly Brooks, Director of Engineering  
**FROM:** Dalton U. Vodden, Associate Engineer  
**RE:** 170-unit senior housing facility – 13333 SE Rusk Road  
CU-2018-003  
**DATE:** February 15, 2019

Lot consolidation and property line adjustment for 170-unit senior housing facility.

1. Per MMC 19.709.5 The public improvement process will conform to conditions laid out in MMC 12.08.020. This will apply to all construction that is completed in the right-of-way that is eventually dedicated to the City.
2. MMC Chapter 12.02 – Public Works Standards
  - A. MMC 12.02.010 – Establishes standards that all new public works, including streets, sanitary sewer, storm sewers, and water lines constructed shall be constructed in conformance with the applicable public works standards.

Proposed driveway will conform to 12.02.010.
3. MMC Chapter 12.08 – Street and Sidewalk Excavations, Construction and Repair  
Construction process will conform to all sections of MMC 12.08.
4. MMC Chapter 12.16 – Access Management
  - A. MMC Section 12.16.040 establishes standards for access (driveway) requirements.
    - i. MMC 12.16.040.A: requires that all properties be provided street access with the use of an accessway.

The proposed development is consistent with MMC 12.16.040A.
    - ii. MMC 12.16.040.B: Access spacing onto arterial and collector streets.

The proposed development is consistent with MMC 12.16.040B.
    - iii. MMC 12.16.040.C: Accessway Locations
      - a. Double Frontage  

The proposed development is consistent with MMC 12.16.040.C.1 as no double frontage lot accessways are proposed.
      - b. Limiting driveway access from arterials and collectors.  

The proposed development is consistent with MMC 12.16.040C.2, as no accessways are proposed on a collector or arterial.

c. Distance from property line

Proposed driveway will conform to MMC 12.16.040.C.3 as conditioned.

d. Distance from Intersection

The proposed development, as conditioned is consistent with MMC 12.16.040.C.4.a.

iv. MMC 12.16.040.D: Number of Accessway Locations

a. Safe access

Applicant has proposed the minimum number of accessway locations. County comments have recommended altering existing access on SE Rusk Rd to be entry only. Plans indicate access will be provided to the church property through easements.

The proposed development is consistent with MMC 12.16.040. D.1.

b. MMC 12.16.040.D.2-3 Does not apply to this development, as no accessways are on arterials or collectors are proposed. Also, only 1 accessway per property is proposed.

v. MMC 12.16.040.E & MMC 12.16.040.F: Accessway Design - ADA standards & Width

Proposed driveways will conform to MMC 12.16.040.E & MMC 12.16.040.F as conditioned.

5. MMC Chapter 12.24 – Clear Vision at Intersections

A. MMC Section 12.24.030: clear vision requirements

Proposed driveways, accessways and intersections will conform to MMC 12.24.030 as conditioned.

6. MMC Chapter 13.14 – Stormwater Management

A. MMC Section 13.14.020 - Definitions

“Public Works Standards” mean the City of Milwaukie Public Works Standards and the referenced City of Portland Stormwater Management Manual that the City requires be complied with for the design and construction of on-site mitigation facilities including stormwater detention, retention, and water quality treatment facilities.

The City accepts the stormwater considerations using WES’s BMP calculation to meet SLOPES V requirements. Final stormwater report will include City of Portland PAC calculations to approve the stormwater facility sizing and configuration to meet City requirements.

The applicant proposes revising the FEMA floodway map. All stormwater facilities must be outside of the floodway. The City will not approve stormwater facilities located inside the floodway. Final design will conform to a design that satisfies Portland’s

Stormwater Manual as well as Milwaukie's requirements for city maintenance of systems treating stormwater from public streets.

7. MMC Title 18 – Flood Hazard Regulations

MMC Title 18 applies to all special flood hazard areas and all flood management areas within the jurisdiction of the City.

A. MMC Section 18.040.100 – Development Permit Required

Applicant is proposing current FEMA floodway mapping of the area is inaccurate and a map revision will be submitted. Current FEMA floodway mapping provided by applicant clearly shows proposed development in the floodway. The applicant proposes after their revision is expected by FEMA, no development will occur in the floodway. The applicant identifies the revision process requires a Community Acknowledgement Form. This form is completed by the community official responsible for floodplain management. The applicant must indicate that no fill is to occur in the floodway and they will meet all requirements in this section. Such a form has yet to be submitted for review.

B. MMC Section 18.04.150 General Standards

i. MMC 18.04.150.A-B Anchoring and Construction Materials and Methods

Does not apply if mapping revision is accepted by FEMA as applicant proposes.

ii. MMC 18.04.150.C – Utilities

Utilities shall conform to requirements set forth in 18.04.150.C as conditioned.

8. MMC Chapter 19.700 – Public Facility Improvements

MMC 19.700 applies to partitions, subdivisions, new construction, and modification or expansion of an existing structure or a change or intensification in use that result in any projected increase in vehicle trips or any increase in gross floor area on the site. The subdivision triggers the requirements of MMC Title 19.700.

A. MMC Section 19.703 Approval Criteria

i. MMC 19.703.1 Preapplication Conference

Requirement for a preapplication conference was satisfied on September 6<sup>th</sup>, 2018.

MMC 19.703.2 Application Submittal

Development will require a Transportation Impact Study, and a Transportation Facilities Review application has been submitted.

The proposed development is consistent with MMC 19.703.2

ii. MMC 19.703.3 Approval Criteria

Applicant will provide transportation improvements and mitigation in rough proportion to the potential impacts of the development.

The proposed development is consistent with MMC 19.703.3.

- B. MMC Section 19.704 requires submission of a transportation impact study documenting the development impacts on the surrounding transportation system.

Transportation impact study has been provided and reviewed.

The proposed development is consistent with MMC 19.704.

- C. MMC Section 19.705 requires that transportation impacts of the proposed development be mitigated.

The traffic impact study does not require any mitigation measures beyond frontage improvements. The City of Milwaukie is requiring the construction of a right turn lane extension for northbound traffic at SE Rusk Rd and OR-224. As this requirement is not a recommendation by the TIS, it is eligible for system development charges credits. The cost of construction and engineering of the right turn lane will be offset by a reduction of the transportation SDC's on the building permit.

- D. MMC Section 19.708 – Transportation Facility Requirements

- i. MMC Subsection 19.708.1 – General Street Requirements and Standards

MMC 19.708.1.A – Access Management

Access requirements shall comply with access management standards contained in Title 12.16.

MMC 19.708.1.B – Clear Vision

Clear vision requirements shall comply with clear vision requirements contained in Title 12.24.

MMC 19.708.1.C – Development in downtown zones

Does not apply to this development

MMC 19.708.1.D – Development in Non-Downtown Zones

The proposed development is consistent with MMC 19.708.1.D.

MMC 19.708.1.E – Street Layout & Connectivity

MMC 19.708.1.E.1-2

Proposed development is consistent with MMC 19.708.1.E.1-2

MMC 19.708.1.E.3

Does not apply to proposed development as no streets are going to be extended to adjacent properties.

MMC 19.708.1.E.4

Proposed development is consistent with MMC.19.708.1.E.4

MMC 19.708.1.F – Intersection Design and Spacing



Proposed development is consistent with MMC 19.708.1.F

- ii. MMC Subsection 19.708.2 establishes standards for street design and improvement.

Proposal is consistent with MMC 19.708.2.

MMC 19.708.2.A.12 – Street Trees

Landscape strips are present on application. Street trees will be required at an average 40' spacing.

- iii. MMC Subsection 19.708.3 requires sidewalks to be provided on the public street frontage of all development.

The construction of sidewalks along the proposed development property abutting all public rights-of-way is included in the street frontage requirements.

MMC 19.708.3.A.3 requires that public sidewalks shall conform to ADA standards. Current proposal includes ADA ramps at all corners.

The proposed development is consistent with MMC 19.708.3.

- iv. MMC Subsection 19.708.4 establishes standards for bicycle facilities.

Per Milwaukie's Transportation System Plan, bicycle facilities are required for connecting the northeast corner of the property to the southwest corner of the property. Applicant has proposed to construct an off-street bike path through the development.

Proposed development is consistent with MMC 19.708.4.

- v. MMC Subsection 19.708.5 establishes standards for pedestrian and bicycle paths. The proposed path is in addition to the existing public streets and generally runs parallel. These types of paths are not subject to the provisions of this subsection and shall be designed in accordance with the Public Works Standards or as specified by the Engineering Director.

- vi. MMC Subsection 19.708.6 establishes standards for transit facilities.

The portion of SE Kellogg Creek Drive fronting the proposed development is classified as a transit route in the Milwaukie Transportation System Plan, however, transit facilities are already in place. As a result, transit facility improvements are not required for the proposed development.

- vii. MMC 19.708.6 does not apply to the proposed development.

### **Recommended Conditions of Approval**

- A. Complete FEMA map revision as proposed.

- B. Submit a final stormwater management plan to the City of Milwaukie Engineering Department for review and approval. The plan shall be prepared in accordance with Section 2 – Stormwater Design Standards of the City of Milwaukie Public Works Standards. Submit full-engineered plans for construction of all required public improvements, reviewed and approved by the City of Milwaukie Engineering Department. All utilities shall conform to the Milwaukie Public Works Standards.
- C. Obtain a right-of-way permit for construction of all required public improvements listed in these recommended conditions of approval.
- D. Obtain City Engineer approval for all new traffic control devices visible from the public right-of-way.
- E. Pay an inspection fee equal to 5.5% of the cost of the public improvements.
- F. Provide a payment and performance bond for 100 percent of the cost of the required public improvements.
- G. Provide an erosion control plan and obtain an erosion control permit.
- H. Frontage improvements shall be constructed along the length of SE Kellogg Creek Drive property frontage, including at the existing driveway location on the property. The frontage improvements should include 14' dedication, pavement, bike lanes, sidewalk, planter, drainage, and curb consistent with City of Milwaukie standards for a local street. All roadway and frontage improvements should meet the City of Milwaukie street design standards and should be subject to review and approval by the City Engineer.
- I. Right-of-way shall be dedicated along SE Kellogg Creek Drive to provide for the half-street cross-sections, as identified by the City Engineer.
- J. Construct a right turn lane on the northbound approach on SE Rusk Road at OR-224 and receive proportional SDC credit.
- K. Minimum AASHTO sight distance requirements shall be met at all street and driveway intersections. These should be approved by the City Engineer prior to final site plan approval.
- L. Vehicle access through easements shall be granted to the church.
- M. The final plans should meet all sections of MMC mentioned in this memo as approved by the City Engineer prior to construction.
- N. Provide a 12-month Maintenance Bond upon completion of the construction.
- O. Provide a final approved set of Mylar and electronic PDF "As Constructed" drawings to the City of Milwaukie prior to final inspection.



# CITY OF MILWAUKIE

**To:** Planning Commission  
**Through:** David Levitan, Senior Planner  
**From:** Brett Kelter, Associate Planner  
**Date:** February 22, 2019, for February 26, 2019, Public Hearing  
**Subject:** **Supplemental Materials (Master File #CU-2018-003)**

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## RECOMMENDED FINDINGS AND CONDITIONS

Since publication of the staff report on February 19, 2019, staff has finalized the Recommended Findings and Conditions of approval, included as Attachments 1 and 2, respectively.

## QUESTIONS FROM PLANNING COMMISSIONER JOSEPH EDGE

On January 28, 2019, staff received a list of questions from Commissioner Edge about the application and review process (see Attachment 3). Below is a summary of Mr. Edge's questions, followed by responses from staff.

### Summary

1. **Density** – Where is it established that the density standards do not apply to senior and retirement housing and/or nursing and convalescent homes?
2. **Natural Resources** – What discretion does the Planning Commission have to encourage the applicant to consider alternatives that result in less disturbance of Water Quality Resource (WQR) and Habitat Conservation Area (HCA) resources?
3. **Parking Determination** – Does the Planning Commission have discretion to require or encourage consideration of the City's Comprehensive Plan, Climate Action Plan, and similar policy documents in the evaluation of a parking determination request?
4. **Parking Lot Perimeter Landscaping** – Since the adjacent church property is zoned for residential use, if the site was redeveloped for residential use in the future, would the senior housing development be required at that time to provide screening as required in Milwaukie Municipal Code (MMC) Subsection 19.606.2.C?
5. **Bicycle Parking** – Shouldn't additional bicycle parking be required beyond the typical 10% of vehicle spaces to account for the independent and assisted living residents, who may well be active enough to bike?

- 6. Conditional Use Considerations for Senior & Retirement Housing** – For the specific considerations in MMC Subsection 19.905.9.G for senior and retirement housing, what is the test for each point—pass/fail or more discretionary? What is the test for the whole of the list? And does the Planning Commission have the authority to establish conditions that would ensure compliance with one or more considerations?

## Responses

### 1. Density

The proposed development provides 3 distinct types of units (independent living, assisted living, and memory care), allowing residents to “age in place.” It is reasonable to assume that a stand-alone “senior and retirement housing” development would be subject to the density standards of the underlying zone, as all of the units in this type of development would meet the City’s definition of “dwelling unit” in MMC 19.201 and be subject to the minimum density requirements mandated by Title 1 of Metro’s Urban Growth Management Functional Plan. Although the independent and assisted living units have some characteristics of dwelling units within a senior apartment complex, overall the proposed development would operate more as an institutional facility. The applicant has indicated that the assisted living and memory care unit occupants do not drive and have limited levels of physical activity, which have been factored into the vehicle and bicycle parking standards recommended for the proposal. Staff believes that conditional use and community service use (CSU) review of the proposed development, including the consideration of its size, scale, and impacts on the surrounding neighborhood, is an appropriate context for addressing the density-related issues presented by the proposed development. This issue is addressed in Recommended Finding 10.

### 2. Natural Resources

The discretionary review process for Natural Resource Review, established in MMC Subsection 19.402.12, requires an alternatives analysis as part of the application, and the criteria for approval include a requirement to demonstrate that there are no other practicable alternatives to the proposed development. The Planning Commission has the authority to make a finding that another alternative(s) is practicable and that therefore some adjustments should be made to make the proposal approvable. This issue is addressed in Recommended Finding 11.

### 3. Parking Determination

Due to a miscommunication or misunderstanding, the applicant proposed a Parking Determination, when a Parking Modification request was necessary. MMC Table 19.605.1 does in fact provide ratios for both senior and retirement housing and nursing/convalescent homes. Based on the size and number of the proposed units and according to the Table, the proposal requires a minimum of 163 spaces; the applicant is proposing to provide only 139. In that case, a Parking Modification request is necessary to justify providing fewer than the

minimum required by the code. The applicant has submitted a parking study to support its Parking Modification request, which is addressed in Recommended Finding 13.

#### **4. Parking Lot Perimeter Landscaping**

The perimeter landscaping requirement of MMC Subsection 19.606.2.C.3 specifies that “all parking areas adjacent to a residential *use* shall have a continuous visual screen” [*highlighting by staff for emphasis*]. The requirement is based on the actual current use of the adjacent property and not its zoning and use potential. If the church property is redeveloped for residential use in the future, the proposed senior housing development will not be required at that time to provide screening in the adjacent parking lot perimeter. Future owners may negotiate a private agreement about fencing or screening, but such an effort would be voluntary on the part of the senior housing development.

#### **5. Bicycle Parking**

Early in the application process, staff suggested that the applicant address the multifamily design standards of MMC Subsection 19.505.3 because, although the proposed facility is not technically a multifamily development by code definition, it has the feeling of one in some respects. Efforts to address the multifamily design standards were intended for consideration of the necessary conditional use and CSU applications, and do not represent an actual requirement for compliance.

As per MMC Subsection 19.609.2, a stand-alone multifamily development would have to provide at least 1 bicycle parking space per unit. Staff believes it is reasonable to require more than the minimum 10% of required vehicle parking for bicycles, since it seems likely that at least some of the independent living residents would be active and mobile enough to travel by bike. This issue is addressed in Recommended Finding 16-b(3), and a condition of approval (Condition 3-h) has been recommended that, in addition to the 14 spaces proposed for visitors and staff, would require the provision of at least 24 additional bicycle parking spaces for resident use (to serve 30% of the 78 independent units). The Planning Commission does have discretion to remake reasonable revisions and additions to the findings and conditions of approval, including to require that additional bicycle parking be provided. Bicycle parking is not being required for the assisted living or memory care units, as the applicant has indicated that the occupants of these units are highly unlikely to use bicycles.

#### **6. Conditional Use Considerations for Senior & Retirement Housing**

The items listed in MMC Subsection 19.905.9.G are there for consideration by the Planning Commission as they evaluate the approvability of the senior and retirement housing aspect of the proposed facility. Without clearer direction provided in the code, staff believes the Commission has the discretion to evaluate them however the members see fit, applying a general standard of reasonableness. The City Attorney will be present at the February 26 public hearing, should commissioners have more specific questions about their ability to revise (or impose additional) conditions of approval.

## COMMENTS

Comments received prior to the staff report publication on February 19 were included in the earlier packet. Since then, staff has received the following additional comment(s), summarized below and included as Attachment 4:

- Neil Schulman, Executive Director, North Urban Watersheds Council (NCUWC):** In general, any development in or near the watershed negatively impacts the health of streams and listed fish and increases the risk of flooding. It is important to take this opportunity to reduce the total impervious area within the watershed below the critical 45% coverage level. NCUWC has discussed the proposed development with the applicant over the past several months, offering suggestions and alternative concepts to improve the project’s compatibility with watershed health. NCUWC is supportive of certain aspects of the proposed development: the variance to increase building height, which reduces the building footprint and impacts to WQR and HCA resources; the proposed parking modification to reduce the amount of required parking; the proposed bicycle path along Rusk Rd; the avoidance of impacts to the mature Oregon oak wetland in the southwest corner of the site; and the use of pervious pavement in on-site walkways.

At the same time, NCUWC has the following concerns: additional alternatives should be considered to further reduce the development footprint (building and other impervious surfaces); WQR and HCA resources are vital for watershed health, and no amount of impact is supportable; impacts to the younger Oregon oaks planted within the past few years as part of a regional restoration effort should not be allowed; the applicant should work with the North Clackamas Parks & Recreation District, Clackamas Soil & Water Conservation District, or a nonprofit land trust or conservation organization to transfer ownership of the natural resource portion of the site or put other permanent protections in place; a native seed mix should be used on side slopes adjacent to the riparian corridor; biodegradable erosion control measures should be used during construction; and the applicant and City should work with flood management agencies to more fully evaluate flood risk for the site.

## ATTACHMENTS

Attachments are provided as indicated by the checked boxes.

	Supplemental PC Mailing	Public Copies	Packet
1. Recommended Findings in Support of Approval	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2. Recommended Conditions of Approval	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3. Questions from Planning Commissioner Joseph Edge	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4. Additional Comments Received	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Key:

Supplemental PC Mailing = paper materials provided to Planning Commission on the date of this document (prior to hearing).

Public Copies = paper copies of the packet available for review at City facilities and at the Planning Commission meeting.

Packet = packet materials available online at <https://www.milwaukieoregon.gov/bc-pc/planning-commission-14>.

**Recommended Findings in Support of Approval  
Master File #CU-2018-003  
Bonaventure Senior Housing**

Sections of the Milwaukie Municipal Code (MMC) not addressed in these findings are found to be inapplicable to the decision on this application.

1. The applicant, Bonaventure Senior Living, has applied for approval to create a 170-unit senior housing facility on property currently addressed at 13333 SE Rusk Rd. The site is split zoned Medium Density Residential R-3 on the western half and Low Density Residential R-10 on the eastern half. The land use application master file number is CU-2018-003, with accompanying file numbers CSU-2018-019, NR-2018-006, VR-2018-017, P-2018-003, TFR-2018-002, PLA-2018-001, LC-2018-002, and CSU-2018-020.
2. The subject property is comprised of 4 underlying lots totaling 17.55 acres, with the Turning Point Church located in the southeastern corner of the site and addressed as 13333 SE Rusk Rd (Tax ID 2S2E06AD, lots 600, 700, 900, and 901). As part of the proposed development, the 3 lots on the western side of the original property would be consolidated, and the property line between this new lot and the remaining church lot would be subsequently adjusted to accurately reflect the location of the church building and accompanying off-street parking areas. The resulting church site is approximately 3.7 acres, and the subject property being subdivided is approximately 13.8 acres.
3. The applicant has proposed to establish 170 units of senior housing in a multistory building ranging from 1 to 4 stories in height. The facility would provide 78 independent living suites (1- and 2-bedroom units with full kitchens), 60 assisted living suites (1- and 2-bedroom units, with all meals provided in a communal dining room), and 32 memory care suites (rooms located in a secured section of the building, with a separate serving kitchen and shared dining room and common amenities). A looped driveway would circle the building for access and circulation, with 139 off-street parking spaces for staff, visitors, and the approximately 30% of independent living residents expected to keep a car on site. The remainder of the site, to the west and on the north side of Mount Scott Creek, would remain undeveloped to preserve the designated natural resource and floodplain areas on the property. The adjacent church would retain its shared access through the reconfigured senior housing development property.

Mount Scott Creek flows across the northern portion of the subject property, and a large wetland (approximately 0.7 acres) is located within the 100-year floodplain designated over most of the western half of the site. Water Quality Resource (WQR) and Habitat Conservation Area (HCA) designations exist around the creek and wetland, and portions of these natural resource areas would be disturbed by the proposed development. The applicant has proposed mitigation plantings within the WQR and HCA and has designed the development to avoid intrusion into the floodplain.

4. The proposal is subject to the following provisions of the Milwaukie Municipal Code (MMC):

- MMC Chapter 19.1000 Review Procedures (incl. MMC 19.1006 Type III Review)
- MMC Title 12 Streets, Sidewalks, and Public Places
- MMC Chapter 13.14 Stormwater Management
- MMC Section 14.08.090 Conditional and Community Service Use Signs
- MMC Title 17 Land Division
- MMC Title 18 Flood Hazard Regulations
- MMC Section 19.301 Low Density Residential Zones (including R-10)
- MMC Section 19.302 Medium and High Density Residential Zones (including R-3)
- MMC Section 19.402 Natural Resources
- MMC Chapter 19.500 Supplementary Development Regulations
- MMC Chapter 19.600 Off-Street Parking and Loading
- MMC Chapter 19.700 Public Facility Improvements
- MMC Section 19.904 Community Service Uses
- MMC Section 19.905 Conditional Uses
- MMC Section 19.911 Variances

The applicant's submittal includes applications for Conditional Use, Community Service Use (including a minor modification to the existing church approval), Natural Resource Review, Variance Request, Parking Modification, Transportation Facilities Review, Lot Consolidation, and Property Line Adjustment. The Conditional Use, Community Service Use, Natural Resource Review, and Variance Request applications all require Type III review; the other applications require either Type I or II review. However, as per MMC Subsection 19.1001.6.B, all applications are being processed with Type III review.

The application has been processed and public notice provided in accordance with MMC Section 19.1006 Type III Review. A preapplication conference was held on September 6, 2018, as required by MMC Subsection 19.1002.2. Public notice was sent to property owners and current residents within 500 ft of the subject property on February 6, 2019. MMC Subsection 19.1006.3.D requires a 300-ft radius for public notice, but the applicant requested a broader notice radius to correspond with the notice sent for the applicant's voluntary neighborhood meeting prior to submittal. A public hearing was held on February 26, 2019, as required by law.

5. MMC Title 12 Streets, Sidewalks, and Public Places

a. MMC Chapter 12.16 Access Management

MMC Section 12.16.040 establishes standards for access (driveway) requirements, including access spacing, number and location of accessways, and limitations for access onto collector and arterial streets. For uses other than single-family residential development accessing local and neighborhood streets, new driveways must be spaced at least 100 ft from the nearest intersection.



*The subject property has frontage on both Rusk Rd, a collector street, and Kellogg Creek Dr, a local street. Both streets are currently under the jurisdiction of Clackamas County. The existing church is served by a driveway on each street. As a result of the proposed lot consolidation and property line adjustment, the church would have frontage only on Rusk Rd but would retain the existing Rusk Rd driveway; the new senior housing development would have its primary frontage on Kellogg Creek Dr, with a short length of frontage on Rusk Rd at the intersection with OR 224. The existing Kellogg Creek Dr driveway would be relocated to a point approximately 200 ft from the intersection with Rusk Rd to better serve the new senior housing development. No new access onto Rusk Rd from the senior housing development property is proposed.*

*As proposed, the existing Rusk Rd driveway would be modified to emphasize that it is for entry only. The church would share access to the senior housing development's driveway on Kellogg Creek Dr through an access easement. The County Department of Transportation and Development (DTD) reviewed the proposal and noted that, while its preference is for the existing Rusk Rd driveway to be closed, the proposed modifications to prevent exiting movements onto Rusk Rd are acceptable since the City has determined that a requirement to close the existing driveway is not warranted for the minor modification to the church's land use approval (see Finding 15-b). A condition has been established to ensure that an access easement has been granted to allow two-way vehicle access to the church property from Kellogg Creek Dr.*

*As conditioned, the development is consistent with the applicable standards of MMC 12.16.*

b. MMC Chapter 12.24 Clear Vision at Intersections

MMC 12.24 establishes standards for maintenance of clear vision at intersections to protect the safety and welfare of the public in their use of City streets.

*As proposed, all driveways, accessways, and intersections associated with the proposed development conform to the applicable standards of MMC 12.24.*

*The Planning Commission finds that, as proposed, the development meets all applicable requirements of MMC Title 12. This standard is met.*

6. MMC Chapter 13.14 Stormwater Management

MMC 13.14 establishes standards to ensure that stormwater facilities and conveyances are effectively maintained, operated, regulated, and controlled. As per the definitions provided in MMC Section 13.14.020, the City uses the City of Portland *Stormwater Management Manual* to determine compliance for the design and construction of on-site mitigation facilities including stormwater detention, retention, and water quality treatment facilities.

*The applicant's submittal materials include a preliminary drainage report that addresses the City's requirements for stormwater management and water quality treatment. The City accepts the preliminary drainage report's use of the BMP sizing tool developed by Clackamas County's Water Environment Services (WES) to calculate facility sizing. The final stormwater report will include Presumptive Approach Calculator (PAC) calculations for the City to officially approve the*

*stormwater facility sizing and configuration. There is sufficient area on site outside the floodplain to construct facilities, including constructing additional roadside planters.*

*As required by MMC 13.14, the final stormwater design will conform to a design that satisfies Portland's Stormwater Management Manual as well as Milwaukie's requirements for City maintenance of systems treating stormwater from public streets.*

*The Planning Commission finds that, as proposed, the development meets all applicable requirements of MMC 13.14. This standard is met.*

7. MMC Section 14.08.090 Conditional and Community Service Use Signs

MMC 14.08.090 establishes standards for conditional and community service use signs. In general, such signs are limited to those allowed in the underlying zone, though those standards can be increased to the standards in MMC Table 14.08.090.C with Type III review. As per MMC Table 14.08.090.C, 1 monument or freestanding sign is allowed, with a maximum of 40 sq ft per display surface, a maximum length of 20 ft, and a maximum height of 12 ft. One wall sign is allowed per building face, with a maximum size of 10% of the building face up to 40 sq ft. No illumination is allowed. In reviewing an application for such signs, the Planning Commission will consider the proximity of the sign to residences, the functional classification of adjacent streets, and the scale of surrounding development.

*The applicant has proposed to install 4 non-illuminated signs as part of the development. One monument sign would be located near the intersection of Rusk Rd and OR 224, with a display area of 40 sq ft, a length of 8 ft, and a peak height of 12 ft. Two 40-sq-ft wall signs are proposed for 2 different building faces, one oriented toward OR 224 and Rusk Rd and the other toward Kellogg Creek Dr. Both respective building faces are well over 400 sq ft in area. A second monument sign would be located near the Kellogg Creek Dr driveway but is exempt from the need for conditional or community service use sign review because it meets the standards of MMC Subsection 14.12.010.A, which allows 1 non-illuminated sign that is less than 4 sq ft in area and no more than 3 ft in height if ground-mounted.*

*The Planning Commission finds that, as proposed, the signs requiring Type III review meet the applicable standards of MMC Table 14.08.090.C and would not result in any negative impact on nearby residences, adjacent streets, or surrounding development. This standard is met.*

8. MMC Title 17 Land Division

a. MMC Chapter 17.12 Application Procedure and Approval Criteria

(1) MMC Section 17.12.020 Application Procedure

MMC 17.12.020 requires that property line adjustments and lot consolidations be processed as described in Table 17.12.020. Property line adjustments that are consistent with the Oregon Revised Statutes (ORS) and Title 19 shall be processed through Type I review and any adjustment that modifies a plat restriction shall be processed through Type II review. Lot consolidations other than replats, involving legal lots created by deed, shall be processed through Type I review.

*The Planning Commission finds that the proposed lot consolidation is not a replat and involves legal lots established by deed and that the proposed boundary adjustment does not modify any known plat restriction. Therefore, the proposed lot consolidation and boundary adjustment could be processed with Type I review. As noted in Finding 4, the entire application submittal has been processed concurrently with Type III review.*

- (2) MMC Section 17.12.030 Approval Criteria for Lot Consolidation, Property Line Adjustment, and Replat

MMC 17.12.030 specifies the approval criteria for lot consolidations and property line adjustments.

- (a) MMC Subsection 17.12.030.A.1 requires compliance with Title 17 Land Division Ordinance and Title 19 Zoning Ordinance.

*As evidenced by these finding, the proposed lot consolidation and boundary adjustment meet all applicable standards of Titles 17 and 19.*

- (b) MMC Subsection 17.12.030.A.2 requires that the proposed change allow for reasonable development of the affected lots and not create the need for a variance of any land division or zoning standard.

*The proposed lot consolidation and boundary adjustment would separate the area currently used by the church from the rest of the property, which is the location of the proposed development described in Finding 3. The reconfigured boundary for the church site includes the church building and associated off-street parking area, which is adequate space for the existing church use. The larger undeveloped property is of adequate size for reasonable development without requiring a variance of any land division or zoning standard.*

- (c) MMC Subsection 17.12.030.A.3 requires that the proposed change not reduce the residential density below the minimum density requirements of the zoning district.

*The subject property is not currently developed for residential use. The proposed lot consolidation and boundary adjustment would separate the area currently used by the church from the larger undeveloped portion of the property, but it would not affect the minimum residential density of the site and would not prevent the redevelopment of the church site for residential use in the future.*

*The Planning Commission finds that these criteria are met.*

*The Planning Commission finds that the proposed lot consolidation and boundary adjustment meet all applicable standards of MMC 17.12.*

- b. MMC Chapter 17.16 Application Requirements and Approval Criteria

MMC 17.16 establishes the submittal requirements for boundary changes and land division. For property line adjustments and lot consolidations, MMC Section 17.16.040 requires a completed application form, application fee, narrative report

addressing approval criteria, scaled plan showing sufficient details of the subject properties, and deeds of the properties involved.

*The applicant's submittal materials include the necessary forms and fees, a narrative that addresses all applicable approval criteria, the deed for the subject property, and a site plan that shows the proposed change.*

*The Planning Commission finds that no additional information is required and that the proposed lot consolidation and boundary adjustment meet all applicable standards of MMC 17.16.*

c. MMC Chapter 17.28 Design Standards

MMC 17.28 establishes design standards for land division. In particular, MMC Section 17.28.040 establishes general design standards for lots, including standards for size, shape, compound lot line segments, and frontage.

- (1) MMC 17.28.040.A requires that the lot size, width, shape, and orientation shall be appropriate for the location and the type of use contemplated. Minimum lot standards shall conform to Title 19.

*As a result of the proposed lot consolidation and boundary adjustment, the resulting properties would both have adequate size and dimensions for development and uses allowed in the underlying R-10 and R-3 zones and conform to the standards of Title 19 as described in these findings.*

- (2) MMC 17.28.040.B requires that lot shape shall be rectilinear, except where not practicable due to location along a street radius, or existing lot shape. The sidelines of lots, as far as practicable, shall run at right angles to the street upon which the lots face. As far as practicable, the rear lot line shall run parallel to the street.

*As proposed, the reconfigured church property would be rectilinear in shape, except where the adjacent public right-of-way for Rusk Rd curves around its southeast corner. As proposed, the resulting vacant property would also be rectilinear, except where the adjacent right-of-way for OR 224 extends at an angle along its northern boundary and meets the Rusk Rd right-of-way.*

- (3) MMC 17.28.040.C discourages cumulative lateral changes in direction of a side or rear lot line exceeding 10% of the distance between opposing lot corners along a given lot line. Changes in direction shall be measured from a straight line drawn between opposing lot corners.

*In the current configuration of the subject property, Tax Lot 901 has several compound segments. The proposed lot consolidation would reconfigure the existing compound segment along the eastern boundary of Tax Lot 901, would not affect the small compound segment along its northern boundary, and would shift the location but not the length of the lateral shift along its western boundary. The proposed boundary adjustment would establish a new compound segment along the eastern boundary of the*

*newly consolidated vacant lot where adjacent to the reconfigured church lot, but this is an inevitable result of the consolidated lot being larger than the church lot and adjacent to it on two sides.*

- (4) MMC 17.28.040.D provides that lot shape standards may be adjusted subject to Section 19.911 Variances.

*No adjustments to lot shape standards are requested or required.*

- (5) MMC 17.28.040.E limits double and reversed frontage lots except where essential to provide separations of residential development from railroads, traffic arteries, or adjacent nonresidential uses, or to overcome specific disadvantages of topography and orientation.

*The existing subject property has public street or highway frontage on 3 sides (OR 224, Rusk Rd, and Kellogg Creek Dr). The proposed lot consolidation and boundary adjustment would result in the reconfigured church lot having frontage only on Rusk Rd and would not change the multiple-frontage status of the newly consolidated vacant lot.*

- (6) MMC 17.28.040.F requires that required frontage be measured along the street upon which the lot takes access.

*The reconfigured church lot would continue to have access from Rusk Rd, where it has more than 780 ft of frontage. The newly consolidated vacant lot would take access from Kellogg Creek Dr, where it has more than 650 ft of frontage.*

*The Planning Commission finds that the proposed lot consolidation and boundary adjustment comply with all applicable design standards of MMC 17.28.*

*The Planning Commission finds that the proposed lot consolidation and boundary adjustment meet all applicable standards of MMC Title 17. This standard is met.*

## 9. MMC Title 18 Flood Hazard Regulations

MMC Title 18 provides standards intended to minimize public and private losses due to flood conditions in specific areas. The regulations established in MMC Title 18 do this in part by controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel flood waters; controlling filling, grading, dredging, and other development which may increase flood damage; and preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas. As per MMC Section 18.04.100, a development permit is required prior to any construction or development within the flood management area.

*The subject property includes flood hazard and flood management areas as identified on the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA) and acknowledged by the City for the purposes of implementing this title. Current FEMA floodplain mapping provided by the applicant clearly shows proposed development in the floodplain; however, the applicant has asserted that the FIRM is inaccurate and has presented a revised floodplain*

*boundary on the site that is based on the application of the FEMA floodplain modeling to the actual topographic data for the site. The applicant has proposed to submit a map revision and asserts that, after the map revision is accepted by FEMA, no development will occur in the floodplain.*

*The applicant has noted that the revision process requires a Community Acknowledgement Form, which must be completed by the community official responsible for floodplain management. The applicant must indicate that no fill will occur in the floodplain and that they will meet all the requirements of this title. Such a form has yet to be submitted for review, so conditions have been established to ensure that the applicable standards are met prior to development.*

*The Planning Commission finds that, as conditioned, the proposed development is consistent with the applicable standards of MMC Title 18. This standard is met.*

10. MMC Sections 19.301 Low Density Residential Zones (including R-10) and 19.302 Medium and High Density Residential Zones (including R-3)

The subject property is split-zoned Residential R-10 and Residential R-3. MMC 19.301 and 19.302 establish the allowable uses and development standards for the residential R-10 and R-3 zones, respectively.

a. Permitted Uses

As per MMC Tables 19.301.2 and 19.302.2, senior and retirement housing is allowed as a conditional use subject to the provisions of MMC Section 19.905, and community service uses (CSUs) are allowed subject to the provisions of MMC Section 19.904.

*The proposed development includes 3 distinct types of senior housing units: (1) independent living suites, (2) assisted living suites, (3) memory care suites. The independent and assisted living units fall under the definition provided in MMC Section 19.201 for “senior and retirement housing,” while the memory care units are best categorized as a “nursing or convalescent home,” which is identified as a type of institutional CSU in MMC Subsection 19.904.2.A. All 3 types of senior housing are permitted in the R-10 and R-3 zones with review as conditional and community service uses.*

b. Lot and Development Standards

Table 10-b provides the applicable standards for development in the R-10 and R-3 zones with respect to the reconfigured church lot and the new lot for senior housing development that result from the lot consolidation and boundary adjustment discussed in Finding 8. The entire reconfigured church lot would be zoned R-10, while the new lot for senior housing development would be split-zoned R-10 and R-3. Both lots far exceed the minimum standards in most categories, except where the need for a variance to the building height standard is noted for the senior housing development.

<b>Table 10-b Lot and Development Standards</b>				
<b>Standard</b>	<b>R-10 Requirement</b>	<b>R-3 Requirement</b>	<b>Church Lot (R-10)</b>	<b>Senior Housing Development Lot (R-10 &amp; R-3)</b>
<b>Minimum lot size</b>	10,000 sq ft	3,000 sq ft	>167,000 sq ft	>534,000 sq ft
<b>Minimum lot width</b>	70 ft	30 ft	>410 ft	>650 ft
<b>Minimum lot depth</b>	100 ft	80 ft	>370 ft	>740 ft
<b>Minimum street frontage</b>	35 ft	30 ft	>780 ft	>710 ft
<b>Front yard</b>	20 ft	15 ft	>75 ft	75 ft
<b>Side yard</b>	10 ft	5 ft	>130 ft	50 ft
<b>Street-side yard</b>	20 ft	15 ft	>100 ft	>300 ft
<b>Rear yard</b>	20 ft	15 ft	70 ft	>130 ft
<b>Maximum building height</b>	2.5 stories or 35 ft (whichever is less)	2.5 stories or 35 ft (whichever is less)	(pre-existing, no change)	4 stories (see Finding 17 for discussion of height variance)
<b>Maximum lot coverage</b>	30%	40%	<20%	<12%
<b>Minimum vegetation</b>	35%	35%	>15% (CSU requirement for churches is 15%)	>88%
<b>Front yard minimum vegetation</b>	40%	40%	c.30% (no changes proposed)	>70%
<b>Minimum density</b>	3.5 units/acre	11.6 units/acre	NA (church use)	(see Note below)
<b>Maximum density</b>	4.4 units/acre	14.5 units/acre	NA (church use)	(see Note below)

Note on Density: The proposed senior housing development provides 3 distinct types of units (independent living, assisted living, and memory care), allowing residents to “age in place.” Although the independent and assisted living units have some characteristics of a senior apartment complex, overall the proposed development would operate more as an institutional facility. The Planning Commission finds that its review of the conditional use and CSU aspects of the proposed development, as discussed in Findings 15 and 16, respectively, including its consideration of the size, scale, and impacts of the proposed senior housing development on the surrounding neighborhood, is sufficient to address the density-related issues presented by the proposed development.

11. MMC Section 19.402 Natural Resources

MMC 19.402 establishes regulations for designated natural resource areas. The standards and requirements of MMC 19.402 are an acknowledgment that many of the riparian, wildlife, and wetland resources in the community have been adversely impacted by development over time. The regulations are intended to minimize additional negative impacts and to restore and improve natural resources where possible.

a. MMC Subsection 19.402.3 Applicability

MMC 19.402.3 establishes applicability of the Natural Resource (NR) regulations, including all properties containing Water Quality Resources (WQRs) and Habitat Conservation Areas (HCAs) as shown on the City's Natural Resource (NR) Administrative Map.

*Mount Scott Creek flows across the northern portion of the subject property, and a large wetland (approximately 0.7 acres) is located within the 100-year floodplain designated over most of the western half of the site. The City's NR Administrative Map shows WQR and HCA designations around the creek and wetland, and portions of these natural resource areas will be disturbed by the proposed development.*

*As presented in the applicant's submittal materials, the proposed development will temporarily or permanently disturb approximately 69,550 sq ft of WQR and/or HCA area. At that scale, the proposed activity is not listed as exempt according to the standards outlined in MMC 19.402.4.*

*The Planning Commission finds that the requirements of MMC 19.402 are applicable to the proposed activity.*

b. MMC Subsection 19.402.7 Activities Requiring Type II Review

MMC 19.402.7 establishes that certain activities within a designated WQR and/or HCA are subject to Type II review in accordance with MMC 19.1005. As per MMC 19.402.7.E, this includes boundary verifications that propose substantial corrections to the NR Administrative Map, including identifying the precise location of wetlands, as required by MMC 19.402.15.A.

*The subject property includes a delineated wetland as well as mapped HCA for which the applicant has proposed to make a detailed verification of boundaries. As provided in MMC Subsection 19.402.15.A, the Type II review process is required to confirm the specific location of wetlands and for detailed verification of mapped HCA. However, the proposed activity requires other applications that are being processed concurrently with Type III review. As provided in MMC Subsection 19.1001.6.B.1, concurrent applications are processed according to the highest numbered review type, with a single decision to be issued that includes findings for all concurrent applications.*

*The Planning Commission finds that the boundary verification for wetlands and mapped HCA shall be processed concurrently with Type III review.*

c. MMC Subsection 19.402.8 Activities Requiring Type III Review

MMC 19.402.8 establishes that certain activities within a designated WQR and/or HCA are subject to Type III review in accordance with MMC 19.1006. As per MMC 19.402.8.A.1, this includes activities allowed in the base zone that are not otherwise exempt or permitted as a Type I or II activity.

*The level of disturbance proposed within the designated WQR and HCA areas on the subject property exceeds the levels allowed by Type I and II review, as provided in MMC 19.402.6 and 402.7, respectively. As such, the activity is subject to Type III review and the*



*discretionary process established in MMC 19.402.12. As noted in Finding 11-b above, the Natural Resource review is associated with other applications being processed concurrently with Type IV.*

*The Planning Commission finds that the proposed activity is subject to Type III review and will be processed concurrently with other applications requiring Type IV review.*

d. MMC Subsection 19.402.9 Construction Management Plans

MMC 19.402.9 establishes standards for construction management plans, which are required for projects that disturb more than 150 sq ft of designated natural resource area. Construction management plans must provide information related to site access, staging of materials and equipment, and measures for tree protection and erosion control.

*The applicant's Natural Resource Review report includes a construction management plan that provides the information required by MMC 19.402.9, including tree protection measures. The plan will be formally reviewed at the time of submittal for development permits.*

e. MMC Subsection 19.402.11 Development Standards

MMC 19.402.11 establishes development standards for projects that impact a designated natural resource, including requirements to protect natural resource areas during development and general standards for required mitigation (e.g., plant species, size, spacing, and diversity).

MMC Subsection 19.402.11.C establishes mitigation requirements for disturbance within WQRs. The requirements vary depending on the existing condition of the WQR, according to the categories established in MMC Table 19.402.11.C. For Class A "Good" WQR conditions, MMC Table 19.402.11.C requires that the applicant submit a plan for mitigating water quality impacts related to the development; for Class C "Poor" WQR conditions, the table requires restoration and mitigation with native species using a City-approved plan.

*The proposed development will disturb approximately 23,440 sq ft within the WQR. The portion of the WQR closest to Mount Scott Creek is categorized as Class A ("Good"); other portions are categorized as Class C ("Poor"). In addition, the proposed development will disturb approximately 46,115 sq ft within the HCA-only areas on the site.*

*Using the mitigation planting ratio provided in MMC Subsection 19.402.11.D.2.b as a guide, the applicant proposes to plant 5 trees and 25 shrubs per 500 sq ft of disturbance area. For the total WQR and HCA disturbance of approximately 69,550 sq ft, the applicant proposes to plant 696 native trees and 3,478 native shrubs within a 118,000-sq-ft mitigation area. As proposed, the mitigation plantings will meet the minimum requirements established in MMC Subsection 19.402.11.B. Mitigation trees will be of at least ½-in caliper (measured at 6 ft above the ground level after planting) and shrubs will be of at least 1-gallon size and at least 12-in height.*

*ESA, the City's consultant for on-call natural resource services, has evaluated the proposed mitigation plan and concluded that, with a few adjustments, it adequately addresses the proposed WQR and HCA disturbance. ESA provided a few additional recommendations to improve the mitigation plan, including providing more details on which nuisance species will be targeted for removal and how; identifying areas for oak plantings and how new plantings will accommodate existing oaks on site; providing a typical planting scheme for installing proposed trees and shrubs with respect to existing vegetation; ensuring that temporary impacts to WQR and HCA areas are accounted and mitigated for; and ensuring that adequate construction fencing and tree protection fencing are provided. Conditions have been established to ensure that these recommendations are implemented.*

*As conditioned, the Planning Commission finds that the applicable development standards of MMC 19.402.11 are met.*

f. MMC Subsection 19.402.12 General Discretionary Review

MMC 19.402.12 establishes the discretionary review process for activities that substantially disturb designated natural resource areas.

(1) Impact Evaluation and Analysis

MMC Subsection 19.402.12.A requires an impact evaluation and alternatives analysis in order to determine compliance with the approval criteria for discretionary review and to evaluate alternatives to the proposed development. A technical report prepared by a qualified natural resource professional is required and should include the following components:

- Identification of ecological functions
- Inventory of vegetation
- Assessment of water quality impacts
- Alternatives analysis
- Demonstration that no practicable alternative method or design exists that would have a lesser impact on the resource and that impacts are mitigated to the extent practicable
- Mitigation plan

*The applicant's submittal materials include a technical report prepared by Pacific Habitat Services, Inc., a private firm providing a range of environmental consulting services including natural resource assessment, wetland delineation, and environmental restoration. The technical report includes an impact evaluation and alternatives analysis consistent with the required components listed above, as well as an inventory of existing vegetation and discusses the ecological function of the existing WQR and HCA areas within the project area. The report also provides a mitigation plan for permanent and temporary impacts to the WQR and HCA.*

*The technical report considers 2 alternatives to the proposed senior housing development, involving different configurations of 2-story buildings that would not require a variance to the building height standard. Both alternatives would result in*

*more than twice the amount of disturbance to the WQR and HCA to achieve the same housing capacity of the proposed development. The report concludes that the proposed development is the most practicable alternative that results in the same number of units and the least impact to designated natural resources on the site.*

*ESA has noted that one of the alternatives (Alternative B) would require enough wetland and floodplain impact that it would be challenging to permit by the relevant agencies and so does not appear to be a realistic alternative for purposes of this analysis. ESA has also noted what appear to be reasonable opportunities to further reduce impacts to the WQR and HCA by maximizing use of non-regulated areas in the northeast corner and the southwest portion of the subject property for adjusting the locations of stormwater facilities and off-street parking. Alternately, the applicant could simply eliminate some of the encroaching parking spaces and still meet the minimum requirement or could arrange a shared-parking agreement with the adjacent church. A condition has been established to require the applicant to revise the site plan to shift the location of stormwater facilities and some off-street parking out of the WQR and HCA, or to provide a more detailed justification of why such revisions are not feasible.*

*As conditioned, the Planning Commission finds that the applicant's impact evaluation and alternatives analysis is sufficient for purposes of reviewing the proposed activity against the approval criteria provided in MMC 19.402.12. This standard is met.*

## (2) Approval Criteria

MMC Subsection 19.402.12.B provides the approval criteria for discretionary review as follows:

*Note: ESA reviewed the applicant's technical report and presented its assessment to the City in a summary memo, which informs this portion of the findings.*

- **Avoid** – The proposed activity avoids the intrusion of development into the WQR and/or HCA to the extent practicable, and has less detrimental impact to the natural resource areas than other practicable alternatives.

*Mount Scott Creek cuts across the northern portion of the nearly 14-acre development site, resulting in significant areas of designated WQR and HCA. Site development that avoids any impacts to the WQR and HCA is challenging but not impossible, particularly if the development is focused on the eastern and northeastern portions of the site. The applicant has proposed a multistory building that reduces the development footprint and concentrates impacts in the eastern and northeastern portions of the site. However, a portion of the building and associated parking and stormwater facilities would intrude into the WQR and HCA and disturb approximately 1.6 acres of natural resource area. Considering the discussion of alternatives noted in Finding 11-f(1) above, it appears that some additional adjustments to the site plan could be made that would allow the proposed development to further avoid the WQR and HCA.*

- **Minimize** – If the applicant demonstrates that there is no practicable alternative to avoid disturbance of the natural resource, then the proposed activity shall minimize detrimental impacts to the extent practicable.

*As noted in the above discussion of avoiding impacts, it appears that the proposed development could be adjusted to further reduce impacts to the WQR and HCA. A condition has been established to require revisions to the site plan if the applicant cannot demonstrate that there are no practicable alternatives with lesser impacts. It is also not clear whether the calculation of HCA and WQR impacts includes areas of temporary disturbance, though it appears that temporary disturbance areas are minimal. Another condition has been established to ensure that temporary disturbance is fully accounted for in the calculation of mitigation plantings.*

- **Mitigate** – If the applicant demonstrates that there is no practicable alternative that will avoid disturbance of the natural resource, then the proposed activity shall mitigate for adverse impacts to the resource area. The applicant shall present a mitigation plan that demonstrates compensation for detrimental impacts to ecological functions, with mitigation occurring on the site of the disturbance to the extent practicable, utilization of native plants, and a maintenance plan to ensure the success of plantings.

*As noted in Finding 11-e, the applicant's submittal includes a mitigation plan for the WQR and HCA disturbance that will accompany the proposed development. The applicant has proposed to plant 696 native trees and 3,478 native shrubs within a 118,000-sq-ft mitigation area, and to remove nuisance plants and noxious material and debris. Conditions have been established to confirm which nuisance species will be removed and how and to ensure that new plantings will accommodate existing oaks on site, account and mitigate for temporary impacts to WQR and HCA areas, provide adequate construction fencing and tree protection fencing, utilize native seed mixes on steep slopes adjacent to WQR and HCA areas to limit non-native competition with mitigation plantings, utilize biodegradable erosion control materials, and install signage to reduce foot traffic in natural areas. As conditioned, the revised mitigation plan would ensure the long-term success of the overall mitigation effort.*

*As conditioned, the Planning Commission finds that the proposed development meets the approval criteria for discretionary review as established in MMC 19.402.12.B.*

(3) **Limitations and Mitigation for Disturbance of HCAs**

MMC Subsection 19.402.12.C establishes the discretionary review process for mitigation of more HCA disturbance than would be allowed by the nondiscretionary standards of MMC Subsection 19.402.11.D.1. In such cases, the applicant must submit an Impact Evaluation and Alternatives Analysis

consistent with the standards established in MMC 19.402.12.A and subject to the approval criteria established in MMC 19.402.12.B.

*As discussed in Finding 11-f(1), the applicant's submittal materials include a technical report that provides an evaluation of impacts to the WQR as well as to those impacted HCA areas beyond the WQR, consistent with the standards established in MMC 19.402.12.A. As discussed in Finding 11-f(2), the proposed development, with the conditions noted therein, meets the approval criteria established in MMC 19.402.12.B.*

*As conditioned, the Planning Commission finds that the proposed development meets the discretionary standards for disturbance of HCAs as established in MMC 19.402.12.C.*

*The Planning Commission finds that, as conditioned, the proposed development meets the applicable discretionary review standards of MMC 19.402.12.*

g. MMC Subsection 19.402.15 Boundary Verification and Map Administration

MMC 19.402.15 establishes standards for verifying the boundaries of WQRs and HCAs and for administering the City's Natural Resource Administrative Map (NR map).

The locations of WQRs are determined based on the provisions of MMC Table 19.402.15. For streams, the WQR includes the feature itself and a vegetated corridor that extends 50 ft from the ordinary high water mark or 2-year recurrence interval flood elevation. Where the slope exceeds 25% for less than 150 ft, the vegetated corridor is measured with a 50-ft width from the break in the 25% slope. For wetlands, a wetland delineation report prepared by a professional wetland specialist and approved by the Department of State Lands (DSL) is required.

For HCAs, the City's NR Map is assumed to be accurate with respect to location unless challenged by the applicant, using the procedures outlined in either MMC Subsection 19.402.15.A.1 or MMC Subsection 19.402.15.A.2.b.

*The technical report provided by the applicant includes a detailed topographic map showing the accurate boundaries of the WQR using the provisions of MMC Table 19.402.15, as well as a wetland delineation report prepared in accordance with the standards of DSL and a formal letter of concurrence by DSL.*

*The applicant has also proposed a detailed verification of the mapped HCA on the subject property and has submitted all information required by MMC 19.402.15.A.2.b. Using the methodology outlined in that subsection, the applicant has demonstrated that the actual HCA boundary should be adjusted to more closely parallel the riparian area along the south side of Mount Scott Creek and to include the Oregon oak woodland in the southwestern portion of the site.*

*The Planning Commission finds that the City's NR map shall be adjusted to reflect the detailed information provided by the applicant with respect to the location of the delineated wetland on the site and the verified boundary of the mapped HCA. Furthermore, as a result of*

*the approval of the proposed development, the Planning Commission finds that the NR Map shall be adjusted accordingly to remove those HCA locations that will be permanently disturbed by the proposed development.*

*The Planning Commission finds that, as conditioned, the proposed development's disturbance of WQR and HCA areas on the subject property meets all applicable standards of MMC 19.402.*

## 12. MMC Chapter 19.500 Supplementary Development Regulations

MMC 19.500 provides additional standards for a variety of development types and locations. The applicable portions of this section are addressed below.

### a. MMC Subsection 19.504.1 Clear Vision Areas

MMC 19.504.1 refers to clear vision area requirements in MMC Chapter 12.24.

*As addressed in Finding 5-b, all driveways, accessways, and intersections associated with the proposed development conform to the applicable standards of MMC 12.24.*

*This standard is met.*

### b. MMC Subsection 19.504.7 Minimum Vegetation

MMC 19.504.7 requires that no more than 20% of the required vegetation area may be covered with bark mulch.

*As proposed, more than half the subject property will be vegetated, including mitigation plantings consisting of native species trees, shrubs, and ground cover. Very few of the vegetated areas on the site will be covered with bark mulch.*

*This standard is met.*

### c. MMC Subsection 19.504.9 On-Site Walkways and Circulation

MMC 19.504.9 establishes standards for on-site walkways, including requirements that on-site walkways be at least 5 ft wide, constructed of hard surface materials that are permeable for stormwater, and lighted to a minimum level of 0.5 footcandles.

*The proposed development includes pervious, lighted walkways around the new building, as well as 2 pedestrian connections to the public sidewalk on Kellogg Creek Dr. A condition has been established requiring more detailed photometric information to ensure that the minimum lighting is provided. As addressed in Finding 17, a variance has been requested for relief from the requirement for a pedestrian connection to the site's short frontage on Rusk Rd.*

*As conditioned, the Planning Commission finds that this standard is met.*

### d. MMC Subsection 19.505.3 Multifamily Housing

MMC 19.505.3 establishes design standards for multifamily housing, to facilitate the development of attractive housing that encourages multimodal transportation and good site and building design. The requirements of this subsection are intended to achieve the principles of livability, compatibility, safety and functionality, and

sustainability. The design elements, established in MMC Subsection 19.505.3.D, are applicable to all new multifamily housing developments with 3 or more units.

*The proposed senior housing development is not multifamily housing and is not subject to the standards of MMC 19.505.3. However, the Planning Commission has determined that it is appropriate to consider the proposed development’s consistency with the multifamily design guidelines as part of its conditional use and CSU review of the facility, to evaluate its compatibility with and impacts on neighboring properties (see Findings 15 and 16).*

**Table 12-d  
 Design Guidelines—Multifamily Housing**

<b>Design Element</b>	<b>Guideline</b>	<b>Findings</b>
<b>1. Private Open Space</b>	<p>The development should provide private open space for each dwelling unit, with direct access from the dwelling unit and visually and/or physically separate from common areas.</p> <p>The development may provide common open space in lieu of private open space if the common open space is well designed, adequately sized, and functionally similar to private open space.</p>	<p>The proposed senior housing development is not designed as a typical multifamily project, as the needs of its residents are different. No private open space is provided.</p>
<b>2. Public Open Space</b>	<p>The development should provide sufficient open space for the purpose of outdoor recreation, scenic amenity, or shared outdoor space for people to gather.</p>	<p>The proposed senior housing development would provide a variety of common open spaces for residents, including an outdoor plaza and a secure outdoor courtyard for memory care residents. In addition, the western half of the site would be preserved as open space for natural resources, providing at least a public visual amenity. Common open space would also be available within walking distance at North Clackamas Park.</p>
<b>3. Pedestrian Circulation</b>	<p>Site design should promote safe, direct, and usable pedestrian facilities and connections throughout the development. Ground-floor units should provide a clear transition from the public realm to the private dwellings.</p>	<p>As designed, a connected system of walkways would provide safe and convenient access to and through the site. On-site parking would be distributed around the building to minimize walking distances to building entrances, with a connected walkway around the entire building.</p>

**Table 12-d**  
**Design Guidelines—Multifamily Housing**

Design Element	Guideline	Findings
<p><b>4. Vehicle and Bicycle Parking</b></p>	<p>Vehicle parking should be integrated into the site in a manner that does not detract from the design of the building, the street frontage, or the site. Bicycle parking should be secure, sheltered, and conveniently located.</p>	<p>On-site vehicle parking is designed to provide safe and convenient parking for residents, visitors, and staff. Parking would be distributed around the building to minimize distances to building entrances, with staff directed to park in the furthest spaces to preserve the most convenient parking for visitors and residents.</p> <p>Bicycle parking would be provided at 2 locations on the site, one near the outdoor patio on the west side of the site and another under cover near the main visitors' entrance. A condition requiring additional bicycle parking for the independent living residents has been established, either located in a secure room(s) inside the building or at least covered and conveniently located.</p>
<p><b>5. Building Orientation and Entrances</b></p>	<p>Buildings should be located with the principal façade oriented to the street or a street-facing open space such as a courtyard. Building entrances should be well-defined and protect people from the elements.</p>	<p>The proposed building has multiple entrances, with 2 main entrances visible from Kellogg Creek Dr. The covered entrance to the memory care portion of the facility would be defined by pillars extending out from the building. Another covered entrance with a drop-off and pick-up area for residents and visitors would be located further back from the street but still prominent.</p>
<p><b>6. Building Façade Design</b></p>	<p>Changes in wall planes, layering, horizontal &amp; vertical datums, building materials, color, and/or fenestration should be incorporated to create simple and visually interesting buildings</p> <p>Windows and doors should be designed to create depth and shadows and to emphasize wall thickness and give expression to residential buildings.</p> <p>Windows should be used to provide articulation to the façade and visibility into the street.</p> <p>Building facades should be compatible with adjacent building facades.</p> <p>Garage doors shall be integrated into the design of the larger façade in terms of color, scale, materials, and building style.</p>	<p>The design utilizes various articulation elements on all sides of the building to present a visually interesting façade: varied building materials and colors, a combination of vertical and horizontal siding, ample window area, balconies and pillars, building offsets, and varied rooflines.</p>



**Table 12-d**  
**Design Guidelines—Multifamily Housing**

Design Element	Guideline	Findings
<p><b>7. Building Materials</b></p>	<p>Buildings should be constructed with architectural materials that provide a sense of permanence and high quality, incorporating a hierarchy of building materials that are durable.</p> <p>Street-facing facades should consist predominantly of a simple palette of long-lasting materials such as brick, stone, stucco, wood siding, and wood shingles.</p> <p>Split-faced block and gypsum reinforced fiber concrete (for trim elements) should only be used in limited quantities.</p> <p>Fencing should be durable, maintainable, and attractive.</p>	<p>A variety of materials and colors are proposed for the new building, using a hierarchy of materials to define the different portions and stories of the building. High-quality, durable materials are proposed.</p>
<p><b>8. Landscaping</b></p>	<p>Landscaping should be used to provide a canopy for open spaces and courtyards, and to buffer the development from adjacent properties. Existing, healthy trees should be preserved whenever possible. Landscape strategies that conserve water should be included. Hardscapes should be shaded where possible, as a means of reducing energy costs (heat island effect) and improving stormwater management.</p>	<p>Landscaping is proposed throughout the development: in planting areas around the building itself, the memory care courtyard, perimeter buffers adjacent to parking areas, stormwater facilities around the site, and both sides of the driveway on Kellogg Creek Dr. The western half of the site is a natural resource area, with a large wetland and mature Oregon oak woodland, and Mount Scott Creek and its riparian corridor runs through the northern portion of the site. Much of the existing vegetation within the site's natural resource areas would remain, with additional native plantings as mitigation for the project's impacts to natural resources.</p>
<p><b>9. Screening</b></p>	<p>Mechanical equipment, garbage collection areas, and other site equipment and utilities should be screened so they are not visible from the street and public or private open spaces. Screening should be visually compatible with other architectural elements in the development.</p>	<p>As proposed, a generator would be located near the outdoor patio at the northwest corner of the building, far from Kellogg Creek Dr. A trash/recycling storage area would be located next to the generator and enclosed with materials similar in color to the main building. Heating, ventilation, and air conditioning (HVAC) equipment would be roof-mounted in such a way as to minimize visibility from surrounding properties.</p>

**Table 12-d**  
**Design Guidelines—Multifamily Housing**

Design Element	Guideline	Findings
<b>10. Recycling Areas</b>	Recycling areas should be appropriately sized to accommodate the amount of recyclable materials generated by residents. Areas should be located such that they provide convenient access for residents and for waste/recycling haulers. Recycling areas located outdoors should be appropriately screened or located so they are not prominent features viewed from the street.	Recycling would be located within the trash enclosure described above. A loading area near these enclosures would allow for safe and convenient collection without disrupting traffic on the perimeter loop road. Staff would collect recyclable materials from residents inside the main building and take them to the enclosed storage area outside.
<b>11. Sustainability</b>	Development should optimize energy efficiency by designing for building orientation for passive heat gain, shading, day-lighting, and natural ventilation. Sustainable materials, particularly those with recycled content, should be used whenever possible. Sustainable architectural elements should be incorporated to increase occupant health and maximize a building's positive impact on the environment. When appropriate to the context, buildings should be placed on the site giving consideration to optimum solar orientation. Methods for providing summer shading for south-facing walls, and the implementation of photovoltaic systems on the south-facing area of the roof, are to be considered.	As proposed, the main residential wing of the new building would be oriented along an east-west access that provides the opportunity for passive solar heat gain, daylighting, and natural ventilation for many of the residential units. The other portion of the building would be oriented horizontally and vertically to maximize sun exposure into the memory care courtyard and adjacent unit windows.  The proposed building would incorporate various sustainable design elements, including wood-framed construction using products sourced within 500 miles of the site. HVAC systems and lighting are anticipated to exceed base energy code standards and earn incentives for energy efficiency.
<b>12. Privacy Considerations</b>	Development should consider the privacy of, and sight lines to, adjacent residential properties, and should be oriented and/or screened to maximize the privacy of surrounding residences.	The large distances separating the proposed new building from adjacent properties and roadways, as well as trees planted along the Kellogg Creek Dr frontage, would provide adequate privacy for surrounding residences.
<b>13. Safety</b>	Development should be designed to maximize visual surveillance, create defensible spaces, and define access to and from the site. Lighting should be provided that is adequate for safety and surveillance, while not imposing lighting impacts to nearby properties. The site should be generally consistent with the principles of Crime Prevention Through Environmental Design (CPTED): <ul style="list-style-type: none"> <li>• Natural Surveillance</li> <li>• Natural Access Control</li> <li>• Territorial Reinforcement</li> </ul>	The proposed perimeter loop drive surrounding the new facility would be lit to ensure adequate safety and surveillance. Ground-floor windows on all building faces would provide additional eyes on the grounds. Connected, illuminated pedestrian walkways would provide direct connections between parking areas and building entrances. Outdoor gathering spaces would be located close to the building for enhanced surveillance. All building entrances would be access-controlled, and access to the overall site would be limited to a single point from Kellogg Creek Dr, with visitor check-in required at the main entrance.

*The Planning Commission finds that, as conditioned, the proposed development is consistent with the design guidelines for multifamily housing as established in MMC 19.505.3. See Findings 15 and 16 for more discussion about the consideration of these guidelines as part of the associated CSU and conditional use review, respectively.*

*As conditioned, the Planning Commission finds that the applicable standards of MMC 19.500 are met.*

13. MMC Chapter 19.600 Off-Street Parking and Loading

MMC 19.600 regulates off-street parking and loading areas on private property outside the public right-of-way. The purpose of these requirements includes providing adequate space for off-street parking, minimizing parking impacts to adjacent properties, and minimizing environmental impacts of parking areas.

a. MMC Section 19.602 Applicability

MMC 19.602 establishes the applicability of the provisions of MMC 19.600, and MMC Subsection 19.602.3 establishes thresholds for full compliance with the standards of MMC 19.600. Development of a vacant site is required to provide off-street parking and loading areas that conform fully to the requirements of MMC 19.600.

*The proposed development consists of 170 units of senior housing on a vacant site and is required to conform fully to the requirements of MMC 19.600.*

*The Planning Commission finds that the provisions of MMC 19.600 are applicable to the proposed development.*

b. MMC Section 19.605 Vehicle Parking Quantity Requirements

MMC 19.605 establishes standards to ensure that development provides adequate vehicle parking (off-street) based on estimated parking demand. MMC Subsection 19.605.2 establishes a process for determining parking requirements when a use is not listed in MMC Table 19.605.1 or if the applicant seeks a modification from the minimum required or maximum allowed quantities as listed in the table. MMC Subsection 19.605.2 C.1. provides the approval criteria for granting a parking determination, including a demonstration that the proposed parking quantities are reasonable based on (1) existing parking demand for similar use in other locations; (2) quantity requirements from other jurisdictions; and (3) professional literature.

In addition, the subsection requires that requests for modifications to decrease the amount of minimum required parking shall demonstrate: (a) that the use of transit, parking demand management programs, and/or special characteristics of the site users will reduce expected vehicle use and parking space demand for the proposed use or development, as compared with the standards in Table 19.605.1; (b) that the reduction of off-street parking will not adversely affect available on-street parking; and (c) that the requested reduction is the smallest reduction needed based on the specific circumstances of the use and/or site.

*The proposed senior housing development includes 78 independent living suites, 60 assisted living suites, and 32 memory care suites. The independent and assisted living units are considered by the City's zoning code to be senior and retirement housing, while the memory care units are a nursing and convalescent facility. Of the senior and retirement housing units, 70 are 800 sq ft or less in floor area and 68 are more than 800 sq ft.*

*As per MMC Table 19.605.1, the minimum number of required off-street parking spaces for senior and retirement housing is 1 space per unit for units 800 sq ft or less and 1.25 spaces per unit for units more than 800 sq ft. The maximum number of spaces allowed for senior and retirement housing is 2 spaces per unit, regardless of size. For nursing, convalescent, and extended-care facilities, the minimum number of required spaces is 1 space per 4 beds; the maximum allowed is 1 space per 3 beds. According to MMC Table 19.605.1, the proposed development should provide a minimum of 163 spaces and would have a maximum of 287 spaces allowed.*

*The applicant has asserted that the requirements of MMC Table 19.605.1 are not appropriate for the type of facility represented by the proposed development and has provided a parking assessment prepared by Charbonneau Engineering [for a nearly identical Bonaventure project in Vancouver, WA](#). Citing data on existing parking demand for similar uses in other locations, quantity requirements from other jurisdictions, and a description of factors specific to the proposed use, the applicant's submittal asserts that the proposed senior housing development would have significantly lower parking demand than typical residential uses. Generally, no more than 50% of independent living residents drive and maintain a vehicle on site, while none of the assisted living or memory care residents would have vehicles. Taking into account the demands for staff and visitor parking and drawing from comparisons with other similar facilities in the region, the applicant has asserted that a minimum ratio of 0.70 spaces per unit and a maximum ratio of 0.90 spaces per unit is appropriate for the proposed type of development. For the specific proposed senior housing development, the application of these ratios would result in a minimum parking requirement of 119 spaces and a maximum allowance of 153 spaces. As proposed, the senior housing facility would provide 139 spaces, which falls within that range. The applicant's analysis suggests that the proposed ratios represent a reasonable and adequate standard that would not adversely impact on-street parking.*

*The Planning Commission finds that the proposed parking modification (minimum ratio of 0.70 spaces per unit and maximum ratio of 0.90 spaces per unit) is adequate based on the applicant's assessment. Therefore, the applicant's calculation of a minimum of 119 spaces and a maximum of 153 spaces is adequate for the proposed development, with the proposal to provide 139 spaces falling within that range. This standard is met.*

c. MMC Section 19.606 Parking Area Design and Landscaping

MMC 19.606 establishes standards for parking area design and landscaping, to ensure that off-street parking areas are safe, environmentally sound, and aesthetically pleasing, and that they have efficient circulation.

(1) MMC Subsection 19.606.1 Parking Space and Aisle Dimension

MMC 19.606.1 establishes dimensional standards for required off-street parking spaces and drive aisles. For 90°-angle spaces, the minimum width is 9 ft and minimum depth is 18 ft, with a 9-ft minimum curb length and 22-ft drive aisles. Parallel spaces require with 22-ft lengths and a width of 8.5 ft.

*The applicant has submitted a parking plan that satisfies these dimensional standards.*

(2) MMC Subsection 19.606.2 Landscaping

MMC 19.606.2 establishes standards for parking lot landscaping, including for perimeter and interior areas. The purpose of these landscaping standards is to provide buffering between parking areas and adjacent properties, break up large expanses of paved area, help delineate between parking spaces and drive aisles, and provide environmental benefits such as stormwater management, carbon dioxide absorption, and a reduction of the urban heat island effect.

(a) MMC Subsection 19.606.2.C Perimeter Landscaping

In all but the downtown zones, perimeter landscaping areas must be at least 6 ft wide where abutting other properties and at least 8 ft wide where abutting the public right-of-way. At least 1 tree must be planted for every 40 lineal ft of landscaped buffer area, with the remainder of the buffer planted with grass, shrubs, ground cover, mulch, or other landscaped treatment. Parking areas adjacent to residential uses must provide a continuous visual screen from 1 to 4 ft above the ground to adequately screen vehicle lights.

*For the proposed off-street parking and maneuvering layout, perimeter landscaping is required between the perimeter loop road and Kellogg Creek Dr, between the eastern parking area adjacent to the church parking lot, and adjacent to the perimeter loop road near the northwest corner of the church property and adjacent to the ROW of Rusk Rd and OR 224. As proposed, the landscaping plan (Sheet L100) shows a deficiency of tree planting in the perimeter area in the northeast corner of the subject property. Otherwise, the landscaping plan provides adequate perimeter buffer dimensions and plantings as required. A condition has been established to require revision of the landscaping plan to provide the minimum spacing of trees in the perimeter buffer.*

*As conditioned, this standard is met.*

(b) MMC Subsection 19.606.2.D Interior Landscaping

At least 25 sq ft of interior landscaped area are required for each parking space. Planting areas must be at least 120 sq ft in area, at least 6 ft in width, and dispersed throughout the parking area. For landscape islands, at least 1 tree shall be planted per island, with the remainder of the buffer planted with grass, shrubs, ground cover, mulch, or other landscaped treatment.

*The proposed development includes 139 parking spaces, for which a minimum of 3,475 sq ft of interior landscaping is required. As proposed, the site plan provides approximately 5,345 sq ft of interior landscaping, well over the minimum required. All interior landscaped areas are at least 120 sq ft in size and are disbursed throughout the various parking areas on the site.*

*This standard is met.*

(c) MMC Subsection 19.606.2.E Other Parking and Landscaping Provisions

Preservation of existing trees in off-street parking areas is encouraged and may be credited toward the total number of trees required. Parking area landscaping must be installed prior to final inspection, unless a performance bond is posted with the City. Required landscaping areas may serve as stormwater management facilities, and pedestrian walkways are allowed within landscape buffers if the buffer is at least 2 ft wider than required by MMC 19.606.2.C and 19.606.2.D.

*The plans submitted show that the proposed site work does not allow for the preservation of any existing trees any parking areas. Proper and complete installation of landscaping will be confirmed as part of the subsequent Development Review and final inspection. No pedestrian walkways are proposed within the parking lot landscaping.*

*This standard is met.*

*As conditioned, the Planning Commission finds that the applicable standards of MMC 19.606.2 are met.*

(3) MMC Subsection 19.606.3 Additional Design Standards

MMC 19.606.3 establishes various design standards, including requirements related to paving and striping, wheel stops, pedestrian access, internal circulation, and lighting.

(a) MMC Subsection 19.606.3.A Paving and Striping

Paving and striping are required for all required maneuvering and standing areas, with a durable and dust-free hard surface and striping to delineate spaces and directional markings for driveways and accessways.

*The plans submitted indicate that all parking areas will be paved and striped.*

*This standard is met.*

(b) MMC Subsection 19.606.3.B Wheel Stops

Parking bumpers or wheel stops are required to prevent vehicles from encroaching onto public rights-of-way, adjacent landscaped areas, or pedestrian walkways. Curbing may substitute for wheel stops if vehicles will not encroach into the minimum required width for landscape or pedestrian areas.

*The applicant's narrative indicates that wheel stops will be installed to prevent vehicles from encroaching into pedestrian walkways and perimeter landscaping areas. This requirement will be confirmed as part of the subsequent Development Review and final inspection.*

*This standard is met.*

(c) MMC Subsection 19.606.3.C Site Access and Drive Aisles

Accessways to parking areas shall be the minimum number necessary to provide access without inhibiting safe circulation on the street. Drive aisles shall meet the dimensional requirements of MMC 19.606.1, including a 22-ft minimum width for drive aisles serving 90°-angle stalls and a 16-ft minimum width for drive aisles not abutting a parking space. Along collector and arterial streets, no parking space shall be located such that its maneuvering area is in an ingress or egress aisle within 20 ft of the back of the sidewalk. Driveways and on-site circulation shall be designed so that vehicles enter the right-of-way in a forward motion.

*The proposed development will take access from a driveway on Kellogg Creek. The proposed drive aisles meet the minimum applicable dimensional requirements and are designed so that vehicles enter the ROW in a forward motion.*

*This standard is met.*

(d) MMC Subsection 19.606.3.D Pedestrian Access and Circulation

Pedestrian access shall be provided so that no off-street parking space is farther than 100 ft away, measured along vehicle drive aisles, from a building entrance or a walkway that is continuous, leads to a building entrance, and meets the design standards of MMC Subsection 19.504.9.E.

*As proposed, no off-street parking space is farther than 100 ft away from a building entrance or walkway that meets the standards of this subsection.*

*This standard is met.*

(e) MMC Subsection 19.606.3.E Internal Circulation

The Planning Director has the authority to review the pedestrian, bicycle, and vehicular circulation of the site and impose conditions to ensure safe and efficient on-site circulation. Such conditions may include, but are not limited to, on-site signage, pavement markings, addition or modification of curbs, and modification of drive aisle dimensions.

*The Planning Director has reviewed the proposed circulation plan and concluded that it provides safe and efficient on-site circulation.*

*This standard is met.*

(f) MMC Subsection 19.606.3.F Lighting

Lighting is required for parking areas with more than 10 spaces and must have a cutoff angle of 90° or greater to ensure that lighting is directed toward the parking surface. Lighting shall not cause a light trespass of more than 0.5 footcandles measured vertically at the boundaries of the site and shall provide a minimum illumination of 0.5 footcandles for pedestrian walkways in off-street parking areas.

*The applicant's submittal does not include lighting details for the parking area, but it acknowledges that sufficient detail will be provided as part of the building permit review process. A condition has been established to ensure that this standard is met.*

*As conditioned, this standard is met.*

*As conditioned, the Planning Commission finds that the applicable standards of MMC 19.606.3 are met.*

*As conditioned, the Planning Commission finds that the applicable design and landscaping standards of MMC 19.606 are met.*

d. MMC Section 19.608 Loading

MMC 19.608 establishes standards for off-street loading areas and empowers the Planning Director to determine whether loading spaces are required. For residential development with fewer than 50 dwelling units on a site that abuts a local street, no loading space is required; otherwise, 1 space is required. Loading spaces shall be at least 35 ft long and 10 ft wide, with a height clearance of 13 ft, and located where not a hindrance to drive aisles or walkways.

*The proposed senior housing development includes 170 units, so 1 loading space is required. As proposed, 1 loading space is provided as a pull-out along the perimeter loop road, west of the outdoor patio and gazebo area. The loading space is situated with no height obstructions and meets the minimum required length of 35 ft; a condition has been established to ensure that the loading space will provide the minimum width of 10 ft.*

*As conditioned, the Planning Commission finds that this standard is met.*

e. MMC Section 19.609 Bicycle Parking

MMC 19.609 establishes standards for bicycle parking for new development of various uses. Unless otherwise specified, the number of bicycle spaces provided shall be at least 10% of the minimum required vehicle parking for the use. When at least 10 bicycle spaces are required, a minimum of 50% of the spaces shall be covered and/or enclosed. MMC Subsection 19.609.3.A provides that each bicycle parking space shall have minimum dimensions of 2 ft by 6 ft, with 5-ft-wide aisles for maneuvering. MMC Subsection 19.609.4 requires bike racks to be located within 50 ft of a main building entrance.

*As per the parking modification discussed in Finding 13-b, the proposed senior housing development requires a minimum of 119 vehicle spaces, which equals a minimum of 12 bicycle*



*spaces required. A total of 14 bicycle spaces are proposed, with 7 spaces on the west side of the site near the outdoor patio area and 7 covered spaces closer to the main entrance to the building on the east side of the site. The submitted plans do not include details of the bike stall dimensions, so a condition has been established to require more detailed information sufficient to determine that the applicable standards are met.*

*As conditioned, the Planning Commission finds that this standard is met.*

f. MMC Section 19.610 Carpool and Vanpool Parking

MMC 19.610 establishes carpool parking standards for new industrial, institutional, and commercial development. The number of carpool/vanpool parking spaces shall be at least 10% of the minimum amount of required parking spaces. Carpool/vanpool spaces shall be located closer to the main entrances of the building than other employee or student parking, except ADA spaces and shall be clearly designated with signs or pavement markings for use only by carpools/vanpools.

*The proposed development is a form of institution, so this standard is applicable. As per the parking modification discussed in Finding 13-b, the proposed senior housing development requires a minimum of 119 vehicle spaces, which equals a minimum of 12 carpool/vanpool spaces required. No carpool/vanpool spaces have been proposed, so a condition has been established to require revisions to the applicable plans to ensure that at least 12 carpool/vanpool spaces are provided in accordance with this section.*

*As conditioned, the Planning Commission finds that this standard is met.*

*As conditioned, the Planning Commission finds that the proposed development meets all applicable standards of MMC 19.600.*

14. MMC Chapter 19.700 Public Facility Improvements

MMC 19.700 is intended to ensure that development, including redevelopment, provides public facilities that are safe, convenient, and adequate in rough proportion to their public facility impacts.

a. MMC Section 19.702 Applicability

MMC 19.702 establishes the applicability of the provisions of MMC 19.700, including new construction.

*The applicant proposes to develop a senior housing facility on a vacant site. The proposed new construction triggers the requirements of MMC 19.700.*

b. MMC Section 19.703 Review Process

MMC 19.703 establishes the review process for development that is subject to MMC 19.700, including requiring a preapplication conference, establishing the type of application required, and providing approval criteria.

*The applicant had a preapplication conference with City staff on September 6, 2018, prior to application submittal. The proposed development triggers a Transportation Impact Study (as addressed in Finding 14-c). The proposal's compliance with MMC 19.700 has been evaluated*

*through a concurrent Transportation Facilities Review application. Finding 14-f addresses the proposal's compliance with the approval criteria established in MMC Subsection 19.703.3, particularly the required transportation facility improvements.*

c. MMC Section 19.704 Transportation Impact Evaluation

MMC 19.704 establishes the process and requirements for evaluating development impacts on the surrounding transportation system, including determining when a formal Transportation Impact Study (TIS) is necessary and what mitigation measures will be required.

*The proposed development will trigger a significant increase in trip generation above the existing church use on a portion of the site and therefore requires a TIS. City Engineering staff and the City's on-call traffic consultant (DKS) provided the applicant with a scope of work for the TIS. Kittleson & Associates, the applicant's traffic consultant, prepared the TIS that was included with the applicant's larger submittal for the proposed senior housing development.*

*The TIS concluded that the proposed development does not trigger mitigation of impacts beyond the proposed frontage improvements and bicycle facility, for which conditions of approval have been established. The TIS also concluded that the surrounding transportation system would continue to operate at the same level of service as before the proposed development. The TIS recommended extension of the northbound right-turn lane on Rusk Rd at the OR 224 intersection to provide greater capacity for vehicle queuing and alleviate existing congestion.*

*As submitted, the applicant's TIS, including required mitigation measures, is sufficient to meet the requirements of MMC 19.704.*

d. MMC Section 19.705 Rough Proportionality

MMC 19.705 requires that transportation impacts of the proposed development be mitigated in proportion to its potential impacts.

*The TIS concluded that no mitigation measures are required beyond the proposed frontage improvements and bicycle facility. The TIS did recommend extension of the northbound right-turn lane on Rusk Rd at the OR 224 intersection to provide greater capacity for vehicle queuing and alleviate existing congestion. The City has requested that the applicant construct the recommended right-turn lane extension to reduce congestion; because the extension is not a requirement of the TIS, it is eligible for system development charges (SDC) credits. The cost of construction and engineering of the right turn lane will be offset by a reduction of the transportation SDCs on the associated building permit.*

*As proposed, mitigation for the transportation impacts of the proposed development is consistent with MMC 19.705.*

e. MMC Section 19.707 Agency Notification and Coordinated Review

MMC 19.707 establishes provisions for coordinating land use application review with other agencies that may have some interest in a project that is in proximity to facilities they manage.

*The application was referred to the Oregon Department of Transportation (ODOT), Clackamas County Department of Transportation and Development (DTD), TriMet, and Metro for comment. The sections of Kellogg Creek Dr and Rusk Rd fronting the subject property are under the jurisdiction of Clackamas County. The County has regulatory authority where transportation impacts and improvement standards are concerned, and the County DTD provided comments that have been incorporated into these findings and the associated conditions of approval.*

f. MMC Section 19.708 Transportation Facility Requirements

MMC 19.708 establishes the City’s requirements and standards for improvements to public streets, including pedestrian, bicycle, and transit facilities. However, the subject property’s public street frontages are along Kellogg Creek Dr and Rusk Rd, which are currently under the jurisdiction of Clackamas County. The County DTD provided comments on the application, with recommended findings and conditions that address the County’s requirements for such elements as access management, clear vision, street design, and bicycle and pedestrian facilities. Those comments have been incorporated into these findings as appropriate.

(1) MMC Subsection 19.708.1 General Street Requirements and Standards

MMC 19.708.1 provides general standards for streets, including for access management, clear vision, street layout and connectivity, and intersection design and spacing.

*As proposed, the development is consistent with the applicable standards of MMC 19.708.1.*

(2) MMC Subsection 19.708.2 Street Design Standards

MMC 19.708.2 provides design standards for streets, including dimensional requirements for the various street elements (e.g., travel lanes, bike lanes, on-street parking, landscape strips, and sidewalks).

*The proposed cross section for Kellogg Creek Dr conforms to applicable requirements and are consistent with MMC 19.708.2. As required, street trees shall be planted at an average spacing of 40 ft.*

(3) MMC Subsection 19.708.3 Sidewalk Requirements and Standards

MMC 19.708.3 provides standards for public sidewalks, including the requirement for compliance with applicable standards of the Americans with Disabilities Act (ADA).

*The proposed development includes ADA ramps at all corners as required. To complete the required sidewalk connection along the subject property’s Kellogg Creek Dr frontage*

*and avoid impacts to the mature Oregon oak woodland in the southwest corner of the site, the applicant has proposed to install a mid-block crossing from new sidewalk on the north side of the street to the existing sidewalk on the south side. A condition has been established to ensure that the existing south-side sidewalk will conform to current ADA standards.*

*As conditioned, the development is consistent with all applicable standards of MMC 19.708.3.*

(4) MMC Subsection 19.708.4 Bicycle Facility Requirements and Standards

MMC 19.708.4 provides standards for bicycle facilities, including a reference to the Public Works Standards.

Per Milwaukie’s Transportation System Plan (TSP), a bike lane is required connecting the northeast corner of the property to the southwest corner of the property.

*The applicant has proposed to construct a 5-ft-wide bicycle path along the Rusk Rd frontage of the senior housing development and adjacent church, extending from the intersection with OR 224 to the intersection with Kellogg Creek Dr and transitioning to an on-street bike lane on Kellogg Creek Dr. As proposed, the bike path would be located within Clackamas County ROW for a portion of its extent nearest the OR 224 intersection but would transition to a public access easement on the church property for most of its length and would serve as a facility for two-way bicycle traffic along that section of Rusk Rd.*

*The County DTD has provided comments related to the proposed bike path, noting that, in order to comply with the applicable requirements of the Clackamas County Roadway Standards (which are consistent with the City’s Public Works Standards for bicycle facilities), it shall be designed to accommodate two-way bike traffic, with a minimum width of 10 ft. The City of Milwaukie shall maintain the path and shall enter into an intergovernmental agreement (IGA) with the County. The path shall extend to a point west of the bulb-out and ramp down to the pavement of Kellogg Creek Dr. A design shall be provided for eastbound bikes on Kellogg Creek Dr to safely cross to the north side of the road and enter the bike path at or prior to the Kellogg Creek Dr intersection with Rusk Rd. The County’s recommended conditions have been established to ensure that the bicycle facilities provided by the proposed development are consistent with the applicable County standards and the City’s Public Works Standards.*

*As conditioned, the development is consistent with all applicable standards of MMC 19.708.4.*

(5) MMC Subsection 19.708.5 Pedestrian/Bicycle Path Requirements and Standards

MMC 19.708.5 provides standards for pedestrian and bicycle paths.

*As discussed in Finding 12-c, the proposed development includes 2 pedestrian connections between the proposed senior housing facility and Kellogg Creek Dr. The*

*applicant has requested a variance for relief from the requirement to provide a pedestrian connection to Rusk Rd; this variance is discussed in Finding 17.*

*As proposed, and as per the variance approved in Finding 17, the development is consistent with all applicable standards of MMC 19.708.5.*

(6) MMC Subsection 19.708.6 Transit Requirements and Standards

MMC 19.708.6 provides standards for transit facilities.

*The portion of Kellogg Creek Dr fronting the proposed development is classified as a transit route in the Milwaukie TSP. However, transit facilities are already in place. As a result, transit facility improvements are not required for the proposed development.*

*As proposed, the development is consistent with all applicable standards of MMC 19.708.6.*

*Conditions have been established to ensure that the proposed development will meet all applicable standards of MMC 19.708, the Clackamas County Roadway Standards, and any other applicable City or County requirements.*

*As conditioned, the Planning Commission finds that the proposed development meets the applicable public facility improvement standards of MMC 19.700.*

15. MMC Section 19.904 Community Service Uses

MMC 19.904 provides standards and procedures for review of applications for community service uses (CSUs). These are uses that are not specifically allowed outright in most zoning districts but that address a public necessity or otherwise provide some public benefit. CSUs include nursing and convalescent homes. MMC Subsection 19.904.3 provides that the establishment of a new CSU shall be evaluated through a Type III review per Section 19.1006.

*The memory care aspect of the proposed senior housing development is similar to a nursing or convalescent home and so is subject to Type III review as a CSU.*

a. MMC Subsection 19.904.4 Approval Criteria

MMC Subsection 19.904.4 provides the following approval criteria for establishment of a new CSU:

- (1) The building setback, height limitation, and off-street parking and similar requirements governing the size and location of development in the underlying zone are met. Where a specific standard is not proposed for a CSU, the standards of the underlying zone must be met.

*As proposed, and as discussed in Finding 10, the applicable standards of the underlying R-10 and R-3 zones are met, except where those standards are superseded by the specific standards for nursing and convalescent homes as provided in MMC Subsection 19.904.8 and as discussed in Finding 15-a(2).*

*The Planning Commission finds that this standard is met.*

- (2) Specific standards for the proposed uses as found in MMC Subsections 19.904.7-11 are met.

The standards of MMC Subsection 19.904.8 for nursing and convalescent homes are applicable to the memory care aspect of the proposed senior housing development and include the following requirements:

- (a) Public services must be adequate to serve the facility.

*Existing water (provided by Clackamas River Water), sewer (provided by Clackamas County Water Environment Services), and public street facilities (currently under the jurisdiction of Clackamas County) are available in the Kellogg Creek Dr ROW to serve the proposed development.*

- (b) Facilities will access on arterial or collector streets.

*As proposed, primary access to the senior housing development is from Kellogg Creek Dr, a local street. The applicant has requested a variance for relief from this requirement—see Finding 17 for a discussion in support of the variance.*

- (c) Setbacks must be the greater of 25 ft or the setback of an adjacent residential zone or of the underlying zone.

*The largest setbacks for the underlying and/or adjacent R-10 and R-3 zones are 20 ft and 15 ft, respectively. As proposed, the new building would be at least 25 ft from any property line.*

- (d) Maximum height shall not exceed 45 ft.

*The portion of the proposed senior housing development that contains the memory care units would be 1 story (less than 11 ft) in height.*

- (e) Buffering of noise and light from adjacent streets and between adjacent properties may be required.

*The City received a public comment requesting that no noise-generating equipment be allowed for the proposed development, due to existing noise pollution from existing roadways and industry in the area. To limit additional noise impacts, a condition has been established to require that any outdoor mechanical equipment be adequately sound-buffered to ensure that noise levels remain within the permissible levels established in MMC Section 8.08.090.*

- (f) Sites which could cause hazard to disoriented patients through proximity to heavily traveled streets, water hazards, or ravines or steep slopes shall not be approved unless the applicant can satisfy the commission that safety measures will be used to prevent injury to patients.

*As proposed, the memory care portion of the senior housing facility would be in a secure portion of the larger building, locked at all times, and with 24-hour surveillance and restricted access. An outdoor courtyard area specifically for*

*memory care patients would be entirely enclosed by the building and would not be accessible from outside the building.*

- (g) On parcels surrounded by existing dwellings, additional conditions may be necessary to:
  - (i) Mitigate the effects of traffic caused by shift changes, particularly regarding noise at night and safety of school children in transit; and/or
  - (ii) Maintain neighborhood scale, particularly regarding size of structure, width of driveway, signs, exterior lighting, and placement of parking facilities.

*The site is not surrounded by existing dwellings, though there are existing dwellings across Kellogg Creek Dr from the site as well as to the northwest of the site across Mount Scott Creek. The proposed new building would be located in the central part of the site, buffered on the south by new landscaping and street trees and on the northwest by the open space of the natural resource area.*

*As noted in Finding 14, traffic impacts would not be significant and are mitigated by the proposed street improvements, particularly by extending the northbound right-turn lane on Rusk Rd at OR 224. As discussed in Finding 15-a(2e), and as conditioned, noise from outdoor mechanical equipment would be minimized. Although the proposed building is larger in scale than other surrounding buildings, the taller portions of the structure are set farther back from the existing residences on Kellogg Creek Dr and buffered by the open space of the natural resource area.*

*The proposed signage for the facility is relatively minimal and directed as much at traffic on OR 224 as anywhere else. As required, trespass from exterior lighting into WQR and HCA areas as well as nearby residential properties will be minimal. The proposed parking facilities are spread around the perimeter of the site by design, to avoid large parking areas and to provide more direct connections between parking and building entrances.*

*Although the proposed senior housing development is not multifamily housing, the Planning Commission finds it appropriate to consider the proposed development's consistency with the multifamily design guidelines established in MMC Table 19.505.3.D in the context of whether the proposed design maintains neighborhood scale and compatibility. As discussed in Finding 12-d, the Planning Commission finds that the proposed design is consistent with the multifamily design guidelines and no additional conditions are required beyond the ones discussed therein.*

- (h) Conversion of existing dwellings may be allowed if state codes and rules can be met and the conditions of this subsection are satisfied.

*The proposed development is new construction and would not involve the conversion of existing dwellings. This standard is not applicable.*

- (i) Off-street parking must be provided as per Chapter 19.600.

*As discussed in Finding 13, off-street parking would be provided in accordance with the standards of MMC Chapter 19.600.*

- (j) 15% of the total site is to be landscaped.

*As proposed, and as evidenced on the proposed landscaping plans (Sheet L100 and others), over 70% of the site would be landscaped or preserved as natural open space.*

*As proposed, conditioned, and/or approved by the variances discussed in Finding 17, the Planning Commission finds that the proposed development meets the applicable standards of MMC 19.904.8.*

- (3) The hours and levels of operation of the proposed use are reasonably compatible with surrounding uses.

*With full-time residents, the memory care portion of the proposed senior housing development would be staffed and in operation 24 hours a day, with visiting hours from 7:00 a.m. to 7:00 p.m. Memory care residents do not drive and would not leave the site unsupervised. Impacts to surrounding uses would be minimal.*

*The Planning Commission finds that this standard is met.*

- (4) The public benefits of the proposed use are greater than the negative impacts, if any, on the neighborhood.

*The benefits of a facility that provides quality housing, supervision, and care for people suffering from Alzheimer’s disease and other memory-related conditions are far greater than the minimal impacts, if any, on the neighborhood.*

*The Planning Commission finds that this standard is met.*

- (5) The location is appropriate for the type of use proposed.

*The proposed location is appropriate for a memory care facility, with North Clackamas Park and the Milwaukie Center providing additional outdoor activity options and senior programs adjacent to the west. The adjacent church provides an additional convenient option for worship and fellowship. The site is accessible to OR 224 and connections to downtown Milwaukie, Portland, and the larger metro area. As part of a larger senior housing development that also offers independent and assisted living options, the memory care facility is critical to providing the possibility for seniors in the community and larger region to “age in place.”*

*The Planning Commission finds that this standard is met.*

*As proposed, conditioned, and/or approved by the variances discussed in Finding 17, the Planning Commission finds that the memory care aspect of the proposed development meets the approval criteria of MMC 19.904.4 for establishing a new CSU.*

- b. MMC Subsection 19.904.5.C Minor Modifications



MMC 19.904.5.C allows the approval of a minor modification to an existing approved CSU, provided that such modification meets certain criteria.

*The proposed lot consolidation and boundary adjustment would result in the existing church property being significantly reduced in size and configuration. In addition, improvements associated with the proposed development would result in changes to site access. These changes warrant review in the context of the church's existing CSU approval; the applicant has asserted that the changes constitute only a minor modification.*

MMC 19.904.5.C establishes the following criteria for approval of a minor modification:

- (1) Does not increase the intensity of any use

*The proposed modifications would not increase the size or capacity of the existing church building, and no changes to the church's operating parameters are proposed. The changes are related to a reconfiguration of the existing driveway on Rusk Rd to prohibit exiting movements, establishment of a shared access through the new adjacent senior housing development, and a re-apportioning of perimeter landscaping between the church and the senior housing development properties.*

- (2) Meets all requirements of the underlying zone relating to building size and location and off-street parking and the standards of Title 19

*The proposed modifications related to access are consistent with the requirements of MMC Chapter 19.700 that development provide safe access to a public street. The proposed improvements to prohibit exiting movements through the Rusk Rd driveway would reduce vehicle conflicts on a Collector street and improve safety.*

*The redrawing of boundary lines would not affect the number of existing off-street parking spaces but would technically remove a large amount of landscaping from the current church property and would effectively create perimeter landscaping areas on 2 sides of the church parking lot. The R-10 zone requires a minimum of 35% of the site to be landscaped; however, the CSU standards specifically established for churches and similar institutions in MMC Subsection 19.904.9 require only 15% landscaping. On the revised church property of approximately 162,000 sq ft, the requirement is for a minimum of 24,300 sq ft of landscaping; the site would continue to provide over 30,000 sq ft.*

*In addition, MMC Subsection 19.606.2.C requires perimeter landscaping areas at least 6 ft in width between parking areas and abutting properties. Where the reconfigured church boundary results in a property line between the church parking lot and the new adjacent senior housing development, the proposed modification would provide a 6-ft perimeter landscaping buffer as required, including trees planted at 1 tree per 40 lineal feet. Where the proposed bicycle path along the church's Rusk Rd frontage might result in the removal of some existing trees that currently keep the church parking lot in conformance with the perimeter planting standards of MMC 19.606.2.C, a condition has been established to require replacement as necessary.*

- (3) Does not result in deterioration or loss of any protected natural feature or open space, and does not negatively affect nearby properties

*The proposed modifications to the church property do not affect any protected natural feature or open space and would not negatively affect any nearby properties.*

- (4) Does not alter or contravene any conditions specifically placed on the development by the Planning Commission or City Council

*The church property was annexed into the city limits in 1981 (land use file #A-80-07).*

*In 1983, use of the site for pasture land and grazing for horses was approved as a conditional use (file #C-83-08); however, the conditional use application was subsequently withdrawn.*

*The site was approved as a CSU for church use by the Milwaukie Assembly of God in 1984 (file #CS-84-02). Conditions of approval included requirements to provide plans for landscaping, public facilities, and exterior lighting, as well as a traffic study and right-of-way dedication along Rusk Rd and Kellogg Creek Dr.*

*In 1987, the City Council approved a zone change for the western portion of the property, from R-10 to R-3, along with a conditional use approval for senior housing and an amendment to the Comprehensive Plan map (file #CPA-87-01, ZC-87-05, CU-87-05, with Ordinance #1639). The senior housing project (called Parkside Village) was never developed.*

*In 1992, the City approved a 5,500-sq-ft addition to the church building (file #CSO-92-03, NR-92-01). Conditions of approval included requirements to install the approved landscaping and to direct lighting away from the designated natural resource area.*

*In 1997, the Planning Commission denied a sign permit request to locate an electronic reader board sign on the property near the intersection of Highway 224 and Rusk Rd (file #SP-97-01).*

*The proposed modifications do not alter or contravene any conditions specifically placed on the development by the Planning Commission or City Council.*

- (5) Does not cause any public facility, including transportation, water, sewer and storm drainage, to fail to meet any applicable standards relating to adequacy of the public facility

*The proposed modifications to the church property include improvements to the existing driveway on Rusk Rd, which would prohibit exiting movements and reduce vehicle conflicts on Rusk Rd, a Collector street. For exiting movements, the church would share access through the adjacent senior housing development site to the driveway on Kellogg Creek Dr. Although the County DTD has recommended that the existing driveway be closed, the modifications to the church property related to the proposed senior housing development do not increase the intensity of the existing church use and are minor in nature, so the recommended driveway closure is not warranted.*

*A new bicycle path would be constructed in a public easement on the church property along its Rusk Rd frontage; as conditioned, the proposed path would be widened to provide for safe two-way travel. No other public facilities would be affected by the proposed modifications or would fail to meet any applicable standards related to adequacy.*

*As conditioned, the Planning Commission finds that the proposed minor modification to church's existing CSU approval meets the approval criteria of MMC 19.904.5.C.*

*As conditioned, the Planning Commission finds that the proposed senior housing development is approvable as a new CSU and that the proposed changes to the adjacent church use are approvable as a minor modification to the church's existing CSU approval.*

16. MMC Section 19.905 Conditional Uses

MMC 19.905 establishes a process for evaluating certain uses that may be appropriately located in some zoning districts, if appropriate for the specific site on which they are proposed. Although conditional uses may provide needed services or functions in the community, they are subject to conditional use review because they may adversely change the character of an area or adversely impact the environment, public facilities, or adjacent properties. The conditional use review process allows for the establishment of conditional uses when they have minimal impacts or when identified impacts can be mitigated through conditions of approval. The review process also allows for denial when concerns cannot be resolved or impacts cannot be mitigated.

Approval of a conditional use shall not constitute a zone change and shall be granted only for the specific use requested. Approval is subject to such modifications, conditions, and restrictions as may be deemed appropriate by the review authority.

MMC Subsection 19.905.2.A provides that the provisions of Section 19.905 apply to uses identified as a conditional use in the base zone in Chapter 19.300. MMC Subsection 19.905.3.A provides that the establishment of a new conditional use shall be evaluated through a Type III review per Section 19.1006.

*The proposed senior housing development includes independent living units and assisted living units, which fit the definition of "senior and retirement housing" established in MMC Section 19.201. Senior and retirement housing is listed as an allowed use with conditional use review in both the R-10 and R-3 zones. As such, the proposal to establish a new senior housing facility with a senior and retirement housing component is subject to Type III review as a conditional use.*

a. MMC Subsection 19.905.4 Approval Criteria

MMC Subsection 19.905.4.A establishes the following approval criteria for establishment of a new conditional use:

- (1) The characteristics of the lot are suitable for the proposed use considering size, shape, location, topography, existing improvements, and natural features.

*The site for the proposed senior housing development is large (almost 14 acres) and generally flat within 2 different elevation levels. Mount Scott Creek runs across the*

*northern portion of the property and a large wetland and mature Oregon oak woodland occupy the western and southwestern portions of the site, respectively. WQR and HCA designations overlay these natural resource areas, and the 100-year floodplain extends through the low-lying riparian and wetland areas. As proposed, the new development would be located in the central and eastern part of the site and would largely avoid impacts to the WQR and HCA, as discussed in Finding 11.*

*The large lot size allows the new multistory building to be set back from the nearest existing residences across Kellogg Creek Dr to the south, especially where the height increases to 3 and 4 stories. The protected natural areas are an aesthetic and ecological amenity for residents, visitors, and neighbors and provide an open-space buffer for the neighborhood to the northwest across Mount Scott Creek. The site's proximity to the Rusk Rd intersection with OR 224 provides an important transportation connection to other parts of Milwaukie and the surrounding region, and its location next to North Clackamas Park and the Milwaukie Center make these community resources easily available to residents of the proposed development.*

- (2) The operating and physical characteristics of the proposed use will be reasonably compatible with, and have minimal impact on, nearby uses.

*Nearby uses include existing houses and the Deerfield Village assisted living center across Kellogg Creek Dr to the south, North Clackamas Park and the Milwaukie Center adjacent to the west, a residential neighborhood across Mount Scott Creek to the northwest, and the Turning Point Church adjacent to the east. The proposed senior housing development would be in operation around the clock, with 3 shifts of employees staffing the facility and its full-time residents. Traffic at the site would generally be distributed throughout the day, with peaks at shift-change times and higher visitation periods in evenings and on weekends. The protected natural resource open space and new landscaping buffer the proposed new development from surrounding uses. The varied height, ample articulation, and quality materials provided by the building's design all contribute to an attractive building with minimized massing. The outdoor areas for residents are located so as to minimize noise, and a condition has been established to ensure that noise from outdoor mechanical equipment does not exceed the levels allowed by the City's nuisance code.*

*Although the proposed senior housing development is not multifamily housing, the Planning Commission finds it appropriate to consider the proposed development's consistency with the multifamily design guidelines established in MMC Table 19.505.3.D in the context of its operating and physical characteristics. As discussed in Finding 12-d, the Planning Commission finds that, as conditioned, the proposed design is consistent with the multifamily design guidelines.*

- (3) All identified impacts will be mitigated to the extent practicable.

*As discussed in Finding 11, impacts to the designated natural resources on the site would be mitigated with a robust planting scheme of native-species trees and shrubs within a large planting area in the WQR and HCA. Outdoor mechanical equipment*

*would be sound-buffered to minimize noise impacts. Improvements to the local street system, including an extended northbound right-turn lane on Rusk Rd at the OR 224 intersection, a bike path along the Rusk Rd frontage, adjustments to the existing church driveway on Rusk Rd, and bicycle and pedestrian facilities on Kellogg Creek Dr, would improve safety for multiple travel modes accessing the newly developed site.*

- (4) The proposed use will not have unmitigated nuisance impacts, such as from noise, odor, and/or vibrations, greater than usually generated by uses allowed outright at the proposed location.

*The proposed senior housing development would not generate noise, odors, or vibrations and greater than those resulting from other forms of residential development. A condition has been established to ensure that any noise resulting from outdoor mechanical equipment is limited to the levels allowed by the City's nuisance code.*

- (5) The proposed use will comply with all applicable development standards and requirements of the base zone, any overlay zones or special areas, and the standards in Section 19.905.

*As discussed throughout these findings, the proposed development complies with all applicable development standards and relevant requirements. The 3 elements for which the applicant has requested a variance (building height, walkway connections, and access from a collector street) are discussed and approved in Finding 17.*

- (6) The proposed use is consistent with applicable Comprehensive Plan policies related to the proposed use.

*Chapter 3 (Environmental & Natural Resources): Natural Hazards Element, Objective 1 (Floodplain) – Policies in this section are intended to protect the natural waterway function of 100-year floodplains and the lives and property of those who live along them. With the applicant's proposed revision to more accurately show the actual floodplain boundary on FEMA's floodplain map for this site, the proposed development would not impact any portion of the 100-year floodplain. As required, the applicant will provide the necessary Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) approved by FEMA prior to the issuance of building permits and final occupancy, respectively.*

*Chapter 3: Open Spaces, Scenic Areas, & Natural Resources Element, Objective 2 (Natural Resources) – Policies in this section are intended to preserve and maintain important natural habitats and vegetation, including wetlands, riparian areas, and woodlands. As discussed in Finding 11, the proposed development has been reviewed against the City's standards for natural resource protection to determine whether impacts to WQR and HCA resources on the site have been avoided, minimized, and sufficiently mitigated for. The applicant has provided technical information and analysis to justify the proposed impacts and corresponding mitigation, which the Planning Commission has reviewed with the assistance of ESA, the City's on-call natural resources consultant. The Planning Commission has determined that some adjustments*

*to the development plan are warranted to further reduce impacts, and conditions have been established accordingly.*

Chapter 4 (Land Use): Residential Land Use & Housing Element, Objective 3 (Residential Land Use: Design) – Policies in this section include those that encourage the protection of natural resource areas, preservation of existing tree coverage, and protection of existing trees during construction. As discussed in Finding 11, the proposed development is designed and conditioned to minimize impacts to the WQR and HCA resources on the site. The site layout would avoid impacts in the 100-year floodplain and preserve the mature Oregon oak woodland in the southwest corner of the site.

Chapter 4 (Land Use): Residential Land Use & Housing Element, Objective 6 (Housing Assistance) – Policies in this section include those that encourage the provision of senior housing. The proposed development would provide a high-quality living environment for seniors, with a variety of unit types (independent, assisted, and memory care) that allow residents the option to “age in place” within the community.

- (7) Adequate public transportation facilities and public utilities will be available to serve the proposed use prior to occupancy pursuant to Chapter 19.700.

*Existing water (provided by Clackamas River Water), sewer (provided by Clackamas County Water Environment Services), and public street facilities (currently under the jurisdiction of Clackamas County) are available in the Kellogg Creek Dr ROW to serve the proposed senior housing development. As discussed in Finding 14, the proposed and required street improvements would ensure that the local transportation system is adequate to handle the new impacts of the proposed development.*

*As proposed and conditioned, and as per the variances discussed and approved in Finding 17, the Planning Commission finds that the proposed senior housing development meets the approval criteria for conditional uses as established in MMC 19.905.4.A. This standard is met.*

- b. MMC Subsection 19.905.9 Standards Governing Conditional Uses

As per MMC 19.905.9, a conditional use shall comply with the standards of the base zone, and any overlay zones or special areas, in which it is located, except as these standards have been modified by the Planning Commission when authorizing the conditional use and as otherwise modified by the standards in this subsection.

- (1) MMC Subsection 19.905.9.A Yards

Additional yard width requirements may be imposed as a condition of approval to address impacts related to building height, mass, and proximity to residential land uses.

*As proposed, the new building would be over 75 ft from the front property line, between 50 ft and 90 ft from the nearest church boundaries along the eastern compound-line boundary, over 300 ft from the western boundary, and at least 140 ft from the nearest*

*portion of the rear boundary. At each of those boundaries, the adjacent feature is open space, whether public street, natural resource area, or private parking lot.*

*The Planning Commission finds that no additional yard requirements are necessary to address impacts related to building height, mass, or proximity to residential land uses.*

(2) MMC Subsection 19.905.9.B Access to Property and Building Openings

The City may limit or prohibit vehicle access from a conditional use to a residential street, and it may limit or prohibit building openings within 50 ft of residential property in a residential zone if the openings will cause glare or excessive noise or will otherwise adversely affect adjacent residential property.

*As proposed, the primary access to the senior housing development site would be through a driveway on Kellogg Creek Dr, a Local street. Due to the subject property's limited frontage on Rusk Rd and limitations related to street classification and proximity to the intersection with OR 224, access from a non-residential street is not feasible. No building openings are proposed within 50 ft of any residential property.*

*The Planning Commission finds that no additional conditions related to vehicle access or building openings are necessary to limit impacts to any adjacent property.*

(3) MMC Subsection 19.905.9.G Senior and Retirement Housing

The Planning Commission shall consider the following for consideration of proposed senior and retirement housing:

(a) Pedestrian access to transit.

*The area is currently not well served by transit, with the nearest TriMet bus stop one-half mile away and across OR 224. Despite the proposed development's provision of an improved pedestrian connection from Kellogg Creek Dr to the intersection of Rusk Rd and OR 224, the distance and highway crossing remain as significant inhibitors of transit use from the site.*

(b) Pedestrian access to convenience facilities such as grocery store, pharmacy, laundromat, park and open space, and senior activity center.

*The site is adjacent to North Clackamas Park and the Milwaukie Center (a hub of senior activities), and the proposed pedestrian connections to improved sidewalks on Kellogg Creek Dr would maintain safe access to both facilities. Unfortunately, there are no grocery stores, pharmacies, laundromats, or similar convenience facilities within reasonable walking distance of the proposed senior housing facility.*

(c) Pedestrian access to banking, churches, hospitals, and restaurants.

*With the exception of the adjacent Turning Point Church to the east, there are no other banks, churches, hospitals, or restaurants within reasonable walking distance of the proposed senior housing facility. The nearby Eastern Orthodox Church of the Annunciation to the south off Rusk Rd is set far back from the street down a*

*long driveway, and there is no sidewalk network in place that connects to Kellogg Creek Dr and the proposed development.*

(d) **Quality of project as a living environment for residents.**

*The proposed senior housing development would provide a range of services to enhance the quality of life of all residents, including a restaurant-style communal dining room, housekeeping, social programs, and medical care. Other amenities include open and covered patios, outdoor planting areas for resident use, horseshoe pits, perimeter loop road and sidewalk for on-site mobility, café, formal living room and parlor with public computers for resident use, hobby workshop, fitness center, piano lounge, beauty salon, theater for movies and special events, activity space for cooking/baking programs, and hospitality bar for meals and social functions. The independent living units are equipped with full kitchens and balconies, with on-site parking available for those who still drive their own vehicle. The memory care section of the building has its own serving kitchen, dining room, and enclosed outdoor area.*

*As discussed in Finding 13-3, the applicant has proposed to provide 14 bicycle parking spaces (a minimum of 12 are required) to serve visitors and staff. Although the proposed development is not a multifamily project and the multifamily design guidelines are not technically applicable, it is reasonable to assume that at least some of the independent living residents may have bicycles and need a place to store them. The Planning Commission finds that at least 24 more bike parking spaces be provided (to serve a minimum of 30% of the 78 independent living units) and that they should be located in a secure room(s) inside the building or at least be covered and conveniently located for residents. A condition has been established to appropriately improve the quality of the project as a living environment for residents.*

*Overall, the proposed development would provide a high-quality facility where residents could comfortably “age in place.”*

(e) **Minimizing impact on the surrounding area.**

*As discussed elsewhere in these findings, traffic impacts from the proposed development are expected to be minimal and would be mitigated by the proposed and required improvements, particularly the extended northbound right-turn lane on Rusk Rd at the OR 224 intersection. As required, exterior lighting would be designed to avoid trespass onto adjacent properties and into the WQR and HCA resources on the site. Preservation of the open space natural resource area, along with new landscaping at the driveway entrance on Kellogg Creek Dr and around the perimeter of the new building, would provide a buffer from surrounding properties. On-site parking areas are distributed around the site to minimize large hardscape surfaces. The building itself is designed with varying heights, articulation, and quality materials that would minimize building mass and present*



*an attractive façade. Noise from outdoor mechanical equipment would be minimized to be below the levels allowed by the City’s nuisance code.*

*The Planning Commission finds that no additional conditions, beyond those addressed elsewhere in these findings, are necessary for senior and retirement housing aspect of the proposed senior housing development.*

*As proposed, and as conditioned elsewhere in these findings, the Planning Commission finds that the proposed senior housing development meets the applicable standards of MMC 19.905.9.*

*As conditioned, the Planning Commission finds that the senior and retirement housing aspect of the proposed senior housing development meets the applicable standards of MMC 19.905 and is approvable as a conditional use.*

17. MMC Section 19.911 Variances

MMC Section 19.911 establishes the variance process for seeking relief from specific code sections that have the unintended effect of preventing reasonable development or imposing undue hardship.

a. MMC Subsection 19.911.2 Applicability

MMC 19.911.2 establishes applicability standards for variance requests.

Variances may be requested to any standard of MMC Title 19, provided the request is not specifically listed as ineligible in MMC Subsection 19.911.2.B. Ineligible variances include requests that result in any of the following: change of a review type, change or omission of a procedural step, change to a definition, increase in density, allowance of a building code violation, allowance of a use that is not allowed in the base zone, or the elimination of restrictions on uses or development that contain the word “prohibited.”

*The applicant has requested the following 3 variances:*

- (1) to exceed the maximum building height of the underlying R-10 and R-3 zones (2.5 stories or 35 ft) for the senior and retirement housing aspect of the proposed development;*
- (2) for relief from the requirement to provide a pedestrian walkway connection into the site for every 300 ft of frontage; and*
- (3) for relief from the requirement that nursing and convalescent homes have access form an arterial or collector street.*

*The requested variances meet the eligibility requirements established in MMC 19.911.2.*

b. MMC Subsection 19.911.3 Review Process

MMC 19.911.3 establishes review processes for different types of variances. Subsection 3-B establishes the Type II review process for limited variations to certain numerical standards. Subsection 3-C establishes the Type III review process for larger

or more complex variations to standards that require additional discretion and warrant a public hearing.

*None of the requested variances are identified in MMC 19.911.3.B as being eligible for Type II review. Therefore, the requested variances are subject to the Type III review process and the approval criteria established in MMC Subsection 19.911.4.B.*

c. MMC Subsection 19.911.4 Approval Criteria

MMC 19.911.4 establishes approval criteria for variance requests. Specifically, MMC Subsection 19.911.4.B.1 provides the following approval criteria for Type III variances where the applicant elects to utilize the Discretionary Relief Criteria:

- (1) The applicant's alternatives analysis provides, at a minimum, an analysis of the impacts and benefits of the variance proposal as compared to the baseline code requirements.

*Building Height: To minimize the building footprint and reduce impacts to the WQR and HCA resources on the site, the applicant has proposed a multistory building with sections that would be 1 story, 3 stories, and 4 stories in height. The senior and retirement housing (independent and assisted living units) would occupy the 3- and 4-story portions of the building, with a maximum height of almost 48 ft. Without increasing the height, a building of similar capacity would have a larger footprint, which would likely impact a larger portion of the WQR and HCA on site. In addition, a larger footprint would increase the walking distances between services and amenities for residents, who are senior by nature and may have some mobility issues.*

*Walkway Connection: The proposed development would provide 2 pedestrian connections to the sidewalk on Kellogg Creek Dr, where the site has nearly 650 ft of street frontage. The site also has approximately 64 ft of frontage on Rusk Rd, but a walkway connection there is not practicable. Given the proposed site layout, the required connection would traverse approximately 300 ft of open space along the perimeter of the adjacent church parking lot to connect with another walkway on the senior housing development site. With limited opportunities for surveillance from the senior housing and church properties, such a connection would not feel secure for users and would complicate the applicant's effort to promote resident safety by concentrating access to the facility in a more centralized location.*

*Access Requirement: With the approval of the proposed lot consolidation and boundary adjustment to separate the church property from the senior housing development property, the latter would have very little frontage (approximately 64 ft) on Rusk Rd, which is designated as a Collector street. That frontage is adjacent to the intersection with OR 224, so a new vehicle access along the site's Rusk Rd frontage is not allowed. Use of the shared access from the church property's Rusk Rd driveway as a primary access for the development site would increase potential conflicts with church traffic and would be limited to entrance-only movements with a exiting driveway on Kellogg Creek Dr. The proposed access on Kellogg Creek Dr, a Local street, more than meets the*

*minimum spacing requirement of 100 ft from the intersection with Rusk Rd and allows for safe access as a primary entry point to the proposed senior housing development site.*

*The Planning Commission finds that the applicant's submittal provides an adequate analysis of the impacts and benefits of the requested variances compared to the baseline requirements. This criterion is met.*

- (2) The proposed variance is determined to be both reasonable and appropriate, and it meets one or more of the following criteria:
  - (a) The proposed variance avoids or minimizes impacts to surrounding properties.
  - (b) The proposed variance has desirable public benefits.
  - (c) The proposed variance responds to the existing built or natural environment in a creative and sensitive manner.

*Building Height: The proposed height increase reduces the building footprint, resulting in fewer impacts to the designated natural resource areas on the site. Within the proposed footprint, the increased height also maintains the proposed capacity of the facility, providing more housing units for seniors in the larger community. By incorporating varied building heights instead of a uniform 4-story design, the proposed building minimizes the effect of massing on surrounding properties.*

*Walkway Connection: Eliminating the required walkway connection results in no real impacts to surrounding properties and reduces the potential for trespassing onto the site by people that have no business there.*

*Access Requirement: Allowing access to the proposed senior housing development from a Local street (Kellogg Creek Dr) instead of a Collector (Rusk Rd) responds to the existing built environment by locating the primary access to the new facility where it can meet the City's spacing standards and avoid increased impacts to the adjacent church property. The increase in vehicle trips on Kellogg Creek Dr would not result in significant impacts to the surrounding street network, particularly in light of the proposed extension of the northbound right-turn lane on Rusk Rd at the OR 224 intersection, which would alleviate existing congestion.*

*The Planning Commission finds that the requested variances are reasonable and appropriate and that each meets one or more of the criteria provided in MMC Subsection 19.911.B.1.b.*

- (3) Impacts from the proposed variance will be mitigated to the extent practicable.

*Building Height: The increased building height would be mitigated by the location of the building in the central part of the site, set more than 50 ft back from the nearest property line and generally separated further by parking, walkways, and landscaping. The preserved open space of the natural resource area on the western half of the site provides a significant buffer from adjacent properties, and the building's articulation and quality materials present an aesthetically pleasing façade.*

*Walkway Connection: The lack of a pedestrian connection from Rusk Rd across the eastern open space area of the subject property would be mitigated by a new bicycle-pedestrian path along Rusk Rd from OR 224 to Kellogg Creek Dr. That new facility would provide a more visible route to the site and would help maintain security at the senior housing facility.*

*Access Requirement: The proposed development includes street improvements on Kellogg Creek Dr that would improve the existing bicycle and pedestrian facilities there. In addition, the northbound right-turn lane on Rusk Rd at the OR 224 intersection would be extended to provide more space for queuing, which would alleviate existing congestion. The proposed driveway on Kellogg Creek Dr would be buffered by a stormwater swale and accompanying landscaping on each side, and the perimeter loop road serving the site would be more 40 ft from the street; both aspects would further reduce visual and noise impacts that might result from locating the driveway on a Local street.*

*The Planning Commission finds that the requested variances will not result in any impacts that require further mitigation.*

*As proposed, the Planning Commission finds that the requested variances meet the approval criteria established in MMC 19.911.4.B.1 for Type III variances seeking discretionary relief.*

*The Planning Commission finds that the requested variances are allowable as per the applicable standards of MMC 19.911.*

18. The application was referred to the following departments and agencies on January 15, 2019:

- Milwaukie Building Department
- Milwaukie Engineering Department
- Milwaukie Public Works Department
- Milwaukie Police Department
- City Attorney
- Lake Road Neighborhood District Association (NDA), Chairperson and Land Use Committee (LUC)
- Oak Grove Community Council
- Clackamas Fire District #1 (CFD#1)
- Clackamas County Department of Transportation and Development (DTD)
- Metro
- TriMet
- ODOT
- North Clackamas Parks & Recreation District
- North Clackamas School District;

In addition, notice of the public hearing was mailed to owners and residents of properties within 500 ft of the subject property on February 6, 2019. The extended notification boundary is greater than the 300-ft notice required by MMC Subsection 19.1006.3.D but matches the notice area for the public information meeting held by the applicant prior to submittal of the application.

The comments received are summarized as follows:

- **Marah Danielson, Development Review Planner, ODOT Region 1:** ODOT supports the Traffic Impact Analysis recommendation that, “The Applicant should collaborate with the City of Milwaukie to construct a northbound right turn lane on Rusk Rd at OR 224 in conjunction with the site development.” The installation of a northbound right-turn lane will improve operations at the intersection of Rusk Rd and OR 224 for this development as well as future growth in the area.
- **Sarah Hartung, Senior Biologist, ESA (City’s on-call Natural Resource consultant):** ESA has provided a memo serving as peer review of the applicant’s Natural Resource Review report.
- **Ed Hacmac, property owner at 13033 SE Rusk Rd:** Senior housing is needed, and the development will not affect the local school system one way or the other. The biggest impacts will be related to traffic, and the Rusk Rd intersections with Ruscliff Rd and Kellogg Creek Dr need to be reconfigured for safety. Suggestions include a roundabout at Rusk Rd and Kellogg Creek Dr and addition of a travel lane along the church’s frontage. The recommended northbound right-turn lane at the intersection of Rusk Rd and OR 224 will help, but Rusk Rd should be widened all the way from OR 224 to Kellogg Creek Dr. Locating improvements along the church’s frontage seems fairer and less disruptive than pushing them onto the east side of Rusk Rd.
- **George McKee, property owner/resident in the area:** He would like to ensure that the proposed development does not include new equipment (e.g., air conditioning, heating, etc.) that would contribute to noise pollution in the surrounding residential area. The highway and existing businesses in the area already generate noise that affects the quality of life for nearby residents.
- **Kenneth Kent, Senior Planner, Clackamas County Department of Transportation and Development, Engineering Division:** Both Kellogg Creek Dr and Rusk Rd are under the County’s jurisdiction, so County standards and requirements apply where frontage improvements are concerned. The applicant’s Traffic Impact Study (TIS) recommends a reduction of the driveway to single-lane width (12 ft) and channelization to facilitate right-in-only movements. The County would prefer that the existing church driveway at Rusk Rd be closed but will accept the proposed driveway modification. The TIS indicates a need for additional storage for the northbound right-turn lane on Rusk Rd at OR 224, so an extension of the existing right-turn lane is required for at least 100 ft. The proposed bike path must be at least 10 ft wide, must be designed to extend west of the bulb-out and ramp down to the pavement on Kellogg Creek Dr, and shall be maintained by the City through an intergovernmental agreement.

Along the Kellogg Creek Dr frontage, a minimum 7-ft right-of-way dedication is required, with the following half-street improvements: minimum 16-ft roadway, curb or curb and gutter, 5-ft landscape strip with street trees, 5-ft sidewalk, and no bike lane striping. It is acceptable to limit sidewalk construction on the north side of Kellogg Creek Dr as needed to preserve the existing oak trees, with a mid-block crossing pedestrian crossing to the existing sidewalk on the south side of the street. The proposed mid-block crossing shall be designed as per County standards, and the existing south-side sidewalk shall be upgraded to current ADA standards (from the crossing point west to the existing crossing near the park entrance).

- **Izak Hamilton, Fire Inspector, CFD#1:** Standard comments related to fire access and water supply.
- **Dalton Vodden, Associate Engineer, City of Milwaukie Engineering Department:** Comments related to the proposal's compliance with MMC Title 12 Streets, Sidewalks, and Public Places; MMC Chapter 13.14 Stormwater Management; MMC Title 18 Flood Hazard Regulations; and MMC Chapter 19.700 Public Facility Improvements, with relevant recommended conditions of approval.
- **Neil Schulman, Executive Director, North Urban Watersheds Council (NCUWC):** In general, any development in or near the watershed negatively impacts the health of streams and listed fish and increases the risk of flooding. It is important to take this opportunity to reduce the total impervious area within the watershed below the critical 45% coverage level. NCUWC has discussed the proposed development with the applicant over the past several months, offering suggestions and alternative concepts to improve the project's compatibility with watershed health. NCUWC is supportive of certain aspects of the proposed development: the variance to increase building height, which reduces the building footprint and impacts to WQR and HCA resources; the proposed parking modification to reduce the amount of required parking; the proposed bicycle path along Rusk Rd; the avoidance of impacts to the mature Oregon oak wetland in the southwest corner of the site; and the use of pervious pavement in on-site walkways.

At the same time, NCUWC has the following concerns: additional alternatives should be considered to further reduce the development footprint (building and other impervious surfaces); WQR and HCA resources are vital for watershed health, and no amount of impact is supportable; impacts to the younger Oregon oaks planted within the past few years as part of a regional restoration effort should not be allowed; the applicant should work with the North Clackamas Parks & Recreation District, Clackamas Soil & Water Conservation District, or a nonprofit land trust or conservation organization to transfer ownership of the natural resource portion of the site or put other permanent protections in place; a native seed mix should be used on side slopes adjacent to the riparian corridor; biodegradable erosion control measures should be used during construction; and the applicant and City should work with flood management agencies to more fully evaluate flood risk for the site.

## ATTACHMENT 2

### **Recommended Conditions of Approval Master File #CU-2018-003 Bonaventure Senior Housing**

#### **Conditions**

1. As per Finding 11-e, make the following revisions to reduce impacts to designated natural resource areas and improve the proposed mitigation plan:
  - a. Revise the site plan and all related plan sheets to shift off-street parking spaces and stormwater facilities out of the Habitat Conservation Area (HCA) to reduce impacts to protected natural resources. Revise the mitigation plan accordingly, recalculating the areas of temporary and permanent disturbance and adjusting the number of mitigation plantings in accordance with the ratio of 5 trees and 25 shrubs per 500 sq ft of disturbance area. Alternately, demonstrate why such revisions are not feasible, and propose alternative avoidance of, or mitigation to, the HCA to the satisfaction of the Planning Commission.
  - b. Make the following revisions to the mitigation plan:
    - (1) Provide more details on which nuisance species will be targeted for removal and if any substantial earthwork would be needed to control reed canarygrass, for example.
    - (2) Identify areas for oak plantings and how new plantings will accommodate existing oaks on site.
    - (3) Provide a typical planting scheme for installing proposed trees and shrubs with respect to existing vegetation.
    - (4) Describe temporary impacts as well as methods to minimize and restore temporarily disturbed areas. Areas between the sediment fence and limits of grading are presumed to have temporary impacts unless otherwise noted. Recalculate the areas of temporary disturbance and adjust the number of mitigation plantings as described in Condition 1-a.
    - (5) Use a native seed mix(es) on steep slopes adjacent to WQR and HCA resources.
    - (6) Install signage along the western and northern edges of the senior housing development to reduce foot traffic in the WQR and HCA resource areas. Signage shall be spaced at 100-ft intervals beginning on the west side of the Kellogg Creek Dr entrance and continuing clockwise around the western and northern perimeter of the development.
  - c. Update the Construction Management Plan (Figure 10 in the applicant's Natural Resource Review report) to show construction fencing at the outer limits of all proposed work, including staging and stockpile areas. All erosion control materials shall be specified to be biodegradable.

- d. Update Figures 9 and 10 in the applicant's Natural Resource Review report to more accurately show tree protection fencing, specifically for trees at the eastern edge of Wetland A.
2. As per Finding 14, the applicant shall provide the following public improvements:
    - a. The applicant shall dedicate 14 ft to the public ROW along the entire site frontage of Kellogg Creek Dr as necessary to accommodate the required public improvements and shall verify by survey that there is a minimum 27-ft-wide one-half ROW width.
    - b. The applicant shall grant an 8-ft-wide public utility easement adjacent to the public ROW along the entire site frontage of Kellogg Creek Dr.
    - c. The bike path along the north and west side of Rusk Rd shall be located within public ROW or suitable public easement. The path shall be designed to accommodate two-way bike traffic. The minimum width of the path shall be 10 ft. The path shall extend to a point west of the bulb-out and ramp down to the pavement of Kellogg Creek Dr. A design shall be provided for eastbound bikes on Kellogg Creek Dr to safely cross to the north side of the road and enter the bike path at or prior to the Kellogg Creek Dr/Rusk Rd intersection.
    - d. The applicant shall design and construct improvements along the entire site frontage of Kellogg Creek Dr in accordance with the *Clackamas County Roadway Standards*. These improvements shall consist of:
      - (1) A minimum 16-ft-wide one-half-street improvement for a local roadway. The applicant shall widen Kellogg Creek Dr so that the minimum total road width along the site frontage is 32 ft. The structural section for Kellogg Creek Dr improvements shall consist of 4 in of asphalt concrete, per *Clackamas County Roadway Standards* Standard Drawing C100.
      - (2) The proposed half-street improvement, modifying the shed section to a crown section, shall comply with Section 250.7.5 of the *Clackamas County Roadway Standards*, including, but not limited to, a maximum cross-slope grade break of 2%.
      - (3) The off-site taper shall be provided per Section 250.6.4 of the *Clackamas County Roadway Standards*. The full road width shall extend to the westerly project property line, with the pavement taper beginning at that point.
      - (4) Standard curb, or curb and gutter if curblin slope is less than 1%.
      - (5) Adjacent to the curb, a 5-ft landscape strip, including street trees planted at an average spacing of 40 ft, shall be constructed along the entire site frontage.
      - (6) Except where modified by the City Engineering Director or City Engineer, a minimum 5-ft-wide unobstructed sidewalk shall be constructed along the Kellogg Creek Dr frontage, per *Clackamas County Roadway Standards* Standard Drawing S960. Where the sidewalk does not connect to sidewalk on adjacent



- property, the end of the sidewalk shall include a concrete ADA accessible ramp providing a transition from the new sidewalk to the edge of the pavement.
- (7) The proposed mid-block pedestrian crossing shall include pavement markings that are continental style, per Section 280.2 of the *Clackamas County Roadway Standards*. Pedestrian crossing signs and advanced warning signs shall be installed. Curb ramps shall be constructed per applicable ODOT Standard Drawings (RD755, RD756, and RD757). The applicant shall upgrade if necessary and verify that the sidewalk on the south side of Kellogg Creek Dr meets ADA standards from the proposed crossing west to the point where the current crossing is located near the park entrance. The existing crossing shall be removed, including pavement makings and ADA ramps, which shall be removed and replaced with curb and sidewalk to match.
  - (8) Drainage facilities shall be provided in conformance with *Clackamas County Roadway Standards* Chapter 4. Stormwater detention facilities shall not be located within the public ROW.
  - (9) Extend the right-turn lane for northbound traffic at the Rusk Road/Highway 224 intersection in accordance with the applicable ODOT standards to a minimum length of 100 ft.
- e. The Turning Point Church driveway on Rusk Rd shall be reduced to a single lane width of 12 ft and shall include channelization to facilitate the right-in-only maneuver. Signs shall be provided in accordance with the Manual on Uniform Traffic Control Devices (MUTCD) indicating entrance only.
3. Prior to issuance of development permits for the senior housing development, the following shall be resolved:
    - a. Provide a Conditional Letter of Map Revision (CLOMR) approved by FEMA, showing a revised 100-year floodplain boundary that is consistent with the proposed contour lines shown on the applicant's various plan sheets.
    - b. As per Findings 12-c and 13-c(3f), provide a photometric plan that demonstrates that on-site walkways and parking areas will be lit to a minimum level of 0.5 footcandles and that light trespass onto other properties does not exceed 0.5 footcandles measured vertically at the boundaries of the site.
    - c. As per Finding 13-c(2), revise the landscaping plan (Sheet L100 and others as applicable) to show a minimum spacing of 1 tree per 40 lineal ft in all perimeter landscaping areas, particularly in the northeast corner of the subject property where the perimeter loop road is adjacent to the church property and the ROW of Rusk Rd and OR 224.
    - d. As per Finding 13-c(3b), demonstrate that wheel stops will be installed as required by MMC Subsection 19.606.3.B and that lighting will be installed as required by MMC Subsection 19.606.3.F.

- e. As per Finding 13-d, revise the plans to ensure that the proposed loading space is at least 10 ft wide.
  - f. As per Finding 13-e, provide sufficient information to confirm that all proposed bicycle parking spaces will meet the applicable standards of MMC Section 19.609.
  - g. As per Finding 13-f, revise all applicable plans to show a minimum of 12 parking spaces dedicated to carpool/vanpool use in accordance with the standards of MMC Section 19.610.
  - h. As per Finding 16-b, in addition to the 14 bike parking spaces proposed for staff and visitors, revise the plans to provide at least 24 more bike parking spaces (to serve a minimum of 30% of the 78 independent living units). The additional spaces should be located in a secure room(s) inside the building or at least be covered and conveniently located for residents.
4. Prior to issuance of a certificate of occupancy for the senior housing development, the following shall be resolved:
- a. As per Finding 5-a, vehicle access easements shall be granted to the church property over those portions of the private accessways on the senior housing development property as needed to allow two-way vehicle access to the church property from Kellogg Creek Dr. The required easements shall be recorded with Clackamas County, and documentation of the recording shall be provided to the City Planning Department.
  - b. As per Finding 8, record the approved lot consolidation and property line adjustment with the Clackamas County Surveyor, and provide a copy of the recorded recording instrument to the City Planning Department.
  - c. As per Finding 15-a(2), demonstrate that all outdoor mechanical equipment will be sound-buffered as needed to ensure that noise levels remain within the permissible levels established in MMC Section 8.08.090.
  - d. As per Finding 15-b(2), replace all trees removed for construction of the bicycle path along the church's Rusk Rd frontage as needed to keep the adjacent church parking lot in conformance with the perimeter planting standards of MMC 19.606.2.C.

### **Additional Requirements**

The following items are not conditions of approval necessary to meet applicable land use review criteria. They relate to other development standards and permitting requirements contained in the Milwaukie Municipal Code (MMC) and Public Works Standards that are required at various points in the development and permitting process.

1. At the time of submittal of the associated development permit application(s), the following shall be resolved:
  - a. The applicant shall submit an application for Development Review in accordance with the standards established in MMC Section 19.906.

- b. Final plans submitted for development permit review shall be in substantial conformance with the plans approved by this action, which are the plans stamped received by the City on January 28, 2019; with a modified Sheet A3.1 (Exterior Elevations) and Sheet A0.5 (Signage Plan), stamped received on February 1, 2019; except as otherwise modified by these conditions of approval.
  - c. Provide a narrative describing all actions taken to comply with these conditions of approval. In addition, describe any changes made after the issuance of this land use decision that are not related to these conditions of approval.
  - d. As per Finding 11, demonstrate that, where practicable, lights adjacent to WQR and HCA areas are placed so that they do not shine directly into any WQR and/or HCA location.
  - e. Submit a final stormwater management plan to the City of Milwaukie Engineering Department for review and approval. The plan shall be prepared in accordance with Section 2 – Stormwater Design Standards of the City of Milwaukie Public Works Standards. Submit full-engineered plans for construction of all required public improvements, reviewed and approved by the City of Milwaukie Engineering Department. All utilities shall conform to the Milwaukie Public Works Standards.
  - f. Provide an erosion control plan and Construction Management Plan (as per Finding 11) and obtain an erosion control permit.
2. All frontage improvements in, or adjacent to Clackamas County right-of-way (ROW), shall be in compliance with the Clackamas County Roadway Standards. Prior to commencement of site work, the applicant shall obtain a Development Permit from the Clackamas County Engineering Division for design and construction of required improvements to Clackamas County ROW on Kellogg Creek Dr and Rusk Rd. To obtain the Permit, the applicant shall submit plans prepared and stamped by an Engineer registered in the State of Oregon, provide a Performance Guarantee, and pay an Inspection Fee. The Performance Guarantee is 125% of the approved Engineer's cost estimate for the required improvements. Prior to commencement of utility work within Clackamas County ROW on Kellogg Creek Dr or Rusk Rd, a Utility Placement Permit shall be obtained from the Clackamas County Engineering Division.
  3. The City of Milwaukie shall maintain the approved bicycle path along the north and west side of Rusk Rd and shall enter into an intergovernmental agreement (IGA) with the County accordingly.
  4. Prior to commencement of any earth-disturbing activities, the applicant shall obtain a City erosion control permit.
  5. Obtain a City ROW permit for construction of all required public improvements listed in these recommended conditions of approval for the public ROW under City of Milwaukie jurisdiction.
    - a. Pay an inspection fee equal to 5.5% of the cost of the public improvements.

- b. Provide a payment and performance bond for 100% of the cost of the required public improvements.
  - c. Install all underground utilities, including stubs for utility service prior to surfacing any streets. Utilities shall be designed to minimize or eliminate infiltration of floodwaters into the system. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into the system and discharge from the systems into floodwaters. Relocate or provide a private utility easement for all utilities encroaching onto adjacent properties.
  - d. Clear vision areas shall be maintained at all driveways and accessways and on the corners of all property adjacent to an intersection. Remove all signs, structures, or vegetation more than 3 ft in height located in “vision clearance areas” at intersections of streets, driveways, and alleys fronting the proposed development.
  - e. The final site plan shall be approved by the City Engineering Director or City Engineer prior to construction.
  - f. Provide a 12-month Maintenance Bond upon completion of the construction.
  - g. Provide a final approved set of Mylar and electronic PDF “As Constructed” drawings to the City of Milwaukie prior to final inspection.
6. Requirements from Clackamas Fire District #1 (CFD#1)

This review is based upon the current version of the Oregon Fire Code (OFC), as adopted by the Oregon State Fire Marshal's Office. The scope of review is typically limited to fire apparatus access and water supply, although the applicant must comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the fire code official. The following items should be addressed by the applicant:

- a. A Fire Access and Water Supply plan is required for subdivisions and commercial buildings over 1000 sq ft in size or when required by CFD#1. The plan shall show fire apparatus access, fire lanes, fire hydrants, fire lines, available fire flow, FDC location (if applicable), building square footage, and type of construction. The applicant shall provide fire flow tests per NFPA 291, and shall be no older than 12 months. Work to be completed by experienced and responsible persons and coordinated with the local water authority.

Emergency responder radio coverage must be tested or provided due to the following:

- (1) Any building 50,000 sq ft in size or larger.
- b. Access:
    - (1) Provide address numbering that is clearly visible from the street.

- (2) No part of the building may be more than 150 ft from an approved fire department access road.
- (3) The inside turning radius and outside turning radius for a 20-ft-wide road shall not be less than 28 ft and 48 ft, measured from the same center point.
- (4) Fire apparatus access roads shall have an unobstructed driving surface width of not less than 20 ft (26 ft adjacent to fire hydrants) and an unobstructed vertical clearance of not less than 13 ft 6 in.
- (5) Fire apparatus access roads must support a 75,000-lb fire apparatus.
- (6) Buildings exceeding 30 ft in height shall require extra width and proximity provisions for aerial apparatus.
- (7) Provide at least 2 approved means of fire apparatus access to developments with more than 30 detached dwellings, or more than 100 multifamily dwelling units. Installation of fire sprinkler systems in all structures may exempt this requirement.
- (8) Access streets between 26 ft and less than 32 ft in width must have parking restricted to one side of the street. Access streets less than 26 ft in width must have parking restricted on both sides of the street. No parking restrictions for access roads 32 ft wide or more

c. Water Supply

- (1) Fire Hydrants Commercial Buildings: Where a portion of the building is more than 400 ft from a hydrant on a fire apparatus access road, as measured in an approved route around the exterior of the building, on-site fire hydrants and mains shall be provided.

Note: This distance may be increased to 600 ft for buildings equipped throughout with an approved automatic sprinkler system.

- (2) All new buildings shall have a firefighting water supply that meets the fire flow requirements of the Fire Code. Maximum spacing between hydrants on street frontage shall not exceed 500 ft. Additional private on-site fire hydrants may be required for larger buildings. Fire sprinklers may reduce the water supply requirements. Please visit the website below for access to our fire flow worksheet and requirements:

<http://www.clackamasfire.com/fire-prevention/new-construction-resources/>

- (3) Prior to the start of combustible construction required fire hydrants shall be operational and accessible.
- (4) The fire department connection (FDC) for any fire sprinkler system shall be placed as near as possible to the street, and within 100 ft of a fire hydrant.

7. Prior to issuance of a certificate of occupancy for the proposed development, the following shall be resolved:

- a. Provide a narrative describing all actions taken to comply with these conditions of approval. In addition, describe any changes made after the issuance of this land use decision that are not related to these conditions of approval.
- b. Provide public easements and/or deed restrictions as required by this approval, including for public access to the bike path on the north and west side of Rusk Rd. Record all required easements and/or deed restrictions with the Clackamas County Recorder's office and provide a copy of each to the City Planning Department.
- c. Provide a Letter of Map Revision (LOMR) approved by FEMA, showing a revised 100-year floodplain boundary that is consistent with the proposed contour lines shown on the applicant's various plan sheets.
- d. Submit a letter from the project landscape designer attesting that all required site plantings have been completed in conformance with the approved site plans and with City standards, including all mitigation plantings. This includes removal of all invasive or nuisance species vegetation (as identified on the Milwaukie Native Plant List), noxious materials, and man-made debris such as concrete rubble from within all WQR and HCA locations on the site, on the north and south sides of the creek, as per Finding 11.
- e. Construct and receive Engineering Department inspection for all required public improvements.

8. Recording the Boundary Change

As per MMC Section 17.04.120, the recording instruments for the lot consolidation and property line change must be submitted to the County Surveyor within 6 months of City approval. Prior to recording, the applicant shall submit the recording instruments to the Planning Director for a determination of consistency with the code and this approval. Lot consolidations for units of land legally created by metes and bounds descriptions may be recorded by deed subject to approval of the County Surveyor.

9. Conditional Use Permit

As per MMC Subsection 19.905.6, the City will issue a conditional use permit upon the approval of this application to establish a conditional use. The conditional use permit shall include the following information:

- a. A description of the use that has been approved by the City.
- b. Restrictions and/or conditions of approval placed upon the use.
- c. Ongoing responsibilities required for the operation of the conditional use.
- d. Allowance for the transfer of rights and responsibilities upon change in ownership of either the use or the property containing the use.
- e. Procedures for review, revisions, and suspension of the conditional use permit.

The applicant must record the conditional use permit with the Clackamas County Recorder's Office and provide a copy to the City prior to commencing operations allowed by the conditional use permit.

10. Limitations on Development Activity

Development activity on the site shall be limited to 7:00 a.m. to 10:00 p.m. Monday through Friday and 8:00 a.m. to 5:00 p.m. Saturday and Sunday, as per MMC Subsection 8.08.070(I).

11. Landscaping Maintenance

As per MMC Subsection 19.402.11.B.9, a minimum of 80% of all required mitigation plantings for WQR or HCA disturbance shall remain alive on the second anniversary of the date the planting is completed. An annual report on the survival rate of all plantings shall be submitted for 2 years.

12. Expiration of Approval

As per MMC Subsection 19.1001.7.E, the land use approval granted with this decision shall expire and become void unless the following criteria are satisfied. For proposals requiring any kind of development permit, the development must complete both of the following steps:

- a. Obtain and pay for all necessary development permits and start construction within 2 years of land use approval.
- b. Pass final inspection and/or obtain a certificate of occupancy within 4 years of land use approval.

## ATTACHMENT 3

CU-2018-003

Questions for Staff (from Planning Commissioner Joseph Edge)

1. 19.301.4/19.302.4 Density standards
  - a. Where is it established that the density standards do not apply to senior and retirement housing and/or nursing and convalescent homes?
2. 19.402
  - a. To what extent do we have standing to require or encourage the applicant to consider design alternatives that result in less disturbance to the WQR buffer and HCA? For example:
    - i. Generators, electrical equipment, and sources of light or noise pollution such as trash and recycling collection areas and loading zones should not be located within the HCA or WQR buffer.
    - ii. The southern wing could be shifted or rotated easterly, especially with removal of the parking spaces around the circle driveway on the east side of the building. This would enable the squaring of the perimeter drive, moving disturbances further from the HCA and WQR buffer.
    - iii. The northern wing could be shifted easterly.
    - iv. Parking spaces at the extreme northerly and westerly areas could be reconsidered.
3. 19.605.2.C Parking Determination Approval Criteria
  - a. The Planning Director has discretion in identifying data relevant to making a parking quantity determination. Does the Commission have standing to require or provide guidance to the Planning Director to consider specific data, plans, or policies of the Comp Plan? Such as the Climate Action Plan? Perhaps we can set an average parking utilization rate target of 85%, so the occasional peak will near 100%, either in conjunction with or independent of the Climate Action Plan, or approve only the minimum end of the range provided by the applicant. Excess parking increases runoff, urban heat island effect, induces more driving with associated CO2 emissions, etc. and should be discouraged or prohibited.
  - b. In amending the plans to comply with any prescribed reduction in parking spaces below that number proposed to be constructed, the applicant should prioritize for elimination any parking spaces that encroach in the WQR buffer, then spaces that encroach in the HCA, then spaces that require removal of healthy, mature trees, and then other spaces, as needed. The amended plans should show protected WQR buffer or HCA, landscaping, or unpaved, exposed natural surface in place of the removed parking spaces.
4. 19.606.2.C.3. Perimeter landscaping adjacent to residential uses
  - a. The adjacent site is zoned residential. A current CSU permit authorizes a church use, but the site could be redeveloped with a residential subdivision or any other use permitted in the R-10 district. Assuming the inherent right of the adjacent landowner to use their property consistently with city code, if the adjacent site were to redevelop with residential uses, would the then-owner of the current



proposal be required to upgrade their perimeter landscaping to be consistent with this standard?

- b. Are we able to apply a condition of approval that triggers upon redevelopment of the adjacent property with residential uses? It's reasonable to expect that the site will remain as a church use for the foreseeable future, but we need to be able to guarantee compliance with this standard if the church site does redevelop.
  - c. Or do we require perimeter landscaping to be consistent with this standard because the intended use of the adjacent lot pursuant to the Comp Plan is residential?
5. 19.609.2.A. Quantity of bicycle parking
- a. For all intents and purposes, the 78 independent living suites - and, perhaps to a lesser extent, the 60 assisted living suites - are part of a mixed use development with nonresidential and multifamily residential uses combined into a single building. The applicant has made this very assertion in their narrative with respect to 19.608.2 and by voluntarily demonstrating compliance with 19.505.3.
  - b. Findings published throughout the last decade by many reputable researchers have identified trends towards retirees being healthier and more active than prior generations. Most are favoring downsizing to smaller dwellings in walkable, urban or mixed use communities with recreational amenities nearby, including in independent living communities where they can transition to assisted living without changing communities. Given proximity to the park and an increasingly interconnected regional trail system with plans for regional trails in the vicinity of the subject site, it is a safe assumption that this proposed use will draw active retirees who will bring their bicycles with them, and they'll need secure facilities in which to store their bicycles. Also, it is very common for "active" people who ride bicycles to possess more than one bicycle per rider in the household. While this may not extend to all residents of the proposed facility, it seems clear that a secure, indoor, shared bicycle parking facility consistent with the multifamily standards is a more appropriate response to this standard than the 10% rule, which should still apply to the nonresidential uses of the proposal to provide bicycle parking for employees and visitors.
6. 19.905.9.G. "...the Planning Commission shall consider..."
- a. What is the test for each of the numbered items of 19.905.9.G?
    - i. Items 1 and 3 are clearly objective: there either is or is not pedestrian access to specific, enumerated types of services. Item 2 offers discretion in determining if certain pedestrian-accessible destinations are substantially similar ("such as") in classification to enumerated types of services. So, in making a determination of pass or fail for each pedestrian access criterion, is the test a weighing of listed services/destinations that are pedestrian accessible vs. those that are not? Or is it a binary question where an affirmative to any one of the enumerated services/destinations qualifies as a pass for that criterion?

- ii. Item 4 reads as purely discretionary. Do we have a precedent for how this criterion has been weighed and applied in prior applications?
  - iii. Item 5 feels objective, in that we can enumerate impacts defined in the code that relate to the proposed use and affirm that a condition of approval exists to mitigate each impact.
- b. On the whole for 19.905.9.G, is the test a cumulative evaluation of items 1-5, with a weighing of the number of items that pass vs the number that fail, or does each criterion stand alone, and each must earn a pass to find that the proposal is substantially consistent with 19.905.9.G?
- c. Do we have standing to apply conditions of approval to guarantee compliance with - or mitigate noncompliance with - 19.905.9.G, outside of the conditions of approval enumerated by 19.905.5? For example, a shuttle service that would drive residents to nearby major shopping and services destinations and transit stations?

## ATTACHMENT 4

### Brett Kelper

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**From:** Neil Schulman <neil@ncuwc.org>  
**Sent:** Thursday, February 21, 2019 1:53 PM  
**To:** Brett Kelper; Dennis Egnor  
**Cc:** Dick Shook; Bob Bohannon; Chris Runyard; Mark Fitzsimons  
**Subject:** Submission to Milwaukie Planning Commission RE: Rusk Road Proposed Development, CU-2018-003  
**Attachments:** BonaventureLetterFinal\_2-26-19.pdf

Dear Denny and Brett,

Please find attached the North Clackamas Urban Watersheds Council's comments for the record regarding the proposed senior housing development at 13333 SE Rusk Road, CU-2018-003. Please advance these comments to the Planning Commission in advance to the hearing on 2/26/19. I will be out of town for a statewide meeting but two of our board members will be present to testify.

Thank you,  
Neil

Neil Schulman  
Executive Director  
North Clackamas Urban Watersheds Council  
503-550-9282  
2416 SE Lake Rd. Milwaukie, OR 97222  
[neil@ncuwc.org](mailto:neil@ncuwc.org)  
[www.ncuwc.org](http://www.ncuwc.org)

# North Clackamas Urban Watersheds Council

2416 SE Lake Rd., Milwaukie, OR 97222 • (503) 550-9282 • ncuwc.org



February 21, 2019

TO: Milwaukie Planning Commission

FROM: Neil Schulman, Executive Director

RE: Proposed senior housing development at 13333 SE Rusk Rd, CU-2018-003

CC: Denny Egner, Planning Director  
Brett Kelter, Associate Planner

This letter is the North Clackamas Urban Watersheds Council's (the Council) response regarding the proposal for senior housing at 1333 SE Rusk Road proposed by Bonaventure Senior Living.

The Council's mission is to protect and enhance our watersheds' water quality, fish, and wildlife habitat. We work for a healthy environment for fish and wildlife and for the people of our watersheds, both those who live here now, and those in the generations to come.

In the past several months, we have spent considerable time with Bonaventure Senior Living discussing their proposal and providing examples and alternative design concepts to make the proposed development more compatible with the health of the Kellogg/Mt. Scott Watershed. Based on these conversations and the information provided in this application, the Council endorses some aspects of the proposal, and has some questions and/or concerns about others.

First and foremost, and beyond the specifics of this proposal, development in and near our watershed negatively impacts the health of our streams and listed salmonid populations, and increases risk to people and property located in the floodplain and those downstream who bear the increased flood risk created by impervious surfaces upstream. With climate change and higher peak flows, this risk will increase in the future. When total impervious area (TIA) in a watershed reaches 45% in a basin there are substantial impairments to habitat and water quality that become progressively much harder to reverse (May, et al. 1997, Wang, et al 2001); Kellogg Mt. Scott Watershed is currently 47% TIA (Clackamas Partnership, 2018). The City of Milwaukie and other agencies therefore have a narrow window of opportunity to *reduce* impervious surface levels can bring the watershed TIA below this threshold rather than add more or hold TIA at current levels. The longer we wait to do this, the more difficult and expensive it will become. We therefore do not support additional floodplain development.

However, given the zoning of this project, we will also respond to specific aspects of this proposal.

## **The Council Supports the Following Aspects of This Proposal:**

1. Building Height Variance for a Fourth Story  
Reducing building footprints by building vertically rather than horizontally is a critical aspect of reducing impact on watersheds and water quality, as it reduces the amount of disturbed natural resources and the amount of new impervious surface that impact both flooding and water quality. This is especially critical in this proposal due to the proximity to HCA, WQR, wetlands, Mt. Scott Creek, and Oak trees. The Council discussed this with Bonaventure over the past several months and strongly support this variance.
2. Reduced Parking Ratio  
The Council strongly supports a reduced parking ratio. Like building footprint, parking is a major impact on natural resources, creates more impervious surface, and the runoff from parking lots creates major impacts on water quality in the form of chemicals contained in vehicles such as oil, copper, and other harmful chemicals. We support a reduced parking ratio, and would encourage the Commission and Bonaventure to also consider a further reduced parking ratio given the opportunity to share parking with the Turning Point Church next door, which has a large parking lot that is largely empty except on Sundays.
3. Bicycle Pathway  
We support the inclusion of the bicycle pathway that provides public connection from the intersection of Rusk Road and OR-224 south to Kellogg Creek drive and to North Clackamas Park. More public access to parks and natural areas via multimodal transportation will be increasingly vital as Milwaukie's population grows. In the future, we would like to see this pathway as a potential piece of bike/pedestrian/active transportation trail and bicycle network linking North Clackamas Park, Three Creeks Natural Area and the Harmony Campus of Clackamas Community College and Aquatic Center, and Downtown Milwaukie.
4. Avoiding Impacts to Mature Oaks  
The project does not encroach into the mature oak trees in the HCA. At the same time, we have concerns about the projects' impact on oaks planted with public resourced, identified below. Oak woodlands are identified by The Oregon Department of Fish and Wildlife (ODFW) as a "Strategy Habitat" in the Willamette Valley ecoregion, which is a vegetation cover type of high conservation value.
5. Pervious Pavement  
The inclusion of pervious pavement in the sidewalk surrounding the proposed building will reduce the impervious surface as well as demonstrate an environmentally-friendly and poorly understood technique for stormwater

infiltration. As described below, we also believe more opportunities exist for this approach to stormwater treatment.

## **The Council Has Questions and/or Concerns about the Following Aspects of the Proposal:**

### 1. Building Footprint and Impervious Surface

The Council believes that the building footprint and amount of impervious surface could be reduced further, reducing flood risk to both the site and downstream residents, as well as water quality and hydrological impacts to Mt. Scott Creek. It is unclear from the proposal to what extent these alternatives have been evaluated. Possible approaches include but are not limited to:

- Building the requested additional story across the entire building, rather than a stair-stepped approach, further shrinking the footprint;
- Placing the parking on the ground floor of the building, which would shrink the footprint, greatly reduce polluted stormwater from vehicles that would be no longer be washed into the stormwater system by rain, and reduce ground floor flood risk to property and elderly residents;
- Greater use of pervious pavement in the parking lot, which could reduce the number of stormwater facilities required;
- Further reduction of parking spaces, including sharing parking with the Turning Point Church.

### 2. Incursion into HCA and WQR

While this design reduces incursion into the HCA and WQR compared to previous proposals, the Council does not support incursion into HCA and WQR zones. These zones are identified for the vital purpose of protecting Mt. Scott Creek for listed threatened salmon and steelhead, trout, water quality, and quality of life for current and future Milwaukie residents. Many of the steps listed above could eliminate this incursion entirely. Furthermore, the parking area on the north side of the site near Mt. Scott Creek is of particular concern due to its closeness to the creek. We request that it be realigned to use the area further from the creek to the east of the building, especially for staff who are not mobility-limited. Again, the Council believes that given the large mostly empty parking lot of the church, further parking reductions can be easily achieved with no hardship.

### 3. Impact on Public Investment in Oak Habitat

While the proposed development does not impact mature Oak woodland, it does impact restoration of Oak woodland conducted by the Council, and funded through public dollars via Metro and the Oregon Watershed Enhancement Board. The Council planted 5,000 native plants, including 600 Oregon White Oaks, on the property when Turning Point Church was enrolled in the Council's Streamside Stewards Program. Many of these plantings would be impacted. Removing these plants and then planting others for mitigation would be

redundant and less effective than simply not impacting the plants that are already there.

4. Permanent Protection of Oaks and Wetlands

The Council believes that the habitat value of the Oak and wetland areas on the west side of the property make this portion of the site highly unsuitable for development and worthy of permanent protection. Large diameter oaks in particular are valued for providing diverse wildlife habitat, and only approximately 5 percent of the historic white oak habitat in the Willamette Valley is remaining (ODFW, 2005). We therefore urge Bonaventure to work closely with NCPRD, CSWCD, or a nonprofit Land Trust such as the Trust for Public Land or The Nature Conservancy to transfer this portion of the property, conservation and/or trail easements, or establish other means of permanent protection. This may have tax benefits to Bonaventure as well.

5. Non-Native Seed Mix Used on Side Slopes

While most plantings are native species, the planting plan shows using a non-native lawn seed mix (ryegrass/fescue) on the side slopes. The Council requests a native seed mix for the side slopes, especially those adjacent to the riparian corridor, with flowers for pollinators. Riparian corridors are vital wildlife habitat, which rely on native plants, and non-native plants spread quickly through riparian corridors. Examples can be found at <https://ptlawnseed.com/collections/native-seeds>.

6. Biodegradable Erosion Control Materials During Construction

Many construction projects use plastic erosion control materials that inevitably become part of the site and interfere with later planting efforts and do not degrade. The Council requests that all erosion control materials be specified to be biodegradable.

7. Floodplain Impact

As is well documented, flooding is a major risk in the area of downstream residents, and a narrow window exists to bring the Kellogg/Mt Scott watershed below the 45% TIA threshold. Properties just upstream of this site are being purchased by FEMA because of repeat loss due to flooding. Furthermore, FEMA maps do not provide enough detail and are generally outdated and do not provide sufficient guidance for protecting the public from increased flooding, and do not account for the higher peak flows expected with development in Happy Valley and climate change. The Council urges the City and Bonaventure to work with DOGAMI and other agencies on the forefront of flood management to more fully evaluate risk to this site, and to any downstream properties that may result from this project. A forward-thinking City of Milwaukie, with the duty to ensure a high quality of life for both current and future residents, should be extremely cautious about any further development near or close to the floodplain and any buildout of impervious surface that is not matched by greater or equal removal of impervious surface elsewhere upstream in the watershed.

The Council would like to acknowledge the collaboration of Bonaventure Senior Living during this process and their incorporation of several steps into their design. As the owner and operator of the future facility, they will be the beneficiaries of an environmentally sensitive structure, and a healthy environment nearby. We look forward to continuing to work with them to make this project as watershed friendly as possible.

Sincerely,

Handwritten signature of Neil Schulman in blue ink.

Neil Schulman  
Executive Director

Handwritten signature of Mark Fitzsimons in black ink.

Mark Fitzsimons  
Vice Chair