



CITY OF MILWAUKIE

PLANNING COMMISSION MINUTES

City Hall Council Chambers
10722 SE Main Street
www.milwaukieoregon.gov

September 14, 2021

Present: Lauren Loosveldt, Chair
Joseph Edge, Vice Chair
Greg Hemer
Adam Khosroabadi
Robert Massey
Jacob Sherman

Staff: Brett Kelter, Senior Planner
Justin Gericke, City Attorney

Absent: Amy Erdt

(00:14:36)

1.0 Call to Order — Procedural Matters*

Chair Loosveldt called the meeting to order at 6:30 p.m. and read the conduct of meeting format into the record.

Note: *The information presented constitutes summarized minutes only. The meeting video is available by clicking the Video link at <http://www.milwaukieoregon.gov/meetings>.*

(00:15:08)

2.0 Information Items

No information was presented for this portion of the meeting.

(00:15:29)

3.0 Audience Participation

No information was presented for this portion of the meeting.

(00:16:00)

4.0 Hearing Items

(00:16:00)

4.1 VR-2021-013, Bonaventure Senior Housing Walkways

Brett Kelter, Senior Planner, shared the staff report. The applicant's proposed senior housing facility was approved by land use application CU-2018-003 in 2019. After beginning construction on the project in 2019 it was put on hold due to COVID-19. The applicant had applied for a variance to waive the requirement of MMC 19.504.9 and allow the on-site walkways to be constructed with impervious materials. The applicant noted poor infiltration, user safety, durability, and maintenance as the rationale for requesting the variance. The staff report recommended approval of the variance with the condition that tree plantings be used as mitigation.

Commissioner Khosroabadi asked whether the number of mitigation plantings necessary would change if the tree credit worksheet presented in the staff report was used for planting calculations instead of the numbers noted in the watershed council's recommendations presented in the meeting packet. **Kelver** responded that the calculations used in the tree credit worksheet provide a range between 69 and 137 plantings. For example, the number of tree plantings necessary varies based on the composition of species planted, as evergreen tree species are awarded more square footage credit for impervious surface mitigation than broadleaf/deciduous species. **Commissioner Sherman** reiterated Commissioner Khosroabadi's question about planting calculations, asking whether the proposed mitigation plantings were depicted in the images shown in the staff report and what survival rate of plantings would be considered. **Kelver** responded that the images did not depict the proposed mitigation plantings. The survival rate was informed by the natural resource code, which requires a survival rate of 80% of the mitigation plantings after two years. The watershed council recommendations included a five-year survival period to better ensure success of the new plantings. The 100% survival rate at two years was recommended by staff since each individual planting correlates to some square footage of impervious surface allowed. **Vice Chair Edge** asked if there were legal concerns requiring a 100% survival rate. **City Attorney Justin Gericke** responded that there are no legal concerns around the requirement.

Commissioner Edge asked what concerns for proportionality were considered. **Kelver** responded that the tree credit worksheet was used to partially address the proportionality issue. **Gericke** noted that the calculated impact the proposed impervious surface will have on stormwater runoff was used to ensure proper mitigation of the impact. He added that mitigating the effects of the increased runoff is the primary goal of plantings, rather than ensuring proportionality between the increased stormwater runoff and new plantings.

The applicants shared that the primary reason for the requested variance was for resident safety. The walkways will serve as the residents' primary form of exercise and given the high proportion of limited mobility residents, traditional concrete sidewalks are necessary to ensure safety during use.

Commissioner Massey asked why the variance was requested after the original application had been approved, noting the 2019 application did not request traditional concrete sidewalks even though the resident demographic and other factors were known at that time. **The applicants** responded that the permeability requirement was not known at the time of the original application and the delay in the variance request was due to extenuating circumstances caused by the COVID-19 pandemic. **Chair Loosveldt** asked whether a pervious parking lot was considered to offset the lost pervious surface caused by the traditional concrete walkways. **The applicants** responded that the soil conditions on the site prevent adequate infiltration, which would inhibit the pervious parking lot's ability to realize its potential.

Chair Loosveldt called for any public testimony on the application. **Kelver** confirmed that there were no attendees indicating an interest in testifying. **Chair**

Loosveldt closed the public testimony portion of the hearing and proceeded with the commissioner discussion.

Commissioner Khosroabadi expressed concern about ensuring the survival of the plantings used for mitigation. **Commissioner Hemer** asked whether the City's water quality resource regulations were intended to address walkways on the exterior of parking lots or more interior walkways. Hemer stated that, if the intent was to address exterior walkways, the proposed mitigation may go beyond what is necessary since the project was already reviewed for water quality resource impacts. **Commissioner Sherman** requested that the condition of approval for the survival rate be changed to 80% at five years. **Commissioner Edge and Khosroabadi** agreed. **Commissioner Hemer** stated his opinion that the survival rate should not go beyond the proposed condition of approval, a survival rate of 100% at two years.

Commissioner Sherman introduced a motion to approve VR-2021-013, Bonaventure Senior Housing Walkways, as recommended by staff, with an amendment to page 5 of the recommended findings in support of approval that "Given that each new tree is mitigation for a specific amount of impervious walkway, the condition requires a 100% survival rate at two years for the number of trees planted" be changed to "Given that each new tree is mitigation for a specific amount of impervious walkway, the condition requires an 80% survival rate at five years for the number of trees planted." The motion was approved with a 5-1 vote.

(01:25:07)

5.0 Planning Department Other Business/Updates

No information was presented for this portion of the meeting.

(01:25:07)

6.0 Planning Commission Committee Updates and Discussion Items

No information was presented for this portion of the meeting.

(01:28:28)

7.0 Forecast for Future Meetings:

September 28, 2021	1. Public Hearing: DR-2021-001, Coho Point Redevelopment (tentative)
October 12, 2021	1. Public Hearing: Middle Housing Code – Hearing #1

Meeting adjourned at approximately 7:49 p.m.

Respectfully submitted,

Will First, Administrative Specialist II



CITY OF MILWAUKIE

AGENDA

September 14, 2021

PLANNING COMMISSION

milwaukieoregon.gov

Zoom Video Meeting: due to the governor's "Stay Home, Stay Healthy" order, the Planning Commission will hold this meeting through Zoom video. The public is invited to watch the meeting online through the City of Milwaukie YouTube page (https://www.youtube.com/channel/UCRFbfqe3OnDWLQKSB_m9cAw) or on Comcast Channel 30 within city limits.

If you wish to provide comments, the city encourages written comments via email at planning@milwaukieoregon.gov. Written comments should be submitted before the Planning Commission meeting begins to ensure that they can be provided to the Planning Commissioners ahead of time. To speak during the meeting, visit the meeting webpage (<https://www.milwaukieoregon.gov/bc-pc/planning-commission-79>) and follow the Zoom webinar login instructions.

1.0 Call to Order – Procedural Matters — 6:30 PM

2.0 Information Items

3.0 Audience Participation — This is an opportunity for the public to comment on any item not on the agenda

4.0 Hearing Items

4.1 Bonaventure Senior Housing walkways

Summary: Variance to allow on-site walkways to be constructed with impervious materials

Applicant: MWSH Milwaukie LLC

Address: 5801 SE Kellogg Creek Dr

File: VR-2021-013

Staff: Senior Planner Brett Kelter

5.0 Planning Department Other Business/Updates

6.0 Planning Commission Committee Updates and Discussion Items — This is an opportunity for comment or discussion for items not on the agenda.

7.0 Forecast for Future Meetings

September 28, 2021 Hearing: DR-2021-001, Coho Point Redevelopment

October 12, 2021 Hearing: Middle Housing Code

Hearing: PD-2021-001-Hillside Final PD (tentative)

October 26, 2021 Hearing: Middle Housing Code

Hearing: VR-2021-014, 23rd Ave Property Line Adjustment

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 register to provide spoken comment at this meeting or for background information on agenda items please send an email to planning@milwaukieoregon.gov.
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.
3. **FORECAST FOR FUTURE MEETINGS.** 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 attend the Zoom meeting posted on the city website, state their name and city of residence for the record, and remain available until the Chairperson has asked if there are any questions from the Commissioners. Speakers are asked to submit their contact information to staff via email so they may establish standing.

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.

Meeting Accessibility Services and Americans with Disabilities Act (ADA) Notice

The city is committed to providing equal access to public meetings. To request listening and mobility assistance services contact the Office of the City Recorder at least 48 hours before the meeting by email at ocr@milwaukieoregon.gov or phone at 503-786-7502. To request Spanish language translation services email espanol@milwaukieoregon.gov at least 48 hours before the meeting. Staff will do their best to respond in a timely manner and to accommodate requests. Most Council meetings are broadcast live on the city's YouTube channel and Comcast Channel 30 in city limits.

Servicios de Accesibilidad para Reuniones y Aviso de la Ley de Estadounidenses con Discapacidades (ADA)

La ciudad se compromete a proporcionar igualdad de acceso para reuniones públicas. Para solicitar servicios de asistencia auditiva y de movilidad, favor de comunicarse a la Oficina del Registro de la Ciudad con un mínimo de 48 horas antes de la reunión por correo electrónico a ocr@milwaukieoregon.gov o llame al 503-786-7502. Para solicitar servicios de traducción al español, envíe un correo electrónico a espanol@milwaukieoregon.gov al menos 48 horas antes de la reunión. El personal hará todo lo posible para responder de manera oportuna y atender las solicitudes. La mayoría de las reuniones del Consejo de la Ciudad se transmiten en vivo en el canal de YouTube de la ciudad y el Canal 30 de Comcast dentro de los límites de la ciudad.

Milwaukie Planning Commission:

Lauren Loosveldt, Chair
Joseph Edge, Vice Chair
Greg Hemer
Robert Massey
Amy Erdt
Adam Khosroabadi
Jacob Sherman

Planning Department Staff:

Laura Weigel, Planning Manager
Vera Kolias, Senior Planner
Brett Kelter, Senior Planner



Applicant/Owner: MWSH Milwaukie LLC
Applicant's Representative: Mark Lowen
Address: 5801 SE Kellogg Creek Dr
Legal Description (Map & Tax Lot): 2S2E06AD, lot 901
NDA(s): Lake Road

Approve the requested variance associated with land use application file #VR-2021-013 and adopt the Recommended Findings and Conditions of Approval found in Attachments 1 and 2. This action would allow the senior housing facility approved at 5801 SE Kellogg Creek Dr with master file #CU-2018-003 to construct its on-site walkway system with impervious material instead of making it permeable for stormwater.

CU-2018-003 was approved in early 2019, allowing for the development of 170 units of senior housing in a multistory building ranging from one to four stories in height (see Figure 1). The facility will provide 78 independent living suites (one- and two-bedroom units with full kitchens), 60 assisted living suites (one- and two-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).

Site plan for the proposed 28,304 SF building. The plan shows the building footprint, parking lots with 80 stalls, and various site features like stormwater ponds, wetlands, and existing structures. Key areas include the proposed building, parking stalls, stormwater ponds, wetlands, and existing structures like the existing building and parking lot. The plan also shows the location of the building relative to the surrounding landscape, including the wetlands and the existing building. The plan is oriented with North at the top.

A looped driveway will circle the building for access and provides 139 off-street parking spaces for staff, visitors, and the approximately 30 percent 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, will remain undeveloped to preserve the designated natural resource and floodplain areas on the property. A network of on-site walkways will encircle the building to provide access to various building entrances and plazas, as well as to the widely distributed off-street parking and the public sidewalk on Kellogg Creek Drive. As approved with CU-2018-003, the on-site walkways are required to be permeable for stormwater; however, the applicant has requested relief from that standard and proposes to construct the walkways with impervious concrete.

A. Site and Vicinity

The subject property is approximately 14.3 acres in area and is located at 5801 SE Kellogg Creek Dr (see Figure 2). Following the approval of CU-2018-003, some site work was initiated (primarily grading) but has been suspended since early 2020 due to the ongoing COVID-19 pandemic and associated financing issues.

Adjacent to the east is the Turning Point Church, which was previously part of the subject property (the two were separated as part of the CU-2018-003 process) and which shares access to Kellogg Creek Drive through an access easement over the subject property. To the west is North Clackamas Park and the Milwaukie Center. Highway 224 runs along the northeastern border of the site, separating the subject property from an R-3-zoned neighborhood to the north (within the city limits). To the south, across Kellogg Creek Drive in unincorporated Clackamas County, there are three single-family houses (zoned R-10) and the Deerfield Village assisted living facility. Another unincorporated R-10 residential neighborhood is across Mount Scott Creek to the northwest.

Mount Scott Creek flows east to west across the subject property, leaving an approximately two-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 site. 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 newly designated as HCA as a result of the CU-2018-003 decision.

Figure 2. Site and vicinity



B. Zoning Designation

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

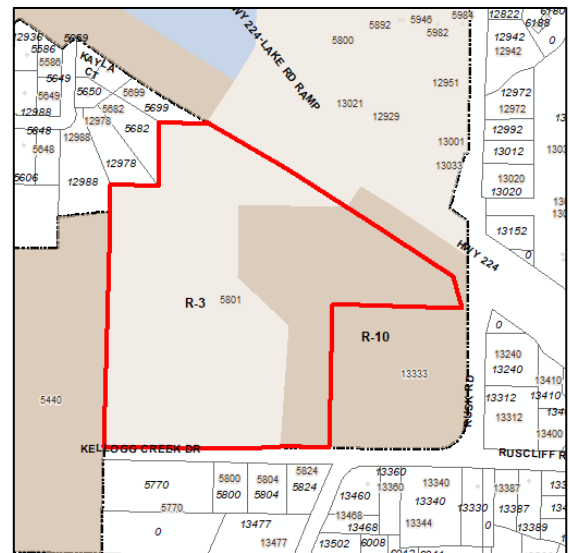
C. Comprehensive Plan Designation

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.
- **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 Department of State Lands (DSL) regulations; the fill was required to be removed and the wetlands restored in 1991. The softball field does not appear to have been 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 Road (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

Figure 3. Zoning



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 was within 100 ft of the HCA on the site and required a construction management plan.

- **January 2018:** A prior 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.
- **February 2019:** Planning Commission approved the 170-unit senior housing facility (master file #CU-2018-003) that is the subject of the current applicant's variance request. The approval included conditions related to reducing the project's impacts to designated natural resource areas (by shifting off-street parking spaces out of the northern HCA areas on the site), improving the mitigation plan, providing public street improvements (including a bike path along the north and west sides of Rusk Road), restricting turning movements at the Turning Point Church driveway on Rusk Road, and extending the right-turn lane for northbound traffic at the Rusk Road/Highway 224 intersection.

E. Proposal

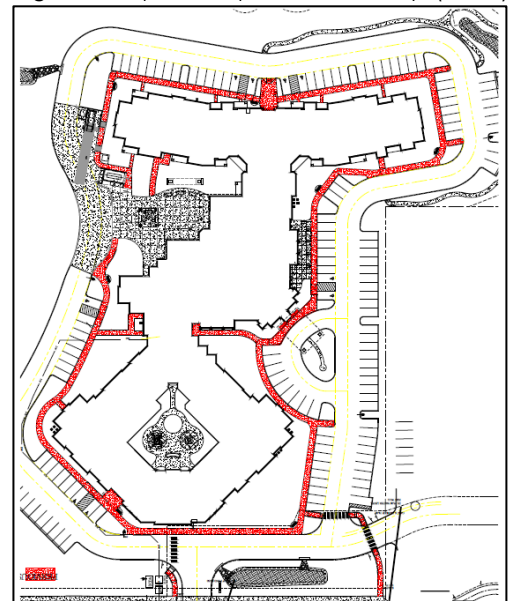
The applicant is seeking relief from the requirement established in Milwaukie Municipal Code (MMC) Subsection 19.504.9.E that on-site walkways be permeable for stormwater. As proposed, the granting of the requested variance would allow the applicant to construct the entire network of walkways on the subject property with impervious concrete instead of pervious material (see Figure 4).

See Attachment 3 for the applicant's submittal materials.

The project requires approval of the following application(s):

1. Variance Request (VR-2021-013)

Figure 4. Proposed impervious walkways (in red)



KEY ISSUES

Summary

Staff has identified the following key issue(s) 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. Is any mitigation necessary for the proposed increase in impervious area on the site? If so, what kind of and how much mitigation is warranted?

Analysis

- A. Is any mitigation necessary for the proposed increase in impervious area on the site? If so, what kind of and how much mitigation is warranted?**

The applicant's engineering team has confirmed that the approved on-site stormwater management system—consisting of various catch basins directing runoff to five planted swales distributed around the site—is adequately sized to handle the additional runoff of the approximately 13,630-sq-ft network of on-site walkways, without the need for any expansion or alteration. Quantitatively speaking, the additional volume of stormwater generated by impervious walkways does not need additional management.

However, as originally proposed and approved, the on-site system of pervious walkways would infiltrate stormwater in a dispersed fashion around the perimeter of the building, broadly recharging the water table and reducing the potential of higher sheet flows into nearby Mount Scott Creek during heavy rainfall and storm events. This provides a qualitative value that would be lost with the requested change to impervious concrete, since more stormwater runoff would be concentrated into one of the stormwater swales distributed around the site.

Trees serve an important stormwater management function by intercepting precipitation, removing water from the soil through transpiration, and enhancing infiltration. Tree roots help increase the infiltration of soil and improve groundwater recharge. In this case, while the approved landscape planting plan does include a few trees near the walkways at certain points around the site, it is reasonable to suggest that planting additional trees alongside the impervious walkway system would be one way to mitigate for the loss of dispersed infiltration. It is also reasonable to directly associate the square footage of impervious walkway with the area of tree canopy provided by new trees, where increasing canopy coverage would increase the accompanying stormwater benefits.

In evaluating possible mitigation options, staff started with a 1:1 ratio of new tree canopy for impervious walkway area and used an average canopy size of 20 sq ft per tree at five years after planting. At that ratio, the mitigation for 13,630 sq ft of walkway would be around 680 new trees. Both the expense and the amount of space required for that level of planting seem disproportionate to the impacts of the requested variance. (Note: Mitigation plantings for the project's approved disturbance of approximately 69,550 sq ft of natural resource area on the site included nearly 700 trees.)

Staff adjusted the ratio to 1:4 (one square foot of new tree canopy for every four square feet of impervious walkway), resulting in a more proportional-seeming requirement of 170 trees. This was the ratio staff discussed with the North Clackamas Watersheds Council (NCWC) in response to the group's expression of concern about the requested variance, and it was the ratio staff was working with when NCWC submitted its comments on the application (see Attachment 4).

However, prior to finalizing this report, staff reviewed the City's Tree Credit Worksheet, which is used to determine allowable reductions in stormwater facility size based in return for planting trees (see Attachment 5). The worksheet gives credit for 200 sq ft of impervious surface for each coniferous tree and 100 sq ft for each broadleaf tree. New trees must be at least 1.5-in caliper at time of planting, and coniferous trees must also be at least 5 ft tall. Continuing with staff's assumption of an average canopy of 20 sq ft per tree, the worksheet ratios are effectively 1:10 for coniferous trees and 1:5 for broadleaf trees. Although the rationale for these ratios is not evident from the worksheet itself, the worksheet represents an established methodology already in use by the City and is therefore a better guide for determining a proportional form of mitigation in this case.

The City's Urban Forester visited the site and suggested several tree species that would be appropriate for this particular environment: Oregon oak, Oregon ash, bigleaf maple, Scouler's willow, red alder, and Ponderosa pine. The NCWC comments included a caution against the broad use of red alder or Oregon oak for this stormwater-related mitigation. Staff suggests a condition of approval requiring the planting of a combination of the other four species noted by the Urban Forester, in such numbers as would achieve 13,630-sq-ft worth of credit as per the Tree Credit Worksheet.

The NCWC comments also assert that mitigation trees would be most effective at intercepting rainfall if placed over or near impervious areas, which is consistent with the requirement noted on the Tree Credit Worksheet to locate trees within 10 ft of impervious surfaces. The walkway is very close to the building in many areas, with little room for adding large trees. There are some areas around the outer edges of the on-site roadway that may offer opportunities for tree planting, and there is considerable open space in the vicinity of each of the stormwater swales dispersed around the site. Staff recommends prioritizing planting locations near impervious surfaces before looking to the larger open spaces on the site.

NCWC suggested extending the standard required maintenance and survival period for mitigation plantings from two years to five years, to ensure a greater chance of long-term plant survival. Although staff agrees with the spirit of this suggestion, the two-year maintenance requirement (with 80% survival) is a standard one for natural resource mitigation plantings. A longer timeline would be more complicated for monitoring and enforcement. However, a slightly higher survival rate (100%) at two years is recommended since each new tree is mitigation for a specific amount of impervious walkway.

CONCLUSIONS

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

1. Approve the requested variance (file #VR-2021-013) to remove the requirement that the on-site walkways be permeable for stormwater.
2. Adopt the attached Findings and Conditions of Approval.

B. Staff recommends the following key condition(s) of approval (see Attachment 2):

- Plant additional trees on the site as mitigation, at the ratios provided on the City's Tree Credit Worksheet. The trees should be a mix of Oregon ash, bigleaf maple, Scouler's willow, and Ponderosa pine and should be least 1.5-in caliper (and at least 5 ft tall, for coniferous trees) at the time of planting. The applicant should coordinate with staff to identify planting locations, prioritizing areas near impervious surfaces. One hundred percent (100%) of the number of trees planted as mitigation for the variance must survive at least two years, with replacement plants installed as necessary.

CODE AUTHORITY AND DECISION-MAKING PROCESS

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

- MMC Subsection 19.504.9 On-Site Walkways and Circulation
- MMC Section 19.911 Variances
- MMC Section 19.1006 Type III Review

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 four 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 November 27, 2021, 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 development was given to the following agencies and persons: City of Milwaukie Community Development, Engineering, Building, Public Works, and Police Departments; City Attorney; Lake Road Neighborhood District Association (NDA); Clackamas Fire District #1 (CFD#1); Clackamas County Department of Transportation & Development; Metro; ODOT; TriMet; North Clackamas School District; and NW Natural.

The following is a summary of comments received by the City (see Attachment 4 for more details).

- **Paul Hawkins, Land Use Committee Chair, Lake Road NDA:** The NDA is supportive of this project and would like to see it move forward. Changing the walkway material would not adversely affect the moisture content of the surrounding soil
- **Alex McGladrey, Lieutenant - Deputy Fire Marshal, CFD #1:** No comments.
- **Neil Schulman, Executive Director, North Clackamas Watersheds Council (NCWC):** NCWC is working to reduce the amount of impervious surface in the watershed to minimize future downstream flood risk and improve water quality. Although NCWC would prefer that the on-site walkways remain permeable as originally approved, it is amenable to the variance request if native trees are planted as mitigation to intercept rainfall on or near impervious areas. NCWC supports the staff recommendation of tree planting at a ratio of 1:4 (one square foot of tree canopy for every four square feet of impervious walkway), provided that (1) mitigation trees are placed near impervious areas, (2) appropriate tree species are used, and (3) the requirement for maintenance and survival is increased from two to five years.

Staff response: The Council's comments and suggestions have been taken into consideration in the staff report discussion and are reflected (at least in part) in the recommended findings and conditions.

ATTACHMENTS

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

	Early PC Mailing	Public Copies	E-Packet
1. Recommended Findings in Support of Approval	☐	☐	☒
2. Recommended Conditions of Approval	☐	☐	☒
3. Applicant's Submittal Materials (received July 2, 2021)			
a. Application Forms	☒	☒	☒
b. Narrative	☒	☒	☒
c. Geotechnical Report (September 2018)	☒	☒	☒
d. Site Plan (updated August 18, 2021)	☒	☒	☒
4. Comments Received	☐	☐	☒
5. Tree Credit Worksheet	☐	☐	☒

Key:

Early PC Mailing = electronic materials provided to Planning Commission at the time of public notice (20 days prior to the hearing).
Public Copies = materials posted online to the website for this application (<https://www.milwaukieoregon.gov/planning/vr-2021-013>).
E-Packet = packet materials available online 7 days before the hearing at <https://www.milwaukieoregon.gov/bc-pc/planning-commission-79>.

**Recommended Findings in Support of Approval
File #VR-2021-013, Bonaventure Senior Housing Walkways**

Sections of the Milwaukie Municipal Code not addressed in these findings are found to be inapplicable to the decision on this application.

1. The applicant, MWSH Milwaukie LLC, has applied for approval of a variance related the design standards for on-site walkways established in Milwaukie Municipal Code (MMC) Subsection 19.504.9.E. In particular, the request is to vary the requirement that walkways must be permeable for stormwater. The walkways are part of a larger project approved in 2019 to develop a 170-unit senior housing facility (master land use application file #CU-2018-003). The subject property is addressed as 5801 SE Kellogg Creek Dr (Tax ID 2S2E06AD, lot 901). The land use file number for the variance request is VR-2021-013.
2. The subject property is approximately 14.3 acres in area. The proposed development approved with CU-2018-003 will establish 170 units of senior housing in a multistory building ranging from one to four stories in height. The facility will provide 78 independent living suites, 60 assisted living suites, and 32 memory care suites. A looped driveway will circle the building for access and provides 139 off-street parking spaces. The remainder of the site, to the west and on the north side of Mount Scott Creek, will remain undeveloped to preserve the designated natural resource and floodplain areas on the property.
3. The proposal is subject to the following provisions of the Milwaukie Municipal Code (MMC):
 - MMC Subsection 19.504.9 On-Site Walkways and Circulation
 - MMC Section 19.911 Variances
 - MMC Section 19.1006 Type III Review

The application has been processed and public notice provided in accordance with MMC Section 19.1006 Type III Review. A public hearing was held by the Planning Commission on September 14, 2021, as required by law.

4. 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.

As originally proposed and approved with CU-2018-003, the proposed development included pervious, lighted walkways around the new building, as well as two pedestrian connections to the public sidewalk on Kellogg Creek Dr. A condition was established to require more detailed photometric information to confirm that the minimum lighting was provided, and a variance was granted for relief from the requirement for a pedestrian connection to the site's short frontage on Rusk Road.

With this variance application, the applicant is requesting relief from the requirement of MMC Subsection 19.504.9.E that the on-site walkways be permeable and is proposing to construct them with impervious concrete instead. The rationale for that request, and a discussion of how the request responds to the approval criteria for a variance, are addressed in Finding 5. Compliance with the various conditions of approval of CU-2018-003 (including for walkway lighting) has been assessed and confirmed through the development review process (file #DEV-2019-010).

As discussed in Finding 5, the Planning Commission finds that the requested variance from the requirement for permeable on-site walkways is approvable, and that the other applicable standards of MMC 19.504.9 are met, pursuant to the other applicable conditions of CU-2018-003.

5. MMC Section 19.911 Variances

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 a variance to the requirement of MMC Subsection 19.504.9.E that on-site walkways be constructed to be permeable for stormwater.

The requested variance meets the eligibility requirements.

b. MMC Subsection 19.911.3 Review Process

MMC 19.911.3 establishes review processes for different types of variances. MMC Subsection 19.911.3.B establishes the Type II review process for limited variations to certain numerical standards. MMC Subsection 19.911.3.C establishes the Type III review process for larger or more complex variations to standards that require additional discretion and warrant a public hearing.

The requested variance is not eligible for Type II review and so is subject to the Type III review process.

c. MMC Subsection 19.911.4 Approval Criteria

MMC 19.911.4 establishes approval criteria for variance requests. For Type III variances, MMC Subsection 19.911.4.B.1 provides approval criteria related to discretionary relief and MMC Subsection 19.911.4.B.2 provides approval criteria related to economic hardship.

The applicant has elected to address the discretionary relief criteria for the requested variance.

- (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.

The applicant's submittal materials include an assessment of the situation provided by a geotechnical engineer. The assessment explains that pervious concrete sidewalks are suitable for use when the supporting subgrade soils have a certain capacity for retaining nutrients and include at least a baseline level of organic matter. According to the geotechnical assessment, pervious pavement treatments are not recommended for structural fill soils like the ones on the subject property because they have a limited rate of infiltration.

The assessment indicates that the limited infiltration capacity of the soil on site would require an increased thickness of underlying aggregate base rock beneath the on-site walkways to provide adequate storage of stormwater during storm events. Even with increased base rock and proper design, the assessment notes that a pervious walkway would still be susceptible to excess runoff in an extreme rainfall event.

The applicant's narrative suggests that pervious concrete would not provide as smooth a surface as impervious concrete, posing a mobility challenge to residents of the approved senior housing facility. The narrative posits that pervious concrete has a greater probability for damage and instability in the context of Oregon weather and that impervious concrete provides a safer, long-lasting, all-weather surface that is critical for maintaining a safe and reliable surface.

The Planning Commission finds that the analysis of the impacts and benefits of the requested variance compared to the baseline requirements is acceptable. 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:
 - The proposed variance avoids or minimizes impacts to surrounding properties.
 - The proposed variance has desirable public benefits.
 - The proposed variance responds to the existing built or natural environment in a creative and sensitive manner.

The applicant's narrative indicates that, due to the large percentage of pervious area on the site, the additional stormwater runoff that will be generated if the walkways are impervious (covering an area of approximately 13,630 sq ft) would sufficiently infiltrate elsewhere on the subject property. The applicant's engineers have confirmed that the various stormwater swales dispersed around the site are adequately sized to handle the additional runoff.

The approved development is a senior housing facility, whose residents will have a range of mobility challenges that can be mitigated by having a smooth and consistent surface.

As noted above, the applicant has asserted that pervious concrete is harder to maintain in the condition that best serves the needs of residents, staff, and guests. The applicant's narrative suggests that allowing the use of impervious concrete provides a public benefit by improving the long-term condition of this one important aspect of the approved senior housing facility.

Finally, the geotechnical assessment references the presence of compacted structural fill in the near-surface soil on the site, with near-surface subgrade soils consisting of a practically impermeable mixture of sand, silt, and clay. The existing soil conditions make it difficult to ensure adequate infiltration and storage of stormwater through a pervious walkway without increasing the thickness of underlying aggregate base rock. The proposal to use impervious concrete would reduce both the need for more intensive maintenance (to prevent clogging of a pervious walkway) and the pace of walkway deterioration. The result would make the extensive on-site walkway system safer and easier to maintain.

The Planning Commission finds that the requested variance is reasonable and appropriate and that it 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.

As originally proposed and approved, the on-site system of pervious walkways would infiltrate stormwater in a dispersed fashion around the perimeter of the building, broadly recharging the water table. The dispersed infiltration offered by pervious walkways would reduce the potential of higher sheet flows into nearby Mount Scott Creek during heavy rainfall and storm events. Although the approved on-site stormwater management system is designed and sized to accommodate the additional volume of runoff from the approximately 13,630-sq-ft walkway system if it is made impervious instead of permeable, the requested change to impervious material would direct more stormwater into one of five large stormwater swales distributed around the site. This represents a loss of opportunity for more dispersion and arguably warrants some mitigation.

Trees serve an important stormwater management function by intercepting precipitation, removing water from the soil through transpiration, and enhancing infiltration. Tree roots help increase the infiltration of soil and improve groundwater recharge. In this case, while the approved landscape planting plan does include a few trees near the walkways at certain points around the site, it is reasonable to suggest that planting additional trees alongside the impervious walkway system would be one way to mitigate for the loss of dispersed infiltration. It is also reasonable to directly associate the square footage of impervious walkway with the area of tree canopy provided by new trees, where increasing canopy coverage would increase the accompanying stormwater benefits. A condition has been established to ensure this mitigation.

*The City's Urban Forester visited the site and identified several tree species that would be appropriate for this particular environment: Oregon ash (*Fraxinus latifolia*), bigleaf maple (*Acer macrophyllum*), Scouler's willow (*Salix scouleriana*), and *Ponderosa**

pine (Pinus ponderosa). The City's Tree Credit Worksheet, which is used to determine allowable reductions in stormwater facility size based in return for planting trees, gives credit for 200 sq ft of impervious surface for each coniferous tree and 100 sq ft for each broadleaf tree. The worksheet represents an established methodology already in use by the City and is therefore an appropriate guide for determining a proportional number of trees as mitigation. The condition requires planting a combination of the four species noted above, in such numbers as would achieve 13,630-sq-ft worth of credit as per the Tree Credit Worksheet.

When used to determine the allowable reduction in the size of required stormwater facilities, the Tree Credit Worksheet requires new trees to be planted within 10 ft of impervious surface, where they are more effective at intercepting rainfall. The walkway is very close to the building in many areas, with little room for adding large trees. There are some areas around the outer edges of the on-site roadway that may offer opportunities for tree planting, and there is considerable open space in the vicinity of each of the stormwater swales dispersed around the site. The condition prioritizes locations near impervious surfaces over the larger open spaces on the site but allows for mitigation plantings in both. Given that each new tree is mitigation for a specific amount of impervious walkway, the condition requires a 100% survival rate at two years for the number of trees planted.

As conditioned, the Planning Commission finds that any impacts resulting from the requested variance will be sufficiently mitigated. This criterion is met.

As conditioned, the Planning Commission finds that the requested variance meets 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 variance is allowable as per the applicable standards of MMC 19.911.

6. The application was referred to the following departments and agencies on August 4, 2021:
 - Milwaukie Community Development Department
 - Milwaukie Engineering Department
 - Milwaukie Building Department
 - Milwaukie Public Works Department (including Environmental Services)
 - Milwaukie Police Department
 - City Attorney
 - Lake Road Neighborhood District Association (NDA) Chairperson and Land Use Committee (LUC)
 - Clackamas Fire District #1 (CFD #1)
 - Clackamas County Department of Transportation & Development
 - Metro
 - ODOT

- TriMet
- North Clackamas School District
- NW Natural

The comments received are summarized as follows:

- **Paul Hawkins, LUC Chair, Lake Road NDA:** The NDA is supportive of this project and would like to see it move forward. Changing the walkway material would not adversely affect the moisture content of the surrounding soil.
- **Alex McGladrey, Lieutenant – Deputy Fire Marshal, CFD #1:** No comments.
- **Neil Schulman, Executive Director, North Clackamas Watersheds Council (NCWC):** NCWC is working to reduce the amount of impervious surface in the watershed to minimize future downstream flood risk and improve water quality. Although NCWC would prefer that the on-site walkways remain permeable as originally approved, it is amenable to the variance request if native trees are planted as mitigation to intercept rainfall on or near impervious areas. NCWC supports the staff recommendation of tree planting at a ratio of 1:4 (one square foot of tree canopy for every four square feet of impervious walkway), provided that (1) mitigation trees are placed near impervious areas, (2) appropriate tree species are used, and (3) the requirement for maintenance and survival is increased from two to five years.

Recommended Conditions of Approval
File #VR-2021-013, Bonaventure Senior Housing Walkways

Conditions

1. As per Finding 5-c, revise the overall landscaping plan approved with master file #CU-2018-003 to include additional new trees, at the ratios provided on the City's Tree Credit Worksheet for the total amount of new impervious walkway (approximately 13,630 sq ft as proposed). The trees must be a mix of Oregon ash (*Fraxinus latifolia*), bigleaf maple (*Acer macrophyllum*), Scouler's willow (*Salix scouleriana*), and Ponderosa pine (*Pinus ponderosa*) and should be least 1.5-in caliper (and at least 5 ft tall, for coniferous trees) at the time of planting. The applicant must coordinate with City staff to identify planting locations, prioritizing areas near impervious surfaces. One hundred percent (100%) of the number of trees planted as mitigation for the approved variance must survive at least two years after planting, with replacement plants installed as necessary. An annual report on mitigation planting survival must be submitted for two years.

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. Expiration of Approval

As per MMC Subsection 19.1001.7.E, the land use approval granted with this decision will 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 two years of land use approval.
- b. Pass final inspection and/or obtain a certificate of occupancy within four years of land use approval.

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

July 2, 2021

Subject: Request for variance

Site: MSWH Milwaukie – 5801 SE Kellogg Creek Dr

Mr. Kelter,

Enclosed please find the following:

Land Use Application*
Fee Check # 1008 in the amount of \$2000.00
Narrative - Waiver Approval Criteria*
Submittal Requirements form*
Preapplication waiver form*
Letter from Redmond Geotechnical Engineering*
Site Plan identifying the area impacted in the waiver request*

*Original and 4 copies

Please accept these documents and drawing as our official application for a Type III variance request.

Feel free to contact me for any additional information or clarification.

I look forward to working with you on this project.

Thank you,



Mark Lowen

Project Manager

3425 Boone Road SE | Salem, OR 97317

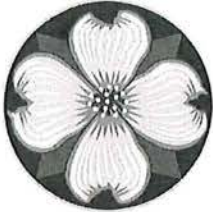
W: 503 480 3151 | C: 503 586 4104

mloven@livebsl.com



3425 Boone Rd. SE | Salem, OR 97317

Phone: (503) 566-5715 | Fax: (503) 588-3531



MILWAUKIE PLANNING
 6101 SE Johnson Creek Blvd
 Milwaukie OR 97206
 503-786-7630
 planning@milwaukieoregon.gov

Application for Land Use Action

Master File #: **VR-2021-013**

Review type*: ☐ I ☐ II ☒ III ☐ IV ☐ V

CHECK ALL APPLICATION TYPES THAT APPLY:

- | | | |
|---|---|---|
| ☐ Amendment to Maps and/or Ordinances:
☐ Comprehensive Plan Text Amendment
☐ Comprehensive Plan Map Amendment
☐ Zoning Text Amendment
☐ Zoning Map Amendment
☐ Code Interpretation
☐ Community Service Use
☐ Conditional Use
☐ Development Review
☐ Director Determination
☐ Downtown Design Review
☐ Extension to Expiring Approval
☐ Historic Resource:
☐ Alteration
☐ Demolition
☐ Status Designation
☐ Status Deletion | ☐ Land Division:
☐ Final Plat
☐ Lot Consolidation
☐ Partition
☐ Property Line Adjustment
☐ Replat
☐ Subdivision
☐ Miscellaneous:
☐ Barbed Wire Fencing
☐ Mixed Use Overlay Review
☐ Modification to Existing Approval
☐ Natural Resource Review**
☐ Nonconforming Use Alteration
☐ Parking:
☐ Quantity Determination
☐ Quantity Modification
☐ Shared Parking
☐ Structured Parking
☐ Planned Development | ☐ Residential Dwelling:
☐ Accessory Dwelling Unit
☐ Duplex
☐ Manufactured Dwelling Park
☐ Temporary Dwelling Unit
☐ Sign Review
☐ Transportation Facilities Review
☒ Variance:
☐ Use Exception
☐ Variance
☐ Willamette Greenway Review
☐ Other: _____
☐ Use separate application forms for:
Annexation and/or Boundary Change
• Compensation for Reduction in Property Value (Measure 37)
Daily Display Sign
• Appeal
• Appeal |
|---|---|---|

RESPONSIBLE PARTIES:

APPLICANT (owner or other eligible applicant—see reverse): **MWSH Milwaukie LLC**

Mailing address: **3425 Boone Rd SE, Salem** State/Zip: **OR, 97317**

Phone(s): **503-373-3151 - 503-586-4104 -cell** Email: **MLowen@livebsl.com**

Please note: The information submitted in this application may be subject to public records law.

APPLICANT'S REPRESENTATIVE (if different than above): **Mark D. Lowen**

Mailing address: **3425 Boone RD SE, Salem** State/Zip: **OR, 97317**

Phone(s): **503-586-4104** Email: **MLowen@livebsl.com**

SITE INFORMATION:

Address: **5801 SE Kellog Creek Dr** Map & Tax Lot(s): **22E06AD00901**

Comprehensive Plan Designation: **MED.D** Zoning: **R-3 / R-10** Size of property: **14.07 acres**

PROPOSAL (describe briefly):

Request for a variance to waive the requirement to install pervious PCC walkways, per the recommendation provided by our Geotechnical Engineer (Attached)

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: **Kelley Hamilton**

Date: **July 1, 2021**

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

****Note:** Natural Resource Review applications **may require a refundable deposit**. Deposits require completion of a Deposit Authorization Form, found at www.milwaukieoregon.gov/building/deposit-authorization-form.

THIS SECTION FOR OFFICE USE ONLY:

FILE TYPE	FILE NUMBER	AMOUNT (after discount, if any)	PERCENT DISCOUNT	DISCOUNT TYPE	DATE STAMP
Master file	VR-2021-013	\$ \$2,000 (Type III variance)			July 2, 2021 (materials & payment received)
Concurrent application files		\$			
		\$			
		\$			
		\$			
Deposit (NR only)				☐ Deposit Authorization Form received	
TOTAL AMOUNT RECEIVED: \$ \$2,000			RECEIPT #:		RCD BY: BK
Associated application file #s (appeals, modifications, previous approvals, etc.): CU-2018-003					
Neighborhood District Association(s): Lake Road					
Notes: Variance request for on-site walkways for overall project previously approved with master file #CU-2018-003.					



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 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/

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:

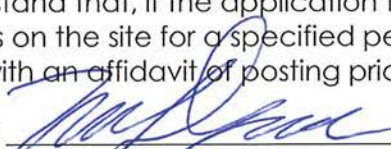
- Five hard copies of all application materials are required at the time of submittal. Staff will determine how many additional hard copies are required, if any, once the application has been reviewed for completeness. Provide an electronic version, if available.
- All hard copy application materials 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.
- By submitting the application, the applicant agrees that City of Milwaukie employees, and appointed or elected City Officials, have authority to enter the project site for the purpose of inspecting project site conditions and gathering information related specifically to the project site.
- Submittal of a full or partial electronic copy of all application materials is strongly encouraged.

As the authorized applicant I, (print name) Mark D. Lowen, 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: 

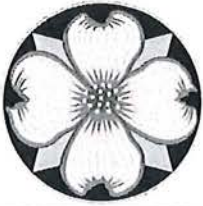
Date: July 1, 2021

Official Use Only

Date Received (date stamp below):

July 2, 2021
(materials & payment
received)

Received by: BK



MILWAUKIE PLANNING
6101 SE Johnson Creek Blvd
Milwaukie OR 97206
503.786.7600
planning@milwaukieoregon.gov

PREAPPLICATION CONFERENCE WAIVER

I/We, MWSH Milwaukie LLC (print), as applicant(s)/property owner(s) of 5801 SE Kellogg Creek Dr (address of property), request to waive the requirement for a preapplication conference for the submission of a **Type II / III / IV / V** (circle one) land use application per MMC Subsection 19.1002.2 Applicability.

Please provide an explanation for the waiver request:

MMC Section 19.1002 Preapplication Conference is provided on the reverse
Request waiver for the Preapplication Conference due to prior PA conferences and ongoing communication with Milwaukie Planning and the minor nature of this variance request.

Signed: _____

Applicant/Property Owner

Approved: _____

Planning Director

19.1002 PREAPPLICATION CONFERENCE

19.1002.1 Purpose

The purpose of the preapplication conference is to acquaint the applicant or applicant's representative with the requirements of the municipal code in preparation for submission of a land use application, including relevant approval criteria, development standards, and procedures. The preapplication conference is not an exhaustive review of all potential issues or requirements. Furthermore, the information provided by the City is not binding, and it does not preclude the City from raising new issues or identifying additional requirements during the land use review process.

19.1002.2 Applicability

- A. For Type I applications, a preapplication conference is optional.
- B. For Type II, III, IV, and V applications, and expedited annexations per Section 19.1104, a preapplication conference is required, with the following exceptions:
 - 1. The Planning Director may waive the preapplication conference requirement for proposals that are not complex or, for some other reason, would not benefit from a formal conference.
 - 2. A preapplication conference is not required for City-initiated Type IV or V applications.

19.1002.3 Preapplication Conference Procedures

The Planning Director shall adopt administrative rules for how the City processes preapplication conferences. The rules shall ensure that preapplication conferences are held in a timely fashion and provide a thorough explanation of all required City permits, fees, and approvals for any given development proposal. They shall include standards for scheduling, conducting, and communicating the outcomes of preapplication conferences.

19.1002.4 Preapplication Conference Expiration

- A. A preapplication conference is valid for 2 years. If a land use application or development permit has not been submitted within 2 years of the conference date, the applicant is required to schedule a new preapplication conference prior to submittal. This requirement may be waived per Subsection 19.1002.2.B.1.
- B. An applicant may request additional preapplication conferences at any time. There is no limit to the number of preapplication conferences that may be requested.
- C. If a development proposal is significantly modified after a preapplication conference occurs, the Planning Director may require a new preapplication conference. The City may refuse to accept a land use application or development permit for a significantly altered development proposal until a new preapplication conference is held.

BONAVENTURE OF MILWAUKIE Milwaukie, Oregon

A Land Use Application for:

Type III Variance
Request to waive pervious concrete requirement.

Applicant:
MWSH Milwaukie LLC

Submitted:
July 2, 2021

Prepared by:
Bonaventure

I. Applicable Project Team

Applicant & Property Owner

MWSH Milwaukie LLC
3425 Boone Road SE
Salem, OR 97317
Contact: Mark D. Lowen
503-480-3151 - o
503-586-4104 - c
MLowen@liveBSL.com

Geotechnical Engineering

Redmond Geotechnical Services
437 N. Tomahawk Island Rd
Portland, OR 97217
Contact : Daniel M Redmond, PE., G.E.
503-285-0598 - o
503-268-7176 - f

II. Background

Bonaventure identified a need for additional senior housing in the City of Milwaukie, entered contract with Turning Point Church to purchase land along Highway 224, and submitted land use applications to the city with the intent of building a community consisting of 78 Independent Living Suites, 60 Assisted Living Suites, and 32 Memory Care Suites.

Per the Notice of Decision, on February 28, 2019, the Milwaukie Planning Commission approved with conditions the Conditional Use, Community Service Use, Natural Resource Review, Variance Request, Parking Determination, Transportation Facilities Review, Lot Consolidation, and Property Line Adjustment requested by Bonaventure Senior Living. The appeal period closed at 5:00 p.m. on March 15, 2019. Master File CU-2018-003

Following the decision by the planning commission, MWSH Milwaukie LLC purchased the land from Turning Point Church and submitted building permits to the City. Site Development permits were issued, and work began.

The COVID-19 pandemic resulted in a halt and delay the Milwaukie project. MWSH Milwaukie LLC requested and was granted an extension to the original approvals, Land Use File EXT-2021-001 effective February 25, 2021 (no appeal filed).

During this interim we have reviewed and evaluated the site and building approvals. As a result, we propose the following variance request.

III. Request

The applicant requests that the City consider and approve a Type III Variance waiving the requirement of onsite pavements and walkways being constructed of pervious PCC concrete.

IV. Compliance with City of Milwaukee Development Code

19.900 Land Use Applications

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: The site design and sidewalk locations remain unchanged; the variance only addresses the type of material used in the construction of the sidewalks

B. Location

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

Response: No modifications are request to the location of the on-site sidewalks as currently approved.

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: All proposed sidewalk connections remain as designed and approved.

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: All proposed sidewalk connections remain as designed and approved.

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: Design and location of all sidewalks will remain as approved. Regarding the permeable stormwater standard. Applicant requests a Type III Variance waiving the permeable materials requirement for sidewalk construction. This request is due to the condition of the on-site soils, based on the observations and recommendations included in the letter from Redmond Geotechnical Services, Daniel M. Redmond, P.E., G.E. dated October 23, 2020 (attached)

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.

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.
- 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.

Response: Due to this sites substantial pervious area (70%+) stormwater runoff from the sidewalks will be mitigate onsite, creating no additional impacts on the surrounding properties.

(2) The proposed variance has desirable public benefits.

Response: This site will function as a Senior Living Facility; our residents have varying degrees of mobility challenges. Some utilizing canes, walkers, wheelchairs and other mobility assist devices. Great care needs to be exercised to assure our residents, staff and guests always have reliable, safe, convenient, stable pedestrian access and pathways. Pervious concrete has a greater probability for damage and instability when subject to Oregon's inclement weather resulting in stormwater and freeze conditions. Standard concrete hard surfaces provide a stable, all weather, long term, safe surface for all pedestrian access and uses.

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

Response: The soil condition and type supporting the sidewalk locations on this site are not conducive with pervious sidewalk construction. These conditions are identified in the attached letter dated October 23, 2020. From *Daniel M Redmond of Redmond Geotechnical Services who states "Typical rates of infiltration for this type of structural fill subgrade soil would be less than 0.2 inches per hour which is considered practically impermeable"*, Potentially creating backup and clogging of storm water on and within the pervious surfaces. These conditions can result in damage and rapid deterioration of the sidewalk surface creating safety hazards and substantial maintenance issues.

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

Response: Storm water runoff will be controlled on site and released to meet all codes and standards, mitigating all sidewalk stormwater runoff issues.

V. Conclusions

The Type III Variance request for a waiver from utilizing pervious PCC concrete for the sidewalks and pavements on this site is reasonable and consistent with City standards and criteria. The applicant therefore requests that the Planning Director approve their request for said Type III Variance.



Project No. 1004.032.G
Page No. 1

October 23, 2020

Mr. Daniel Dobson
Bonaventure
3425 Boone Road SE
Salem, Oregon 97317

Dear Mr. Dobson:

**Re: Supplemental Geotechnical Consultation Services, Evaluation of Pervious Concrete Pavements,
Proposed Bonaventure of Milwaukie Project, SE Rusk Road, Milwaukie, Oregon**

In accordance with your request, we are providing you with the following professional opinion with regard to the reported planned use of pervious concrete pavements and/or sidewalks at the above subject project. As you are aware, we previously performed a Geotechnical Investigation for the project the results of which were presented in our formal report dated September 28, 2018.

Specifically, we understand that pervious PCC sidewalks and/or pavements are currently planned and/or required for the project. In general, pervious PCC sidewalks and/or pavements are suitable for use when the supporting subgrade soils have a Cation Exchange Capacity (CEC) greater than 5 milliequivalents per 100 grams of dry soil (USEPA Method 9091) and an Organic Content greater than one (1%) percent. However, the use of pervious pavements is generally not recommended above structural fill soils due to their limited and/or restrictive rate of infiltration.

Based on the results of our previous Geotechnical Investigation as well as our observations made during the recent site grading and earthwork operations for the project, the subject site near surface soils consist of a well compacted structural fill soil. Specifically, the near surface subgrade soils across the site consist of a mixture of sand, silt and clay with a trace of and/or occasional gravel compacted to at least 92 percent of the maximum dry density as determined by the ASTM D-1557 (AASHTO T-180) test procedures. Typical rates of infiltration for this type of structural fill subgrade soil would be less than 0.2 inches per hour which is considered practically impermeable.

While an organic content test was not performed on the structural fill soils placed at the site, the results of our site observations made during the recent site grading operations would suggest that the organic content in the near surface subgrade soils is less than one (1%) percent. Additionally, based on the results of our observations made during the recent site grading operations as well as past experience with other similar types of structural fill soils, the structural fill soils which are present within the near surface subgrade soils across the site have a Cation Exchange Capacity of less than 5 milliequivalents per 100 grams of dry soil. Further, pervious pavements and/or sidewalks are susceptible and/or prone to clogging. As such, routine maintenance of the pervious pavement(s) will be required. In addition to the above, due to the limited ability of the near surface structural fill subgrade soils to infiltrate storm water, the thickness of the underlying aggregate base rock section will need to be increased and/or required to provide for storage of stormwater during the design storm and/or rainfall event. However, we also point out that under extreme rainfall events, even a properly designed and/or constructed pervious pavement would be susceptible to excess stormwater runoff. As such, pervious pavements should also be design and/or constructed with the ability to effectively convey excess stormwater runoff.

In this regard, based on the above, it is our professional opinion that the use of pervious PCC sidewalks and/or pavements for the above subject Bonaventure of Milwaukie project is generally not recommended.

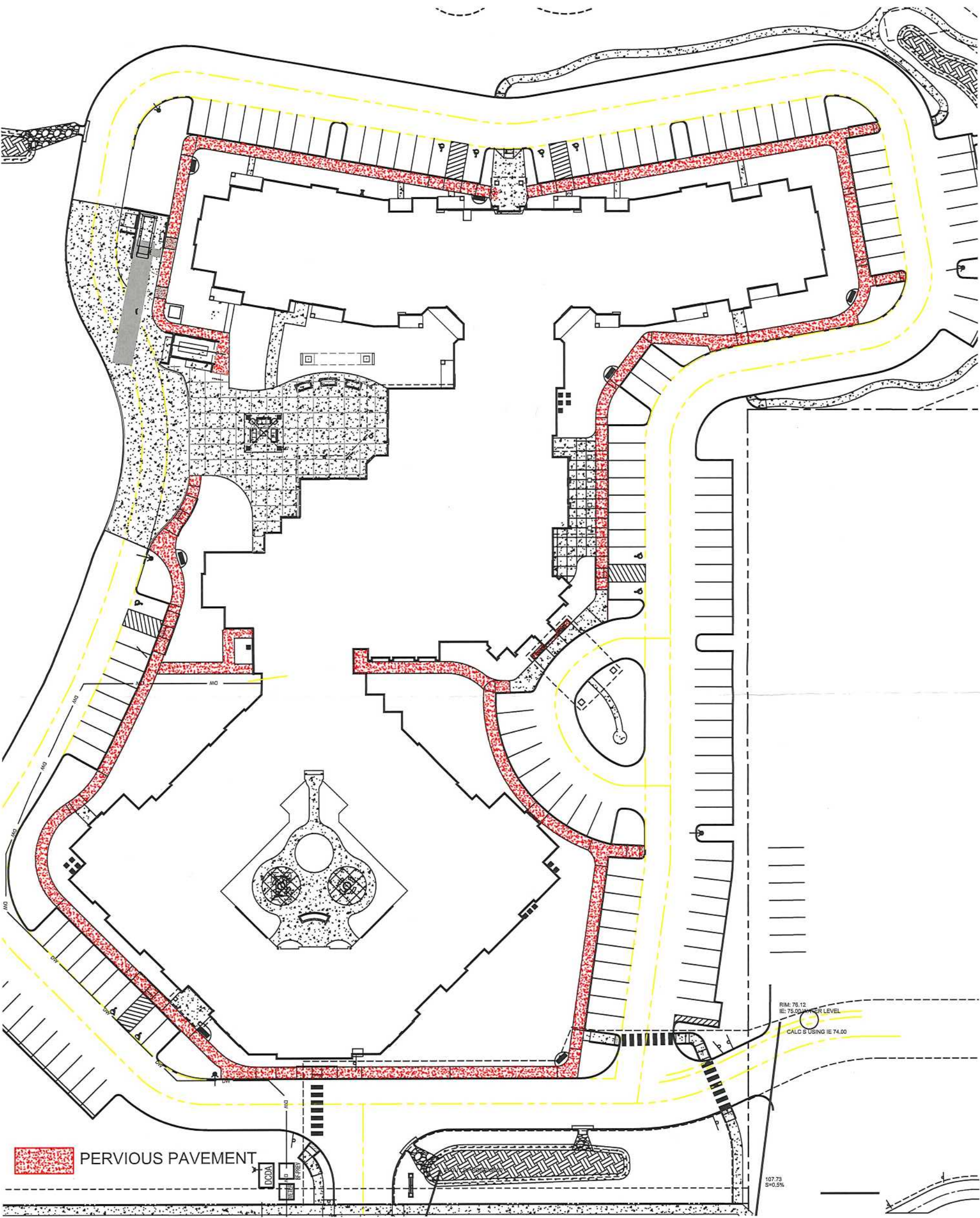
We appreciate this opportunity to be of service to you at this time and trust that the above information is suitable to your present needs. Should you have any questions regarding the above or if you require any additional information and/or assistance, please do not hesitate to call.

Sincerely,



Daniel M. Redmond, P.E., G.E.
President/Principal Engineer





ADDENDUM:
PAGE:
DATE: 6-30-21
DRAWN:
JOB NO.:

Bonaventure Milwaukie
Pervious Sidewalks

4.1 Page 31

BONAVENTURE
Senior Living



3425 Boone Rd SE
Salem, Oregon 97317
Phone: (503) 361-7153
FAX: (503) 588-3531



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

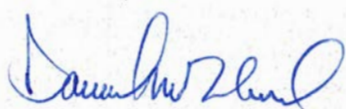
Dear Mr. Dobson:

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



TABLE OF CONTENTS

	Page No.
INTRODUCTION	1
PROJECT DESCRIPTION	1
SCOPE OF WORK	2
SITE CONDITIONS	3
Site Geology	3
Surface Conditions	3
Subsurface Soil Conditions	4
Groundwater	5
INFILTRATION TESTING	5
LABORATORY TESTING	5
SEISMICITY AND EARTHQUAKE SOURCES	6
Liquefaction	7
Landslides	7
Surface Rupture	7
Tsunami and Seiche	8
Flooding and Erosion	8
CONCLUSIONS AND RECOMMENDATIONS	8
General	8
Site Preparation	9
Foundation Support	11
Shallow Foundations	11
Floor Slab Support	12

Table of Contents (continued)

Retaining/Below Grade Walls	12
Pavements	13
Access Drives and Parking	13
Pavement Subgrade, Base Course & Asphalt Materials	13
Wet Weather Grading and Soft Spot Mitigation	14
Shrink-Swell and Frost Heave	14
Excavations/Slopes	15
Surface Drainage/Groundwater	15
Design Infiltration Rates	16
Seismic Design Considerations	16
CONSTRUCTION MONITORING AND TESTING	17
CLOSURE AND LIMITATIONS	17
LEVEL OF CARE	18
REFERENCES	19
ATTACHMENTS	
Figure No. 1 - Site Vicinity Map	
Figure No. 2 - Site Exploration Plan	
Figure No. 3 - Perimeter Footing/Retaining Wall Drain Detail	
APPENDIX A	
Test Pit Logs and Laboratory Data	

**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**

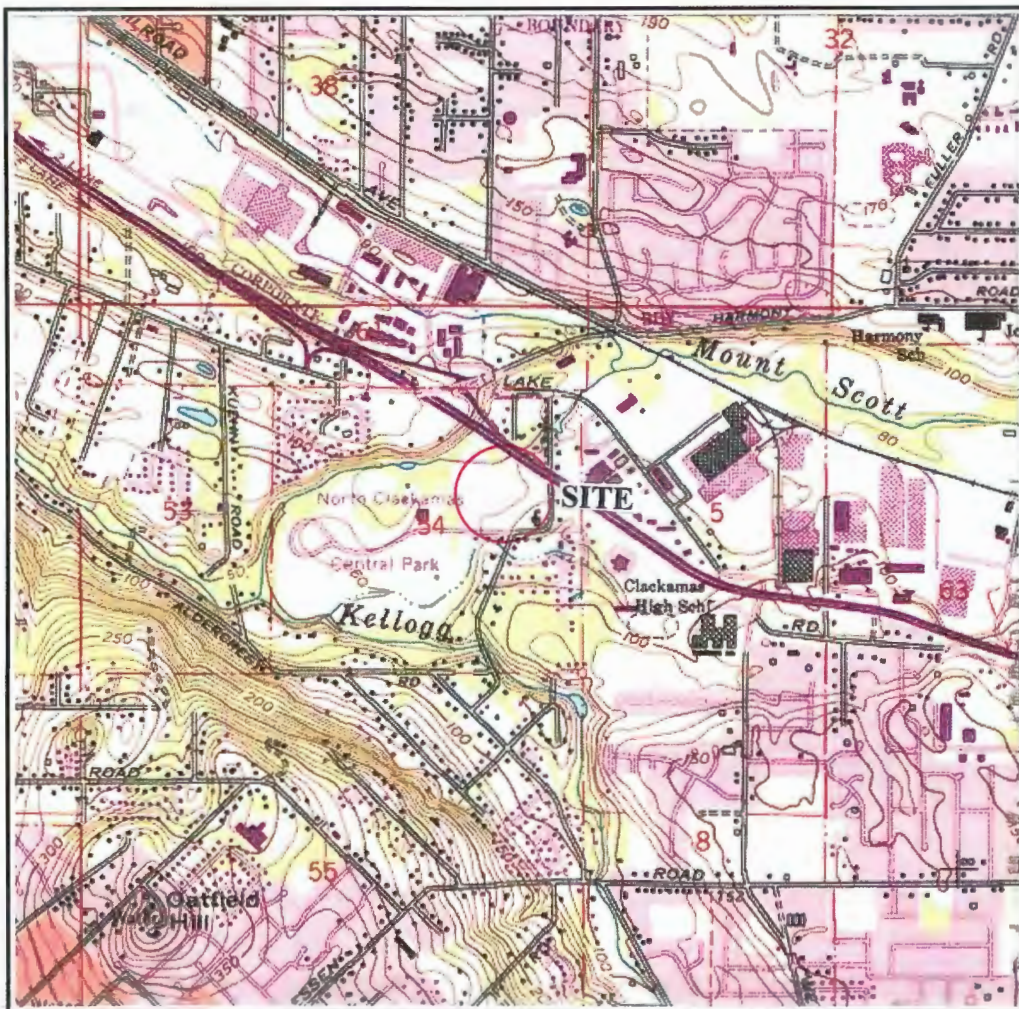
INTRODUCTION

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.

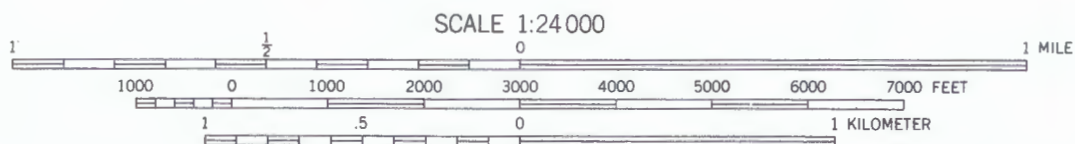
PROJECT DESCRIPTION

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.

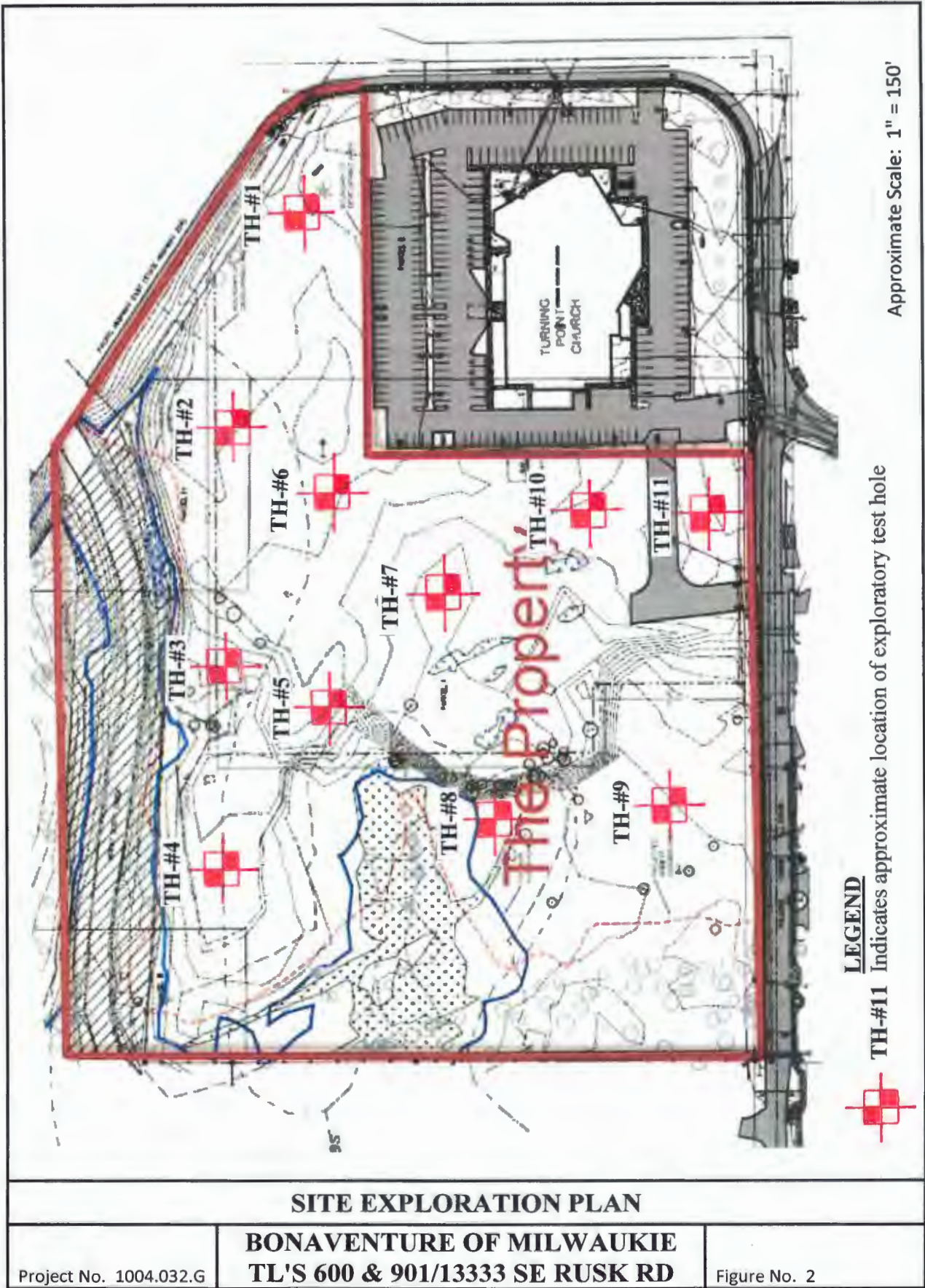
Topographically, the site is characterized as relatively flat-lying to gently to moderately sloping terrain (10 to 20 percent) descending downward towards the north and west with overall topographic relief estimated at about ten (10) to fifteen (15) feet and is estimated to lie at about Elevation 70 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.



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 posses 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

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	35	30
3H:1V	60	50
2H:1V	90	80

For walls which are fully restrained at the top and prevented from rotation about their base, we recommend that at-rest earth pressures be computed on the basis of the following equivalent fluid densities:

Restrained Retaining Wall Pressure Design Recommendations

Slope Backfill (Horizontal/Vertical)	Equivalent Fluid Density/Silt (pcf)	Equivalent Fluid Density/Gravel (pcf)
Level	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:

	Asphaltic Concrete Thickness (inches)	Crushed Base Rock Thickness (inches)
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

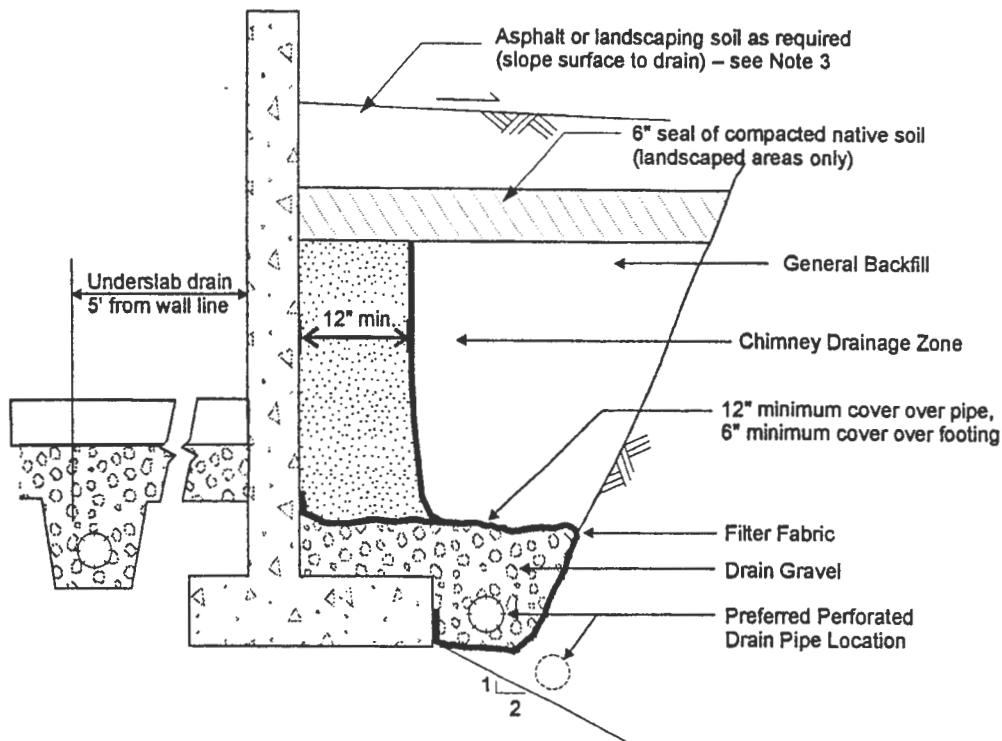
Based on the results of our field infiltration testing, we recommend using the following infiltration rate to design any on-site subsurface storm water infiltration and/or disposal systems for the project:

Subgrade Soil Type	Recommended Infiltration Rate
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 (Fa and Fv) 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 $\frac{3}{4}$ " to $1\frac{1}{2}$ " gravel.
5. General backfill to be on-site gravels, or $\frac{3}{4}$ "-0 or $1\frac{1}{2}$ "-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 _s	S ₁	F _a	F _v	S _{MS}	S _{M1}	S _{DS}	S _{D1}
D	0.965	0.412	1.114	1.588	1.075	0.654	0.717	0.436

Notes: 1. S_s and S₁ were established based on the USGS 2015 mapped maximum considered earthquake spectral acceleration maps for 2% probability of exceedence in 50 years.

2. F_a and F_v were established based on IBC 2015 tables using the selected S_s and S₁ values.

CONSTRUCTION MONITORING AND TESTING

We recommend that **Redmond Geotechnical Services, LLC** be retained to provide construction monitoring and testing services during all earthwork operations for the proposed new 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.

REFERENCES

- Adams, John, 1984, Active Deformation of the Pacific Northwest Continental Margin: *Tectonics*, v.3, no. 4, p. 449-472.
- Applied Technology Council, ATC-13, 1985, Earthquake Damage Evaluation Data for California.
- Atwater, B.F., 1992, Geologic evidence for earthquakes during the past 2000 years along the Copalis River, southern coastal Washington: *Journal of Geophysical Research*, v. 97, p. 1901-1919.
- Atwater, B.F., 1987a, A periodic Holocene recurrence of widespread, probably coseismic Subsidence in southwestern Washington: *EOS*, v. 68, no. 44.
- Atwater, B.F., 1987b, Evidence for great Holocene earthquakes along the outer coast of Washington State: *Science*, v. 236, no. 4804, pp. 942-944.
- Campbell, K.W., 1990, Empirical prediction of near-surface soil and soft-rock ground motion for the Diablo Canyon Power Plant site, San Luis Obispo County, California: Dames & Moore report to Lawrence Livermore National Laboratory.
- Carver, G.A., and Burke, R.M., 1987, Late Holocene paleoseismicity of the southern end of the Cascadia Subduction zone [abs.]: *EOS*, v. 68, no. 44, p. 1240.
- Chase, R.L., Tiffin, D.L., Murray, J.W., 1975, The western Canadian continental margin: In Yorath, C.J., Parker, E.R., Glass, D.J., editors, *Canada's continental margins and offshore petroleum exploration: Canadian Society of Petroleum Geologists Memoir 4*, p. 701-721.
- Crouse, C.B., 1991a, Ground motion attenuation equations for earthquakes on the Cascadia Subduction Zone: *Earthquake Spectra*, v. 7, no. 2, pp. 201-236.
- Crouse, C.B., 1991b, Errata to Crouse (1991a), *Earthquake Spectra*, v. 7, no. 3, p. 506.
- Dariento, M.E., and Peterson, C.D., 1987, Episodic tectonic subsidence recorded in late Holocene salt marshes, northern Oregon central Cascadia margin: *Tectonics*, v. 9, p. 1-22.
- Dariento, M.E., and Peterson, C.D., 1987, Episodic tectonic subsidence recorded in late Holocene salt marshes northwest Oregon [abs]: *EOS*, v. 68, no. 44, p. 1469.
- EERI (Earthquake Engineering Research Institute), 1993, The March 25, 1993, Scotts Mill Earthquake, Western Oregon's Wake-Up Call: *EERI Newsletter*, Vol. 27, No. 5, May.
- Geomatrix, 1995 Seismic Design Mapping, State of Oregon: Final Report to Oregon Department of Transportation, January.

Geologic Map Series (GMS-49), Map of Oregon Seismicity, 1841-1986 dated 1986.

Geologic Map Series (GMS-97), Geologic Map of the Coos Bay Quadrangle, Coos County, Oregon dated 1995.

Grant, W.C., and McLaren, D.D., 1987, Evidence for Holocene Subduction earthquakes along the northern Oregon coast [abs]: EOS v. 68, no. 44, p. 1239.

Grant, W.C., Atwater, B.F., Carver, G.A., Darienzo, M.E., Nelson, A.R., Peterson, C.D., and Vick, G.S., 1989, Radiocarbon dating of late Holocene coastal subsidence above the Cascadia Subduction zone-compilation for Washington, Oregon, and northern California, [abs]: EOS Transactions of the American Geophysical Union, v. 70, p. 1331.

International Conference of Building Officials (ICBO), 1994, Uniform Building Code: 1994 Edition, Whittier, CA. 1994.

Joyner, W.B., and Boore, D.M., 1998, Measurement, characterization and prediction of strong ground motion: Earthquake Engineering and Soil Dynamics II – Recent Advances in Ground Motion Evaluation, ASCE Geotech. Special Publ. No. 20, p. 43-102.

Riddihough, R.P., 1984, Recent movements of the Juan de Fuca plate system: Journal of Geophysical Research, v. 89, no. B8, p. 6980-6994.

Youngs, R.R., Day, S.M., and Stevens, J.L., 1998, Near field ground motions on rock for large Subduction earthquakes: Earthquake Engineering and Soil Dynamics II – Recent Advances in Ground Motion Evaluation, ASCE Geotech. Special Publ. No. 20, p. 445-462.

Appendix "A"

Test Pit Logs and Laboratory Test Data

APPENDIX

FIELD EXPLORATIONS AND LABORATORY TESTING

FIELD EXPLORATION

Subsurface conditions at the site were explored by excavating 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.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty, or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

DEFINITION OF TERMS

U.S. STANDARD SERIES SIEVE					CLEAR SQUARE SIEVE OPENINGS			
200	40	10	4	3/4"	3"	12"		
SILTS AND CLAYS	SAND			GRAVEL		COBBLES		BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE			

GRAIN SIZES

SANDS, GRAVELS AND NON-PLASTIC SILTS	BLOWS/FOOT [†]
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CLAYS AND PLASTIC SILTS	STRENGTH [‡]	BLOWS/FOOT [†]
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

RELATIVE DENSITY

[†] Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1-3/8 inch I.D.) split spoon (ASTM D-1586).

[‡] Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

CONSISTENCY

KEY TO EXPLORATORY TEST PIT LOGS Unified Soil Classification System (ASTM D-2487)

BONAVENTURE OF MILWAUKIE
Milwaukie, Oregon

PROJECT NO.

DATE

Figure A-4

4.1 Page 63 . 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
15						

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
						Total Depth = 6.0 feet No groundwater encountered at time of exploration
10						
15						

LOG OF TEST PITS

PROJECT NO. 1004.032.G

BONAVENTURE OF MILWAUKIE

FIGURE NO. A-5

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
15						

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
15						

LOG OF TEST PITS

PROJECT NO. 1004.032.G

BONAVENTURE OF MILWAUKIE

FIGURE NO. A-6

BACKHOE COMPANY: Jim Smith Excavating BUCKET SIZE: 24 inches DATE: 9/07/18

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#5 ELEVATION
0						
	X	X	101.2	12.6	ML/ SM	FILL: 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	NATIVE GROUND: 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
15						

TEST PIT NO. TH-#6 ELEVATION						
0						
	X	X	97.7	13.4	ML/ SM	FILL: 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	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, 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
15						

LOG OF TEST PITS

PROJECT NO. 1004.032.G

BONAVENTURE OF MILWAUKIE

FIGURE NO. A-7

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH-#7 ELEVATION
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
15						

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
15						

LOG OF TEST PITS

PROJECT NO. 1004.032.G

BONAVENTURE OF MILWAUKIE

FIGURE NO. A-8

DEPTH (FEET)	BAG SAMPLE	DENSITY TEST	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	SOIL CLASS. (U.S.C.S.)	SOIL DESCRIPTION
						TEST PIT NO. TH_#9 ELEVATION
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					ML/SM	FILL: Medium brown, damp to moist, poorly to moderately compacted, clayey, sandy SILT to silty SAND with organics and construction debris
	X	X	99.1	14.4		
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

BACKHOE COMPANY: Jim Smith Excavating BUCKET SIZE: 24 inches

DATE: 9/07/18

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
15						

TEST PIT NO.						ELEVATION
0						
5						
10						
15						

LOG OF TEST PITS

PROJECT NO. 1004.032.G

BONAVENTURE OF MILWAUKIE

FIGURE NO. A-10

MAXIMUM DENSITY TEST RESULTS

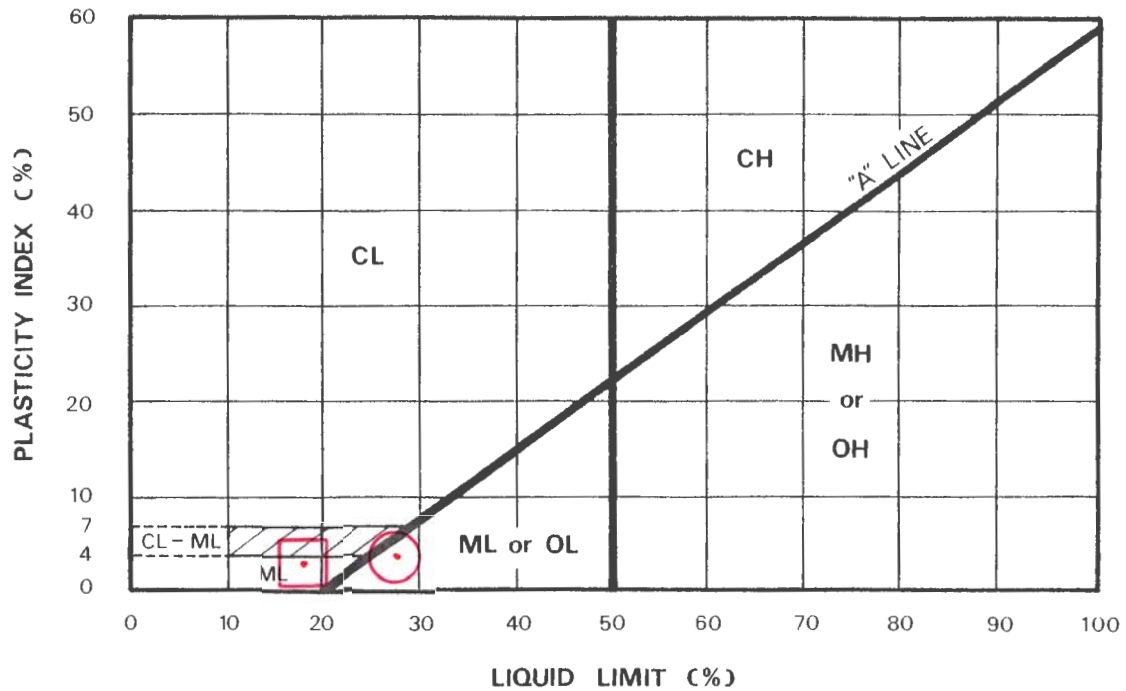
SAMPLE LOCATION	SOIL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
TH-#5 @ 1.5'	Medium brown, clayey, sandy SILT to silty SAND with gravel (ML/SM)	110.0	17.0
TH-#10 @ 1.5'	Medium brown, clayey, sandy SILT to silty SAND with gravel (ML/SM)	112.0	16.0

EXPANSION INDEX TEST RESULTS

SAMPLE LOCATION	INITIAL MOISTURE (%)	COMPACTED DRY DENSITY (pcf)	FINAL MOISTURE (%)	VOLUMETRIC SWELL (%)	EXPANSION INDEX	EXPANSIVE CLASS.

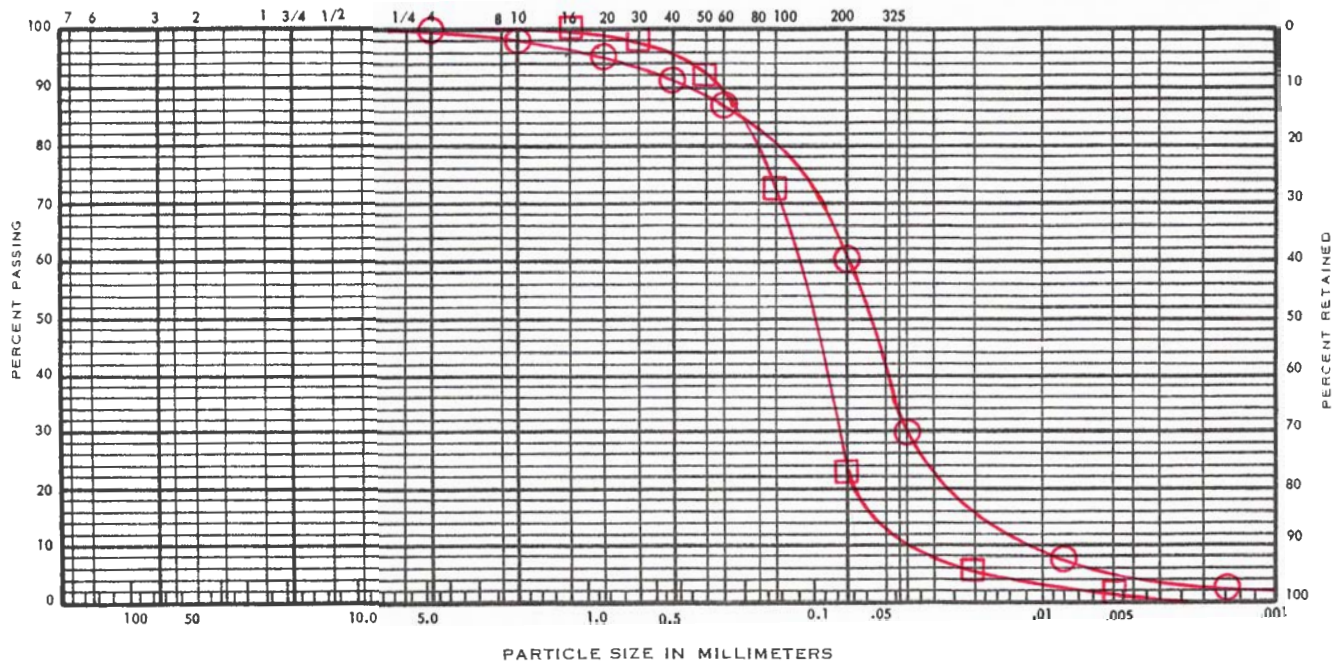
MAXIMUM DENSITY & EXPANSION INDEX TEST RESULTS

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

U. S. STANDARD SIEVE SIZES



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



PO Box 20547 • PORTLAND, OREGON 97294

GRADATION TEST DATA

BONAVENTURE OF MILWAUKIE
Milwaukie, Oregon

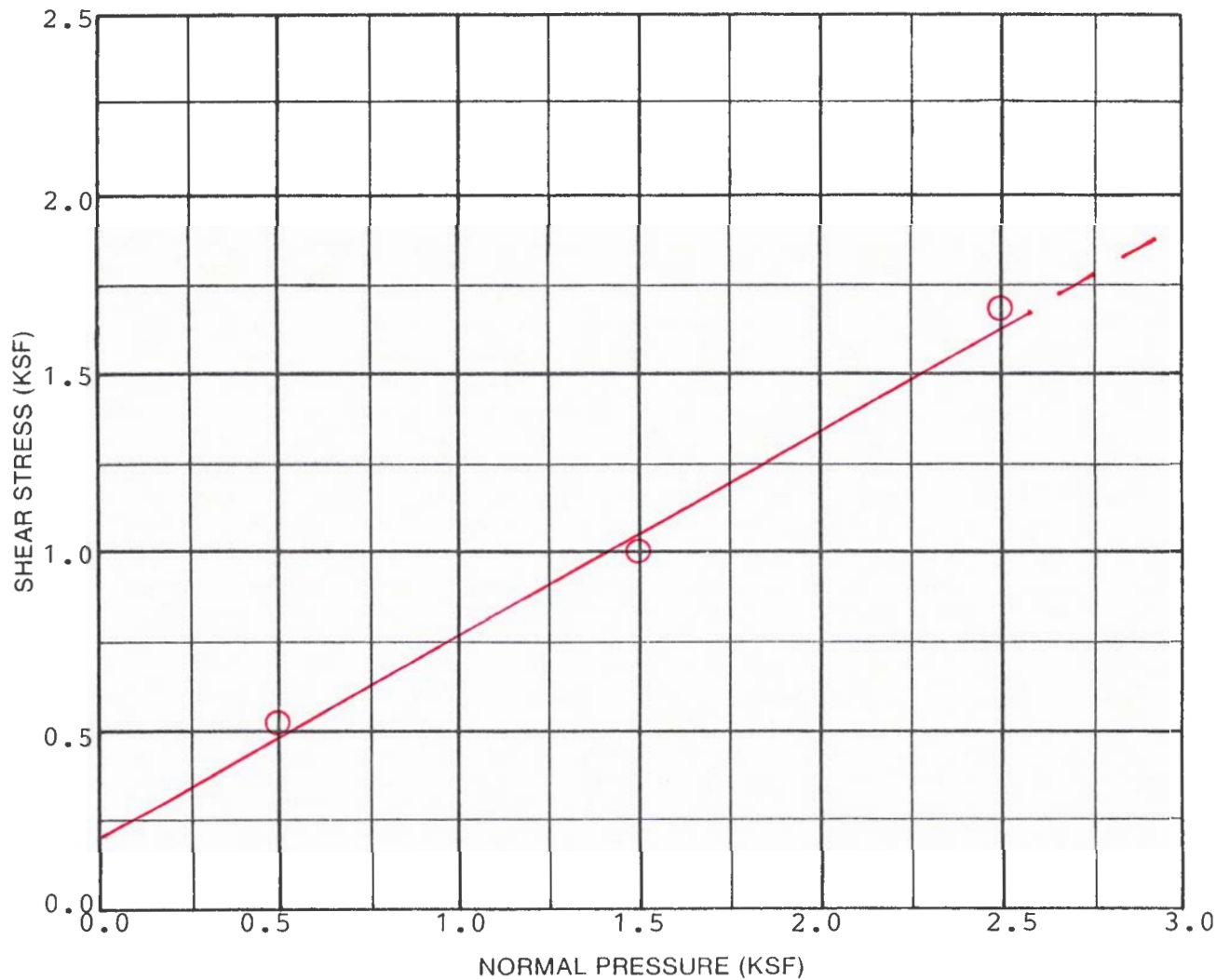
PROJECT NO.

DATE _____

FIGURE A-13

1004.032.G

9/28/18



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 (ϕ): 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 ₂ O CONTENT (%)	16.0	16.0	16.0	
FINAL H ₂ 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				



PO Box 20547 • PORTLAND, OREGON 97294

4.1 Page 73

DIRECT SHEAR TEST DATA

BONAVENTURE OF MILWAUKIE
Milwaukie, Oregon

PROJECT NO.

DATE

Figure A-14

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

104.032.G

9/28/18

RESULTS OF R (RESISTANCE) VALUE TESTS

SAMPLE LOCATION: TH-#6

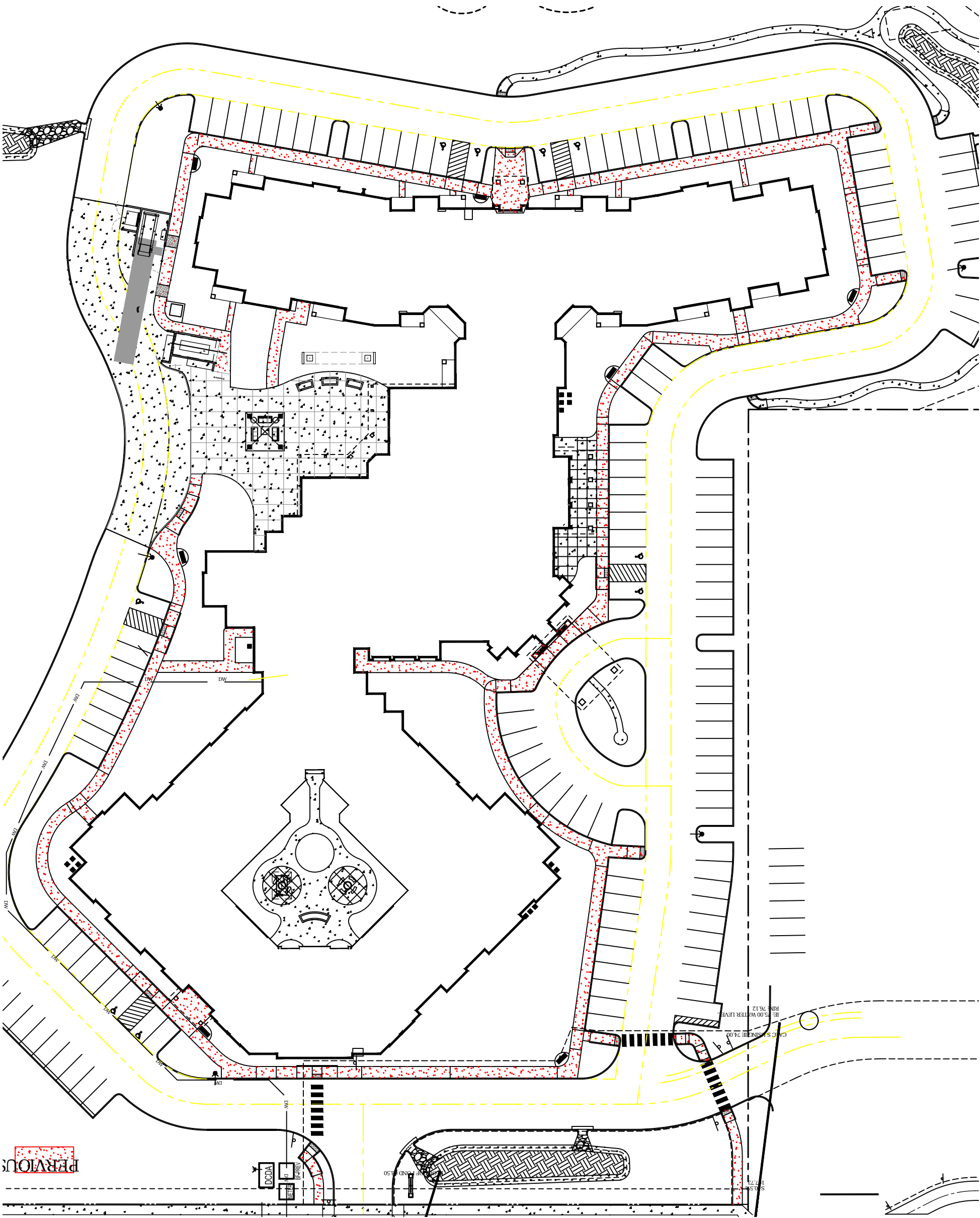
SAMPLE DEPTH: 1.5 feet bgs

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			



PERVIOUS

Brett Kelter

From: paul.hawkins@daimler.com
Sent: Thursday, August 5, 2021 9:14 AM
To: Brett Kelter
Subject: RE: VR-2021-013 Type III Variance

This Message originated outside your organization.

Brett,

The Lake Road NDA would like to see this project move forward. Knowing that construction material prices have increased dramatically, I believe that changing the path material in this situation would not adversely affect the moisture percentage in the surrounding soil. Therefore, I feel comfortable in speaking for the NDA when I say we are in favor of granting this variance.

Thank you,
Paul Hawkins
Lake Rd. Neighborhood Land Use.

From: Brett Kelter <KelterB@milwaukieoregon.gov>
Sent: Thursday, August 05, 2021 9:00 AM
To: Hawkins, Paul (164) [DT] <paul.hawkins@daimler.com>
Subject: RE: VR-2021-013 Type III Variance

Paul,

Thanks for sending your comments so quickly! Should I understand this to be a comment on behalf of the NDA, or your comment as an individual?

BRETT KELVER, AICP

Associate Planner
he • him • his

From: Emilie Bushlen <BushlenE@milwaukieoregon.gov>
Sent: Thursday, August 5, 2021 8:07 AM
To: Brett Kelter <KelterB@milwaukieoregon.gov>
Subject: FW: VR-2021-013 Type III Variance

From: paul.hawkins@daimler.com <paul.hawkins@daimler.com>
Sent: Thursday, August 5, 2021 5:58 AM
To: Emilie Bushlen <BushlenE@milwaukieoregon.gov>
Subject: RE: VR-2021-013 Type III Variance

This Message originated outside your organization.

Emilie,

Considering the kind of use this path surface will have and the percentage of ground covered, I support this variance.

ATTACHMENT 5 TREE CREDIT WORKSHEET



Trees may be able to reduce the size of required stormwater facilities. Small projects, such as residential additions or new detached structures (garages, sheds, accessory dwelling units), may be able to eliminate stormwater requirements through use of tree credit. Trees used for tree credit must be clearly labeled on the site plan and included on the Stormwater Operations & Maintenance Plan.

Tree Credit Applicability:

- For sites with more than 1,000 square feet of new or redeveloped impervious surface to manage, no more than 10% of the impervious area can be mitigated with through tree credit.
- Nuisance trees cannot receive stormwater tree credit.
- Milwaukie may require a certified arborists' report to verify suitable tree selection and preservation.
- Trees planted in stormwater facilities or used towards environmental zone mitigation cannot also receive tree credit.
- Trees (new or existing) must be located within 10 feet of impervious surfaces to qualify for tree credit.

CALCULATE TREE CREDIT

New trees must be at least 1.5 caliper inches at the time of planting; new coniferous trees must be at least 5 feet tall.

NEW TREES	TYPE OF TREE	NUMBER OF TREES	CREDIT PER TREE	TREE CREDIT (SF)
	New coniferous trees		Multiply by 200 square feet	
	New broadleaf trees		Multiply by 100 square feet	

SMALL TREES (Existing trees with caliper of 1.5 to 6 inches)

	NUMBER OF TREES	CREDIT PER TREE	TREE CREDIT (SF)
Existing trees with caliper of 1.5 to 6 inches		Multiply by 200 square feet	

LARGE TREES (Larger than 6 caliper inches)

EXISTING TREES	TYPE OF TREE	CALIPER SIZE (in inches)	DETERMINE CREDIT UNITS	CREDIT UNITS PER TREE (Do not round up)	CREDIT PER 6 CALIPER INCHES	TREE CREDIT (SF)
			Divide by 6		Multiply by 400 square feet	
			Divide by 6		Multiply by 400 square feet	
			Divide by 6		Multiply by 400 square feet	
			Divide by 6		Multiply by 400 square feet	
			Divide by 6		Multiply by 400 square feet	
			Divide by 6		Multiply by 400 square feet	
			Divide by 6		Multiply by 400 square feet	
			Divide by 6		Multiply by 400 square feet	
			Divide by 6		Multiply by 400 square feet	

TOTAL TREE CREDIT

Continue on back

TREE CREDIT WORKSHEET

ALLOWABLE TREE CREDIT

For sites with less than 1,000 square feet of new or redeveloped impervious area, the Total Tree Credit is allowed. Stormwater runoff may go to the existing disposal location.

Allowable Tree Credit = Total Tree Credit

For sites with over 1,000 square feet of new or redeveloped impervious area, a maximum of 10% of the new or redeveloped impervious area can be mitigated through tree credit.

TOTAL NEW OR REDEVELOPMENT IMPERVIOUS AREA (SF)	MAXIMUM TREE CREDIT	TOTAL ALLOWABLE TREE CREDIT (SF)
	Multiply by 0.10	

Allowable Tree Credit is the lesser of the Total Tree Credit
or the Total Allowable Tree Credit

Allowable Tree Credit =

Thank you,
Paul Hawkins
Lake Rd. Neighborhood Land Use

From: Emilie Bushlen <BushlenE@milwaukieoregon.gov>
Sent: Wednesday, August 04, 2021 1:55 PM
To: Kelly Brooks <BrooksK@milwaukieoregon.gov>; Jennifer Backhaus <BackhausJ@milwaukieoregon.gov>; Steve Adams <AdamsS@milwaukieoregon.gov>; Laura Weigel <Weigell@milwaukieoregon.gov>; Luke Strait <straitl@milwaukieoregon.gov>; Samantha Vandagriff <VandagriffS@milwaukieoregon.gov>; Harmony Drake <DrakeH@milwaukieoregon.gov>; Stephanie Marcinkiewicz <MarcinkiewiczS@milwaukieoregon.gov>; Peter Passarelli <PassarelliP@milwaukieoregon.gov>; Ann Ober <OberA@milwaukieoregon.gov>; Justin Gericke <GerickeJ@milwaukieoregon.gov>; Alex McGladrey <alex.mcgladrey@clackamasfire.com>; Mike Boumann <mike.boumann@clackamasfire.com>; Jeremiah Sonne <SonneJ@milwaukieoregon.gov>; Jason Wachs <WachsJ@milwaukieoregon.gov>; Heavytech77@gmail.com; Hawkins, Paul (164) <paul.hawkins@daimler.com>; kkrygier@ncprd.com; Developmentengineering@clackamas.us; landusenotifications@oregonmetro.gov; ODOT_R1_DevRev@odot.state.or.us; developmentreview@trimet.org; Jeremy.Lorence@nwnatural.com; contact@oakgrovecpo.org
Cc: Brett Kelter <KelterB@milwaukieoregon.gov>
Subject: VR-2021-013 Type III Variance

Greetings,

Please access the link below to find the Application Referral for land use application VR-2021-013. The site location is 5801 SE Kellogg Creek Dr. If you have any questions, contact Associate Planner Brett Kelter at 503-786-7657 or kelverb@milwaukieoregon.gov.

Link to file: <https://www.milwaukieoregon.gov/planning/vr-2021-013>

EMILIE BUSHLEN

Administrative Specialist II
City of Milwaukie, Community Development
503.786.7600

Disclaimer

The information contained in this communication from the sender is confidential. It is intended solely for use by the recipient and others authorized to receive it. If you are not the recipient, you are hereby notified that any disclosure, copying, distribution or taking action in relation of the contents of this information is strictly prohibited and may be unlawful.

This email has been scanned for viruses and malware, and may have been automatically archived by **Mimecast Ltd.**

If you are not the addressee, please inform us immediately that you have received this e-mail by mistake, and delete it. We thank you for your support.

Disclaimer

The information contained in this communication from the sender is confidential. It is intended solely for use by the recipient and others authorized to receive it. If you are not the recipient, you are hereby notified that any disclosure, copying, distribution or taking action in relation of the contents of this information is strictly prohibited and may be unlawful.

Brett Kelter

From: McGladrey, Alex <alex.mcgladrey@Clackamasfire.com>
Sent: Thursday, August 5, 2021 1:26 PM
To: Brett Kelter
Subject: Re: VR-2021-013 Type III Variance

This Message originated outside your organization.

Brett,

This looks like its just a variance for the permeable walkway so CFD has no comment.

Thanks

Alex McGladrey

Deputy Fire Marshal | Fire Marshal's Office

direct: [503.742.2662](tel:503.742.2662)

main: 503.742.2600



From: Emilie Bushlen <BushlenE@milwaukieoregon.gov>
Sent: Wednesday, August 4, 2021 13:54
To: Kelly Brooks <BrooksK@milwaukieoregon.gov>; Jennifer Backhaus <BackhausJ@milwaukieoregon.gov>; Steve Adams <AdamsS@milwaukieoregon.gov>; Laura Weigel <WeigelL@milwaukieoregon.gov>; Luke Strait <straitl@milwaukieoregon.gov>; Samantha Vandagriff <VandagriffS@milwaukieoregon.gov>; Harmony Drake <DrakeH@milwaukieoregon.gov>; Stephanie Marcinkiewicz <MarcinkiewiczS@milwaukieoregon.gov>; Peter Passarelli <PassarelliP@milwaukieoregon.gov>; Ann Ober <OberA@milwaukieoregon.gov>; Justin Gericke <GerickeJ@milwaukieoregon.gov>; McGladrey, Alex <alex.mcgladrey@Clackamasfire.com>; Boumann, Mike <mike.boumann@ClackamasFire.com>; Jeremiah Sonne <SonneJ@milwaukieoregon.gov>; Jason Wachs <WachsJ@milwaukieoregon.gov>; Heavytech77@gmail.com <Heavytech77@gmail.com>; paul.hawkins@daimler.com <paul.hawkins@daimler.com>; kkrygier@ncprd.com <kkrygier@ncprd.com>; Developmentengineering@clackamas.us <Developmentengineering@clackamas.us>; landusenotifications@oregonmetro.gov <landusenotifications@oregonmetro.gov>; ODOT_R1_DevRev@odot.state.or.us <ODOT_R1_DevRev@odot.state.or.us>; developmentreview@trimet.org <developmentreview@trimet.org>; Jeremy.Lorence@nwnatural.com <Jeremy.Lorence@nwnatural.com>; contact@oakgrovecpo.org <contact@oakgrovecpo.org>
Cc: Brett Kelter <KelterB@milwaukieoregon.gov>
Subject: VR-2021-013 Type III Variance

Greetings,

Please access the link below to find the Application Referral for land use application VR-2021-013. The site location is 5801 SE Kellogg Creek Dr. If you have any questions, contact Associate Planner Brett Kelter at 503-786-7657 or kelterb@milwaukieoregon.gov.



2416 SE Lake Road, Milwaukie, OR 97222 - 503-550-9282 -
northclackamaswatersheds.org

September 2, 2021

TO: Brett Kelter, City of Milwaukie Planning Department
Milwaukie Planning Commission

CC: Vera Kolias, Planning Department
Natalie Rogers, Climate and Natural Resources Manager

RE: Request for Variance by Bonaventure Senior Living RE: Pervious Pavement

The North Clackamas Watersheds Council is submitting these comments in response to the request for a Type III Variance for an exemption from the requirement for pervious pavement in the walkways of the Bonaventure Senior Living facility on Rusk Road. Our position is as follows:

- While the request to eliminate the pervious pavement from the design is regrettable, it is our understanding that soil conditions may preclude it, if the information provided by the applicant is correct.
- Addition of more impervious surface in a low-lying area of the Mt. Scott watershed will have negative effects on hydrology, future downstream flood risk, water quality, and late-season water availability, especially as climate change proceeds (Milwaukie Climate Action Plan, 2018). The Variance, if granted, would add 13,630 additional square feet of impervious surface, in addition to the proposal's large footprint and incursion into 69,550 square feet of the WQR and HCA areas. This concerns the Watershed Council greatly.
- The only acceptable mitigation of this impact, if it is indeed precluded by soil conditions, would be a large-scale inclusion of native trees to provide interception of rainfall on and near the impervious areas (walkways, parking lots, etc.) These trees would play a vital overhanging function to intercept and absorb water before it runs off the impervious pavement. However, it must be done with careful siting and well-maintained.

Please understand that during the application phase, the Watershed Council worked closely with Bonaventure Senior Living to shrink the footprint of their development by building up rather than out, and the Council supported their inclusion of a third story, reduced parking requirements, and pervious pavement in February 2019. We worked with Bonaventure staff to provide tours of stormwater facilities, propose alternative designs, and set an example of green development. We are disappointed that we were not informed of this request to withdraw a key component of the design without communicating with us previously.

However, the Council believes that the proposal being developed by City staff to add significant native tree cover for interception of rainwater has the potential to offset this addition of significant impervious surface, if done correctly. **We conditionally support the staff proposal of requiring a ratio of 1 sq. foot of native tree canopy per every 4 feet of additional impervious surface (in this case 175 trees) if it is done with care and proper implementation, as described below.**

Impervious Surface in the Kellogg-Mt. Scott Watershed

As background, addition of impervious surface in the Kellogg-Mt. Scott Watershed has poses many risks to downstream residents and property owners, who bear the increased flood risk created by impervious surfaces upstream. It also reduces groundwater recharge, natural floodplain function and hydrologic regimes, and lower water in late summer means more likelihood of low dissolved oxygen levels in the creek, and potentially harmful or even lethal levels for salmon, steelhead, trout, and lamprey which the City and the Council are spending hundreds of thousands of dollars to recover. With climate change and higher peak flows, these risks will increase in the future: "100 year floods" are occurring more and more frequently. 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 and 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. The Council therefore does not support additional floodplain development.

We have been actively working with the City via the Climate program, the Comprehensive Plan Implementation Process, and the development of Tree Code to help provide policies and programs that can provide resilience to these changes.

Adding impervious surface is a step in the wrong direction. Therefore, it is found to be absolutely necessary, robust, well-sited, and well-implemented and maintained mitigation plantings are essential. This will also be a step toward the City of Milwaukie's larger 40% canopy cover goal, which the Council strongly supports.

We support City's staff's concept of a 1:4 native tree canopy cover to increased impervious surface, if the following are included in the proposal:

1. Trees planted must provide interception over impervious areas (walkways, parking lots, etc.).

If the purpose of these trees is to intercept stormwater that would otherwise fall on these impervious surfaces and rapidly enter the stormwater system (and often conveying pollutants) the trees must be located to overhang/intercept rain that would fall on impervious walkways, parking lots, etc. This must be incorporated in the design. While planting trees in other less disturbed areas is easier and provides some other benefits, if the goal is to offset the hydrologic and water quality of the added impervious surface, they must be located in a way that will reduce the amount of water reaching these surfaces.

2. Species Must Be Appropriate

The species proposed by staff: Oregon White Oak (*Quercus garryana*), Bigleaf Maple (*Acer macrophyllum*), Oregon Ash (*Fraxinus Latifolia*), Scouler's Willow (*Salix scouleriana*), Red Alder (*Alnus rubra*) and Ponderosa Pine (*Pinus ponderosa*) generally are appropriate to the site's ecosystem. There are three aspects worth noting that should be considered by City staff:

- Red Alder is often a transitional species that helps establish tree cover, fixed nitrogen, and prevents erosion, but does not reach a very large size or have a very large life span. In areas where Alder are planted as the dominant species, future planting may be necessary in coming decades
- Ponderosa pine, while often associated with drier environments elsewhere in Oregon, is increasingly part of the Council's revegetation strategy to provide resilient plant communities as climate change leads to drier summers and increased wildfire potential.
- Oregon White Oak is a rare habitat of critical concern in the region. Much Oak habitat has been lost due to development. The Watershed Council has worked hard to protect and restore oak habitat on this site, and elsewhere in the Kellogg-Mt. Scott watershed and in Milwaukie. Oaks do require care, since they grow slowly, and require space to grow without being choked out by other species. Therefore, they should not be planted in dense cover with other species. City Urban Forestry should therefore consider its effectiveness at stormwater interception given the need for

cover to provide a dense enough canopy to intercept rain above impervious surfaces.

3. Maintenance Must be Rigorous and Enforced

Unfortunately, the vast majority of mitigation plantings fail. The usual reasons is that trees were planted quickly often in the wrong places for those species, and done inexpensively to meet the mitigation requirement, and only maintained to meet a 2-year survival standard. As a result, the promised benefits to the public—shade, stormwater interception, reduction of the urban heat island effect, increased habitat, water quality, air quality, erosion control, and rises in property values—often fail to appear. 2-year performance standards often are insufficient to see that vegetation is established and survives, especially slow-growing critical plant communities like Oregon Oaks. The Watershed Council actively maintains its plantings for 5 years to ensure survival, manage new incursions of invasive species, and replant when necessary due to die-offs from increasingly extreme weather.

We have an opportunity to prevent that in this case. Because Bonaventure Senior Living, which intends to own and operate its facility as a good steward rather than transfer the property, and any obligations, to an HOA or individual owners. We therefore recommend an 80% survival standard after five years rather than two. This fits with the Watershed Council's comments to the City regarding the proposed tree code moving forward and with Bonaventure Senior Living's expressed commitment to demonstrating environmental stewardship at its facilities and to being a good community neighbor.

Thank you for your consideration. Please let me know if you have any questions.

Sincerely,



Neil Schulman
Executive Director