

INDUSTRIAL FOCUS

APRIL 4, 2019

DESIGN REVIEW SUBMITTAL



NOTE:

Stage 1 master plan and zone change documentation was submitted March 12, 2019 (application deemed complete March 26, 2019).



15895 SW 72ND AVE SUITE 200
PORTLAND, OREGON 97224
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City of Wilsonville
Exhibit B1 DB19-0013 et seq

PROJECT #180146.01

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- traffic report
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- **master sign plan**
- lighting information
- **drawing package** (*reduced scale*)

NOTE:

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Planning Division
Development Permit Application

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

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

Pre-Application Meeting Date: 08.16.18

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

29799 SW Town Center Loop E, Wilsonville, OR 97070
Phone: 503.682.4960 Fax: 503.682.7025
Web: www.ci.wilsonville.or.us

Applicant:

Name: Gavin Russell - Project Manager
Company: CIDA Architects & Engineers
Mailing Address: 15895 SW 72nd Ave. #200
City, State, Zip: Portland, OR 97224
Phone: 503-226-1285 Fax: 503-226-16670
E-mail: gavinr@cidainc.com

Authorized Representative:

Name: Gavin Russell
Company: CIDA Architects & Engineers
Mailing Address: 15895 SW 72nd Ave. #200
City, State, Zip: Portland, OR 97224
Phone: 503-226-1285 Fax: 503-226-16670
E-mail: gavinr@cidainc.com

Property Owner:

Name: Dave Nicoli
Company: Nicoli Pacific LLC
Mailing Address: PO Box 2401
City, State, Zip: Lake Oswego, OR, 97035
Phone: 503.692.1799 Fax:
E-mail: dnicolo@dpnicoli.com

Property Owner's Signature:

Signature of David Nicoli
Printed Name: DAVID NICOLI Date: 04.04.19

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

Signature of Gavin Russell
Printed Name: GAVIN RUSSELL Date: 04.04.19

Site Location and Description:

Project Address if Available: N/A Suite/Unit N/A
Project Location: South of SW Boakman Rd. between SW Boberg and SW Boones Ferry Rd.
Tax Map #(s): 14A Tax Lot #(s): 300 & 500 County: Washington Clackamas

Request:

Phase 1: New 53,000 sf concrete tilt building. The building will be speculative Industrial/Flex. Site includes 40,000 gravel storage yard and self contained wash station.

Project Type: Class I Commercial Class II Class III

Residential Commercial Industrial Other

Application Type(s):

- Annexation Appeal Comp Plan Map Amend Parks Plan Review
Final Plat Major Partition Minor Partition Request to Modify Conditions
Plan Amendment Planned Development Preliminary Plat Site Design Review
Request for Special Meeting Request for Time Extension Signs Stage II Final Plan
SROZ/SRIR Review Staff Interpretation Stage I Master Plan Variance
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PROJECT SUMMARY

The site for this project is located on two undeveloped lots, 31W14A 00500 and 31W14A 00300 in Wilsonville, OR. Lot 500 is approximately 4.07 acres and lot 300 is approximately 2.09 acres. There is no request to consolidate these lots. The lots are currently zoned RA-H and will require a zone change to PDI.

The proposed stage (1) master plan includes three speculative industrial/flex buildings totaling approximately 96,000 square feet. Each building will have the ability to accommodate office-technology, headquarters, manufacturing and warehouse uses. These building will be constructed in three separate phases (see phase schedule and provided phase exhibits).

- Phase (1) includes the construction of one of the 53,000 square foot industrial concrete tilt building on lot 500. 25% of the building will house the headquarters of DP Nicoli Shoring Solutions (construction/special trade contractors). The other 75% will be speculative industrial/flex. In addition, the development will contain new landscaping, parking stalls, a trash enclosure, a 40,000 square foot gravel storage yard, a 1,200 square wash bay and three access driveways off the public right of ways. All outdoor storage will be screened by fencing and landscaping. Furthermore, public improvements along SW Boones Ferry Road and SW Boberg Road will be constructed under this phase.
- Phase (2) includes the construction of an additional 24,000 square foot industrial/flex building on lot 500. The 40,000 square foot storage yard and fencing will be removed under this phase, the wash bay will remain. In addition, the development will contain new landscaping, parking stalls, and a trash enclosure.
- Phase (3) includes the construction of a 19,000 square foot industrial/flex building on lot 300. In addition, the development will contain new landscaping, parking stalls, a trash enclosure and one access driveway off SW Boones Ferry Road.

This development requires city dedications and public improvements. A 20-foot dedication will be taken on SW Boones Ferry Road and 1.5 foot dedication will be taken on SW Boberg Road. In addition, an 8-foot utility easement will run along both side of the new right of way and a 15-foot water utility easement will run across the site. Improvements on SW Boberg Road will include new landscaping and 5-foot-wide sidewalks. Improvements along SW Boones Ferry Road include new landscaping, 5-foot-wide sidewalks, lighting and a bike lane. These dedications and improvements will be coordinated with the city.

BACKGROUND INFORMATION

The vision for this development is to create industrial/flex complex to attract local industry and house DP Nicoli Shoring Solution's corporate headquarters. DP Nicoli Shoring Solutions provides shoring equipment to the construction industry and has been a part of the greater Portland area since 1982. The current headquarters located in Tualatin are inadequate for the needs of their business. Wilsonville and this site are an ideal location for DP Nicoli Shoring Solution's operation due to its excellent exposure off Interstate 5 and the cities' allowance of outdoor storage, which is a necessity for their operation.

With the abundance of space on this site it was logical to develop a master plan that included future buildings. It is the owner's intent to develop buildings that are flexible to accommodate multiple industrial uses. Aesthetically, the buildings will be in harmony with the existing context and will bring visual appeal off Interstate 5. This development is not intended to be single user, rather we envision each building will function independently and have multiple tenants.

Due to the speculative nature of this development, the development packages for each phase will be submitted at separate periods. It should be known that land swap negotiations with the City of Wilsonville on lot 300 are currently in early discussions and are not part of this submittal. However, the outcome of the negotiations may impact phase (3).

We are looking forward to partnering with the city and moving forward with this project.

PHASED DEVELOPMENT SCHEDULE

Phase (1):

- Planning Review: March - July 2019
 - o Zone Map Amendment
 - o Stage 1 Master Plan
 - o Stage 2 Final Plan (Phase 1 only)
 - o Site Design Review
- Building Review (submitted concurrently): May – July 2019
- Construction: August 2019

Phase (2): Construction estimated to begin June 2024

Phase (3): Construction estimated to begin June 2029

KEY ISSUES

Access Driveways:

Lot 300 and 500 have no existing access driveways; four new access driveways are proposed in the master plan. Two driveways are proposed to be located on SW Boberg Road and two access driveways are proposed on SW Boones Ferry Road. City of Wilsonville Public Works Standards recommend a minimum separation distance of 100 and a desired 300 feet between access driveways. The proposed north driveway on SW Boberg Road is less than 100 feet from an existing driveway on the neighboring property. Based on the DKS Transportation Impact Analysis and subsequent discussions with the City of Wilsonville we are currently in the process of obtaining a waiver to the Public Works Standards.

Parking:

Employee parking is located to the perimeter of the site and is separated from larger industrial traffic circulation towards the center of the site. Wilsonville's Public Use Standards require a minimum clear access drive aisle length of 100 feet, which would severely limit access into the perimeter parking areas. We have looked at numerous traffic circulation patterns on this site and it is crucial that parking lot drive aisle be allowed to intersect the 100' access aisle. Based on the DKS Transportation Impact Analysis and subsequent discussions with the City of Wilsonville we are currently in the process of obtaining a waiver to the Public Works Standards.

Flag Pole:

City of Wilsonville limits flagpole height to 30'. The owner has expressed interest in erecting a flagpole of at least 100'.

NOTE: Owner is no longer interested in applying for a waiver, no flag pole is proposed.

Land Swap:

The unique triangular shape at the north end of lot 300 creates potential difficulties for future development. The City of Wilsonville has offered a land swap of the abutting property to square off the site. This land swap is currently in early discussions and has no impact on the current development review.

ANTICIPATED WAIVERS

No anticipated waivers.

AREA E

This is the area planned for industrial use between Boeckman Road and Barber Street, from Boones Ferry Road to the railroad tracks. It also includes the property west of the railroad, immediately north of Barber Street, that has been identified as a potential commuter rail station and park-and-ride lot. The primary concerns for this area have been related to continuity in design and protection of the existing mobile home park.

The area has been previously divided into numerous small lots, many of which are in separate ownerships. For this reason, the opportunity to design development under a common master plan is minimized. Therefore, there is a potential for an uncoordinated patchwork development pattern to occur.

The Walnut Park mobile home park is also located in this area. While economics may ultimately force redevelopment of the park to industrial use, the life of the park can be prolonged through careful design considerations of surrounding development. Doing so will help to retain one of the City's affordable housing opportunities.

Design Objectives

1. Encourage consolidation of smaller lots to allow for master planning of large areas.
2. Provide buffers adjacent to the mobile home park, e.g., increased landscaped setbacks, or complementary uses.
3. Minimize traffic (truck) conflicts with residential activities, including pedestrians.
4. Provide an attractive and easily accessible park-and-ride facility in conjunction with a commuter rail station. If necessary to meet these objectives, prepare a master plan for the area around the selected commuter rail station site.
5. Determine the appropriate alignment for a road connecting 95th Avenue and Kinsman Road through this area.

AREA F

This area is situated west of I-5 and primarily, although not entirely, south of Wilsonville Road and includes commercial and residential properties in the Old Town neighborhood. It includes the existing retail centers, both north and south of Wilsonville Road, plus land to the south along both sides of Boones Ferry Road to the Willamette River. Future development applications in Area 'F' must address the design objectives listed below, as well as all other applicable Development Code requirements.

This Area of Concern specifically includes the "Old Town" area of the City. A portion of Old Town includes properties previously master planned as "Wilsonville Square 76." As a result of the West Side master planning effort, additional emphasis has been placed on creating a special

AREA OF SPECIAL CONCERN E (AREA E)

The development is in Wilsonville Comprehensive Plan Area of Special Concern E (Area E), Design Objectives 1,2 and 3 are applicable.

Ongoing effort has been taken to ensure the design addresses the city's concerns and takes the adjacent development into consideration. Communication with the Greg Davidson, owner of the Walnut Mobile Home Park, was initiated in preliminary stages of design and information was provided to his residents. In addition, we held a neighborhood meeting on 5/21/19 and discussed details of the proposed development in an open forum. We were able to discuss area of concern and made appropriate adjustments on the plans. In general feedback was positive.

- i. Encourage Consolidation of smaller lots to allow for master planning of large areas.

Response:

The site is located on two undeveloped lots, 31W14A 00500 and 31W14A 00300 in Wilsonville, OR. Lot 500 is 4.07 acres and lot 300 is 2.09 acres. Both lots are sufficient in size for individual industrial development and there is no request for consolidation. Both lots are under single ownership and will be established as a cohesive industrial development under a master plan. There are currently ongoing negotiations with the City of Wilsonville for a potential land swap to square off the property on lot 300. Acreage of the property would remain approximately the same.

- ii. Provide buffer adjacent to the mobile home park e.g., increased landscaped setback or complimentary uses.

Response:

It is the intent of this development to improve the landscaping buffer and provide necessary screening between the two lots. The proposed buffer will meet SB overlay standards. A minimum 10-foot setback has been established along the southern property line and a High Wall Standard has been applied. The 6-foot-high CMU wall and retaining wall will run continuously along the property line and provide a visual/noise barrier. Existing trees along the property will be preserved as much as possible. However, many of the trees are in poor or fair condition (see tree survey) and these trees as well as overgrowth on the property will be removed and replaced with plantings that meet city standards. See provide landscape plan for further information.

- iii. Minimize traffic (truck) conflicts with residential activities, including pedestrian.

Response:

Traffic circulation into and out of the development will limit conflicts with the abutting properties residential activities and promote a pedestrian friendly environment. The development provides two access driveways on Boberg Road and one access driveway on Boones Ferry Road. The primary residential driveways into the Walnut Mobile Home Park are located over 300 feet away from the development's access driveways. 300 feet is the desired access spacing per City of Wilsonville Public Works Standards and provides adequate distance to limit traffic conflicts. Landscaping and walls that limit visibility will be held away from the pedestrian and vehicular access points to allow safe maneuvering for all modes. In addition, this development will provide sidewalks along SW Boones Ferry Road and Boberg Road that will enhance the pedestrian walkability and safety.

SECTION 4.137.5 SCREENING & BUFFERING (SB) OVERLAY ZONE

(.01) Purpose. The Screening and Buffering Overlay Zone is intended to be used with any underlying base zone to specify appropriate screening and buffering standards for areas where residential and nonresidential uses abut. The “SB” Overlay Zone is used to assure that there is adequate separation and screening between potentially conflicting land uses. The buffering is achieved by restricting access, increasing setbacks, requiring additional landscaping, restricting signs, and, in some cases, by requiring additional information and proof of mitigation for uses that may otherwise cause off-site impacts or nuisances.

Response:

The SB Overlay Zone has been applied to the Industrial Development site. Care has been taken in the design to mitigate potential disturbances with adjacent lot.

(.02) Where the “SB” Overlay Zone is to be Applied. The Screening and Buffering Overlay Zone is to be applied primarily along the edge of nonresidential zones abutting, or located directly across the street from, residential zones. As with any zoning, the “SB” Overlay Zone is only applied where established by action of the City Council.

Response:

The Industrial Focus site, will be zoned PDI. The adjacent lot to the south contains a mobile home park is an RA-H zone. SB overlay standards will be applied.

(.03) Landscaped Areas. The following landscape requirements apply to the “SB” Overlay Zone. Structures, exterior storage and exterior display of merchandise are prohibited in these landscaped areas.

A. Commercial Properties. For land zoned PDC, a ten (10) foot deep area landscaped to at least the L-3 standard, specified in Section 4.176, must be provided along all street frontages across from properties zoned or designated in the Comprehensive Plan for residential use. (See Figure 23: High Screen Landscaping.) A ten (10) foot deep landscaped area shall also be provided at any point where the property adjoins a property that is planned or zoned for residential use.

B. Industrial Properties. For land zoned PDI, a twenty (20) foot deep area landscaped to at least the L-3 standard, or a ten (10) foot deep area landscaped to at least the L-4 standard, shall be provided along all property lines where the “SB” Overlay Zone is applied. (See Figures 23: High Screen Landscaping and Figure 24: High Wall Landscaping.)

Response:

The Industrial Focus site, will be zoned PDI. A minimum 10 setback and High Wall (L-4) Standards have been applied along the southern property line. No storage, structures or displays of merchandise will be in this buffer area.

(.04) Ingress and Egress. Motor vehicle access shall be limited through any landscaped area required in the “SB” Overlay Zone. The Development Review Board may impose additional landscape requirements to minimize the visual impacts of any vehicle access points that are approved.

Response:

No vehicle access is proposed in landscape buffer.

(.05) Exterior Work. No exterior manufacturing, storage, sales, or other similar work shall be performed within the “SB” Overlay Zone.

Response:

No work will be performed in the buffer.

(.06) Signs. No signs, other than approved monument signs, shall be permitted within the “SB” Overlay Zone.

Response:

No signage is proposed in the buffer.

(.07) Performance Standards and Off-Site Impacts. Many of Wilsonville’s base zones contain performance standards to limit impacts on surrounding properties and the overall community. Developers shall be encouraged to utilize the standards of the “SB” Overlay Zone to help assure compliance with the performance standards.

Response:

All base zone standards will be applied and complied with.

Section 4.140. Planned Development Regulations.**(.01) Purpose.**

- A. The provisions of Section 4.140 shall be known as the Planned Development Regulations. The purposes of these regulations are to encourage the development of tracts of land sufficiently large to allow for comprehensive master planning, and to provide flexibility in the application of certain regulations in a manner consistent with the intent of the Comprehensive Plan and general provisions of the zoning regulations and to encourage a harmonious variety of uses through mixed use design within specific developments thereby promoting the economy of shared public services and facilities and a variety of complimentary activities consistent with the land use designation on the Comprehensive Plan and the creation of an attractive, healthful, efficient and stable environment for living, shopping or working.

Response: The development is proposed as a speculative flex building that would permit headquarters, office-technology, manufacturing and warehouse uses. These uses are consistent with the current land use designations and comprehensive plan.

- B. It is the further purpose of the following Section:
1. To take advantage of advances in technology, architectural design, and functional land use design:
 2. To recognize the problems of population density, distribution and circulation and to allow a deviation from rigid established patterns of land uses, but controlled by defined policies and objectives detailed in the comprehensive plan;
 3. To produce a comprehensive development equal to or better than that resulting from traditional lot land use development.
 4. To permit flexibility of design in the placement and uses of buildings and open spaces, circulation facilities and off-street parking areas, and to more efficiently utilize potentials of sites characterized by special features of geography, topography, size or shape or characterized by problems of flood hazard, severe soil limitations, or other hazards;
 5. To permit flexibility in the height of buildings while maintaining a ratio of site area to dwelling units that is consistent with the densities established by the Comprehensive Plan and the intent of the Plan to provide open space, outdoor living area and buffering of low-density development.
 6. To allow development only where necessary and adequate services and facilities are available or provisions have been made to provide these services and facilities.
 7. To permit mixed uses where it can clearly be demonstrated to be of benefit to the users and can be shown to be consistent with the intent of the Comprehensive Plan.

8. To allow flexibility and innovation in adapting to changes in the economic and technological climate.

(.02) Lot Qualification.

- A. Planned Development may be established on lots which are suitable for and of a size to be planned and developed in a manner consistent with the purposes and objectives of Section 4.140.

Response: The developed property is a suitable established lot for the proposed use.

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

Response: The site is over (2) acres and is developed as a Planned Development.

(.03) Ownership.

- A. The tract or tracts of land included in a proposed Planned Development must be in one (1) ownership or control or the subject of a joint application by the owners of all the property included. The holder of a written option to purchase, with written authorization by the owner to make applications, shall be deemed the owner of such land for the purposes of Section 4.140.

Response: The property is under one ownership.

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

Response: Division and transfer of units is not proposed with this development.

(.04) Professional Design.

- A. The applicant for all proposed Planned Developments shall certify that the professional services of the appropriate professionals have been utilized in the planning process for development.

Response: The owner has engaged appropriate professionals in the planning and design of the proposed addition including survey, geotechnical engineering, civil and landscape, architectural and structural design team members along with their commercial general contractor.

B. Appropriate professionals shall include, but not be limited to the following to provide the elements of the planning process set out in Section 4.139:

1. An architect licensed by the State of Oregon;

Principal Architect is Tara Lund with CIDA Inc., license ARI-4212

2. A landscape architect registered by the State of Oregon;

Response: Landscape Architect is Teresa Long with AAI, license LA0552

3. An urban planner holding full membership in the American Institute of Certified Planners, or a professional planner with prior experience representing clients before the Development Review Board, Planning Commission, or City Council; or

Response: Project planning services are being provided by CIDA Architects & Engineers and AAI Engineering, both with vast experience working with jurisdictions include the City of Wilsonville.

4. A registered engineer or a land surveyor licensed by the State of Oregon.

Civil Engineer is Craig Harris with AAI, license 58412PE

B. One of the professional consultants chosen by the applicant from either 1, 2, or 3, above, shall be designated to be responsible for conferring with the planning staff with respect to the concept and details of the plan.

Response: The project architects are designated as the primary point of contact for jurisdictional correspondence and coordination.

C. The selection of the professional coordinator of the design team will not limit the owner or the developer in consulting with the planning staff.

Response: The owner, Dave Nicoli, has directed correspondence and coordination with the City of Wilsonville.

(.05) Planned Development Permit Process.

A. All parcels of land exceeding two (2) acres in size that are to be used for residential, commercial or industrial development, shall, prior to the issuance of any building permit:

1. Be zoned for planned development;

2. Obtain a planned development permit; and

3. Obtain Development Review Board, or, on appeal, City Council approval.

Response: The subject parcel is greater than (2) acres and will go through/obtain the above approvals prior to issuance of the building permit.

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

Response: The development proposes a zone change from RA-H to PDI.

D. Development Review Board approval is governed by Sections 4.400 to 4.450

Response: See response to Sections 4.400 – 4.450 below.

D. All planned developments require a planned development permit. The planned development permit review and approval process consists of the following multiple stages, the last two or three of which can be combined at the request of the applicant:

1. Pre-application conference with Planning Department;

Response: Pre-application conference was held on August 16th, 2018

2. Preliminary (Stage I) review by the Development Review Board. When a zone change is necessary, application for such change shall be made simultaneously with an application for preliminary approval to the Board; and

Response: Application for Stage 1 will be submitted prior to Stage 2. The intent is to start the process for zone change while finishing documents for Stage 2.

3. Final (Stage II) review by the Development Review Board

Response: Stage 2 will be submitted in April 2019.

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

Response: The development proposes a zone change from RA-H to PDI.

(.06) Staff Report:

A. The planning staff shall prepare a report of its findings and conclusions as to whether the use contemplated is consistent with the land use designated on the Comprehensive Plan. If there is a disagreement as to whether the use contemplated is consistent, the applicant, by request, or the staff, may take the preliminary information provided to the Development Review Board for a use interpretation.

B. The applicant may proceed to apply for Stage I - Preliminary Approval - upon determination by either staff or the Development Review Board that the use contemplated is consistent with the Comprehensive Plan.

(.07) Preliminary Approval (Stage One):

A. Applications for preliminary approval for planned developments shall:

1. Be made by the owner of all affected property or the owner's authorized agent; and

2. Be filed on a form prescribed by the City Planning Department and filed with said Department.

3. Set forth the professional coordinator and professional design team as provided in subsection (.04), above.

4. State whether the development will include mixed land uses, and if so, what uses and in what proportions and locations.

Response: The application is made by the owner on the approved form as provided following our pre-application conference and designates the professional design team and coordinator. The stage 1 masterplan indicates development on both lot 500 and 300. The development includes three speculative industrial/flex buildings. Each building will accommodate office-technology, manufacturing and warehouse. These building will be constructed in three separate phases.

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

Response: The application package contains sufficient information for the stage 1 review.

- C. An application for a Stage I approval shall be considered by the Development Review Board as follows:
1. A public hearing as provided in Section 4.013.
 2. After such hearing, the Board shall determine whether the proposal conforms to the permit criteria set forth in this Code, and may approve or

disapprove the application and the accompanying preliminary development plan or require such changes therein or impose such conditions of approval as are in its judgment, necessary to ensure conformity to said criteria and regulations. In so doing, the Board may, in its discretion, authorize submission of the final development plan in stages, corresponding to different units or elements of the development. It shall do so only upon evidence assuring completion of the entire development in accordance with the preliminary development plan and stage development schedule.

3. A final decision on a complete application and preliminary plan shall be rendered within one hundred and twenty (120) days after the application is deemed complete unless a continuance is agreed upon by the applicant and the appropriate City decision-making body.
4. The determination of the Development Review Board shall become final at the end of the appeal period for the decision, unless appealed to the City Council in accordance with Section 4.022 of this Code.

Response: By way of this application we have prepared materials for the Design Review Board hearing.

(.09) Final Approval (Stage Two):

[Note: Outline Number is incorrect.]

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

Response: Stage 1 and zone change were submitted on March 12 2019.

- B. After such hearing, the Development Review Board shall determine whether the proposal conforms to the permit criteria set forth in this Code, and shall approve, conditionally approve, or disapprove the application.

Response: Applicant is aware of standards for conditions of approval for development and will work with the City staff on applied conditions and timelines associated with each item.

- C. The final plan shall conform in all major respects with the approved preliminary development plan, and shall include all information included in the preliminary plan plus the following:
 1. The location of water, sewerage and drainage facilities;
 2. Preliminary building and landscaping plans and elevations, sufficient to indicate the general character of the development;
 3. The general type and location of signs;

4. Topographic information as set forth in Section 4.035;
5. A map indicating the types and locations of all proposed uses; and
6. A grading plan.

Response: The noted items are included with the application package for Stage 2. Conditions requiring modification of site elements prior to either permit application or approval will be resubmitted as noted to the planning department for confirmation of conformity.

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

Response: The provided application of sufficient detail for review of the proposed development. Further information regarding Site Design Review is noted within Section 4.400.

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

Response: Proposed development does not trigger submission of these documents.

- E. Within thirty (30) days after the filing of the final development plan, the Planning staff shall forward such development plan and the original application to the Tualatin Valley Fire and Rescue District, if applicable, and other agencies involved for review of public improvements, including streets, sewers and drainage. The Development Review Board shall not act on a final development plan until it has first received a report from the agencies or until more than thirty (30) days have elapsed since the plan and application were sent to the agencies, whichever is the shorter period.

Response: Applicant understands the public agency notification timeline.

- G. Upon receipt of the final development plan, the Development Review Board shall conduct a public hearing and examine such plan and determine:
 1. Whether it conforms to all applicable criteria and standards; and
 2. Whether it conforms in all substantial respects to the preliminary approval; or
 3. Require such changes in the proposed development or impose such conditions of approval as are in its judgment necessary to insure conformity to the applicable criteria and standards.

Response: Applicant understands the function of the DRB and hearing.

- H. If the Development Review Board permits the applicant to revise the plan, it shall be resubmitted as a final development plan within sixty (60) days. If the Board approves, disapproves or grants such permission to resubmit, the decision of the Board shall become final at the end of the appeal period for the decision,

unless appealed to the City Council, in accordance with Sections 4.022 of this Code.

Response: Applicant understands the DRB routing options and timeline.

- I. All Stage II Site Development plan approvals shall expire two years after their approval date, if substantial development has not occurred on the property prior to that time. Provided, however, that the Development Review Board may extend these expiration times for up to three (3) additional periods of not more than one (1) year each. Applicants seeking time extensions shall make their requests in writing at least thirty (30) days in advance of the expiration date. Requests for time extensions shall only be granted upon (1) a showing that the applicant has in good faith attempted to develop or market the property in the preceding year or that development can be expected to occur within the next year, and (2) payment of any and all Supplemental Street SDCs applicable to the development. Upon such payment, the development shall have vested traffic generation rights under 4.140 (.10), provided however, that if the Stage II approval should expire, the vested right to use trips is terminated upon City repayment, without interest, of Supplemental Street SDCs. For purposes of this Ordinance, “substantial development” is deemed to have occurred if the required building permits or public works permits have been issued for the development, and the development has been diligently pursued, including the completion of all conditions of approval established for the permit. [Amended by Ord 561, adopted 12/15/03.]

Response: Applicant understands the expiration timeline associated with the DRB decision date.

- J. A planned development permit may be granted by the Development Review Board only if it is found that the development conforms to all the following criteria, as well as to the Planned Development Regulations in Section 4.140:
 1. The location, design, size and uses, both separately and as a whole, are consistent with the Comprehensive Plan, and with any other applicable plan, development map or Ordinance adopted by the City Council.

Response: Proposed application is presented as consistent with the applicable development requirements.

2. That the location, design, size and uses are such that traffic generated by the development at the most probable used intersection(s) can be accommodated safely and without congestion in excess of Level of Service D, as defined in the Highway Capacity Manual published by the National Highway Research Board, on existing or immediately planned arterial or collector streets and will, in the case of commercial or industrial developments, avoid traversing local streets. Immediately planned arterial and collector streets are those listed in the City’s adopted Capital Improvement Program, for which funding has been approved or committed, and that are scheduled for completion within two years of occupancy of the

development or four year if they are an associated crossing, interchange, or approach street improvement to Interstate 5.

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

[Response: Summary of traffic conditions and generation are noted in the Traffic Report conducted by DKS.](#)

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

Response: Based on designs by the noted professionals and review of conditions the existing facilities and services in the area are adequate for the proposed development.

- K. Mapping: Whenever a Planned Development permit has been granted, and so long as the permit is in effect, the boundary of the Planned Development shall be indicated on the Zoning Map of the City of Wilsonville as the appropriate "PD" Zone.

Response: The subject parcel is noted as a PD zone.

- L. Adherence to Approved Plan and Modification Thereof: The applicant shall agree in writing to be bound, for her/himself and her/his successors in interest, by the conditions prescribed for approval of a development. The approved final plan and stage development schedule shall control the issuance of all building permits and shall restrict the nature, location and design of all uses. Minor changes in an approved preliminary or final development plan may be approved by the Director of Planning if such changes are consistent with the purposes and general character of the development plan. All other modifications, including extension or revision of the stage development schedule, shall be processed in the same manner as the original application and shall be subject to the same procedural requirements.

Response: Following issuance of the city decision, the applicant will coordinate any future adjustments or revisions with the city staff as noted.

- M. In the event of a failure to comply with the approved plan or any prescribed condition of approval, including failure to comply with the stage development schedule, the Development Review Board may, after notice and hearing, revoke a Planned Development permit. General economic conditions that affect all in a similar manner may be considered as a basis for an extension of a development schedule. The determination of the Board shall become final thirty (30) days after the date of decision unless appealed to the City Council.

Response: Applicant understands the requirement to comply with the decision and timelines related to expiration of approvals.

- (.10) Early Vesting of Traffic Generation. Applicants with Stage I or Master Plan approvals occurring after June 2, 2003 may apply to vest the right to use available transportation capacity at the intersections of Wilsonville Road with Boone's Ferry Road and with Town Center Loop West, and/or the I-5 interchange. Vesting for properties with such approvals shall occur upon execution of a vesting agreement satisfactory to the city, which agreement shall include a proposed development schedule or phasing plan and either provide for the payment of any and all Supplemental Street SDCs or provide other means of financing public improvements. Vesting for properties pending such approvals shall occur upon such agreement and the date the approvals are final.

The number of trips vested is subject to modification based upon updated traffic analysis associated with subsequent development approvals for the property. A reduction in vested trips shall attend repayment of vesting fees by the City. An increase in available vested trips shall occur upon payment of necessary vesting fees.

Vesting shall remain valid and run with the property, unless an approval that is necessary for vesting to occur is terminated or a vesting agreement is terminated. If the vested right to use certain trips is lost or terminated, as determined by the Community Development Director with the concurrence of City Council, such trips shall be made available to other development upon City repayment, without interest, of associated vesting fees. [Added by Ord. 561, adopted 12/15/03.]

Response: No vesting is proposed.

Section 4.154. On-site Pedestrian Access and Circulation.

(.01) On-site Pedestrian Access and Circulation

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

Response: The proposed development will include pedestrian connection from the building main entry to the public right of way.

- B. Standards. Development shall conform to all of the following standards:

1. Continuous Pathway System. A pedestrian pathway system shall extend throughout the development site and connect to adjacent sidewalks, and to all future phases of the development, as applicable.

Response: The proposed development provides direct connection from the main building entry to the surrounding parking and to the public sidewalk at SW Boones Ferry Rd. Future phased buildings will be connected with pedestrian pathways to SW Boones Ferry Rd. and SW Boberg Rd.

2. Safe, Direct, and Convenient. Pathways within developments shall provide safe, reasonably direct, and convenient connections between primary building entrances and all adjacent parking areas, recreational areas/playgrounds, and public rights-of-way and crosswalks based on all of the following criteria:

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

Response: The onsite circulation connects the perimeter parking to the main entries on the east side of the building. This layout provides access to the building in as direct a layout while maintain sufficient landscaping and circulation throughout the site.

Pedestrian walkways are separate from parking and maneuvering areas via change in material (concrete vs. asphalt) and elevation and curbing/wheelstops to ensure separation of pedestrian and vehicular movement. Where pedestrian walkways cross the drive aisle the crossing will contrast in material identifying the crossing and will be maintained at the sidewalk level, requiring a speed hump for the vehicles.

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

Response: All pedestrian walkways adjacent to drive aisles are separated by a 6" change in elevation at the curb concrete curb.

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

Response: The pedestrian crossing will be of a contrasting material, white paint striping against black asphalt paving.

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

Response: All proposed walkways are concrete and are a minimum of five feet in width.

6. All pathways shall be clearly marked with appropriate standard signs.

Response: Signage will be indicated to denote primary entry along with location of passenger loading/unloading areas.

[Added by Ord. #719, 6/17/13]

Section 4.155. General Regulations - Parking, Loading and Bicycle Parking.

(.01) Purpose:

- A. The design of parking areas is intended to enhance the use of the parking area as it relates to the site development as a whole, while providing efficient parking, vehicle circulation and attractive, safe pedestrian access.

Response: The proposed layout is designed in a manner to provide efficient parking and safe pedestrian access. As noted in Section 4.154, the system connects surrounding parking with building entries and public sidewalks. Furthermore, the site layout provides for separation of truck loading/unloading circulation areas and the parking.

- B. As much as possible, site design of impervious surface parking and loading areas shall address the environmental impacts of air and water pollution, as well as climate change from heat islands.

Response: As much as possible the site design integrates landscaping and water treatment areas throughout the parking/loading areas to mitigate environmental impacts.

The view from the public right of way and adjoining properties is critical to meet the aesthetic concerns of the community and to ensure that private property rights are met. Where developments are located in key locations such as near or adjacent to the I-5 interchanges, or involve large expanses of asphalt, they deserve community concern and attention.

Response: The site abuts I-5 along SW Boones Ferry Rd. The design includes improvements to the landscaping along frontages and a well-developed façade.

(.02) General Provisions:

- A. The provision and maintenance of off-street parking spaces is a continuing obligation of the property owner. The standards set forth herein shall be considered by the Development Review Board as minimum criteria.

1. The Board shall have the authority to grant variances or planned development waivers to these standards in keeping with the purposes and objectives set forth in the Comprehensive Plan and this Code.

2. Waivers to the parking, loading, or bicycle parking standards shall only be issued upon a findings that the resulting development will have no significant adverse impact on the surrounding neighborhood, and the community, and that the development considered as a whole meets the purposes of this section.

Response: The application is not requesting waivers on the driveway access. See provided waiver documents.

- B. No area shall be considered a parking space unless it can be shown that the area is accessible and usable for that purpose, and has maneuvering area for the vehicles, as determined by the Planning Director.

Response: All proposed parking meets the Wilsonville Development Code for space and maneuvering.

- C. In cases of enlargement of a building or a change of use from that existing on the effective date of this Code, the number of parking spaces required shall be based on the additional floor area of the enlarged or additional building, or changed use, as set forth in this Section. Current development standards, including parking area landscaping and screening, shall apply only to the additional approved parking area.

Response: N/A, the development is new construction.

- D. In the event several uses occupy a single structure or parcel of land, the total requirement for off-street parking shall be the sum of the requirements of the several uses computed separately, except as modified by subsection "E," below.

Response: Several uses are proposed for the site and calculated accordingly. Phase 1: 29,000 SF Office Flex = 78.3, 12,000 SF Manufacturing = 19.2, 12,000 SF Storage = 3.6. Total spaces required = 101. Total spaces proved = 101.

- E. Owners of two (2) or more uses, structures, or parcels of land may utilize jointly the same parking area when the peak hours of operation do not overlap, provided satisfactory legal evidence is presented in the form of deeds, leases, or contracts securing full and permanent access to such parking areas for all the parties jointly using them. [Amended by Ord. # 674 11/16/09]

Response: The parking proposed exceeds the minimum requirements on site. No joint parking agreements are proposed as part of the DRB approval process.

- F. Off-street parking spaces existing prior to the effective date of this Code may be included in the amount necessary to meet the requirements in case of subsequent enlargement of the building or use to which such spaces are necessary.

Response: N/A, no existing parking.

- G. Off-Site Parking. Except for single-family dwellings, the vehicle parking spaces required by this Chapter may be located on another parcel of land, provided the parcel is within 500 feet of the use it serves and the DRB has approved the off-site parking through the Land Use Review. The distance from the parking area to the use shall be measured from the nearest parking space to the main building entrance, following a sidewalk or other pedestrian route. The right to use the off-site parking must be evidenced in the form of recorded deeds, easements, leases, or contracts securing full and permanent access to such parking areas for all the parties jointly using them. [Amended by Ord. # 674 11/16/09]

Response: The parking proposed exceeds the minimum requirements. No off-site parking agreements are proposed as part of the DRB approval process.

- H. The conducting of any business activity shall not be permitted on the required parking spaces, unless a temporary use permit is approved pursuant to Section 4.163.

Response: No business activities are proposed that would occupy the required parking.

- I. Where the boundary of a parking lot adjoins or is within a residential district, such parking lot shall be screened by a sight-obscuring fence or planting. The screening shall be continuous along that boundary and shall be at least six (6) feet in height.

Response: The parking lot does not adjoin a residential district; therefore, this section does not apply.

- J. Parking spaces along the boundaries of a parking lot shall be provided with a sturdy bumper guard or curb at least six (6) inches high and located far enough within the boundary to prevent any portion of a car within the lot from extending over the property line or interfering with required screening or sidewalks.

Response: All parking will include a new 6" concrete curb to protect the landscaping from the parking.

- K. All areas used for parking and maneuvering of cars shall be surfaced with asphalt, concrete, or other surface, such as pervious materials (i. e. pavers, concrete, asphalt) that is found by the City's authorized representative to be suitable for the purpose. In all cases, suitable drainage, meeting standards set by the City's authorized representative, shall be provided. [Amended by Ord. # 674 11/16/09]

Response: All parking and maneuvering areas for cars are surfaced with asphalt.

- L. Artificial lighting which may be provided shall be so limited or deflected as not to shine into adjoining structures or into the eyes of passers-by.

Response: The lighting will be building mounted or pole mounted lighting that will be shielded from shining onto the adjacent property or public right of way.

- M. Off-street parking requirements for types of uses and structures not specifically listed in this Code shall be determined by the Development Review Board if an application is pending before the Board. Otherwise, the requirements shall be specified by the Planning Director, based upon consideration of comparable uses.

Response: N/A, uses are listed in code.

- N. Up to forty percent (40%) of the off-street spaces may be compact car spaces as identified in Section 4.001 - "Definitions," and shall be appropriately identified.

Response: The development includes 37 compact spaces (37 %) which is under the 40% maximum.

- O. Where off-street parking areas are designed for motor vehicles to overhang beyond curbs, planting areas adjacent to said curbs shall be increased to a minimum of seven (7) feet in depth. This standard shall apply to a double row of parking, the net effect of which shall be to create a planted area that is a minimum of seven (7) feet in depth.

Response: Bumper overhang extensions at parking stalls are noted on the site plan and where adjacent to landscape areas have been increased to minimum of seven feet.

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

- A. Parking and loading or delivery areas shall be designed with access and maneuvering area adequate to serve the functional needs of the site and shall:

1. Separate loading and delivery areas and circulation from customer and/or employee parking and pedestrian areas. Circulation patterns shall be clearly marked.

Response: The site is designed with loading areas separate from the parking areas. Truck circulation and loading is located on the west side of the building, opposite of employee parking areas.

2. To the greatest extent possible, separate vehicle and pedestrian traffic.

Response: Where pedestrian traffic intersects vehicular traffic, it is designated with a cross walk as further discussed in Section 4.154.

- B. Parking and loading or delivery areas shall be landscaped to minimize the visual dominance of the parking or loading area, as follows:

1. Landscaping of at least ten percent (10%) of the parking area designed to be screened from view from the public right-of-way and adjacent properties. This landscaping shall be considered to be part of the fifteen percent (15%) total landscaping required in Section 4.176.03 for the site development.

Response: Parking area landscaping proposed is 17.4% of the parking area. The parking area = 30,906 sf and 5,385 sf of adjacent landscaping is proposed. Please see landscape sheets L1.3 & L1.4.

2. Landscape tree planting areas shall be a minimum of eight (8) feet in width and length and spaced every eight (8) parking spaces or an equivalent aggregated amount.

Response: All proposed landscape tree islands are located every 8 spaces and are 8 feet in width.

- a. Trees shall be planted in a ratio of one (1) tree per eight (8) parking spaces or fraction thereof, except in parking areas of more than two hundred (200) spaces where a ratio of one (1) tree per six (six) spaces shall be applied as noted in subsection (.03)(B.)(3.). A landscape design that includes trees planted in areas based on an aggregated number of parking spaces must provide all area calculations.

Response: Proposed parking spaces = 101. 17 parking lot trees are proposed. Please see landscape sheets L1.3 & L1.4.

- b. Except for trees planted for screening, all deciduous interior parking lot trees must be suitably sized, located, and maintained to provide a branching minimum of seven (7) feet clearance at maturity.

Response: Plans note that trees adjacent to the parking lot and drive aisles are to be maintained with a 7'-0" clearance.

3. Due to their large amount of impervious surface, new development with parking areas of more than two hundred (200) spaces that are located in any zone, and that may be viewed from the public right of way, shall be landscaped to the following additional standards:

- a. One (1) trees shall be planted per six (6) parking spaces or fraction thereof. At least twenty-five percent (25%) of the required trees must be planted in the interior of the parking area.

Response: Does not apply, the project proposes 101 parking spaces.

- b. Required trees may be planted within the parking area or the perimeter, provided that a minimum of forty percent (40%) of the canopy dripline of mature perimeter trees can be expected to shade or overlap the parking area. Shading shall be determined based on shadows cast on the summer solstice.

Response: Does not apply, the project proposes 101 parking spaces.

- c. All parking lots in excess of two hundred (200) parking spaces shall provide an internal pedestrian walkway for every six (6) parking aisles. Minimum walkway clearance shall be at least five (5) feet in width. Walkways shall be designed to provide pedestrian access to parking areas in order to minimize pedestrian travel among vehicles. Walkways shall be designed to channel pedestrians to the front entrance of the building.

Response: The parking lot is not in excess of 200 stalls therefore this section does not apply.

- d. Parking lots more than three acres in size shall provide street-like features along principal drive isles, including curbs, sidewalks, street trees or planting strips, and bicycle routes.

Response: N/A, the parking lot is not 3 acres.

- e. All parking lots viewed from the public right of way shall have a minimum twelve (12) foot landscaped buffer extending from the edge of the

property line at the right of way to the edge of the parking area. Buffer landscaping shall meet the low screen standard of 4.176(.02)(D) except that trees, groundcovers and shrubs shall be grouped to provide visual interest and to create view openings no more than ten (10) feet in length and provided every forty (40) feet. Notwithstanding this requirement, view of parking area that is unscreened from the right of way due to slope or topography shall require an increased landscaping standard under 4.176(.02) in order to buffer and soften the view of vehicles as much as possible. For purposes of this section, "view from the public right of way" is intended to mean the view from the sidewalk directly across the street from the site, or if no sidewalk, from the opposite side of the adjacent street or road.

[Response: Where the parking is visible from the right of way a 12 foot buffer meeting the low screen standard is proposed.](#)

- f. Where topography and slope condition permit, the landscape buffer shall integrate parking lot storm water treatment in bioswales and related plantings. Use of berms or drainage swales are allowed provided that planting areas with lower grade are constructed so that they are protected from vehicle maneuvers. Drainage swales shall be constructed to Public Works Standards.

[Response: Water treatment swales have been incorporated into the landscape plan. Please see L1.3 and L1.4.](#)

- g. In addition to the application requirements of section 4.035(.04)(6)(d), where view of signs is pertinent to landscape design, any approved or planned sign plan shall accompany the application for landscape design approval.

[Response: No signs pertinent to the landscape design are proposed.](#)

[Amended by Ord. #719, 6/17/13]

- C. Off Street Parking shall be designed for safe and convenient access that meets ADA and ODOT standards. All parking areas which contain ten (10) or more parking spaces, shall for every fifty (50) standard spaces., provide one ADA-accessible parking space that is constructed to building code standards, Wilsonville Code 9.000.

[Response: The site proposes to have four ADA stalls which meets the Oregon Structural Specialty Code Chapter 11 requirement of Four accessible spaces for the provided 101 parking spaces. Of these four, one is required and noted as a "van" accessible space. The stalls are placed immediately adjacent to the entry plaza area with direct access to one of the building's entrances.](#)

- D. Where possible, parking areas shall be designed to connect with parking areas on adjacent sites so as to eliminate the necessity for any mode of travel of

utilizing the public street for multiple accesses or cross movements. In addition, on-site parking shall be designed for efficient on-site circulation and parking.

Response: The site design has an internal pedestrian connection system.

- E. In all multi-family dwelling developments, there shall be sufficient areas established to provide for parking and storage of motorcycles, mopeds and bicycles. Such areas shall be clearly defined and reserved for the exclusive use of these vehicles.

Response: N/A, the site is not a multi-family development.

- F. On-street parking spaces, directly adjoining the frontage of and on the same side of the street as the subject property, may be counted towards meeting the minimum off-street parking standards.

Response: N/A, there is no on-street parking adjacent.

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

Response: Several uses are proposed for the site and calculated accordingly. Phase 1: 29,000 SF Office Flex = 78.3, 12,000 SF Manufacturing = 19.2, 12,000 SF Storage = 3.6. Total spaces required = 101. Total spaces proved = 101.

- H. Electrical Vehicle Charging Stations:

1. Parking spaces designed to accommodate and provide one or more electric vehicle charging stations on site may be counted towards meeting the minimum off-street parking standards.

Response: No EV charging stations are proposed.

2. Modification of existing parking spaces to accommodate electric vehicle charging stations on site is allowed outright.

Response: No EV charging stations are proposed.

- I. Motorcycle parking:

1. Motorcycle parking may substitute for up to 5 spaces or 5 percent of required automobile parking, whichever is less. For every 4 motorcycle parking spaces provided, the automobile parking requirement is reduced by one space.

Response: Motorcycle parking is not proposed.

2. Each motorcycle space must be at least 4 feet wide and 8 feet deep. Existing parking may be converted to take advantage of this provision.

Response: Motorcycle parking is not proposed.

[Amended by Ord. #719, 6/17/13]

(.04) Bicycle Parking:

A. Required Bicycle Parking - General Provisions.

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

Response: Bike parking requirements were based off office/flex space, manufacturing and storage use. 29,000 Office = 6 (min 2) 12,000 Manu. = 2 (min 6) 12,000 Warehouse = 1 (min 2). 14 total spaces are required and 14 spaces are provided.

2. Bicycle parking spaces are not required for accessory buildings. If a primary use is listed in Table 5, bicycle parking is not required for the accessory use.

Response: There are no accessory buildings proposed.

3. When there are two or more primary uses on a site, the required bicycle parking for the site is the sum of the required bicycle parking for the individual primary uses.

Response: Bike parking requirements were based off office/flex space, manufacturing and storage use. 29,000 Office = 6 (min 2) 12,000 Manu. = 2 (min 6) 12,000 Warehouse = 1 (min 2). 14 total spaces are required and 14 spaces are provided.

4. Bicycle parking space requirements may be waived by the Development Review Board per Section 4.118(.03)(A.)(9.) and (10.).

Response: This application is not requesting a waiver of the requirement.

B. Standards for Required Bicycle Parking

1. Each space must be at least 2 feet by 6 feet in area and be accessible without moving another bicycle.

Response: The site plan indicates a 2'x6' clear space for each bike.

2. An aisle at least 5 feet wide shall be maintained behind all required bicycle parking to allow room for bicycle maneuvering. Where the bicycle parking is adjacent to a sidewalk, the maneuvering area may extend into the right-of-way.

Response: The proposed sidewalk is extended to the bike parking, providing walk ways that exceed the minimum 5' requirement.

3. When bicycle parking is provided in racks, there must be enough space between the rack and any obstructions to use the space properly.

Response: Bicycle parking is planned to be 2'x6'. The clear space for each bicycle parking is shown on the site plan.

4. Bicycle lockers or racks, when provided, shall be securely anchored.

Response: Racks will be securely anchored.

5. Bicycle parking shall be located within 30 feet of the main entrance to the building or inside a building, in a location that is easily accessible for bicycles. For multi-tenant developments, with multiple business entrances, bicycle parking may be distributed on-site among more than one main entrance.

Response: The short-term parking is located immediately adjacent to the main entrances to the building.

C. Long-term Bicycle Parking

1. Long-term bicycle parking provides employees, students, residents, commuters, and others who generally stay at a site for several hours a weather-protected place to park bicycles.

Response: 7 spaces will be long term. Long term will be placed inside lobby areas.

2. For a proposed multi-family residential, retail, office, or institutional development, or for a park and ride or transit center, where six (6) or more bicycle parking spaces are required pursuant to Table 5, 50% of the bicycle parking shall be developed as long-term, secure spaces. Required long-term bicycle parking shall meet the following standards:
 - a. All required spaces shall meet the standards in subsection (B.) above, and must be covered in one of the following ways: inside buildings, under roof overhangs or permanent awnings, in bicycle lockers, or within or under other structures.
 - b. All spaces must be located in areas that are secure or monitored (e.g., visible to employees, monitored by security guards, or in public view).
 - c. Spaces are not subject to the locational criterion of (B.)(5.).

[Section 4.155(.04) Added by Ord. #719, 6/17/13]

e. Commercial			
1. Retail store except supermarkets and stores selling bulky merchandise and grocery stores 1500 sq. ft. gross floor area or less	4.1 per 1000 sq. ft.	6.2 per 1000 sq. ft.	1 per 4000 sq. ft. Min. of 2
2. Commercial retail, 1501 sq. ft. or more	4.1 per 1000 sq. ft.	6.2 per 1000 sq. ft.	1 per 4000 sq. ft. Min. of 2
3. Service or repair shops	4.1 per 1000 sq. ft.	6.2 per 1000 sq. ft.	1 per 4000 sq. ft.
4. Retail stores and outlets selling furniture, automobiles or other bulky merchandise where the operator can show the bulky merchandise occupies the major areas of the building	1.67 per 1000 sq. ft.	6.2 per 1000 sq. ft.	1 per 8000 sq. ft. Min. of 2
5. Office or flex space (except medical and dental)	2.7 per 1000 sq. ft.	4.1 per 1000 sq. ft.	1 per 5000 sq. ft. Min. of 2
Bank with drive-thru	4.3 per 1000 sq. ft.	6.5 per 1000 sq. ft.	
6. Medical and dental office or clinic area	3.9 per 1000 sq. ft.	5.9 per 1000 sq. ft.	1 per 5000 sq. ft. Min. of 2
7. Eating or drinking establishments	15.3 per 1000 sq. ft.	23 per 1000 sq. ft.	1 per 4000 sq. ft.
Fast food (with drive-thru)	9.9 per 1000 sq. ft.	14.9 per 1000 sq. ft.	Min. of 4
Other			

8. Mortuaries	1 space/4 seats, or 8ft. of bench length in chapels	No Limit	Min. of 2
f. Industrial			
1. Manufacturing establishment	1.6 per 1000 sq. ft.	No Limit	1 per 10,000 sq. ft. Min. of 6
2. Storage warehouse, wholesale establishment, rail or trucking freight terminal	.3 per 1000 sq. ft.	.5 per 1000 sq. ft.	1 per 20,000 sq. ft. Min. of 2
g. Park & Ride or Transit Parking	As needed	No Limit	10 per acre, with 50% in lockable enclosures

[Table 5 amended by Ordinance No. 538, 2/21/02]

[Table 5 amended by Ordinance No. 548, 10/9/02]

[Table 5 amended by Ordinance No. 719, 6/17/13]

(.05) Minimum Off-Street Loading Requirements:

- A. Every building that is erected or structurally altered to increase the floor area, and which will require the receipt or distribution of materials or merchandise by truck or similar vehicle, shall provide off-street loading berths on the basis of minimum requirements as follows:

Response: The proposed site plan has loading spaces noted on the Site Plan A0.1.

- 1. Commercial, industrial, and public utility uses which have a gross floor area of 5,000 square feet or more, shall provide truck loading or unloading berths in accordance with the following tables:

Square feet of Floor Area	Number of Berths Required
Less than 5,000	0
5,000 - 30,000	1
30,000 - 100,000	2
100,000 and over	3

Response: The project is commercial/industrial and is over 30,000 sf.

- 2. Restaurants, office buildings, hotels, motels, hospitals and institutions, schools and colleges, public buildings, recreation or entertainment facilities, and any similar use which has a gross floor area of 30,000 square feet or more, shall provide off-street truck loading or unloading berths in accordance with the following table:

Square feet of Floor Area	Number of Berths Required
Less than 30,000	0
30,000 - 100,000	1
100,000 and over	2

Response: N/A

- 3. A loading berth shall contain space twelve (12) feet wide, thirty-five (35) feet long, and have a height clearance of fourteen (14) feet. Where the vehicles generally used for loading and unloading exceed these dimensions, the required length of these berths shall be increased to accommodate the larger vehicles.

Response: Loading zones meeting the 12'x35' is provided as described above, one proposed canopy has a clearance of 14 ft.

- 4. If loading space has been provided in connection with an existing use or is added to an existing use, the loading space shall not be eliminated if elimination would result in less space than is required to adequately handle the needs of the particular use.

Response: N/A, no existing use.

5. Off-street parking areas used to fulfill the requirements of this Ordinance shall not be used for loading and unloading operations except during periods of the day when not required to meet parking needs.

Response: Existing off-street parking is not being proposed to be used for the loading zone. Therefore, this section does not apply.

B Exceptions and Adjustments.

1. The Planning Director or Development Review Board may approve a loading area adjacent to or within a street right-of-way where it finds that loading and unloading operations:
 - a. Are short in duration (*i.e.*, less than one hour);
 - b. Are infrequent (less than three operations daily);
 - c. Do not obstruct traffic during peak traffic hours;
 - d. Do not interfere with emergency response services or bicycle and pedestrian facilities; and
 - e. Are acceptable to the applicable roadway authority.

Response: no exception or adjustment is requested.

(.06) Carpool and Vanpool Parking Requirements:

A. Carpool and vanpool parking spaces shall be identified for the following uses:

1. New commercial and industrial developments with seventy-five (75) or more parking spaces,

Response: There are 97 proposed parking spaces for this commercial/industrial development.

2. New institutional or public assembly uses, and

Response: N/A

3. Transit park-and-ride facilities with fifty (50) or more parking spaces.

Response: N/A

B. Of the total spaces available for employee, student, and commuter parking, at least five percent, but not fewer than two, shall be designated for exclusive carpool and vanpool parking.

Response: The site plan has 97 parking stalls, 5% of that is 4.85 stalls, rounded up to 5 stalls provided.

C. Carpool and vanpool parking spaces shall be located closer to the main employee, student or commuter entrance than all other parking spaces with the exception of ADA parking spaces.

Response: The van/carpool stalls are proposed immediately adjacent to the ADA stalls.

D. Required carpool/vanpool spaces shall be clearly marked "Reserved - Carpool/Vanpool Only."

Response: The proposed site plan and associated details show this requirement.

- (.07) Parking Area Redevelopment. The number of parking spaces may be reduced by up to 10% of the minimum required parking spaces for that use when a portion of the existing parking area is modified to accommodate or provide transit-related amenities such as transit stops, pull-outs, shelters, and park and ride stations.

Response: A parking reduction is not being requested.

[Section 4.155 Amended by Ordinance. No. 536, 1/7/02]

[Section 4.155 Amended by Ordinance. No. 719, 6/17/13]

Section 4.156.01. Sign Regulations Purpose and Objectives.

- (.01) Purpose. The general purpose of the sign regulations are to provide one of the principal means of implementing the Wilsonville Comprehensive Plan by fostering an aesthetically pleasing, functional, and economically vital community, as well as promoting public health, safety, and well-being. The sign regulations strive to accomplish the above general purpose by meeting the needs of sign owners while maintaining consistency with the development and design standards elsewhere in Chapter 4. This code regulates the design, variety, number, size, location, and type of signs, as well as the processes required to permit various types of signs. Sign regulations have one or more of the following specific objectives:
- A. Well-designed and aesthetically pleasing signs sufficiently visible and comprehensible from streets and rights-of-way that abut a site as to aid in wayfinding, identification and provide other needed information.
 - B. Sign design and placement that is compatible with and complementary to the overall design and architecture of a site, along with adjoining properties, surrounding areas, and the zoning district.
 - C. A consistent and streamlined sign review process that maintains the quality of sign development and ensures due process.
 - D. Consistent and equitable application and enforcement of sign regulations.
 - E. All signs are designed, constructed, installed, and maintained so that public safety, particularly traffic safety, are not compromised.
 - F. Sign regulations are content neutral.

Response: The proposed development is speculative and will have multiple tenants. A Master Sign Plan will be submitted showing (9) designated areas for building mounted signage and (2) Freestanding signs, located off SW Boones Ferry Road and SW Boberg Road. All signs will meet all the criteria above.

Section 4.156.02. Sign Review Process and General Requirements.

- (.01) Permit Required. Unless exempt under Section 4.156.05, no sign, permanent or temporary, shall be displayed or installed in the City without first obtaining a sign permit.

Response: Permits will be sought for all signs.

- (.02) Sign Permits and Master Sign Plans. Many properties in the City have signs pre-approved through a Master Sign Plan. For the majority of applications where a Master Sign Plan has been approved the applicant need not consult the sign requirements for the zone, but rather the Master Sign Plan, copies of which are available from the Planning Division. Signs conforming to a Master Sign Plan require only a Class I Sign Permit.

Response: The proposed development does not have an existing pre-approved Master Sign Plan.

- (.03) Classes of Sign Permits, Master Sign Plans, and Review Process. The City has three classes of sign permits for permanent signs: Class I, Class II, and Class III. In addition, non-residential developments with three or more tenants require a Master Sign Plan. Class I sign permits are reviewed through the Class I Administrative Review Process as outlined in Subsection 4.030(.01)(A.). Class II sign permits are reviewed through the Class II Administrative Review Process as outlined in Subsection 4.030 (.01)(B.). Class III Sign Permits and Master Sign Plans are reviewed by the Development Review Board (DRB) as outlined in Section 4.031.

Response: The proposed signs are part of a new commercial development with multiple tenants. The development is subject to the DRB approval and requires a Master Sign Plan.

- (.04) Class I Sign Permit. Sign permit requests shall be processed as a Class I Sign Permit when the requested sign or signs conform to a Master Sign Plan or other previous sign approval. In addition, a Minor Adjustment to a Master Sign Plan or other previous sign approval may be approved in connection with a Class I Sign Permit.
- A. Class I Sign Permit Submission Requirements: Application for a Class I Sign Permit shall include two (2) copies of the following along with all required application fees:
1. Completed application form prescribed by the City and signed by the property owner or the property owner's representative,
 2. Sign drawings showing all materials, the sign area and dimensions used to calculate sign areas, and other details sufficient to judge the full scale of the associated sign or signs and related improvements,
 3. Information showing how the proposed sign or signs conform with all applicable code requirements, Master Sign Plans, or other previous sign approvals for the property, and
 4. Information supporting any minor adjustment requests.
- B. Class I Sign Permit Review Criteria: The sign or signs conform with the applicable master sign plan or other previous sign approvals, and applicable code requirements.
- C. Minor Adjustments: Notwithstanding approved Master Sign Plans or other previous sign approvals, as part of a Class I Sign Permit Minor Adjustments may be approved as described in 1. and 2. below. Minor Adjustments are valid only for the Sign Permit with which they are associated and do not carry over to future sign permits or copy changes.
1. Adjustment to Sign Height or Length: Adjustment of not more than ten (10) percent from the sign height (not height from ground) and/or length may be approved for the reasons listed in a. through d. below, unless otherwise

specifically prohibited in the Master Sign Plan. Minor adjustments to sign height and length shall not cause the sign to cross the edge of any fascia, architectural element or area of a building facade identified as a sign band. The area of the sign exceeding the height or length as part of a minor adjustment shall not count against the sign area indicated in a Master Sign Plan or other previous sign approval.

- a. To accommodate the descender on the lower case letters “q, y, p g, or j”, not otherwise accommodated by the measurement method used, where the letter matches the font of other letters in the sign, the descender is no more than 1/2 the cap height of the font, and the descender is no wider than the main body of the letter;
 - b. To accommodate stylized fonts where bowls, shoulders, or serifs of the stylized letters extend beyond the cap height;
 - c. To accommodate an arching or other non-straight baseline; or
 - d. To accommodate a federally registered trademark logo where compliance with the defined maximum sign height would result in the cap height of the text in the logo being ninety (90) percent or less of the cap height for letters otherwise allowed. (i.e. if a Master Sign Plan allowed 24” letters and 24” total sign height, and a 24” logo would result in the cap height of the text within the logo being less than 21.6”, the total height of the logo could be increased to 26.4”)
2. Lateral Adjustment of Building Sign Location: Lateral adjustment of a building sign location identified in drawings or plans for a Master Sign Plan or other sign approval when all of the following are met:
- a. The lateral distance being moved does not exceed fifty (50) percent of the sign length or ten (10) feet, whichever is greater;
 - b. The exact location is not specifically supported or required by written findings or a condition of approval;
 - c. The sign remains within the same architectural feature and sign band, except if the location is on a pillar, column, or similar narrow architectural support feature, the sign may be moved to a sign band on the architecture feature which it supports if no other sign is already placed in that sign band for the tenant space; and
 - d. The placement maintains any spacing from the edge of an architectural feature, building, or tenant space specifically identified in the Master Sign plan or other sign approval or if no spacing is identified, maintains a definable space between the sign and the edge of architectural features, the tenant space, and building.

Response: The proposed development triggers a Master Sign Plan. All submission requirements will be met.

- (.05) Class II Sign Permit. Sign permit requests for meeting one or more of the descriptions listed in A. through C. below shall be processed as a Class II Sign Permit

when the request does not conform with a Master Sign Plan or other previous sign approval but meets the requirements of the applicable sign regulations, unless the request would modify a condition of approval specifically imposed by the DRB or City Council:

- A. Existing residential development;
- B. Existing non-residential development with less than three (3) tenants unless the request involves a freestanding or ground mounted sign greater than eight (8) feet in height in a new location;
- C. Major Adjustments to a Master Sign Plan when all of the following criteria are met:
 - 1. The request is compatible with the pattern of signage established in the sign plan in terms of locations, placement on buildings, proportionality to fascia and building facade, architectural design, and materials used;
 - 2. The request is due to special conditions or circumstances that make it difficult to comply with the established Master Sign Plan;
 - 3. The request involves signs for a single tenant, a single multi-tenant freestanding or ground mounted sign, or a series of similar related multi-tenant freestanding or ground mounted signs in the same development; and
 - 4. The request does not involve a freestanding or ground mounted sign greater than eight (8) feet in height at a new location.
- D. Class II Sign Permit Submission Requirements: Application for a Class II Sign Permit shall include two (2) paper copies and one (1) electronic copy of the following in addition to all required fees:
 - 1. Completed application form prescribed by the City and signed by the property owner or their authorized representative;
 - 2. Sign drawings or descriptions of all materials, sign area and dimensions used to calculate areas, lighting methods, and other details sufficient to judge the full scale of the signs and related improvements;
 - 3. Documentation of the lengths of building or tenant space facades used in calculating maximum allowed sign area;
 - 4. Drawings of all building facades on which signs are proposed indicating the areas of the facades on which signs will be allowed;
 - 5. Narrative describing the scope of the project, including written findings addressing all applicable review criteria, along with any other information showing how the proposed signage conforms with requirements for the applicable zone;
- E. Class II Sign Permit Review Criteria: Class II Sign Permits shall satisfy the sign regulations for the applicable zoning district and the Site Design Review Criteria in Sections 4.400 through 4.421, as well as the following criteria:

1. The proposed signage is compatible with developments or uses permitted in the zone in terms of design, materials used, color schemes, proportionality, and location, so that it does not interfere with or detract from the visual appearance of surrounding development;
2. The proposed signage will not create a nuisance or result in a significant reduction in the value or usefulness of surrounding development; and
3. Special attention is paid to the interface between signs and other site elements including building architecture and landscaping, including trees.

Response: The proposed development triggers a Master Sign Plan. All submission requirements will be met.

- (.06) Class III Sign Permit. Sign permit requests shall be processed as a Class III Sign Permit when associated with new development, or redevelopment requiring DRB review, and not requiring a Master Sign Plan; when a sign permit request is associated with a waiver or non-administrative variance; or when the sign permit request involves one or more freestanding or ground mounted signs greater than eight (8) feet in height in a new location.

Response: The proposed development triggers a Master Sign Plan. Therefore, this section is not applicable.

- A. Class III Sign Permit Submission Requirements: Ten (10) paper and electronic copies of the submission requirements for Class II Sign Permits plus information on any requested waivers or variances in addition to all required fees.
 - B. Class III Sign Permit Review Criteria: The review criteria for Class II Sign Permits plus waiver or variance criteria when applicable.
- (.07) Master Sign Plans. A Master Sign Plan is required for non-residential developments with three (3) or more tenants. In creating a Master Sign Plan thought should be given to needs of initial tenants as well as the potential needs of future tenants.
- A. Master Sign Plan Submission Requirements: Applications for Master Sign Plans shall include ten (10) paper and electronic copies of all the submission requirements for Class II and III Sign Permits and the following in addition to all required fees:
 1. A written explanation of the flexibility of the Master Sign Plan for different potential tenant space configurations over time;
 2. A written explanation of the extent to which different sign designs, including those incorporating logos, stylized letters, multiple lines of text, non-straight baselines, or different materials and illumination will be allowed and if allowed how the flexibility of the master sign plan will allow these different sign designs over time;
 3. A written explanation of how the sign plan provides for a consistent and compatible sign design throughout the subject development.

Response: The proposed signs are integrated into the development of the site and elevation layouts including proportions, sizes and materials. The signs are positioned on building faces and on the site frontage in locations not interfering the safe maneuvering within or adjacent to the site. The signs are integrated into the development as part of the overall concept and not positioned to deter from adjacent site or building components.

B. Master Sign Plan Review Criteria: In addition to the review criteria for Class II and Class III Sign Permits, Master Sign Plans shall meet the following criteria:

1. The Master Sign Plan provides for consistent and compatible design of signs throughout the development; and
2. The Master Sign Plan considers future needs, including potential different configurations of tenant spaces and different sign designs, if allowed.

Response: The master sign plan will provide consistent guidelines that meet the Criteria and consider all future needs. The drawings and submittal package denote locations of signs and provide information on size and materials as well as calculation notes related to allowed sign areas.

C. Modifications of a Master Sign Plan: Modifications of a Master Sign Plan, other than Minor and Major Adjustments, shall be reviewed the same as a new Master Sign Plan.

Response: Any modification made to the Master Sign Plan shall be reviewed as a new Master Sign Plan.

(.08) Waivers and Variances. Waivers and variances are similar in that they allow deviation from requirements such as area, and height from ground. They differ in that waivers are granted by the DRB as part of a comprehensive review of the design and function of an entire site to bring about an improved design and variances are granted by either the Planning Director or DRB to relieve a specific hardship caused by the regulations.

A. Waivers. The DRB may grant waivers for sign area, sign height from ground (no waiver shall be granted to allow signs to exceed thirty-five (35) feet in height), number of signs, or use of electronic changeable copy signs in order to better implement the purpose and objectives of the sign regulations as determined by making findings that all of the following criteria are met:

1. The waiver will result in improved sign design, in regards to both aesthetics and functionality.
2. The waiver will result in a sign or signs more compatible with and complementary to the overall design and architecture of a site, along with

adjoining properties, surrounding areas, and the zoning district than signs allowed without the waiver.

3. The waiver will result in a sign or signs that improve, or at least do not negatively impact, public safety, especially traffic safety.
4. Sign content is not being considered when determining whether or not to grant a waiver.

B. Variances.

1. Administrative Variance: In reviewing a Sign Permit the Planning Director may grant or deny a variance to relieve a hardship through the Class II Administrative Review process. Such a variance shall only be approved where the variance does not exceed twenty percent (20%) of area, height, or setback requirements. The Planning Director shall approve such a variance only upon finding that the application complies with all of the required variance criteria listed in Section 4.196.
2. Other Variances: In addition to the authority of the Planning Director to issue administrative variances as noted above, the Development Review Board may authorize variances from sign requirements of the Code, subject to the standards and criteria listed in Section 4.196.

Response: The development does not request any waiver or variance related to the proposed signs.

(.09) Temporary Sign Permits. Temporary sign permits shall be reviewed as follows:

- A. 30 days and less- Class I Administrative Review
- B. 31 days up to 120 days- Class II Administrative Review
- C. Submission Requirements: Applications for a temporary sign permit shall include the following in addition to the required application fee:
 1. Completed application form prescribed by the City and signed by the property owner or their authorized representative,
 2. Two (2) copies of sign drawings or descriptions showing all materials, sign area and dimensions used to calculate areas, number of signs, location and placement of signs, and other details sufficient to judge the full scale of the sign or signs,
 3. Information showing the proposed sign or signs conform with all applicable code requirements.
- D. Review Criteria: Temporary Sign Regulations in Section 4.156.09
- E. When a temporary sign permit request is submitted as part of the broader temporary use permit request of the same duration, the sign request shall not require an additional fee.

Response: The development does not include any temporary signs.

- (.10) Waiver of Documentation. The Planning Director may, in his or her discretion, waive an application document for Class I, Class II, and temporary sign permits where the required information has already been made available to the City, or where the Planning Director determines the information contained in an otherwise required document is not necessary to review the application.

Response: The sign designs have not been previously presented via permit to the City. The sign information is presented as part of the overall development package for the Site Development Review application. It is assumed that no further information or separate application will be required for the requested signs.

Section 4.156.03. Sign Measurement

- (.01) Sign Area:

- A. Cabinet Signs and Similar: The area for signs enclosed by cabinet, frame, or other background (including lighted surface) not otherwise part of the architecture of a building or structure shall be the area of a shape drawn around the outer dimension of the cabinet, frame, or background.
1. If the cabinet, frame, or background is an irregular shape the signs perimeter shall be measured the same as an individual element sign under B. below.
 2. The sign area does not include:
 - a. Foundations, supports, and other essential structures that are not designed to serve as a backdrop or border to the sign;
 - a. Architectural elements of a freestanding or ground mounted sign designed to match or complement the architectural design of buildings on the site not and otherwise meeting the definition of a sign;
 - c. A pole or other structural support, unless such pole or structural support is internally illuminated or otherwise so designed to constitute a display device.

Response:

(2) freestanding signs will be mounted to a cabinets. This cabinet will be designed to match the building architectural design and materials and therefore meets the exception 2.b above. The sign area will be calculated based on the area of the individual elements for each sign face.

The foundation base is not included in the sign area calculation as noted in 2.a above.

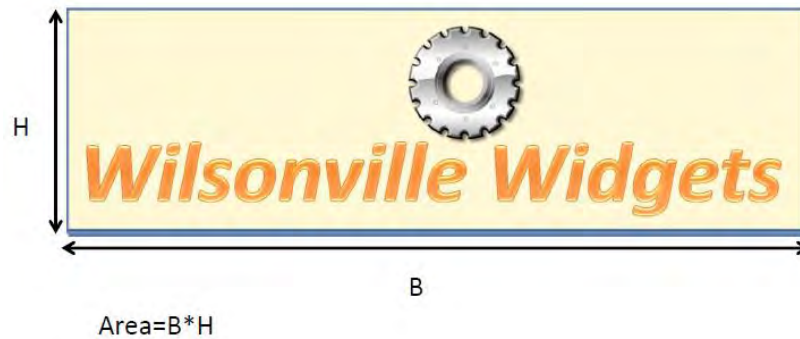
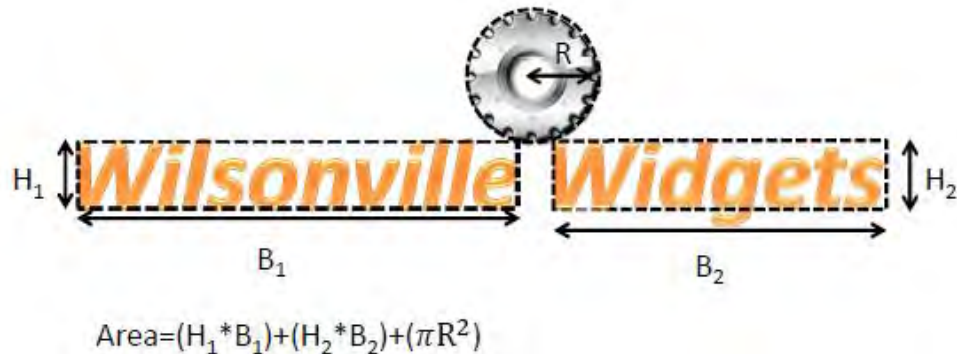


Figure S-1. Measurement of Cabinet or Similar Signs

- B. Individual Element Signs: The area for signs constructed of individual elements (letters, figures, etc.) attached to a building wall or similar surface or structure shall be the summed area of up to three squares, rectangles, circles, or triangles drawn around all sign elements.
1. The descender on the lower case letters “q, y, p g, or j.” shall not be included in sign area when the letter otherwise matches the font of other letters in the sign, the descender is no more than 1/2 the cap height of the font, and the descender is no wider than the main body of the letter.



Response: The individual elements of each sign including the logo and lettering is calculated using the perimeter areas noted above.

Figure S-2. Measurement of Individual Element Signs

- C. Round or Three-Dimensional Signs: The area of a round or three-dimensional sign shall be the maximum surface area visible from any one location on the ground measured the same as A. above except if the maximum surface area is an irregular shape the signs perimeter shall be measured the same as an individual element sign under B. above.

Response: Any 3D elements will be calculated as noted above.

- D. Awning or Marquee Signs: The area of signs incorporated into awnings or marquees shall be the area of the entire panel containing the sign measured the

same as A. above unless it is clear that part of the panel contains no sign-related display or decoration, other than the background color of the awning.

Response: The development does not propose any marquee or awning style signs. Therefore, this section does not apply.

- E. Painted Wall Signs: The area of painted wall signs shall be determined as follows:
1. If individual elements are painted without a background it shall be calculated in the manner indicated in B. above.
 2. If a background is painted it shall be calculated in the manner indicated in A. above.

Response: All proposed signs do not include painted wall signs. Therefore, this section does not apply.

- F. Temporary Signs: The area of temporary signs including banners, lawn signs, and rigid signs shall be calculated in the manner indicated in A. above.

Response: The development does not include any temporary signs. Therefore, this section does not apply.

- G. Unless otherwise specified, the sign area of a two-sided sign, with two matching sides, shall be considered to be the area of one side. For example, the sign area of a two-sided sign having thirty-two (32) square feet per sign face shall be considered to be thirty-two (32) square feet, unless this code specifies otherwise.

Response: The free standing signs located along Boones Ferry Road and Boberg Road will be double sided.

(.02) Sign Height above Ground.

- A. The height above ground of a freestanding or ground-mounted sign is measured from the average grade directly below the sign to the highest point of the sign or sign structure except as follows:
1. A freestanding or ground mounted sign on a man-made base, including a graded earth mound, shall be measured from the grade of the nearest pavement or top of any pavement curb to the highest point of the sign or sign structure. In all cases signs on a berm shall be allowed to be eight (8) feet in height from the top of the berm.
 2. A freestanding or ground mounted sign placed below the elevation of the right-of-way it fronts shall be measured from the lowest point in the right-of-way along the frontage to the highest point of the sign.

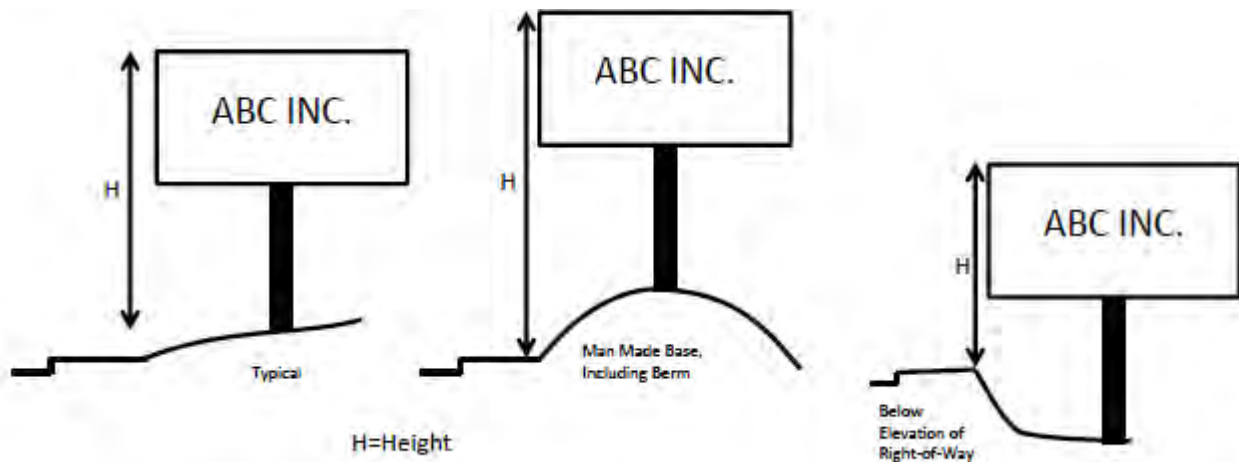


Figure S-3. How to Measure Height of a Freestanding or Ground Mounted Sign

Response: The proposed monument sign is placed at grade and the elevation of the sign is based on the base grade elevation at the sign to the top of the sign as noted (0.2)1 above.

(.03) Sign Height and Length.

- A. Height of a sign is the vertical distance between the lowest and highest points of the sign.
- B. Length of a sign is the horizontal distance between the furthest left and right points of the sign.

Response: These methods of sign measurements are used on the provided drawings to indicate the height and length of each sign.

- (.04) Final Determination of Sign Measurement. The Planning Director shall be responsible for determining the area, height above ground and height and length of a sign, subject to appeal as specified in Section 4.022. Applicants for sign plans and permits shall provide the dimensions needed to calculate the area, height above ground, height, and length.

Response: Sign areas and dimensions along with locations are noted with the design review drawing package on sheet A0.1 Site Plan and A0.2 Site Details related to the free-standing sign and Master Sign elevations.

Section 4.156.04. Non-Conforming Signs.

- (.01) Non-Conforming Signs. Non-conforming signs, which may be non-conforming structures or non-conforming uses, are subject to the standards for non-conforming uses and non-conforming structures delineated in Sections 4.189 through 4.190. Except, however, that a non-conforming sign that is damaged beyond fifty percent

(50%) of its value, as determined by the City Building Official, may only be reconstructed if the reconstructed sign meets all applicable zoning, structural, and electrical standards applicable at the time of reconstruction. Nothing in this Section is intended to impair any previously approved sign permit that has been issued by the City of Wilsonville, subject to state or federal law, or to require the removal of any sign that was legally erected or installed prior to the effective date of these regulations. In the event that a previously erected or installed sign no longer meets applicable City zoning standards it may remain in place, subject to the standards for non-conforming uses or nonconforming structures noted above. However, a sign that is required to be moved solely because of a public taking may be replaced on the site, and maintain its non-conforming status, subject to a Class II Sign Permit, provided the replacement sign is found to not increase in non-conformity to current code standards other than required setbacks.

Response: All signs, as part of the new development, are designed based on the code parameters.

Section 4.156.05. Signs Exempt From Sign Permit Requirements.

(.01) The following signs are exempt from the permit requirements of this code and do not require sign permits. Unless otherwise specified, the area of the exempted signs shall not be included in the calculations of sign area permitted on a given site:

A. Traffic or other governmental or directional signs, as may be authorized by the City or other units of government having jurisdiction within the City.

Response: There are not proposed traffic or directional signs.

B. Signs installed by public utility companies indicating danger, or which serve as an aid to public safety, or which show the location of utilities or public facilities, including underground utilities.

Response: Utility signs will be installed as required by the utilities.

C. Flags displayed from permanently-located freestanding or wall-mounted flagpoles that are designed to allow raising and lowering of flags. One site may have up to two (2) exempt flags; no exempt flag may be more than thirty (30) feet in height.

Response: The proposed development does not include any flags.

(.02) Other Signs. No sign permit is necessary before placing, constructing or erecting the following signs. However, in all other particulars such signs shall conform to the requirements of applicable Building and Electrical Codes, as well as this Code.

A. Signs inside a building except for prohibited signs listed in Section 4.156.06.

Response: The proposed development does not include any prohibited signage within the building.

B. Name Plates and Announcements.

1. A sign identifying the name, street address, occupation and/or profession of the occupant of the premises in the aid of public health and safety. One name plate, not exceeding a total of three (3) square feet shall be allowed for each occupant. The name plate shall be affixed to the building.
2. Announcements posted on a given property (e.g., no smoking, no parking, rules of conduct, etc.) and not intended to be read from off-site, are permitted to be located as needed. Such announcements shall not be considered to be part of the sign allotment for the property.

Response: Signs related to “no smoking” and other site standards will be located at building entries and not intended to be viewed from off-site.

- C. Directional Signs. Designed for non-changing messages, directional signs facilitate the safe movement of the traveling public. Such signs are subject to the following standards and conditions:
1. The sign area does not exceed three (3) square feet per sign face,
 2. The sign location is not within public rights-of-way and meets City vision clearance requirements;
 3. No sign lighting;
 4. No logo or a logo that does not exceed one (1) square foot in size; and
 5. No more than one (1) directional sign is located on the same tax lot.

Response: Signs related to parking and directional signage will be included on the site and are indicated on the A0.1 site plan. These signs are non-illuminated and do not contact logos.

- D. Changes of Copy Only, where the graphics contained on an existing sign are changed, but the sign itself is not structurally altered, and no building or electrical permit is required.

Response: No existing signs, not applicable.

- E. Signs not visible from any off-site location.

Response: The proposed signs are visible from the adjacent right-of-ways. Therefore, these three signs are not exempt.

- F. Holiday lights and decorations, in place between November 15 and January 15.

Response: Temporary decorations will be provided by owner and will be subject to calendar limitations and are not part of this application review.

- G. Signs on scoreboards or ballfields located on public property.

Response: There are no scoreboards proposed with this application. Therefore, this section is not applicable.

- H. One small decorative banner per dwelling unit placed on site, in residential zones.

Response: The development does not include dwelling units. Therefore, this section is not applicable.

- I. Lawn Signs meeting the standards of Table S-1 and the following conditions:
 1. Such signs shall not be intentionally illuminated and shall not display movement.
 2. Such signs shall not obscure sight lines of the motoring public, obscure traffic or other government signs, or create a nuisance to the use or occupancy of any property.
 3. Lawn signs associated with temporary events may be posted no longer than sixty (60) days before the beginning of an event and must be removed at the event's completion.
 4. Lawn signs not associated with temporary events may be posted for one period of up to sixty (60) days in a calendar year.
 5. Such signs may be up to six (6) feet in height.
 6. Such signs may be one (1) or two (2) sided.

Response: Temporary yard signs associated with special events will be provided by the owner and will be subject to timelines, placement and sizing limitations and are not part of this application review.

- J. Rigid Signs meeting the standards of Table S-1 and the following conditions:
 1. Such signs shall not be intentionally illuminated and shall not display movement.
 2. Such signs shall not obscure sight lines of the motoring public, obscure traffic or other government signs, or create a nuisance to the use or occupancy of any property.
 3. Such signs may be up to six (6) feet in height, except signs on lots with an active construction project (active building permit), which may be up to ten (10) feet in height. (Note that signs exceeding six (6) feet in height typically require building permits.)
 4. Such signs may be one (1), two (2), or three (3) sided.
 5. On Residential and Agriculture zoned lots:
 - a. A rigid sign not associated with an ongoing temporary event may be displayed for no more than sixty (60) days each calendar year.
 - b. A rigid sign associated with an ongoing temporary event may be displayed for the duration of that event. Note: Section 4.156.06 (.01) Q. of this Code prohibits signs associated with temporary events to remain posted after the completion of the event.
 6. On Commercial, Industrial, or Public Facility zoned lots:
 - a. A rigid sign not associated with an ongoing temporary event may be displayed for no more than ninety (90) days each calendar year.

- b. A rigid sign associated with an ongoing temporary event may be displayed for the duration of that temporary event. Note: Section 4.156.06(.01)(Q.) of this Code prohibits signs associated with temporary events to remain posted after the completion of the event.
- c. A temporary event must have an end, marked by the occurrence of a specifically anticipated date or happening. A temporary event may not be a part of a broader, continuing event or of related, serial events. Temporary events shall not be defined by content, but may include isolated merchandise sales or discounts, or availability of real estate for sale or lease.

Response: Rigid signs associated with special events will be provided by the owner and will be subject to timelines, placement and sizing limitations and are not part of this application review.

- K. Signs allowed in Subsections 6.150 (1) and (2) Wilsonville Code for special events.

Response: Signs allowed under Subsection 6.150 (1) and (2) are not part of this application package.

Section 4.156.06. Prohibited Signs

- (.01) Prohibited Signs. The following signs are prohibited and shall not be placed within the City:
- A. Search lights, strobe lights, and signs containing strobe lights or other flashing lights, unless specifically approved in a sign permit.
 - B. Obstructing signs, a sign or sign structure such that any portion of its surface or supports will interfere in any way with the free use of any fire escape, exit, hydrant, standpipe, or the exterior of any window; any sign projecting more than twelve (12) inches from a wall, except projecting signs that are specifically permitted through the provisions of this Code.
 - C. Changing image signs, including those within windows.
 - D. Changeable copy signs that use lighting changed digitally, unless specifically approved through a waiver process connected with a Class III Sign Permit or Master Sign Plan. In granting a waiver for a digital changeable copy signs the DRB shall ensure the following criteria will be met:
 - 1. The sign shall be equipped with automatic dimming technology which automatically adjusts the sign's brightness in direct correlation with ambient light conditions and the sign owner shall ensure appropriate functioning of the dimming technology for the life of the sign.
 - 2. The luminance of the sign shall not exceed five thousand (5000) candelas per square meter between sunrise and sunset, and five hundred (500) candelas per square meter between sunset and sunrise.
 - E. Roof signs - signs placed on the top of a building or attached to the building and projecting above the top of that building, unless specifically approved through the temporary sign permit procedures or the architectural design of a building makes the slope of the roof below the peak a practicable location of signs on a building and the general location of signs on the roof is approved by the DRB during Stage II Approval, as applicable, and Site Design Review.
 - F. Signs obstructing vision clearance areas.
 - G. Pennants, streamers, festoon lights, balloons, and other similar devices intended to be moved by the wind, unless specifically authorized in an approved sign permit.
 - H. Signs attached to trees, public sign posts, or public utility poles, other than those placed by appropriate government agencies or public utilities.
 - I. Signs using bare-bulb illumination or signs lighted so that the immediate source of illumination is visible, unless specifically authorized by the Development Review Board or City Council such as Digital Changeable Copy Signs. This is not intended to prohibit the use of neon or LED's as a source of illumination.

- J. Signs that use flame as a source of light or that emit smoke or odors.
- K. Any sign, including a window sign, which is an imitation of or resembles an official traffic sign or signal; and which may include display of words or graphics that are likely to cause confusion for the public, such as “STOP,” “GO,” “SLOW,” “CAUTION,” “DANGER,” “WARNING,” etc.
- L. Any sign, including a window sign, which by reason of its size, location, movements, content, coloring or manner of illumination may be confused with, or construed as, a traffic control device, or which hides from view any traffic sign, signal, or device.
- M. Portable signs, exceeding six (6) square feet of sign area per side, other than those on vehicles or trailers. The display of signs on a vehicle or trailer is prohibited where the vehicle or trailer is not fully operational for use on public roads or where the primary function of the vehicle or trailer is advertising. Examples where the primary function of the vehicle or trailer is advertising include mobile billboards such as those on which advertising space is rented, sold, or leased.
- N. Signs located on public property in violation of Section 4.156.10.
- O. Signs placed on private property without the property owner’s permission.
- P. Signs erected or installed in violation of standards prescribed by the City of Wilsonville, State of Oregon or the U.S. government.
- Q. Signs associated with temporary events, after the temporary event is completed.
- R. Any private signs, including window signs, with a luminance greater than five thousand (5000) candelas per square meter between sunrise and sunset and five hundred (500) candelas per square meter between sunset and sunrise.
- S. Video Signs

Response: Proposed signs do not include any of the prohibited items listed above.

Section 4.156.07. Sign Regulations In Residential Zones.

- (.01) Ground Mounted Signs for Residential Developments. One ground mounted sign, not exceeding eighteen (18) square feet in area and six (6) feet in height above ground, shall be permitted for each residential subdivision or for any multi-family development.
 - A. Additional ground mounted signs of eighteen (18) square feet or less shall be permitted for additional entrances to the subdivision or development located on a separate street frontage or on the same street frontage located at least two hundred (200) feet apart.
 - B. For one entrance on a street frontage, an additional ground mounted sign may be placed on opposite side of the street or private drive at the intersection.

- (.02) Ground Mounted Signs for Outdoor Recreational Areas on Separate Lots. Public or private parks or other similar outdoor recreational areas on separate lots than dwelling units are allowed one (1) ground mounted sign of eighteen (18) square feet or less in area and six (6) feet or less in height above ground.
- (.03) Non-Residential Uses. Uses, other than residential and outdoor recreation, shall be subject to the sign regulations for PDC, PDI, and Public Facility zones.

Response: Subject site is not in a Residential Zone. Therefore, this section does not apply.

Section 4.156.08. Sign Regulations in the PDC, PDI, and PF Zones.

- (.01) Freestanding and Ground Mounted Signs:
 - A. One freestanding or ground mounted sign is allowed for the first two-hundred (200) linear feet of site frontage. One additional freestanding or ground mounted sign may be added for through and corner lots having at least two-hundred (200) feet of frontage on one street or right-of-way and one-hundred (100) feet on the other street or right-of-way.

Response: The property has greater than 200 lineal feet of frontage on SW Boones Ferry Road and SW Boberg Road. Therefore, a single freestanding sign is allowed on both frontages.

- B. The allowed height above ground of a freestanding or ground mounted sign is twenty (20) feet except as noted in 1-2 below.
 - 1. The maximum allowed height above ground for signs along the frontage of Interstate 5, and parallel contiguous portions of streets, as identified in Figure S-4, associated with multiple tenants or businesses may be increased by three (3) feet for each tenant space of ten thousand (10,000) square feet or more of gross floor area up to a maximum of thirty-five (35) feet.
 - 2. The allowed height above ground for signs in the PDC-TC Zone, Old Town Overlay Zone, and PDI Zone is eight (8) feet, except those signs along the frontage of Interstate 5 and parallel contiguous portions of streets identified in Figure S-4.

Response:

Boberg Road Freestanding max sign height = (8) feet.

The sign is located is a PDI zone and is not along Interstate 5 frontage.

Boones Ferry Road max sign height = (35) feet.

Boones Ferry Road is parallel with Interstate 5. The phase (1) building has 4 tenant spaces over (10,000) square feet. In addition, Phase (2) and

Phase (3) will have additional tenant spaces over (10,000). The sign can be mounted at a maximum (35) feet. Proposed freestanding sign on Boones Ferry Road is (34) feet high.

- C. The maximum allowed area for each freestanding or ground-mounted sign is determined based on gross floor area and number of tenant spaces:
 - 1. For frontages along streets other than those indicated in 2 below sign area allowed is calculated as follows:
 - a. The sign area allowed for signs pertaining to a single tenant:

Gross Floor Area in a Single Building	Maximum Allowed Sign Area
Less than 11,000 sq. ft.	32 sq. ft.
11,000-25,999 sq. ft.	32 sq. ft. + 2 sq. ft. per 1000 sq. ft. of floor area greater than 10,000 rounded down to the nearest 1,000 sq. ft.
26,000 sq. ft. or more	64 sq. ft.

- i. For PF (Public Facility) zoned properties adjacent to residential zoned land the maximum allowed area is thirty-two (32) square feet.
- b. The maximum allowed sign area for signs pertaining to multiple tenants or businesses is thirty-two (32) square feet plus the following for each tenant space:

Gross Floor Area of Tenant Space	Additional Allowed Sign Area for Tenant Space
Less than 1,000 sq. ft.	3 sq. ft.
1,000-10,999	3 sq. ft. + 3 sq. ft. per 1,000 sq. ft. of floor area rounded down to the nearest 1,000 sq. ft.
11,000 sq. ft. or more	32 sq. ft.

- i. The total sign area shall not exceed two hundred (200) square feet, except in the PDC-TC Zone, Old Town Overlay Zone, and PDI Zone the total sign area shall not exceed eighty (80) square feet.
- ii. Though the maximum allowed sign area is calculated based on number of tenant spaces and their size, the content of the sign and area used for different content is at the discretion of the sign owner, except for required addressing.

Response:

Boberg Road freestanding max sign area = (80) square feet.

(4) 12,000 square foot tenant spaces.

Max area = 32+(4x32) = 160.

However, this site is located in the PDI zone which limits area to (80) square feet. The proposed monument sign is double sided and has a calculated sign area

of (80) square feet per side. As noted in 4.156.03(.01)G, two-sided signs with matching elevations count as a single sign; therefore, the area of sign is (80) square feet complies

2. Signs fronting Interstate 5 and parallel contiguous street sections, as identified in Figure S-4.
 - a. For signs on properties or within developments with a single tenant or business the sign area allowed is sixty-four (64) square feet.
 - b. For signs on properties or within developments with multiple tenants or businesses the maximum allowed area is sixty-four (64) square feet plus an additional thirty-two (32) square feet for each tenant space of 10,000 square feet or more of gross floor area up to a maximum total sign area of three hundred (300) square feet.
 - i. Though the sign area allowed is calculated based on number of large tenant spaces, the content of the sign and area used for different content is at the discretion of the sign owner, except for any required addressing.

Response:

Boberg Road freestanding max sign area = (256) square feet.

The proposed sign on Boones Ferry Road runs parallel to Interstate 5. (Phase 1) has (4) 10,000 square foot tenant spaces. (Phase 2 &3) have at minimum (2) 10,000 square foot tenant spaces .

Max area = $64 + (6 \times 32) = 256$ square feet.

The proposed sign is double sided and has a calculated sign area of 256 square feet per side. As noted in 4.156.03(.01)G, two-sided signs with matching elevations count as a single sign; therefore, the area of sign is 256 square feet complies

- D. Pole or sign support placement shall be installed in a full vertical position.

Response: The free-standing signs are in a vertical position.

- E. Freestanding and ground mounted signs shall not extend into or above public rights-of-way, parking areas, or vehicle maneuvering areas.

Response: The free-standing signs are setback from and do not project into either the public right-of-way, the internal parking and vehicle maneuvering areas.

- F. The location of free standing or ground mounted signs located adjacent to or near the Public Right-of-Way shall be in compliance with the City's Public Works Standards for sight distance clearance. Prior to construction, the location of the sign shall be approved by the City of Wilsonville Engineering Division.

Response: The free-standing signs are positioned twenty feet of the nearest driveway approach and outside of a 30x30 vision triangle.

- G. Freestanding and ground mounted signs shall be designed to match or complement the architectural design of buildings on the site.

Response: The freestanding sign will be placed on a concrete base similar to the building. The sign cabinet itself will be constructed of metal siding matching the profiles and colors of the building.

- H. For freestanding and ground mounted signs greater than eight (8) feet in height, the width of the sign shall not exceed the height.

Response: The proposed sign on Boberg Road is 8 feet in height and 10 feet wide. The proposed sign on Boones Ferry Road is 34 feet high and is 8 feet wide.

- I. Along street frontages in the PDC-TC Zone and Old Town Overlay Zone monument style signs are required.

Response: The site is not located in a PDC-TC or Old Town Overlay zone. Therefore, this section does not apply.

- J. Freestanding and ground mounted signs shall be no further than fifteen (15) feet from the property line and no closer than two (2) feet from a sidewalk or other hard surface in the public right-of-way.

Response: The free-standing signs are situated approximately 8' from the property line.

- K. Except for those signs fronting Interstate 5, freestanding and ground mounted signs shall include the address number of associated buildings unless otherwise approved in writing by the City and the Fire District.

Response: The address number of the building is depicted on the sides of the sign cabinet and is clearly visible from the right-of-way on Boberg Road.

- L. When a sign is designed based on the number of planned tenant spaces it shall remain a legal, conforming sign regardless of the change in the number of tenants or configuration of tenant spaces.

Response: All signs will remain conforming regardless of a change in tenant spaces.

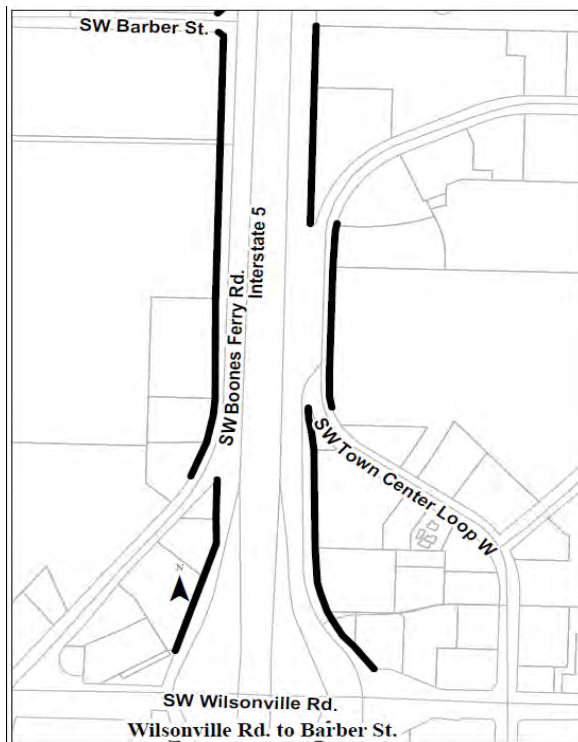
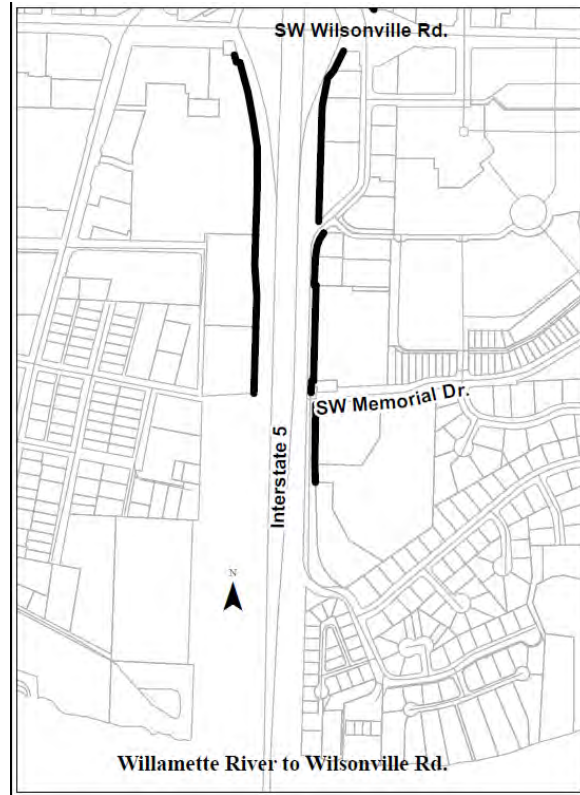
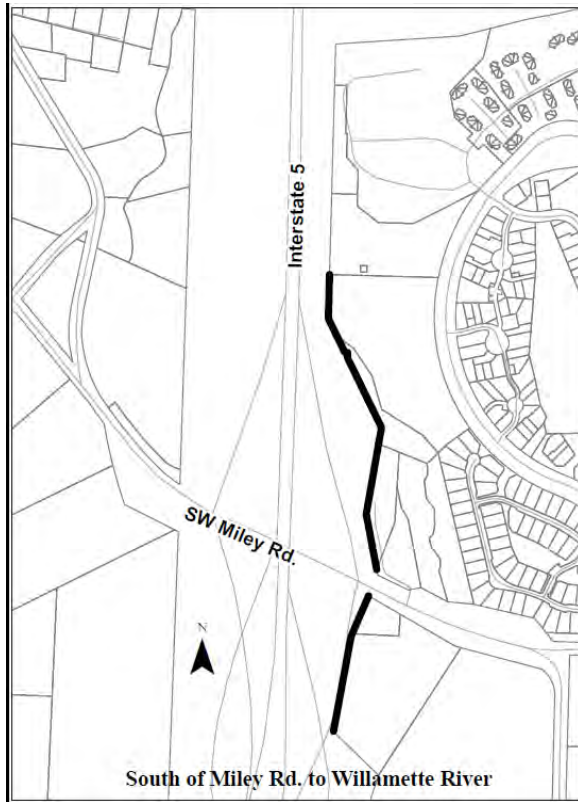


Figure S-4. Interstate 5 and Contiguous Parallel Street Frontages

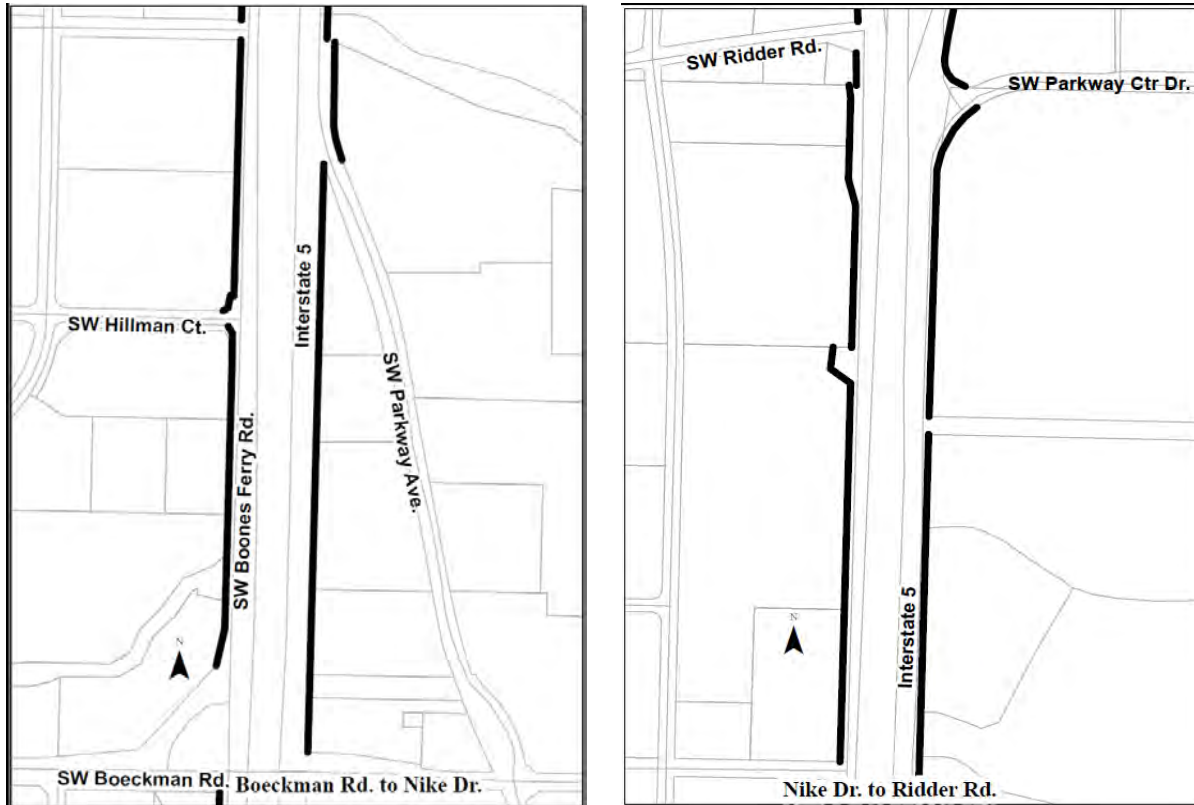


Figure S-4. Interstate 5 and Contiguous Parallel Street Frontages (continued)

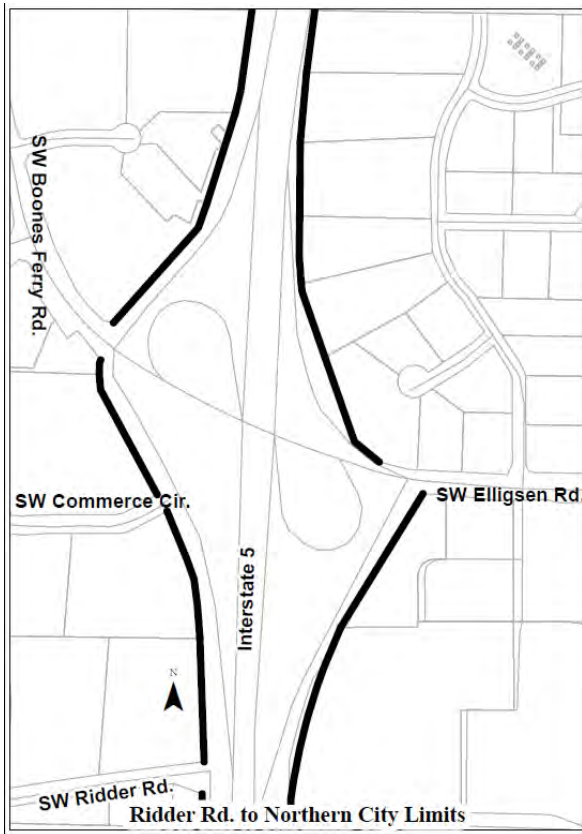


Figure S-4. Interstate 5 and Contiguous Parallel Street Frontages (continued)

(.02) Signs on Buildings.

- A. Sign Eligible Facades: Building signs are allowed on a facade of a tenant space or single tenant building when one or more of the following criteria are met:
1. The facade has one or more entrances open to the general public;
 2. The facade faces a lot line with frontage on a street or private drive with a cross section similar to a public street, and no other buildings on the same lot obstruct the view of the building facade from the street or private drive; or
 3. The facade is adjacent to the primary parking area for the building or tenant.

Response: The building proposes (9) façade mounted signs. These signs are placed on the facades facing Boberg and Boones Ferry Road.

B. Sign Area Allowed:

1. The sign area allowed for all building signs on a sign eligible façade is shown in the table below:

Linear Length of Façade (feet)	Sign Area Allowed*
Less than 16	Area equal to linear length
16 to 24	24 sq. ft.

Greater than 24 to 32	32 sq. ft.
Greater than 32 to 36	Area equal to linear length
Greater than 36 to 72	36 sq. ft.
Greater than 72	36 sq. ft. plus 12 sq. ft. for each 24 linear feet or portion thereof greater than 72 up to a maximum of 200 sq. ft.

*Except as noted in 2. through 5. Below

Response: The following are the façade lengths of the building portion that the sign is mounted to and allowed sign areas for each sign. The building façade is divided among (5) potential tenant spaces.

East Elevation @ I-5 frontage and parking:

- Tenant 1: Façade length = 50' Allowed area = 36 square feet
- Tenant 2: Façade length = 50' Allowed area = 36 square feet
- Tenant 3: Façade length = 50' Allowed area = 36 square feet
- Tenant 4: Façade length = 50' Allowed area = 36 square feet
- Tenant 5: Façade length = 120' Allowed area = 60 square feet

West Elevation:

- Tenant 1: Façade length = 50' Allowed area = 36 square feet
- Tenant 2: Façade length = 50' Allowed area = 36 square feet
- Tenant 3: Façade length = 50' Allowed area = 36 square feet
- Tenant 4: Façade length = 50' Allowed area = 36 square feet

2. The sign area allowed for facades with a primary public entrance or with a frontage along a public street dominated by windows or glazing may be increased by transferring to the façade up to one half (1/2) the sign area allowed for adjacent facades up to fifty (50) square feet. In no case shall the allowed sign area exceed an area equal to the linear length of the façade.

Response: No transfer is proposed.

3. The sign area allowed is increased as follows for signs at separate building entrances:
 - a. For building entrances open to the general public located at least fifty (50) feet apart on the same facade, the sign area allowed is increased by fifty (50) percent up to fifty (50) square feet.

- b. For building entrances located less than fifty (50) feet apart on the same facades, the sign area allowed is increased by twenty (20) percent up to twenty (20) square feet.

Response: Each tenant shares a lobby entrance.

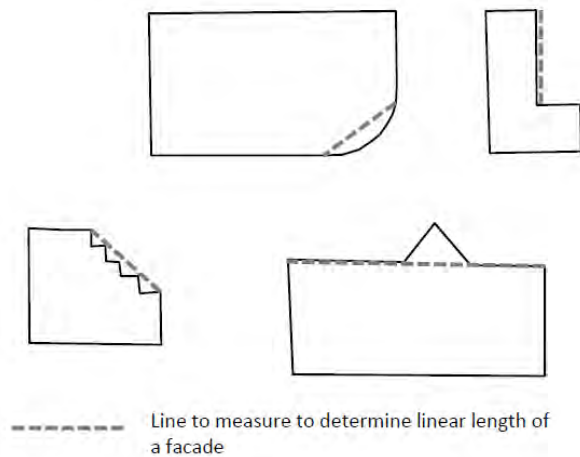
4. For businesses occupying multiple buildings in a campus setting, sign area shall be limited to that allowed for the largest building. which may then be distributed throughout the campus.

Response: The development is not proposing the same business occupying multiple buildings.

5. If a façade otherwise not sign eligible faces a lot line with frontage on Interstate 5, the applicant can transfer sign area allowed from one (1) of the locations described in a. and b. below. In no case shall the allowed sign area exceed an area equal to the allowed sign area for a sign eligible façade of the same linear length.
 - a. The freestanding sign along the Interstate 5 frontage. This generally involves placing building signs on the subject façade in lieu of installing a freestanding sign.
 - b. Adjacent façade up to fifty (50) square feet, when a majority of the adjacent façade from which the sign area is being transferred is visible from Interstate 5.

Response: The development is proposing a freestanding sign along Interstate 5 frontage, area cannot be transferred.

6. Calculating linear length of a façade for the purpose of determining maximum sign area allowed. For facades of a single tenant building the length the facade measured at the building line, except as noted in a. and b. below. For multi-tenant buildings the width of the façade of the tenant space shall be measured from the centerline of the party walls or the outer extent of the exterior wall at the building line, as applicable, except as noted in a. and b. below. Applicants shall provide the dimensions needed to calculate the length. Each tenant space or single occupant building shall not be considered to have more than five (5) total facades.
 - a. If a façade is curvilinear, stepped, or otherwise not a straight line, the façade shall be measured by drawing a straight line between the edges of the façade as shown in the figure below.
 - b. For an “L” shaped tenant space or single tenant building the longest leg of the interior of the “L” shall be basis for measuring the length of the L-shaped facade. Sign area allowed based on the longest leg can be distributed between legs.



Response: The building does not step in planes where the signs are installed. Therefore, this is not applicable.

C. The length of individual tenant signs shall not exceed seventy-five (75) percent of the length of the facade of the tenant space.

Response: Tenant signs will not exceed 75% of tenant facade.

D. The height of building signs shall be within a definable sign band, fascia, or architectural feature and allow a definable space between the sign and the top and bottom of the sign band, fascia, or architectural feature.

Response: All signs are placed above second floor windows and a bordered by architectural reveals to create a defined area.

E. Types of signs permitted on buildings include wall flat, fascia, projecting, blade, marquee and awning signs. Roof-top signs are prohibited.

Response: The proposed signs are flat metal logo and letter that are mounted to standoffs on the sign bands. No roof-top signs are proposed.

(.03) Additional signs. Notwithstanding the signs allowed based on the site in (.01) and (.02) above, the following signs may be permitted, subject to standards and conditions in this Code:

A. Directional Signs: In addition to exempt directional signs allowed under Subsection 4.156.05 (.02) C. freestanding or ground mounted directional signs six (6) square feet or less in area and four (4) feet or less in height:

1. The signs shall be designed to match or complement the architectural design of buildings on the site;
2. The signs shall only be placed at the intersection of internal circulation drives; and
3. No more than one (1) sign shall be placed per intersection corner with no more than two (2) signs per intersection.

Response: Noted.

- B. Planned Development Signs. Up to thirty (32) square feet of the allowed sign area for freestanding signs in a planned development may be used for a separate on-site monument sign or off-site monument sign on an adjacent parcel identifying the Planned Development project.

Response: The two proposed freestanding signs are adequate for this development.

- C. Blade Signs. To aid in pedestrian wayfinding, one (1) blade sign, not to exceed six (6) square feet, per facade eligible for building signs. Blade signs over pedestrian accessible areas shall provide a minimum of eight (8) feet of clearance from the ground.

Response: The proposed development does not include any blade style signs.

- D. Fuel or Service Station Price Signs. In addition to the freestanding or ground mounted signs allowed, changeable copy signs shall be allowed for the purpose of advertising fuel prices, subject to the following standards and conditions:

1. The signs shall have a maximum of eleven (11) square feet in area per face per type of fuel sold and shall be permanently affixed to the building or a freestanding sign.
2. The signs shall not be considered in calculating the sign area or number of signs allowed.
3. Signs on fuel pumps shall be permitted, providing that they do not project beyond the outer edge of the pump in any direction.

Response: The development does not include fuel or service station use. Therefore, this section is not applicable.

Section 4.156.09. Temporary Signs In All Zones.

The following temporary signs may be permitted in addition to the permanent signs allowed in different zones and exempt temporary signs unless specifically prohibited in a master sign plan or other sign approval:

- (.01) General Allowance. Except as noted in subsection (.02) below up to two (2) temporary signs not exceeding a combined total of twenty four (24) square feet may be permitted per lot or non-residential tenant. Such signs may be banners, rigid signs, lawn signs, portable signs, or other signs of similar construction.
- (.02) Opening Banner for a New Business or Housing Development. A banner corresponding with the opening of a new business or housing development may be permitted, subject to the following standards and conditions:
- A. One such banner shall be allowed either from the date of issuance of Building Permits until four (4) weeks after issuance of Certificates of Occupancy, or if no Building Permit is issued, for four (4) weeks after occupancy of a new business.
 - B. Such banner may be two-sided but shall not exceed thirty-two (32) square feet per face.

- C. Such signs shall not be permitted at the same time as general allowance signs in (.01) above.
- (.03) Annual Event Signs. Up to ten (10) lawn signs may be permitted to be located in the public right-of-way for up to fourteen (14) days if all of the following are met:
- A. Signs will not be located in the areas listed in Subsection 4.156.10 (.01) A. 4.
 - B. The applicant or event has not been issued a permit for and placed signs in the public right-of-way in the previous six (6) months;
 - C. Not more than one (1) other permit has been issued for lawn signs in the right-of-way during the time period the applicant is requesting;
 - D. The event to which the signs pertain is expected to attract two hundred fifty (250) or more people;
 - E. The request is not in addition to exempt lawn signs for large special events allowed for in Section 6.150; and
 - F. The applicant has indicated on a map the exact locations the signs will be placed and has submitted an application along with the required fee.
- (.04) Inflatable Signs. Inflatable signs may be permitted for a maximum of fifteen (15) days of display use in any calendar year subject to the following standards and conditions:
- A. Does not exceed ten (10) feet in overall height; and
 - B. If attached to a building in any manner, it meets applicable building code requirements including consideration of wind loads.

[Response: Temporary signs associated with special events, grand opening, etc. will be provided by the tenants and will be subject to timelines, placement and sizing limitations and are not part of this application review.](#)

Section 4.156.10. Signs on City and ODOT Right-Of-Way.

- (.01) Signs on City Property. For the purposes of this section, City property is defined as physical sites, City rights-of-way, and rights-of-way over which the City has jurisdiction. City property includes, but is not limited to, the following: City Hall, the Community Center, the Library, parks and open space, Transit and Fleet Building, SMART Central, and the City's reservoir, pump station, and treatment plant properties.
- A. Allowed Signs. The following signs may be placed on City property and/or City rights-of-way and right-of-ways over which the City has jurisdiction under the following conditions:
- 1. Such signs as are necessary to locate and direct the public to City premises, or other governmental premises.

2. Such signs as are necessary for the public's health, safety and welfare authorized under law, regulation, ordinance, or order including but not limited to traffic signs. This shall include signs authorized to conform with the State's Tourism Information program and any similar local government program.
3. Signs and their placement as authorized in subsections 1 and 2, above, shall meet all other applicable standards and criteria under law, regulation, ordinance, or order.
4. Lawn signs may be placed, subject to the standards in subsection 4.156.10 (.01)A. 5., below, on City rights-of-way and rights-of-way over which the City has jurisdiction except 1) those rights-of-way adjoining City properties defined in subsection 4.156.10 (.01) above, and 2) in the following locations where the placement of signs could damage landscaping or interfere with the maintenance of the rights-of-way:
 - a. In any median or landscaped strip inside the City limits as identified below in Sections 4.156.10 (.01) A. 4. b. through p.
 - b. Either side of French Prairie Road.
 - c. Either side of Canyon Creek Road North, from Boeckman Road to Elligsen Road.
 - d. Either side of Wilsonville Road between Town Center Loop East and the Portland & Western (previously Burlington Northern) Railroad property.
 - e. Either side of Town Center Loop West and East.
 - f. Both sides of former S.W. Parkway frontage between Town Center Loop West and Wilsonville Road.
 - g. Wilsonville Road between Willamette Way West and Willamette Way East.
 - h. The north side of Wilsonville Road from Town Center Loop East to Boeckman Creek.
 - i. Either side of Wilsonville Road between Boeckman Road and the southern boundary of the Wilsonville High School property.
 - j. Either side of Parkway Center Avenue.
 - k. The south side of Elligsen Road from the eastern city limits to a point directly across from the west side of the Tualatin Valley Fire District fire station.
 - l. Either side of Boeckman Road and all islands, from the railroad tracks west to 110th.
 - m. Either side of 110th between Barber Street and Boeckman Road.
 - n. The eastern side of Grahams Ferry Road from Tooze Road to the City limits.
 - o. Either side of Barber Street between 110th and Brown Road, including islands and roundabouts.

- p. Such other areas as the City may designate as requiring protection from landscape damage.
- 5. Lawn signs shall meet the following standards and conditions:
 - a. Allowed only between the hours of 6 a.m. Friday and 8 p.m. Sunday, and the hours of 9 a.m. and 4 p.m. Tuesdays;
 - b. Not greater than thirty (30) inches in height. A-frame signs may be 24” by 36” provided that they are designed to meet vision clearance requirements (typically not over 30 inches in height when standing);
 - c. Not placed on street surfaces, sidewalks, paths, median strips, or bicycle ways;
 - d. Located within forty (40) feet of an intersection;
 - e. No more than three (3) signs per person; and
 - f. Placed no more than one every fifty (50) feet and at least ten (10) feet away from any other temporary sign.
- 6. Banners on public light and other poles identified in a plan maintained or adopted by the City and installed by or under arrangement with the Public Works Department.

Response: The proposed development does not propose signs to be placed on City property.

- (.02) Signs within ODOT Right-Of-Way. Consistent with the Laws and Administrative Rules of the State of Oregon, all signs of any kind are prohibited within right-of-way of the Oregon Department of Transportation (ODOT), except those signs that are specifically determined by ODOT to be necessary for the public’s health, safety, or welfare. The City may assist the State in the removal of signs that are illegally placed within ODOT right-of-way, as provided above for signs in City right-of-way. City assistance is justified in view of the substantial public investment that has recently been made to improve and beautify both freeway interchange areas north of the Willamette River.

Response: The proposed development does not include any signs within the ODOT right-of-way.

Section 4.156.11. Sign Enforcement.

- (.01) General. Any person who places a sign that requires a permit under this section, and who fails to obtain a permit before installing the sign, shall be subject to penalties and fines as established in Wilsonville Code 4.025.
- (.02) Removal of Signs. Any sign placed on public property in violation of the provisions of this Code shall be immediately removed by the City. As soon thereafter as reasonable, the City shall notify the owner or the owner’s representative that the sign has been removed, and that if the sign is not claimed within ten (10) days, the sign will be deemed abandoned and subject to disposal by the City. The City shall

have no responsibility to contact the owner of the sign if the owner's name, address, and telephone number are not clearly indicated on the sign and shall dispose of the sign ten days after its removal by the City. The City Council may establish fees to be collected at the time of releasing impounded signs in order to cover the City's costs in collecting, storing, and returning these signs and administering the sign removal program.

- (.03) Civil Enforcement. Any sign which is intentionally placed in violation of the provisions of this code after the owner of the sign has been notified of the initial sign removal and reason for its removal, shall subject the owner to a civil violation not to exceed \$100.00 as and for a civil fine for each day that a violation continues to exist.
- (.04) Additional enforcement. The remedies described herein are not exclusive and may be used in addition to those prescribed elsewhere in the Wilsonville Code, including Sections 1.012 and 1.013, Violations, and 6.200 through 6.620, Nuisances. The City Attorney may use any enforcement process available at law or equity, including but not limited to, seeking injunctive relief, equitable relief, damages, or fines for violations.

Response: All proposed signs are included with this application for Design Review. Additional future signs, or modifications of proposed, will be reviewed with the City as required.

<u>Sign Description</u>	<u>Location</u>	<u>Lawn Signs</u> [see WC 4.156.05 I.]	<u>Rigid Signs</u> [see WC 4.156.05 (.02) J.]	<u>Maximum Combined Lawn and Rigid Signs</u>
Part 1. General Allowances for Lawn and Rigid Signs				
Residential or Agriculture zoned lots. ¹	Area per sign face	6 sq. ft.	6 sq. ft.	
	Exempt at one time	3 signs per lot	1 sign per lot	<i>3 signs per lot</i>
Commercial, Industrial, or Public Facility zoned lots. ²	Area per sign face	6 sq. ft.	32 sq. ft.	
	Exempt at one time	3 signs per lot	1 sign per lot, plus 1 additional sign if the lot is more than 3 acres in area or has multiple street frontages	<i>3 signs per lot, plus 1 additional rigid sign if the lot is more than 3 acres in area or has multiple street frontages.</i>
Part 2. Additional Special Allowances for Rigid Signs³				
Lots with active commercial, industrial, public facility, or multi-family construction projects. ⁴	Area per sign face		64 sq. ft.	
	Exempt at one time		1 sign per lot	
Residential or Agriculture tracts of land in excess of 5 acres or recorded residential subdivisions with more than 25% of the lots remaining unsold and undeveloped.	Area per sign face		32 sq. ft.	
	Exempt at one time		1 sign per qualifying tract or subdivision	
<p>¹ Residential and Agriculture zones include all PDR (Planned Development Residential) zones, along with the R (Residential), RA-H (Residential Agriculture-Holding) zone, and any county-zoned land within Wilsonville City limits. In addition, lots not zoned Residential, but designated exclusively for residential use in an approved Master Plan, shall be considered residentially-zoned for the purposes of this table. This includes residential lots and in the Village Zone.</p> <p>² Commercial, Industrial, Public Facility zones include all PDC (Planned Development Commercial), PDI (Planned Development Industrial), and PF (Public Facility) zones. In addition, lots zoned Village, but designated for commercial, mixed-use, or publically-owned use in an approved Master Plan, shall fall under this description category for the purposes of this table.</p> <p>³ Sign allowances in Part 2 are in addition to the allowances and maximums in Part 1.</p> <p>⁴ An active construction project means a construction project for which any required building permits have been obtained <u>and</u> for which the City Building Official has <u>not</u> approved building occupancy. When the Building Official issues a temporary Certificate of Occupancy, the construction project shall be considered active until a permanent Certificate of Occupancy is issued. Active construction projects involving churches, private schools, or other non-single-family uses are included in this description.</p>				

Table S-1: Exempt Lawn and Rigid Sign Allowances

[Table added by Ord. No. 675, 3/1/10][Sign Regulations revised by Ord. No. 704, 6/18/12.]

Section 4.171. General Regulations - Protection of Natural Features and Other Resources.

- (.01) Purpose. It is the purpose of this Section to prescribe standards and procedures for the use and development of land to assure the protection of valued natural features and cultural resources. The requirements of this Section are intended to be used in conjunction with those of the Comprehensive Plan and other zoning standards. It is further the purpose of this Section:
- A. To protect the natural environmental and scenic features of the City of Wilsonville.
 - B. To encourage site planning and development practices which protect and enhance natural features such as riparian corridors, streams, wetlands, swales, ridges, rock outcroppings, views, large trees and wooded areas.
 - C. To provide ample open space and to create a constructed environment capable and harmonious with the natural environment.

Response:

The site contains no scenic features or views and does not have natural features including streams or wetlands. See the arborist report for condition assessment of the existing trees and protection requirements noted within the tree protection plans.

The proposed project creates an active open space adjacent to the building entrance as part of the site development.

(.02) General Terrain Preparation:

- A. All developments shall be planned, designed, constructed and maintained with maximum regard to natural terrain features and topography, especially hillside areas, floodplains, and other significant landforms.
- B. All grading, filling and excavating done in connection with any development shall be in accordance with the Uniform Building Code
- C. In addition to any permits required under the Uniform Building Code, all developments shall be planned, designed, constructed and maintained so as to:
 1. Limit the extent of disturbance of soils and site by grading, excavation and other land alterations.
 2. Avoid substantial probabilities of: (1) accelerated erosion; (2) pollution, contamination, or siltation of lakes, rivers, streams and wetlands; (3) damage to vegetation; (4) injury to wildlife and fish habitats.
 3. Minimize the removal of trees and other native vegetation that stabilize hillsides, retain moisture, reduce erosion, siltation and nutrient runoff, and preserve the natural scenic character.

Response: All grading, filling and permits for this development will be in conformance with the Uniform Building Code.

The site contains no natural features including streams or wetlands requiring additional protection. Erosion control measures will be installed at project limits and areas of grading and site modification. See the arborist report for condition assessment of the existing trees and protection requirements noted within the tree protection plans.

- (.03) Hillsides: All developments proposed on slopes greater than 25% shall be limited to the extent that:
- A. An engineering geologic study approved by the City, establishes that the site is stable for the proposed development, and any conditions and recommendations based on the study are incorporated into the plans and construction of the development. The study shall include items specified under subsection 4.171(.07)(A.)(2.)(a-j):
 - B. Slope stabilization and re-vegetation plans shall be included as part of the applicant's landscape plans.
 - C. Buildings shall be clustered to reduce alteration of terrain and provide for preservation of natural features.
 - D. Creation of building sites through mass pad grading and successive padding or terracing of building sites shall be avoided where feasible.
 - E. Roads shall be of minimum width, with grades consistent with the City's Public Works Standards.
 - F. Maintenance, including re-vegetation, of all grading areas is the responsibility of the developer, and shall occur through October 1 of the second growing season following receipt of Certificates of Occupancy unless a longer period is approved by the Development Review Board.
 - G. The applicant shall obtain an erosion and sediment control permit from the City's Building and Environmental Services Division's.

Response: The project site is not on a hillside. All slopes on site are less than 25%.

- (.04) Trees and Wooded Areas.
- A. All developments shall be planned, designed, constructed and maintained so that:
 - 1. Existing vegetation is not disturbed, injured, or removed prior to site development and prior to an approved plan for circulation, parking and structure location.
 - 2. Existing wooded areas, significant clumps/groves of trees and vegetation, and all trees with a diameter at breast height of six inches or greater shall be incorporated into the development plan and protected wherever feasible.
 - 3. Existing trees are preserved within any right-of-way when such trees are suitably located, healthy, and when approved grading allows.

- B. Trees and woodland areas to be retained shall be protected during site preparation and construction according to City Public Works design specifications, by:
1. Avoiding disturbance of the roots by grading and/or compacting activity.
 2. Providing for drainage and water and air filtration to the roots of trees which will be covered with impermeable surfaces.
 3. Requiring, if necessary, the advisory expertise of a registered arborist/horticulturist both during and after site preparation.
 4. Requiring, if necessary, a special maintenance, management program to insure survival of specific woodland areas of specimen trees or individual heritage status trees.

Response:

Those trees removed on this site will be mitigated with new trees in required landscaped areas. See the arborist report for condition assessment of the existing trees.

(.05) High Voltage Powerline Easements and Rights of Way and Petroleum Pipeline Easements:

- A. Due to the restrictions placed on these lands, no residential structures shall be allowed within high voltage powerline easements and rights of way and petroleum pipeline easements, and any development, particularly residential, adjacent to high voltage powerline easements and rights of way and petroleum pipeline easements shall be carefully reviewed.
- B. Any proposed non-residential development within high voltage powerline easements and rights of way and petroleum pipeline easements shall be coordinated with and approved by the Bonneville Power Administration, Portland General Electric Company or other appropriate utility, depending on the easement or right of way ownership.

Response: The site includes no high voltage powerlines or petroleum pipeline easements. Therefore, this section does not apply.

(.06) Hazards to Safety: Purpose:

- A. To protect lives and property from natural or human-induced geologic or hydrologic hazards and disasters.
- B. To protect lives and property from damage due to soil hazards.
- C. To protect lives and property from forest and brush fires.
- D. To avoid financial loss resulting from development in hazard areas.

Response: The development proposed is typical of the area and will not contribute to potential hazards.

(.07) Standards for Earth Movement Hazard Areas:

- A. No development or grading shall be allowed in areas of land movement, slump or earth flow, and mud or debris flow, except under one of the following conditions:
 - 1. Stabilization of the identified hazardous condition based on established and proven engineering techniques which ensure protection of public and private property. Appropriate conditions of approval may be attached by the City.
 - 2. An engineering geologic study approved by the City establishing that the site is stable for the proposed use and development. The study shall include the following:
 - a. Index map.
 - b. Project description, to include: location; topography, drainage, vegetation; discussion of previous work; and discussion of field exploration methods.
 - c. Site geology, to include: site geologic map; description of bedrock and superficial materials including artificial fill; location of any faults, folds, etc.; and structural data including bedding, jointing, and shear zones.
 - d. Discussion and analysis of any slope stability problems.
 - e. Discussion of any off-site geologic conditions that may pose a potential hazard to the site or that may be affected by on-site development.
 - f. Suitability of site for proposed development from geologic standpoint.
 - g. Specific recommendations for cut slope stability, seepage and drainage control, or other design criteria to mitigate geologic hazards.
 - h. Supportive data, to include: cross sections showing subsurface structure; graphic logs of subsurface explorations; results of laboratory tests; and references.
 - i. Signature and certification number of engineering geologist registered in the State of Oregon.
 - j. Additional information or analyses as necessary to evaluate the site.
- B. Vegetative cover shall be maintained or established for stability and erosion control purposes.
- C. Diversion of storm water into these areas shall be prohibited.
- D. The principal source of information for determining earth movement hazards is the State Department of Geology and Mineral Industries (DOGAMI) Bulletin 99 and any subsequent bulletins and accompanying maps. Approved site specific engineering geologic studies shall be used to identify the extent and severity of the hazardous conditions on the site, and to update the earth movement hazards database.

Response: A geotechnical report has been provided and is included with the submittal package. Erosion control measures for ground disturbance areas are summarized within the erosion control drawings as part of the drawing package submitted with this application.

(.08) Standards for Soil Hazard Areas:

- A. Appropriate siting and design safeguards shall insure structural stability and proper drainage of foundation and crawl space areas for development on land with any of the following soil conditions: wet or high water table; high shrink-swell capability; compressible or organic; and shallow depth-to-bedrock.
- B. The principal source of information for determining soil hazards is the State DOGAMI Bulletin 99 and any subsequent bulletins and accompanying maps. Approved site-specific soil studies shall be used to identify the extent and severity of the hazardous conditions on the site, and to update the soil hazards database accordingly.

Response: N/A, no soil hazard areas.

(.09) Historic Protection: Purpose:

- A. To preserve structures, sites, objects, and areas within the City of Wilsonville having historic, cultural, or archaeological significance.
- B. Standards:
 - 1. All developments shall be planned, designed, constructed, and maintained to assure protection of any designated historic or cultural resource on or near the site. Restrictions on development may include:
 - a. Clustering of buildings and incorporation of historic and/or cultural resources into site design in a manner compatible with the character of such resource.
 - b. Limitations on site preparation and grading to avoid disturbance of areas within any historic or archaeological sites, monuments or objects of antiquity.
 - c. Provision of adequate setbacks and buffers between the proposed development and the designated resources.
 - 2. The city may attach additional conditions with respect to the following design factors in protecting the unique character of historic/cultural resources:
 - a. Architectural compatibility;
 - b. Proposed intensity of development;
 - c. Relationship to designated open space;
 - d. Vehicular and pedestrian access; and
 - e. Proposed building or structural mass in relation to the designated resource.
- C. Review Process:
 - 1. The Development Review Board shall be the review body for:

- a. All development which proposes to alter a designated historic, or cultural resource or resource site; and
 - b. All development which proposes to use property adjacent to a designated cultural resource; and
 - c. All applications requesting designation of a cultural or historic resource
2. The application shall include the following:
- a. A complete list of exterior materials, including color of these materials.
 - b. Drawings:
 - i. Side elevation for each side of any affected structure.
 - ii. Drawings shall show dimensions or be to scale.
 - iii. Photographs may be used as a substitute for small projects.
 - c. Plot plans shall be submitted for new structures, fences, additions exceeding fifty (50) square feet, or any building relocation.
3. Any improvement proposed for property adjacent to a designated, cultural or historic resource site, shall be subject to the following provisions:
- a. All uses and structures which are incompatible with the character of the cultural or historic resource are prohibited. The criteria used to determine incompatibility shall include the following:
 - i. The intensity and type of use when compared with the historic use patterns of the areas.
 - ii. The orientation, setback, alignment, spacing and placement of buildings.
 - iii. The scale, proportions, roof forms, and various architectural features of building design.
 - b. Setbacks may be required which are over and above those required in the base zone in order to protect the resource. Setbacks should be appropriate to the scale and function of the resource, but allow reasonable use of the adjacent property.
 - c. An appropriate buffer or screen may be required between the new or converting use on the adjacent property and the resource.
4. Nothing in this chapter shall be construed to prevent the ordinary maintenance or repair of any exterior architectural feature in or on any property covered by this chapter that does not involve a change in design, material or external reconstruction thereof, nor does this Code prevent the construction, reconstruction, alteration, restoration, demolition or removal of any such feature when the Building Official certifies to the Development Review Board that such action is required for the public safety due to an unsafe or dangerous condition which cannot be rectified through the use of acceptable building practices.
5. The owner, occupant or other person in actual charge of a cultural resource, or an improvement, building or structure in an historic district shall keep in good repair all of the exterior portions of such improvement, building or

structure, all of the interior portions thereof when subject to control as specified in the designating ordinance or permit, and all interior portions thereof whose maintenance is necessary to prevent deterioration and decay or any exterior architectural feature.

Response: N/A, no existing structures.

(.10) Alteration and Development Criteria:

- A. Demolition or alteration of any structure, or any change in any site or object which has been designated as a cultural resource, is prohibited unless it is determined:
 - 1. In the case of a designated cultural resource, the proposed work would not detrimentally alter, destroy or adversely affect any exterior architectural or other identified feature; or
 - 2. In the case of any property located within a historic district, the proposed construction, removal, rehabilitation, alteration, remodeling, excavation or exterior alteration conforms to any prescriptive standards as adopted by the City, and does not adversely affect the character of the district; or
 - 3. In the case of construction of a new improvement, building or structure upon a cultural resource site, the exterior of such improvements will not adversely affect and will be compatible with the external appearance of existing designated improvements, buildings and structures on said site; or
 - 4. That no reasonable use can be made of the property without such approval.

Response: N/A, no existing structures.

(.11) Cultural Resource Designation Criteria: A cultural resource may be designated and placed on the Cultural Resources Inventory if it meets the following criteria:

- A. It exemplifies or reflects special elements of the City's cultural, social, economic, political, aesthetic, engineering or architectural history; or
- B. It is identified with persons or events significant in local, state, or national history; or
- C. It embodies distinctive characteristics of a style, type, period, or method of construction, or it is a valuable example of the use of indigenous materials or craftsmanship; or
- D. It is representative of the notable work of a builder, designer, or architect.

Response: N/A, no existing structures.

Section 4.175. Public Safety and Crime Prevention.

- (.01) All developments shall be designed to deter crime and insure public safety.

Response: The proposed building large expanse of glass allowing for visual connection of the street and pedestrians to the building occupants.

Furthermore, a fencing and security gate system will be provided for the exterior storage yard.

- (.02) Addressing and directional signing shall be designed to assure identification of all buildings and structures by emergency response personnel, as well as the general public.

Response: The building will be properly addressed and identified as described within the Signage chapter of this narrative. Address numbers will be placed on the building frontage to SW Boones Ferry Rd. as coordinated with the fire marshal for final location.

- (.03) Areas vulnerable to crime shall be designed to allow surveillance. Parking and loading areas shall be designed for access by police in the course of routine patrol duties.

Response: The building has windows from internal program areas to the parking areas providing visual connection between site elements and the building occupants. Entries and other key areas of the site will be monitored as well. Security elements including exterior cameras and parking and building entries will be addressed by owner.

- (.04) Exterior lighting shall be designed and oriented to discourage crime.

Response: Site areas will be illuminated with building mounted and pole mounted lights at parking areas. At entries and exit doors wall mounted, or canopy lights, will be placed to illuminate these points of access.

Section 4.176. Landscaping, Screening, and Buffering.

Note: the reader is encouraged to see Section 4.179, applying to screening and buffering of storage areas for solid waste and recyclables.

- (.01) Purpose. This Section consists of landscaping and screening standards and regulations for use throughout the City. The regulations address materials, placement, layout, and timing of installation. The City recognizes the ecological and economic value of landscaping and requires the use of landscaping and other screening or buffering to:
- A. Promote the re-establishment of vegetation for aesthetic, health, erosion control, flood control and wildlife habitat reasons;
 - B. Restore native plant communities and conserve irrigation water through establishment, or re-establishment, of native, drought-tolerant plants;
 - C. Mitigate for loss of native vegetation;
 - D. Establish and enhance a pleasant visual character which recognizes aesthetics and safety issues;
 - E. Promote compatibility between land uses by reducing the visual, noise, and lighting impacts of specific development on users of the site and abutting sites or uses;
 - F. Unify development and enhance and define public and private spaces;
 - G. Promote the retention and use of existing topsoil and vegetation. Amended soils benefit stormwater retention and promote infiltration;
 - H. Aid in energy conservation by providing shade from the sun and shelter from the wind; and
 - I. Screen from public view the storage of materials that would otherwise be considered unsightly.
 - J. Support crime prevention, create proper sight distance clearance, and establish other safety factors by effective landscaping and screening.
 - K. Provide landscaping materials that minimize the need for excessive use of fertilizers, herbicides and pesticides, irrigation, pruning, and mowing to conserve and protect natural resources, wildlife habitats, and watersheds.
- (.02) Landscaping and Screening Standards.
- A. Subsections “C” through “I,” below, state the different landscaping and screening standards to be applied throughout the City. The locations where the landscaping and screening are required and the depth of the landscaping and screening is stated in various places in the Code.
 - B. All landscaping and screening required by this Code must comply with all of the provisions of this Section, unless specifically waived or granted a Variance as otherwise provided in the Code. The landscaping standards are minimum

requirements; higher standards can be substituted as long as fence and vegetation-height limitations are met. Where the standards set a minimum based on square footage or linear footage, they shall be interpreted as applying to each complete or partial increment of area or length (e.g., a landscaped area of between 800 and 1600 square feet shall have two trees if the standard calls for one tree per 800 square feet).

C. General Landscaping Standard.

1. Intent. The General Landscaping Standard is a landscape treatment for areas that are generally open. It is intended to be applied in situations where distance is used as the principal means of separating uses or developments and landscaping is required to enhance the intervening space. Landscaping may include a mixture of ground cover, evergreen and deciduous shrubs, and coniferous and deciduous trees.

2. Required materials. Shrubs and trees, other than street trees, may be grouped. Ground cover plants must fully cover the remainder of the landscaped area (see Figure 21: General Landscaping). The General Landscaping Standard has two different requirements for trees and shrubs:

a. Where the landscaped area is less than 30 feet deep, one tree is required for every 30 linear feet.

RESPONSE: The landscape area adjacent to Boones Ferry Road and SW Boeburg Rd. is less than 30 feet deep, therefore; one tree per 30 linear feet is proposed. Please see Landscape Plan sheets L1.3 & L1.4.

b. Where the landscaped area is 30 feet deep or greater, one tree is required for every 800 square feet and two high shrubs or three low shrubs are required for every 400 square feet.

RESPONSE: Does not apply.

D. Low Screen Landscaping Standard.

1. Intent. The Low Screen Landscaping Standard is a landscape treatment that uses a combination of distance and low screening to separate uses or developments. It is intended to be applied in situations where low screening is adequate to soften the impact of one use or development on another, or where visibility between areas is more important than a total visual screen. The Low Screen Landscaping Standard is usually applied along street lot lines or in the area separating parking lots from street rights-of-way.

2. Required materials. The Low Screen Landscaping Standard requires sufficient low shrubs to form a continuous screen three (3) feet high and 95% opaque, year-round. In addition, one tree is required for every 30 linear feet of landscaped area, or as otherwise required to provide a tree canopy over the landscaped area. Ground cover plants must fully cover the remainder of the landscaped area. A three (3) foot high masonry wall or a berm may be substituted for the shrubs, but the trees and ground cover plants are still required. When applied along street lot lines, the screen or wall is to be

placed along the interior side of the landscaped area. (See Figure 22: Low Screen Landscaping).

RESPONSE: There is a proposed evergreen hedge, ground cover and trees (at 30' o.c.) proposed adjacent to Boones Ferry Road and SW Boeburg Rd. Please see Landscape Plan sheets L1.3 & L1.4.

E. High Screen Landscaping Standard.

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

RESPONSE: Does not apply.

F. High Wall Standard.

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

RESPONSE: High wall standards will be applied at the south property line.

G. High Berm Standard.

1. Intent. The High Berm Standard is intended to be applied in situations where extensive screening to reduce both visual and noise impacts is needed to protect abutting uses or developments from one-another, and where it is desirable and practical to provide separation by both distance and sight-obscuring materials. This screening is most important where either, or both, of the abutting uses or developments can be expected to be particularly sensitive to noise or visual impacts.
2. Required materials. The High Berm Standard requires a berm at least four (4) feet high along the interior side of the landscaped area (see Figure 25: High Berm Landscaping). If the berm is less than six (6) feet high, low shrubs

meeting the Low Screen Landscaping Standard, above, are to be planted along the top of the berm, assuring that the screen is at least six (6) feet in height. In addition, one tree is required for every 30 linear feet of berm, or as otherwise required to provide a tree canopy over the landscaped area. Ground cover plants must fully cover the remainder of the landscaped area.

RESPONSE: Does not apply.

H. Partially Sight-Obscuring Fence Standard.

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

RESPONSE: Does not apply.

I. Fully Sight-Obscuring Fence Standard.

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

RESPONSE: Does not apply.

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

Native Plant List maintained by the City of Wilsonville). [Amended by Ord. # 674 11/16/09]

Response: 26,335 sf of landscaping is provide do n this site. 26,335/171,206 sf = 15.4%

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

A. All intensive or higher density developments shall be screened and buffered from less intense or lower density developments.

Response: N/A

B. Activity areas on commercial and industrial sites shall be buffered and screened from adjacent residential areas. Multi-family developments shall be screened and buffered from single-family areas.

Response: N/A

C. All exterior, roof and ground mounted, mechanical and utility equipment shall be screened from ground level off-site view from adjacent streets or properties.

Response: Roof top mounted HVAC equipment will be screened by parapet walls and equipment screens.

D. All outdoor storage areas shall be screened from public view, unless visible storage has been approved for the site by the Development Review Board or Planning Director acting on a development permit.

Response: 6' chain link fence with landscape screening is proposed around storage yard.

E. In all cases other than for industrial uses in industrial zones, landscaping shall be designed to screen loading areas and docks, and truck parking.

Response: Loading docks and truck parking associated with this project will be screened by fencing and landscaping.

F. In any zone any fence over six (6) feet high measured from soil surface at the outside of fenceline shall require Development Review Board approval.

Response: No fence over 6'-0" tall is proposed.

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

(.06) Plant Materials.

A. Shrubs and Ground Cover. All required ground cover plants and shrubs must be of sufficient size and number to meet these standards within three (3) years of planting. Non-horticultural plastic sheeting or other impermeable surface shall not be placed under mulch. Native topsoil shall be preserved and reused to the extent feasible. Surface mulch or bark dust are to be fully raked into soil of appropriate depth, sufficient to control erosion, and are confined to areas around plantings. Areas exhibiting only surface mulch, compost or barkdust are not to be used as substitutes for plant areas. [Amended by Ord. # 674 11/16/09]

1. Shrubs. All shrubs shall be well branched and typical of their type as described in current AAN Standards and shall be equal to or better than 2-gallon containers and 10" to 12" spread.

RESPONSE: All shrubs will meet current AAN standards and be a min. of two gallon containers with a 10" to 12" spread. Please see Landscape plans L1.3 & L1.4

2. Ground cover. Shall be equal to or better than the following depending on the type of plant materials used: gallon containers spaced at 4 feet on center minimum, 4" pot spaced 2 feet on center minimum, 2-1/4" pots spaced at 18 inch on center minimum. No bare root planting shall be permitted. Ground cover shall be sufficient to cover at least 80% of the bare soil in required landscape areas within three (3) years of planting. Where wildflower seeds are designated for use as a ground cover, the City may require annual re-seeding as necessary.

RESPONSE: Ground cover plants will be a min. 4" pot at 18" o.c. or 1 gallon container at 24" o.c. Please see Landscape plans L1.3 & L1.4

3. Turf or lawn in non-residential developments. Shall not be used to cover more than ten percent (10%) of the landscaped area, unless specifically approved based on a finding that, due to site conditions and availability of water, a larger percentage of turf or lawn area is appropriate. Use of lawn fertilizer shall be discouraged. Irrigation drainage runoff from lawns shall be retained within lawn areas.

RESPONSE: Lawn is not proposed as part of the Landscape design.

4. Plant materials under trees or large shrubs. Appropriate plant materials shall be installed beneath the canopies of trees and large shrubs to avoid the appearance of bare ground in those locations.

RESPONSE: Noted.

5. Integrate compost-amended topsoil in all areas to be landscaped, including lawns, to help detain runoff, reduce irrigation and fertilizer needs, and create a sustainable, low-maintenance landscape. [Added by Ord. # 674 11/16/09]

RESPONSE: Noted.

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

RESPONSE: Deciduous trees are 2" cal. and conifers are 6 feet in height at time of planting.

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

RESPONSE: Noted.

- D. Street Trees. In order to provide a diversity of species, the Development Review Board may require a mix of street trees throughout a development. Unless the Board waives the requirement for reasons supported by a finding in the record,

different types of street trees shall be required for adjoining blocks in a development.

1. All trees shall be standard base grafted, well branched and typical of their type as described in current AAN Standards and shall be balled and burlapped (b&b). Street trees shall be planted at sizes in accordance with the following standards:
 - a. Arterial streets - 3" minimum caliper
 - b. Collector streets - 2" minimum caliper.
 - c. Local streets or residential private access drives - 1-3/4" minimum caliper. [Amended by Ord. 682, 9/9/10]
 - d. Accent or median tree -1-3/4" minimum caliper.

RESPONSE: Noted. At this time street trees are not included in the landscape plan.

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

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

RESPONSE: Noted.

E. Types of Plant Species.

1. Existing landscaping or native vegetation may be used to meet these standards, if protected and maintained during the construction phase of the development and if the plant species do not include any that have been listed by the City as prohibited. The existing native and non-native vegetation to be incorporated into the landscaping shall be identified.
3. Selection of plant materials. Landscape materials shall be selected and sited to produce hardy and drought-tolerant landscaping. Selection shall be based

on soil characteristics, maintenance requirements, exposure to sun and wind, slope and contours of the site, and compatibility with other vegetation that will remain on the site. Suggested species lists for street trees, shrubs and groundcovers shall be provided by the City of Wilsonville.

3. Prohibited plant materials. The City may establish a list of plants that are prohibited in landscaped areas. Plants may be prohibited because they are potentially damaging to sidewalks, roads, underground utilities, drainage improvements, or foundations, or because they are known to be invasive to native vegetation.

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

RESPONSE: Noted.

F. Tree Credit.

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

Existing trunk diameter	Number of Tree Credits
18 to 24 inches in diameter	3 tree credits
25 to 31 inches in diameter	4 tree credits
32 inches or greater	5 tree credits

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

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

RESPONSE: No existing trees are to remain on the site.

- F. Exceeding Standards. Landscape materials that exceed the minimum standards of this Section are encouraged, provided that height and vision clearance requirements are met. [Amended by Ordinance No. 538, 2/21/02.]

- G. Compliance with Standards. The burden of proof is on the applicant to show that proposed landscaping materials will comply with the purposes and standards of this Section.[Amended by Ordinance No. 538, 2/21/02.]

(.07) Installation and Maintenance.

- A. Installation. Plant materials shall be installed to current industry standards and shall be properly staked to assure survival. Support devices (guy wires, etc.) shall not be allowed to interfere with normal pedestrian or vehicular movement.

RESPONSE: Plant materials will meet current AAN standards. Trees shall be supported with stakes and guy wires as per tree planting detail on sheet L2.0.

- B. Maintenance. Maintenance of landscaped areas is the on-going responsibility of the property owner. Any landscaping installed to meet the requirements of this Code, or any condition of approval established by a City decision-making body acting on an application, shall be continuously maintained in a healthy, vital and acceptable manner. Plants that die are to be replaced in kind, within one growing season, unless appropriate substitute species are approved by the City. Failure to maintain landscaping as required in this Section shall constitute a violation of this Code for which appropriate legal remedies, including the revocation of any applicable land development permits, may result.

RESPONSE: Landscape areas will be maintained by a professional landscape company.

- C. Irrigation. The intent of this standard is to assure that plants will survive the critical establishment period when they are most vulnerable due to a lack of watering and also to assure that water is not wasted through unnecessary or inefficient irrigation. Approved irrigation system plans shall specify one of the following:

1. A permanent, built-in, irrigation system with an automatic controller. Either a spray or drip irrigation system, or a combination of the two, may be specified.

RESPONSE: A permanent, fully automatic irrigation system is proposed.

3. A permanent or temporary system designed by a landscape architect licensed to practice in the State of Oregon, sufficient to assure that the plants will become established and drought-tolerant.
4. Other irrigation system specified by a licensed professional in the field of landscape architecture or irrigation system design.
5. A temporary permit issued for a period of one year, after which an inspection shall be conducted to assure that the plants have become established. Any plants that have died, or that appear to the Planning Director to not be thriving, shall be appropriately replaced within one growing season. An inspection fee and a maintenance bond or other security sufficient to cover all costs of replacing the plant materials shall be provided, to the satisfaction of the Community Development Director. Additionally, the applicant shall provide the City with a written license or easement to enter the property and cause any failing plant materials to be replaced.

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

RESPONSE: All planting areas are protected via curbs and/or wheel stops.

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

Response: The property is not on a corner lot, this requirement does not apply.

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

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

These categories shall be noted in general on the plan and on the plant material list.

RESPONSE: Water usage is listed on the planting schedule.

- (.10) Completion of Landscaping. The installation of plant materials may be deferred for a period of time specified by the Board or Planning Director acting on an application, in order to avoid hot summer or cold winter periods, or in response to water shortages. In these cases, a temporary permit shall be issued, following the same procedures specified in subsection (.07)(C)(3), above, regarding temporary irrigation systems. No final Certificate of Occupancy shall be granted until an adequate bond or other security is posted for the completion of the landscaping, and the City is given written authorization to enter the property and install the required

landscaping, in the event that the required landscaping has not been installed. The form of such written authorization shall be submitted to the City Attorney for review.

- (.11) Street Trees Not Typically Part of Site Landscaping. Street trees are not subject to the requirements of this Section and are not counted toward the required standards of this Section. Except, however, that the Development Review Board may, by granting a waiver or variance, allow for special landscaping within the right-of-way to compensate for a lack of appropriate on-site locations for landscaping. See subsection (.06), above, regarding street trees.
- (.12) Mitigation and Restoration Plantings. A mitigation plan is to be approved by the City's Development Review Board before the destruction, damage, or removal of any existing native plants. Plantings intended to mitigate the loss of native vegetation are subject to the following standards. Where these standards conflict with other requirements of this Code, the standards of this Section shall take precedence. The desired effect of this section is to preserve existing native vegetation.

RESPONSE: This does not apply, there are no native plants on the existing site.

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

required to be submitted to the City's Planning Department one year after the planting is completed.

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



Figure 21: General Landscaping

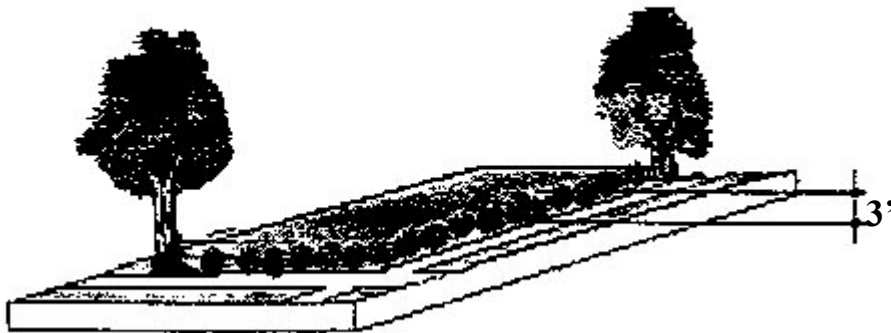


Figure 22: Low Screen Landscaping

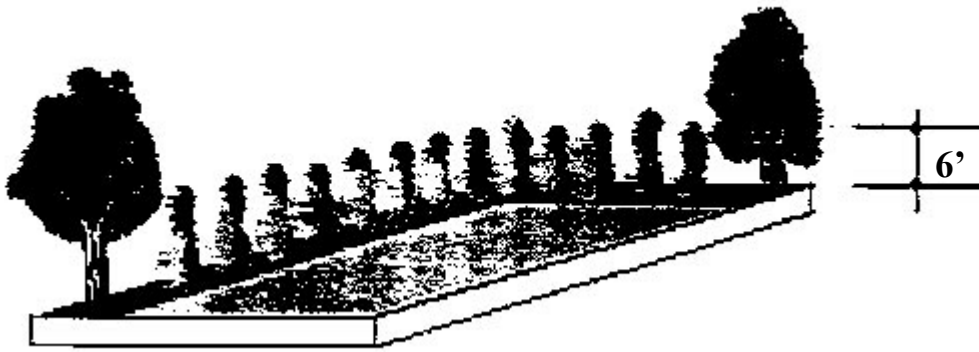


Figure 23: High Screen Landscaping

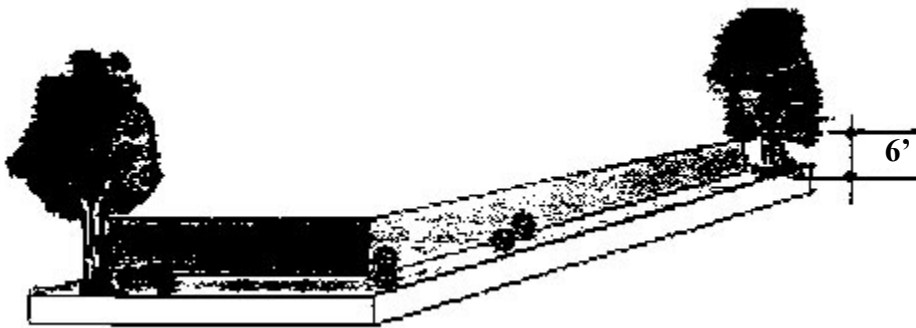


Figure 24: High Wall Landscaping

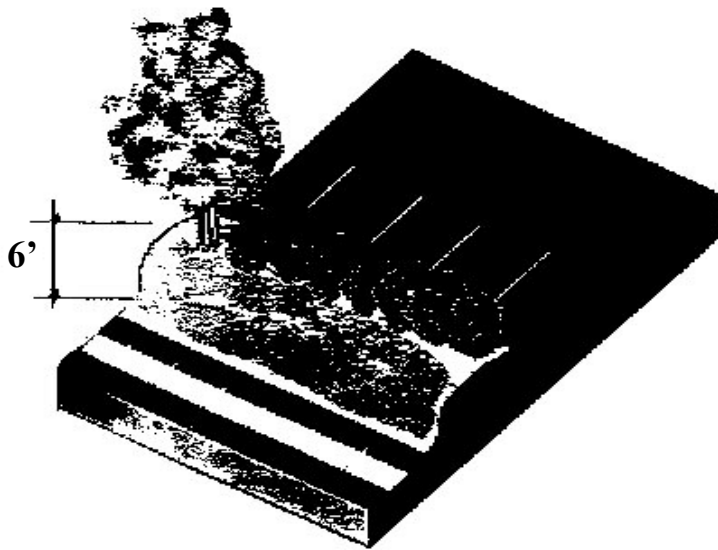


Figure 25: High Berm Landscaping

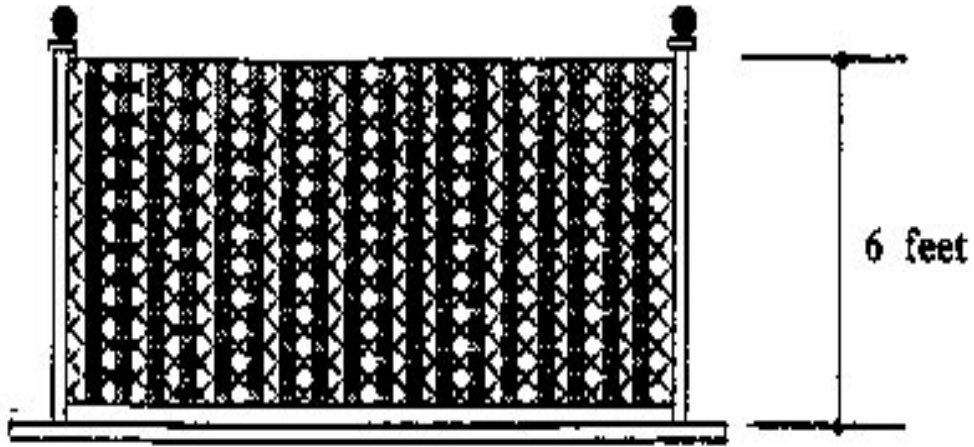


Figure 26: Partially Sight-Obscuring Fence

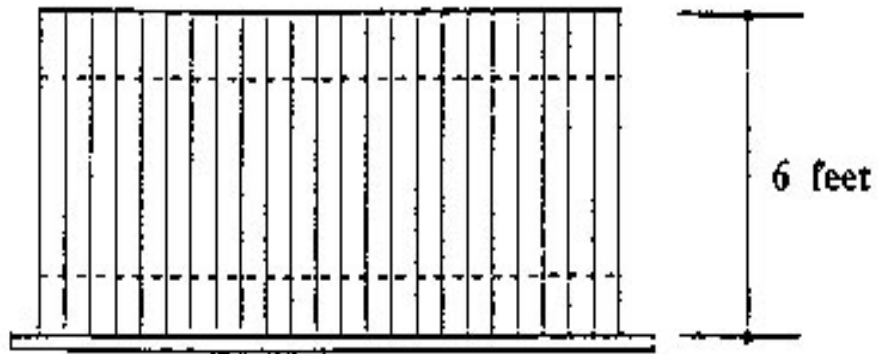


Figure 27: Totally Sight-Obscuring Fence

TREE CLEARANCES

The Landscaping Graphics

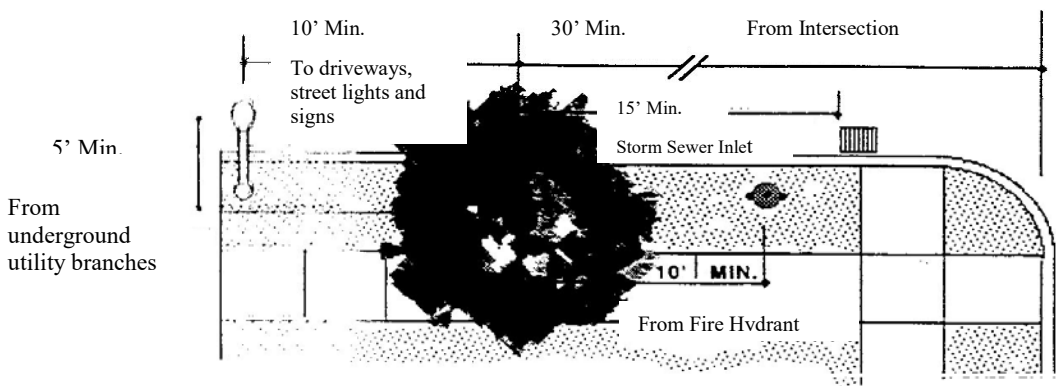
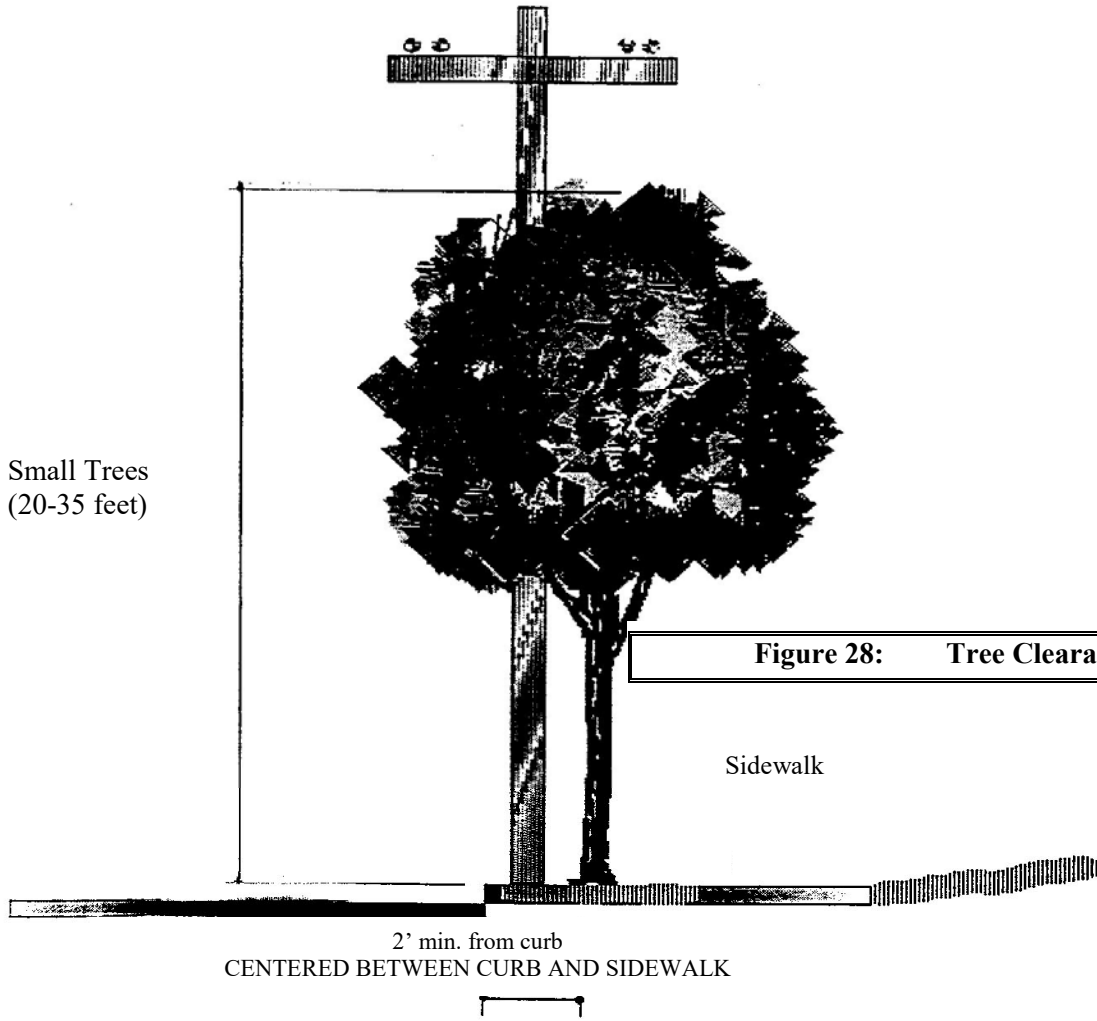


Figure 29: Tree Clearances

Section 4.177. Street Improvement Standards.

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

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

Response: The development triggers dedication of right-of-way on SW Boones Ferry Road and landscape dedication on SW Boberg Road. All improvements will comply with Wilsonville Public Works Standards.

- (.02) Street Design Standards.

A. All street improvements and intersections shall provide for the continuation of streets through specific developments to adjoining properties or subdivisions.

1. Development shall be required to provide existing or future connections to adjacent sites through the use of access easements where applicable. Such easements shall be required in addition to required public street dedications as required in Section 4.236(.04).

Response: No access easement through the site is needed.

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

Response: It was noted by City staff during the pre-application meeting on August 16th that dedication of right-of-way would be triggered by the development.

C. Rights-of-way.

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

shall be 55 feet from the centerline or 25 feet from the right-of-way designated on the Master Plan, whichever is greater.

Response: It was noted by City staff during the pre-application meeting on August 16th that dedication of right-of-way would be triggered by the development. The development is not protesting the dedication.

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

Response: The project site does not include any dead-end streets or cul-de-sacs. This section is not applicable.

E. Corner or clear vision area.

1. A clear vision area which meets the Public Works Standards shall be maintained on each corner of property at the intersection of any two streets, a street and a railroad or a street and a driveway. However, the following items shall be exempt from meeting this requirement:
 - a. Light and utility poles with a diameter less than 12 inches.
 - b. Trees less than 6" d.b.h., approved as a part of the Stage II Site Design, or administrative review.
 - c. Except as allowed by b., above, an existing tree, trimmed to the trunk, 10 feet above the curb.
 - d. Official warning or street sign.
 - e. Natural contours where the natural elevations are such that there can be no cross-visibility at the intersection and necessary excavation would result in an unreasonable hardship on the property owner or deteriorate the quality of the site.

Response: The phase 1 development has (2) access driveway connections to SW Boberg Road and (1) access driveway connection to SW Boones Ferry Road. These driveways will be maintained with clear vision clearance as noted.

F. Vertical clearance - a minimum clearance of 12 feet above the pavement surface shall be maintained over all streets and access drives.

Response: The site design does not include project over paved surfaces. Therefore the minimum 12 foot clear is maintained.

- G. Interim improvement standard. It is anticipated that all existing streets, except those in new subdivisions, will require complete reconstruction to support urban level traffic volumes. However, in most cases, existing and short-term projected traffic volumes do not warrant improvements to full Master Plan standards. Therefore, unless otherwise specified by the Development Review Board, the following interim standards shall apply.
1. Arterials - 24 foot paved, with standard sub-base. Asphalt overlays are generally considered unacceptable, but may be considered as an interim improvement based on the recommendations of the City Engineer, regarding adequate structural quality to support an overlay.
 2. Half-streets are generally considered unacceptable. However, where the Development Review Board finds it essential to allow for reasonable development, a half-street may be approved. Whenever a half-street improvement is approved, it shall conform to the requirements in the Public Works Standards:
 3. When considered appropriate in conjunction with other anticipated or scheduled street improvements, the City Engineer may approve street improvements with a single asphalt lift. However, adequate provision must be made for interim storm drainage, pavement transitions at seams and the scheduling of the second lift through the Capital Improvements Plan.

[Amended by Ord. 610, 5/1/06]

[Response: It was noted by City staff during the pre-application meeting on August 16th that dedication of right-of-way would be triggered by the development. The development will follow Wilsonville Public Works Standard.](#)

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

[Response: Sidewalks will be provided in the dedicated right-of-way.](#)

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

Response: Bike parking will be located at entries. Bike lanes will be implemented if required by the City of Wilsonville.

(.05) Multiuse Pathways. Pathways may be in addition to, or in lieu of, a public street. Paths that are in addition to a public street shall generally run parallel to that street, and shall be designed in accordance with the Public Works Standards or as specified by the City Engineer. Paths that are in lieu of a public street shall be considered in areas only where no other public street connection options are feasible, and are subject to the following standards.

- A. Paths shall be located to provide a reasonably direct connection between likely pedestrian and bicyclist destinations. Additional standards relating to entry points, maximum length, visibility, and path lighting are provided in the Public Works Standards.
- B. To ensure ongoing access to and maintenance of pedestrian/bicycle paths, the City Engineer will require dedication of the path to the public and acceptance of the path by the City as public right-of-way; or creation of a public access easement over the path.

Response: It is assumed that multi-use pathway is not required by the City at this location.

(.06) Transit Improvements

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

- A. Development shall at a minimum provide:
 - 1. Reasonably direct pedestrian connections, as defined by Section 4.154, between building entrances and the transit facility and between buildings on the site and streets adjoining transit stops.
 - 2. Improvements at major transit stops. Improvements may include intersection or mid-block traffic management improvements to allow for pedestrian crossings at major transit stops.
- B. Developments generating an average of 49 or more pm peak hour trips shall provide bus stop improvements per the Public Works Standards. Required improvements may include provision of benches, shelters, pedestrian lighting; or provision of an easement or dedication of land for transit facilities.
- C. In addition to the requirements of 4.177(.06)(A)(2.), development generating more than 199 pm peak hour trips on major transit streets shall provide a bus pullout, curb extension, and intersection or mid-block traffic management improvements to allow for pedestrian crossings at major transit stops.

D. In addition to the requirements of 4.177(.06)(A.) and (B.), development generating more than 500 pm peak-hour trips on major transit streets shall provide on-site circulation to accommodate transit service.

Response: The project is along an existing transit street SW Boberg Road with existing bus line service. SW Boones Ferry Road is not a transit street.

The proposed development will not generate PM Peak Hour trips at the thresholds noted.

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

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

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

1. The design of residential private access drives shall be stamped by a professional engineer registered in the state of Oregon and shall be approved by the City Engineer or City's Authorized Representative to ensure the above requirement is met.

2. Prior to issuing a certificate of occupancy for any residential dwelling unit whose primary vehicular access is from a Residential Private Access Drive the City Engineer or City's Authorized Representative shall certify construction of the Residential Private Access Drive substantially conforms the design approved by the City Engineer or City's Authorized Representative.

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

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

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

Response: N/A, the development is non-residential.

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

A. An access drive to any proposed development shall be designed to provide a clear travel lane free from any obstructions.

Response: The access drives will have clear travel lanes.

B. Access drive travel lanes shall be constructed with a hard surface capable of carrying a 23-ton load.

Response: The travel lanes will be paved surfaces capable of carrying 23-ton load.

- C. Where emergency vehicle access is required, approaches and driveways shall be designed and constructed to accommodate emergency vehicle apparatus and shall conform to applicable fire protection requirements. The City may restrict parking, require signage, or require other public safety improvements pursuant to the recommendations of an emergency service provider.

Response: The access drives were designed to accommodate emergency vehicles.

- D. Secondary or emergency access lanes may be improved to a minimum 12 feet with an all-weather surface as approved by the Fire District. All fire lanes shall be dedicated easements.

Response: All drive aisles are greater than the 12 foot minimum.

- E. Minimum access requirements shall be adjusted commensurate with the intended function of the site based on vehicle types and traffic generation.

Response: The access drives were developed to accommodate semi-trucks with trailers and provide a full loop around the perimeter of the building for emergency vehicles.

- F. The number of approaches on higher classification streets (e.g., collector and arterial streets) shall be minimized; where practicable, access shall be taken first from a lower classification street.

Response: Both SW Boberg Road and SW Boones Ferry are classified as collector.

- G. The City may limit the number or location of connections to a street, or impose access restrictions where the roadway authority requires mitigation to alleviate safety or traffic operations concerns.

Response: Noted

- H. The City may require a driveway to extend to one or more edges of a parcel and be designed to allow for future extension and inter-parcel circulation as adjacent properties develop. The City may also require the owner(s) of the subject site to record an access easement for future joint use of the approach and driveway as the adjacent property(ies) develop(s).

Response: It is assumed that an inter-parcel driveway is not required by the City at this location.

- I. Driveways shall accommodate all projected vehicular traffic on-site without vehicles stacking or backing up onto a street.

Response: The 3 proposed approaches will facilitate traffic movement through the site without queuing at the street. Waivers have been submitted for each driveway and are compliant with the City of Willsonvilles suggestions.

- J. Driveways shall be designed so that vehicle areas, including but not limited to drive-up and drive-through facilities and vehicle storage and service areas, do not obstruct any public right-of-way.

Response: The proposed use does not include the noted uses.

- K. Approaches and driveways shall not be wider than necessary to safely accommodate projected peak hour trips and turning movements, and shall be designed to minimize crossing distances for pedestrians.

Response: Driveway approaches were designed to accommodate maneuvering of semi-trucks with trailers.

- L. As it deems necessary for pedestrian safety, the City, in consultation with the roadway authority, may require traffic-calming features, such as speed tables, textured driveway surfaces, curb extensions, signage or traffic control devices, or other features, be installed on or in the vicinity of a site.

Response: Noted.

- M. Approaches and driveways shall be located and designed to allow for safe maneuvering in and around loading areas, while avoiding conflicts with pedestrians, parking, landscaping, and buildings.

Response: Approaches & Driveways are located in areas to promote safe maneuvering. Loading dock circulation on the west side of the building is separated from the parking lot on the east side of the building.

- N. Where a proposed driveway crosses a culvert or drainage ditch, the City may require the developer to install a culvert extending under and beyond the edges of the driveway on both sides of it, pursuant applicable Public Works standards.

Response: N/A, the approaches do not cross a ditch or culvert.

- O. Except as otherwise required by the applicable roadway authority or waived by the City Engineer, temporary driveways providing access to a construction site or staging area shall be paved or graveled to prevent tracking of mud onto adjacent paved streets.

Response: Temporary access will be paved or graveled.

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

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

Response: N/A, the development does not include residential or mixed-use development.

(.09) Minimum street intersection spacing standards.

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

Response: N/A, the proposed development does not include any new streets.

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

[Section 4.177 amended by Ord. 719, 6/17/13]

Response: This project is submitting waivers for all 4 driveways onto this lot. See waiver documents for more information.

Section 4.179. Mixed Solid Waste and Recyclables Storage in New Multi-Unit Residential and Non-Residential Buildings.

- (.01) All site plans for multi-unit residential and non-residential buildings submitted to the Wilsonville Development Review Board for approval shall include adequate storage space for mixed solid waste and source separated recyclables. [Amended by Ordinance No. 538, 2/21/02.]

Response: The project is for a non-residential building. The site plan sheet, A0.1, shows the proposed location of a trash enclosure.

- (.02) The floor area of an interior or exterior storage area shall be excluded from the calculation of building floor area for purposes of determining minimum storage requirements.

Response: The entire square footage of the building was used to determine the enclosure sizing, including incidental accessory storage areas.

- (.03) The storage area requirement shall be based on the predominant use(s) of the building. If a building has more than one of the uses listed herein and that use occupies 20 percent or less of the floor area of the building, the floor area occupied by that use shall be counted toward the floor area of the predominant use(s). If a building has more than one of the uses listed herein and that use occupies more than 20 percent of the floor area of the building, then the storage area requirement for the whole building shall be the sum of the requirement for the area of each use.

Response: The building is for industrial commercial flex space and includes office, warehouse and manufacturing.

- (.04) Storage areas for multiple uses on a single site may be combined and shared.

Response: The development has a single waste enclosure for multiple uses.

- (.05) The specific requirements are based on an assumed storage height of four feet for solid waste/recyclables. Vertical storage higher than four feet but no higher than seven feet may be used to accommodate the same volume of storage in a reduced floor space. Where vertical or stacked storage is proposed, the site plan shall include drawings to illustrate the layout of the storage area and dimensions for the containers.

Response: The enclosure calculation and provided size is based on the standard requirement noted above of four feet.

- (.06) The specific requirements for storage area are as follows:

A. Multi-unit residential buildings containing five-ten units shall provide a minimum storage area of 50 square feet. Buildings containing more than ten residential units shall provide an additional five square feet per unit for each unit above ten.

Response: N/A

B. Non-residential buildings shall provide a minimum storage area of ten square feet, plus:

1. Office: Four square feet per 1,000 square feet gross floor area (GFA);
2. Retail: Ten square feet per 1,000 square feet GFA;
3. Wholesale / Warehouse / Manufacturing: Six square feet per 1,000 square feet GFA; and
4. Other: Four square feet per 1,000 square feet GFA.

Response: The building's uses include office, manufacturing and storage.

The building area is approximately 53,000 total square. 29,000 sf office = 116 sf and 24,000 sf warehouse/manufacturing = 144. 260 square feet of the waste enclosure is required. The proposed enclosure layout provides 264 square feet.

- (.07) The applicant shall work with the City's franchised garbage hauler to ensure that site plans provide adequate access for the hauler's equipment and that storage area is adequate for the anticipated volumes, level of service and any other special circumstances which may result in the storage area exceeding its capacity. The hauler shall notify the City by letter of their review of site plans and make recommendations for changes in those plans pursuant to the other provisions of this section.

Response: The proposed enclosure plan and site layout has been provided to the franchise hauler – Republic Services – for review and comment. A letter of approval is included within the application materials.

- (.08) Existing multi-unit residential and non-residential developments wishing to retrofit their structures to include storage areas for mixed solid waste and recycling may have their site plans reviewed and approved through the Class I Administrative Review process, according to the provisions of Section 4.035. Site plans for retrofitting existing developments must conform to all requirements of this Section, "Mixed Solid Waste and Recyclables Storage In New Multi-Unit Residential and Non-Residential Buildings," and 4.430, "Location, Design and Access Standards for Mixed Solid Waste and Recycling Areas," of the Wilsonville City Code. [Added by Ordinance #426 - April 4, 1994]

Response: N/A

Section 4.199 OUTDOOR LIGHTING

- Section 4.199.10 Outdoor Lighting In General.
- Section 4.199.20 Applicability.
- Section 4.199.30 Lighting Zones.
- Section 4.199.40 Lighting Systems Standards for Approval.
- Section 4.199.50 Submittal Requirements.
- Section 4.199.60 Major Additions or Modifications.

Section 4.199.10. Outdoor Lighting In General.

- (.01) Purpose: The purpose of this Code is to provide regulations for outdoor lighting that will:
- A. Permit reasonable uses of outdoor lighting for nighttime safety, utility, security, productivity, enjoyment and commerce.
 - B. Conserve energy and resources to the greatest extent possible.
 - C. Minimize glare, particularly in and around public rights-of-way; and reduce visual discomfort and improve visual acuity over large areas by avoiding “light islands” and “spotlighting” that result in reduced visual perception in areas adjacent to either the source of the glare or the area illuminated by the glare.
 - D. Minimize light trespass, so that each owner of property does not cause unreasonable light spillover to other property.
 - E. Curtail the degradation of the nighttime environment and the night sky.
 - F. Preserve the dark night sky for astronomy and enjoyment.
 - G. Protect the natural environment, including wildlife, from the damaging effects of night lighting from human sources.

Response: The development will include building mounted and pole mounted LED fixtures. The fixtures cover entrances, parking area, storage area and walkways.

- (.02) Purpose Statement as Guidelines: Declaration of purpose statements are guidelines and not approval criteria in the application of WC Section 4.199.

Section 4.199.20. Applicability.

- (.01) This Ordinance is applicable to:
- A. Installation of new exterior lighting systems in public facility, commercial, industrial and multi-family housing projects with common areas.

Response: The project includes new exterior lighting on a commercial project.

- B. Major additions or modifications (as defined in this Section) to existing exterior lighting systems in public facility, commercial, industrial and multi-family housing projects with common areas.

Response: N/A

- (.02) Exemption. The following luminaires and lighting systems are EXEMPT from these requirements:
 - A. Interior lighting.
 - B. Internally illuminated signs.
 - C. Externally illuminated signs.
 - D. Temporary lighting for theatrical, television, and performance areas.
 - E. Lighting in swimming pools and other water features governed by Article 680 of the National Electrical Code.
 - F. Building Code required exit path lighting.
 - G. Lighting specifically for stairs and ramps.
 - H. Temporary and seasonal lighting provided that individual lamps are 10 watts or less.
 - I. Lighting required and/or regulated by the City (i.e. construction related activities), Federal Aviation Administration, U.S. Coast Guard or other Federal or State agency.
 - J. Single-family residential lighting.
 - K. Code Required Signs.
 - L. American flag.
 - M. Landscape lighting.
 - N. Lights approved by the City through an Administrative Review Temporary Use Permit process.
 - O. Public street lights.
 - P. ATM security lighting.
 - Q. Those "Exceptions" listed in the "Exterior Lighting Power Allowance" provisions of the *Oregon Energy Efficiency Specialty Code*. [Added by Ord. 688, 11/15/10]

Response: The project includes several lighting systems noted as exempt including signage, interior, landscape lighting, egress lighting and building exits.

Section 4.199.30. Lighting Overlay Zones.

- (.01) The designated Lighting Zone as indicated on the Lighting Overlay Zone Map for a commercial, industrial, multi-family or public facility parcel or project shall

determine the limitations for lighting systems and fixtures as specified in this Ordinance.

- A. Property may contain more than one lighting zone depending on site conditions and natural resource characteristics.

Response: The subject property is the LZ2 shaded zone on the overlay map. The site is indicated on the map below with a star.

(.02) The Lighting Zones shall be:

- A. LZ 1. Developed areas in City and State parks, recreation areas, SROZ wetland and wildlife habitat areas; developed areas in natural settings; sensitive night environments; and rural areas. This zone is intended to be the default condition for rural areas within the City.
- B. LZ 2. Low-density suburban neighborhoods and suburban commercial districts, industrial parks and districts. This zone is intended to be the default condition for the majority of the City.
- C. LZ 3. Medium to high-density suburban neighborhoods and districts, major shopping and commercial districts as depicted on the Lighting Overlay Zone Map.
- D. LZ 4. Reserved for limited applications with special lighting requirements. This zone is appropriate for users who have unique site or operating circumstances that warrant additional light. This zone shall not be applied to residential or agricultural areas.

[Section 4.199.30(.02) amended by Ord. 688, 11/15/10]

Response: The subject property is the LZ2 shaded zone on the overlay map. The site is indicated on the map below with a star.

(.03) Modification of Lighting Zones.

- A. The City Council may modify the designated Lighting Zones of one or more parcels if the City Council finds that the original Lighting Zone was in error, a change in circumstances has occurred warranting the change since the designation was established or the purposes of this section are better served.

Response: The development does not request modification of the designated lighting zone.

- B. The Development Review Board (DRB) may modify the designated Lighting Zones as part of the Stage II, Site Design Review Process if the DRB finds that the original Lighting Zone was in error, or a change in circumstances has occurred warranting the change since the designation was established or the purposes of this section are better served.

Response: The development does not request modification of the designated lighting zone.

- C. This ordinance establishes a Lighting Overlay Zone Map. The Planning Division shall maintain the current Lighting Overlay Zone Map.

Response: The map, included with this section, has been reviewed for the subject site which is indicated with a star below.

Section 4.199.40. Lighting Systems Standards for Approval.

(.01) Non-Residential Uses and Common Residential Areas.

- A. All outdoor lighting shall comply with either the Prescriptive Option or the Performance Option below.
- B. Prescriptive Option. If the lighting is to comply with this Prescriptive Option, the installed lighting shall meet all of the following requirements according to the designated Lighting Zone.
1. The maximum luminaire lamp wattage and shielding shall comply with Table 7.
 2. Except for those exemptions listed in Section 4.199.20(.02), the exterior lighting for the site shall comply with the *Oregon Energy Efficiency Specialty Code, Exterior Lighting*.
 3. The maximum pole or mounting height shall be consistent with Table 8.
 4. Each luminaire shall be set back from all property lines at least 3 times the mounting height of the luminaire:
 - a. Exception 1: If the subject property abuts a property with the same base and lighting zone, no setback from the common lot lines is required.
 - b. Exception 2: If the subject property abuts a property which is zoned (base and lighting) other than the subject parcel, the luminaire shall be setback three times the mounting height of the luminaire, measured from the abutting parcel's setback line. (Any variance or waiver to the abutting property's setback shall not be considered in the distance calculation).
 - c. Exception 3: If the luminaire is used for the purpose of street, parking lot or public utility easement illumination and is located less than 3 mounting heights from the property line, the luminaire shall include a house side shield to protect adjoining property.
 - d. Exception 4: If the subject property includes an exterior column, wall or abutment within 25 feet of the property line, a luminaire partly shielded or better and not exceeding 60 lamp watts may be mounted onto the exterior column, wall or abutment or under or within an overhang or canopy attached thereto.
 - e. Exception 5: Lighting adjacent to SROZ areas shall be set back 3 times the mounting height of the luminaire, or shall employ a house side shield to protect the natural resource area.

Response: The exterior lighting design shall comply with the prescriptive option per the Oregon Energy Specialty Code Comcheck Compliance forms. All luminaires that face away from the property-lines to include a house side shield. All wall mounted luminaire wattages are below 60 lamp watts.

- C. Performance Option. If the lighting is to comply with the Performance Option, the proposed lighting design shall be submitted by the applicant for approval by the City meeting all of the following:
1. The weighted average percentage of direct uplight lumens shall be less than the allowed amount per Table 9.
 2. The maximum light level at any property line shall be less than the values in Table 9, as evidenced by a complete photometric analysis including horizontal illuminance of the site and vertical illuminance on the plane facing the site up to the mounting height of the luminaire mounted highest above grade. The Building Official or designee may accept a photometric test report, demonstration or sample, or other satisfactory confirmation that the luminaire meets the shielding requirements of Table 7. Luminaires shall not be mounted so as to permit aiming or use in any way other than the manner maintaining the shielding classification required herein:
 - a. Exception 1. If the property line abuts a public right-of-way, including a sidewalk or street, the analysis may be performed across the street at the adjacent property line to the right-of-way.
 - b. Exception 2. If, in the opinion of the Building Official or designee, compliance is impractical due to unique site circumstances such as lot size or shape, topography, or size or shape of building, which are circumstances not typical of the general conditions of the surrounding area. The Building Official may impose conditions of approval to avoid light trespass to the maximum extent possible and minimize any additional negative impacts resulting to abutting and adjacent parcels, as well as public rights-of-way, based on best lighting practices and available lighting technology.
 3. The maximum pole or mounting height shall comply with Table 8.

Response: N/A

- D. Curfew. All prescriptive or performance based exterior lighting systems shall be controlled by automatic device(s) or system(s) that:
1. Initiate operation at dusk and either extinguish lighting one hour after close or at the curfew times according to Table 10; or
 2. Reduce lighting intensity one hour after close or at the curfew time to not more than 50% of the requirements set forth in the *Oregon Energy Efficiency Specialty Code* unless waived by the DRB due to special circumstances; and

3. Extinguish or reduce lighting consistent with 1. and 2. above on Holidays.

The following are exceptions to curfew:

- a. Exception 1: Building Code required lighting.
- b. Exception 2: Lighting for pedestrian ramps, steps and stairs.
- c. Exception 3: Businesses that operate continuously or periodically after curfew.

[Section 4.199.40 amended by Ord. 688, 11/15/10]

Response: All lighting branch circuits to be routed through automatic lighting control. Luminaires to be 50% dimmed after dusk. Integral photocell on each luminaire to activate luminaire to 100% lumen output upon activation by motion.

(.02) Special Permit for Specific Lighting Fixtures and Systems and When Exceeding Lighting Requirements.

- A. This section is intended to apply to situations where more than normal foot candles are required due to a unique circumstance or use or where it is absolutely essential to perform the proposed activities after dark. All special permits shall be reviewed by the DRB.
- B. Upon issuance of a special permit by the Development Review Board (DRB), lighting systems not complying with the technical requirements of this Ordinance may be installed, maintained, and replaced for lighting that exceeds the maximums permitted by this Ordinance. This section is intended to be applied to uses such as sports lighting systems including but not limited to, sport fields and stadiums, such as baseball and football field lighting, tennis court lighting, swimming pool area lighting and prisons; other very intense lighting defined as having a light source exceeding 200,000 lumens or an intensity in any direction of more than 2,000,000 candelas; building façade lighting of portions of buildings over two stories high; and public monuments.
- C. To obtain such a permit, applicants shall demonstrate that the proposed lighting installation:
 1. Is within Lighting Zone 3 or above.
 2. Has been designed to minimize obtrusive light and artificial sky glow, supported by a signed statement from a registered civil or electrical engineer describing the mitigation measures. Such statement shall be accompanied by calculations indicating the light trespass levels (horizontal and vertical at ground level) at the property line.
 3. Will not create excessive glare, sky glow, or light trespass beyond that which can be reasonably expected by application of best lighting practices, and available technology.
 4. Provides appropriate lighting curfew hours based on the use and the surrounding areas.

- D. The DRB may impose conditions of approval to mitigate any negative impacts resulting to the abutting parcel, based on best lighting practices and available lighting technology.
- E. The City may charge a review fee and may, at the Building Official's option, employ the services of a qualified professional civil or electrical engineer to review such submittals and the cost thereof shall be an additional fee charged to the applicant.

[Response: The site has no special activities to warrant any special lighting levels.](#)

Section 4.199.50. Submittal Requirements.

- (.01) Applicants shall submit the following information as part of DRB review or administrative review of new commercial, industrial, multi-family or public facility projects:
 - A. A statement regarding which of the lighting methods will be utilized, prescriptive or performance, and a map depicting the lighting zone(s) for the property.
 - B. A site lighting plan that clearly indicates intended lighting by type and location. For adjustable luminaires, the aiming angles or coordinates shall be shown.
 - C. For each luminaire type, Drawings, cut sheets or other documents containing specifications for the intended lighting including but not limited to, luminaire description, mounting, mounting height, lamp type and manufacturer, lamp watts, ballast, optical system/distribution, and accessories such as shields.
 - D. Calculations demonstrating compliance with *Oregon Energy Efficiency Specialty Code, Exterior Lighting*, as modified by Section 4.199.40(.01)(B).(2.) [Amended by Ord. 688, 11/15/10]
 - E. Lighting plans shall be coordinated with landscaping plans so that pole lights and trees are not placed in conflict with one another. The location of lights shall be shown on the landscape plan. Generally, pole lights should not be placed within one pole length of landscape and parking lot trees.
 - F. Applicants shall identify the hours of lighting curfew.

[Response: Design review package contains appropriate documents.](#)

- (.02) In addition to the above submittal requirements, Applicants using the Prescriptive Method shall submit the following information as part of the permit set plan review:
 - A. A site lighting plan (items 1 A - F, above) which indicates for each luminaire the 3 mounting height line to demonstrate compliance with the setback requirements. For luminaires mounted within 3 mounting heights of the property line the compliance exception or special shielding requirements shall be clearly indicated.
- (.03) In addition to the above submittal requirements, Applicants using the Performance Method shall submit the following information as part of the permit set plan review:

- A. Site plan showing horizontal isocandle lines, or the output of a point-by-point computer calculation of the horizontal illumination of the site, showing property lines and light levels immediately off of the subject property.
- B. For each side of the property, the output of a point-by-point vertical footcandle calculation showing illumination in the vertical plane at the property line from grade to at least 10 feet higher than the height of the tallest pole.
- C. Lighting plans shall be prepared by a qualified licensed engineer.

Response: Not performance method. N/A

(.04) In addition to the above applicable submittal requirements, Applicants for Special Permits shall submit the following to the DRB for review:

- A. Tabulation of International Engineering Society of North America (IESNA) lighting recommendations for each task including area illuminated, recommended illumination level, actual maintained illumination level, and luminaires used specifically to achieve the indicated criteria.
- B. Lighting plans shall be prepared by a qualified licensed engineer.

Response: N/A

(.05) For all calculations, the following light loss factors shall be used unless an alternative is specifically approved by the City:

Metal halide	0.6
High pressure sodium	0.8
Compact fluorescent	0.7
Full size fluorescent	0.75
Incandescent	0.9
Halogen	0.95
Other	As approved

Response: Drawings to comply with submittal process requirements above. All LEDs are calculated with a 0.9 light loss factor.

Section 4.199.60. Major Additions or Modifications to Pre-Existing Sites.

(01.) Major Additions. If a major addition occurs on a property, all of the luminaires on the site shall comply with the requirements of this Section. For purposes of this subsection, the following are considered to be major additions:

- A. Additions of 50 percent or more in terms of additional dwelling units, gross floor area, seating capacity, or parking spaces, either with a single addition or with cumulative additions after July 2, 2008.
- B. Modification or replacement of 50 percent or more of the outdoor lighting luminaries' within a 5-year timeframe existing as of July 2, 2008.

Response: N/A

Table 7: Maximum Wattage And Required Shielding				
Lighting Zone	Fully Shielded	Shielded	Partly Shielded	Unshielded
LZ 1	70	20	13	Low voltage landscape lighting 50 watts or less
LZ 2	100	35	39	Low voltage landscape lighting 50 watts or less
LZ 3	250	100	70	Landscape and facade lighting 100 watts or less; ornamental lighting on private drives of 39 watts and less
LZ 4	450	150	150	Landscape and facade lighting 250 watts or less; ornamental lights on private drives and lanterns 70 watts or less; marquee lighting not employing medium based lamps

[Table 7 amended by Ord. 682, 9/9/10; Ord. 688, 11/15/10]

Table 8: Maximum Lighting Mounting Height In Feet			
Lighting Zone	Lighting for private drives, driveways, parking, bus stops and other transit facilities	Lighting for walkways, bikeways, plazas and other pedestrian areas	All other lighting
LZ 0	20	8	4
LZ 1	25	12	4
LZ 2	40	18	8
LZ 3	40	18	16
LZ 4	Height limit to be determined by Special Use Permit Only		

Lighting mounted onto buildings or other structures shall not exceed a mounting height greater than 4 feet higher than the tallest part of the building or structure at the place where the lighting is installed, nor higher than 33.33 percent of the horizontal distance of the light from the nearest property line, whichever is less.

[Table amended by Ord. 682, 9/9/10]

Table 9: Performance Method			
Lighting Zone	Maximum percentage of direct upright lumens	Maximum Light Level at Property Line	
		Horizontal plane at grade (foot candles - fc)	Vertical plane facing the site in question, from grade to mounting height of highest mounted luminaire (foot candles – fc)
LZ 0	0	0.01 fc	0.02 fc
LZ 1	1%	0.05 fc	0.1 fc
LZ 2	5%	0.2 fc	0.4 fc
LZ 3	10%	0.4 fc	0.8 fc
LZ 4	20%	0.8 fc	1.6 fc

Table 10: Curfew	
Lighting Zone	Curfew Time
LZ 0	8:00 PM (2000 hours)
LZ 1	
LZ 2	10:00 PM (2200 hours)
LZ 3	Midnight (2400 hours)
LZ 4	

[Tables, above, renumbered by Ord. 688, 11/15/10

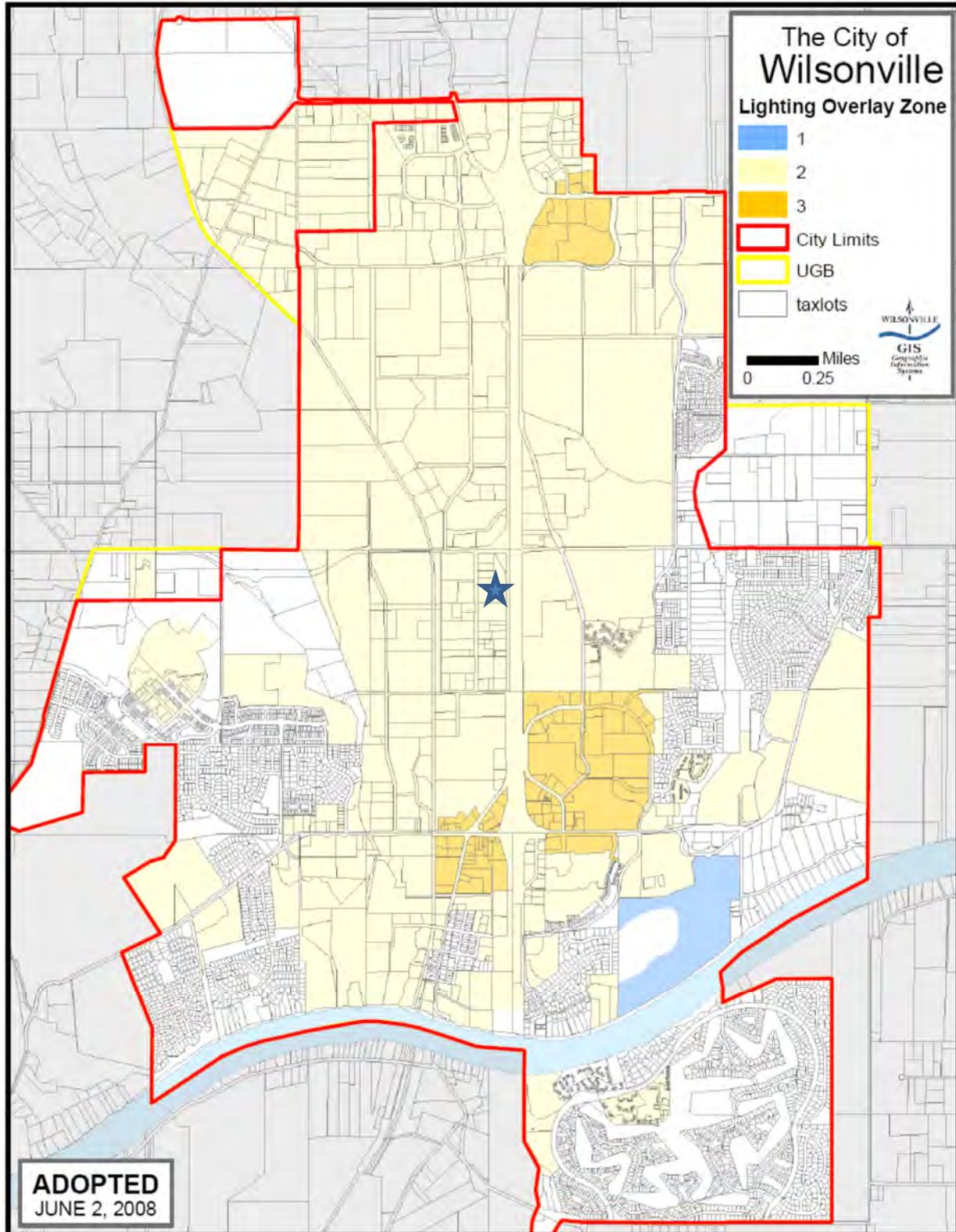


Figure 30: Lighting Overlay Zone Map

[Section 4.199 – 4.199.60 added by Ord. No. 649, adopted 6/2/08]

UNDERGROUND UTILITIES

Section 4.300. General.

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

Response: All proposed utility connections and services will be completed underground with no aerial utilities or connections proposed.

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

Response: All proposed utility connections and services will be completed underground with no aerial utilities or connections proposed.

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

Response: All proposed utilities are designed to meet the City's public works standards.

Section 4.310 Exceptions.

Section 4.300 of this Code shall not apply to surface-mounted transformers, surface-mounted connection boxes, wireless communication facilities, and meter cabinets and other appurtenances which are reasonably necessary to be placed above ground, or to temporary utility service facilities during construction, or to high capacity electric and communication feeder lines, or to utility transmission lines operating at 50,000 volts or more.

Section 4.320. Requirements.

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

Response: All proposed utility connections and services will be completed underground with no aerial utilities or connections proposed. All proposed utilities are designed to meet the Public Utility standards.

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

Response: Coordination will be completed with the City to verify the layout and locations of all proposed utilities.

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

Response: A water easement is included in the project for a future public water main extension. Outside of any possible PUE easements requested by the City, no other public utility easements are anticipated for this project.

SITE DESIGN REVIEW.

Section 4.400. Purpose.

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

Response: The layout of the building design provides variation in materials that are complementary to commercial industrial context of this location. Landscaping provides additional variation and connectivity to existing features.

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

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

Response: The site layout provides for an efficient functioning site layout with parking, pedestrian circulation, landscaping and building orientation.

B. Encourage originality, flexibility and innovation in site planning and development, including the architecture, landscaping and graphic design of said development;

Response: The project design uses variation in materials and reveals to offset the simplistic geometry of a standard tilt building. Two circulation towers of differing material highlight the buildings entries. The landscaping design enhances the overall building expression and connectivity.

C. Discourage monotonous, drab, unsightly, dreary and inharmonious developments;

Response: The use of building form, described above, along with the building's unique design. The variety of reveal and form pattern in the architectural concrete panels provide texture beyond a typical tilt building.

D. Conserve the City's natural beauty and visual character and charm by assuring that structures, signs and other improvements are properly related to their sites, and to surrounding sites and structures, with due regard to the aesthetic qualities of the natural terrain and landscaping, and that proper attention is given to exterior appearances of structures, signs and other improvements;

Response: The building and site layout were developed to create a design that addressed the public at the street while maintaining future flexibility.

Signage is placed where necessary for building identity as well as with respect to public views and neighboring properties.

landscaping and paving features complement the building program and design while also improving the general aesthetic of the site condition.

- E. Protect and enhance the City's appeal and thus support and stimulate business and industry and promote the desirability of investment and occupancy in business, commercial and industrial purposes;

Response:

The development of this property is meant to provide a flexible facility that attracts and promotes local business.

- F. Stabilize and improve property values and prevent blighted areas and, thus, increase tax revenues;

Response: This site is currently undeveloped and is an excellent opportunity to enhance the fabric of this area and improve the right of way along Boones Ferry Road.

- G. Insure that adequate public facilities are available to serve development as it occurs and that proper attention is given to site planning and development so as to not adversely impact the orderly, efficient and economic provision of public facilities and services.

Response: Public facilities and improvements will be included with this project. Ongoing coordination with the city is being completed to determine the scope and requirements for these improvements.

- H. Achieve the beneficial influence of pleasant environments for living and working on behavioral patterns and, thus, decrease the cost of governmental services and reduce opportunities for crime through careful consideration of physical design and site layout under defensible space guidelines that clearly define all areas as either public, semi-private, or private, provide clear identity of structures and opportunities for easy surveillance of the site that maximize resident control of behavior -- particularly crime;

Response:

This facility provides a welcoming addition to a previously undeveloped lot. The transparency on the east side connects the interior the exterior providing eyes on the street and vice versa. The private industrial yard and docks are clearly delineated with fencing and security gates.

- I. Foster civic pride and community spirit so as to improve the quality and quantity of citizen participation in local government and in community growth, change and improvements;

Response: This project is intended to foster civic pride by enhancing a previously undeveloped lot along Interstate 5 with an attractive new building and improving the public right of way. The expectation is that this new development will house the headquarters of DP Nicoli Shoring Solutions and attract new businesses that will contribute to the local economy, grow community and improve Wilsonville.

J. Sustain the comfort, health, tranquility and contentment of residents and attract new residents by reason of the City's favorable environment and, thus, to promote and protect the peace, health and welfare of the City.

Response: The project location is adjacent to the Walnut Mobile Park, which is a small pocket of residential mobile homes situated amongst existing industrial facilities. The building location is set amply back from the abutting site. A 10' landscape buffer with a 6' tall masonry wall provide a further buffer between lots.

Section 4.420. Jurisdiction and Powers of the Board.

(.01) Application of Section. Except for single-family or two-family dwellings in any residential zoning district, and in the Village zone, row houses or apartments, no Building Permit shall be issued for a new building or major exterior remodeling of an existing building, and no Sign Permit, except as permitted in Sections 4.156.02 and 4.156.05, shall be issued for the erection or construction of a sign relating to such new building or major remodeling, until the plans, drawings, sketches and other documents required for a Sign Permit application have been reviewed and approved by the Board. [Amended by Ord. No. 538, 2/21/02.] [Amended by Ord. No. 557, 9/5/03.] [Amended by Ord. No. 704, 6/18/12]

Response: The development is for a new building which triggers this application for review by the Board.

(.02) Development in Accord with Plans. Construction, site development and landscaping shall be carried out in substantial accord with the plans, drawings, sketches and other documents approved by the Board, unless altered with Board approval. Nothing in this subsection shall be construed to prevent ordinary repair, maintenance and replacement of any part of the building or landscaping which does not involve a substantial change from the purpose of Section 4.400. If the Board objects to such proposed changes, they shall be subject to the procedures and requirements of the site design review process applicable to new proposals.

Response: Pending unforeseen conditions, the proposed development, once approved by the Board will be developed with substantial conformance to the design package. The applicant will coordinate with the city updates to the design to determine those adjustment which require review through the DRB.

(.03) Variances. The Board may authorize variances from the site development requirements, based upon the procedures, standards and criteria listed in Section 4.196. Variances shall be considered in conjunction with the site design review process.

Response: The proposed development does not include any requests for variance.

Section 4.421. Criteria and Application of Design Standards.

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

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

Response: Site grading and layout were adjusted as much as possible to preserve existing landscaping.

B. Relation of Proposed Buildings to Environment. Proposed structures shall be located and designed to assure harmony with the natural environment, including protection of steep slopes, vegetation and other naturally sensitive areas for wildlife habitat and shall provide proper buffering from less intensive uses in accordance with Sections 4.171 and 4.139 and 4.139.5. The achievement of such relationship may include the enclosure of space in conjunction with other existing buildings or other proposed buildings and the creation of focal points with respect to avenues of approach, street access or relationships to natural features such as vegetation or topography.

Response: The building considers the existing conditions of the site and was located in the most logical layout to meet the site and building programmatic needs. The site does not have steep slopes, natural vegetation or sensitive areas for wildlife habitat. The surrounding uses are of similar intensity and landscaping at the site perimeter provides sufficient buffering to these adjacent properties.

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

Response: The development separates the primary parking on the east side from the industrial truck loading/unloading area on the west side. New access driveways

are proposed on each side of the lot. This provides an efficient, safe and convenient layout of the circulation system for vehicles and pedestrians.

Pedestrian routing from the main entry to a new sidewalk connection to the public right-of-way at Boones Ferry Road.

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

Response: The proposed stormwater management for the site will be completed through the installation of a swale and rain garden on site. These facilities are located at the west side of the site to ensure that the facilities capture all stormwater runoff and will not allow runoff on to the adjacent properties and public right-of-ways.

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

Response: The complete storm and sewer design is shown on the submitted plans. The design and layout of these utilities is in accordance with the City requirements and will meet this code.

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

Response: The proposed signs will incorporate materials and color palette used on the building to tie the signs into the overall context of the structure. Sign forms and size relative to the building locations and geometry will enhance the architecture of the project and will not detract from the adjacent properties.

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

Response: The project includes a 40,000 square foot storage yard and truck loading area. The storage area will be properly screened by a 6' tall fence and landscaping.

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

Response: The project does not include any accessory buildings or structures on the site.

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

Response: As noted in response to Section 4.400 above, the proposed development is believed to be in strong support of the purpose and goals of this chapter, the underlying zoning district standards, the surrounding area and other standards of the Wilsonville Development Code.

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

Response: The applicant is aware that review of this application through the DRB may include conditions in response to the application.

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

Response: Applicant is aware of standards for conditions of approval for development and will work with the City staff on applied conditions and timelines associated with each item.

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

A. Where the conditions of approval for a development permit specify that certain paints or colors of materials be used, the use of those paints or colors shall be binding upon the applicant. No Certificate of Occupancy shall be granted until compliance with such conditions has been verified.

B. Subsequent changes to the color of a structure shall not be subject to City review unless the conditions of approval under which the original colors were set included a condition requiring a subsequent review before the colors could be changed.

Response: Proposed development application package includes the building color and material palette.

Section 4.430. Location, Design and Access Standards for mixed Solid Waste and Recycling Areas

- (.01) The following locations, design and access standards for mixed solid waste and recycling storage areas shall be applicable to the requirements of Section 4.179 of the Wilsonville City Code.

Response: See response to Section 4.179 for additional responses.

- (.02) Location Standards:

- A. To encourage its use, the storage area for source separated recyclables shall be co-located with the storage area for residual mixed solid waste.

Response: The solid waste enclosure includes two larger yard bins, one for refuse and one for cardboard, with additional space for roll can recycle bins within the enclosure.

- B. Indoor and outdoor storage areas shall comply with Uniform Building and Fire Code requirements.

Response: The waste collection storage area is entirely outdoors. The enclosure will be designed to building code requirements for structural design.

- C. Storage area space requirements can be satisfied with a single location or multiple locations and can combine with both interior and exterior locations.

Response: The site includes a single location for collection solid waste and recycling.

- D. Exterior storage areas can be located within interior side yard or rear yard areas. Minimum setback shall be three (3) feet. Exterior storage areas shall not be located within a required front yard setback, including double frontage lots.

Response: The enclosure is not set located in a setback.

- E. Exterior storage areas shall be located in central and visible locations on a site to enhance security for users.

Response: The enclosure is placed at central south end of the site with good visibility from one primary driveway and the building.

- F. Exterior storage areas can be located in a parking area if the proposed use provides at least the minimum number of parking spaces required for the use after deducting the area used for storage. Storage areas shall be appropriately screened according to the provisions of Section 4.430 (.03), below.

Response: The enclosure is placed within the site's parking and circulation area. The parking provided meets the minimum number per the calculations presented in Section 4.155.

- G. The storage area shall be accessible for collection vehicles and located so that the storage area will not obstruct pedestrian or vehicle traffic movement on the site or on public streets adjacent to the site.

Response: The enclosure is positioned with gates facing directly in line with a primary drive aisle. This location was presented and approved by the franchise waste hauler as noted in the included memo from Republic Services.

(.03) Design Standards.

A. The dimensions of the storage area shall accommodate containers consistent with current methods of local collection.

Response: The enclosure is designed to include two four-yard collection bins for refuse and cardboard recycling. In addition there is sufficient room for roll can collection bins of additional recycling materials.

B. Storage containers shall meet Uniform Fire Code standards and be made of or covered with waterproof materials or situated in a covered area.

Response: Storage containers will be typical steel collection bins with hinged covers typical of the franchise hauler.

C. Exterior storage areas shall be enclosed by a sight obscuring fence, wall or hedge at least six (6) feet in height. Gate openings for haulers shall be a minimum of ten (10) feet wide and shall be capable of being secured in a closed or open position. In no case shall exterior storage areas be located in conflict with the vision clearance requirements of Section 4.177.

Response: The enclosure has a six-foot-high concrete tilt walls on all sides. A double gate with total opening width of 16 feet is provided. The gates themselves are slatted chainlink with cane bolt for secured closure and propped open options.

D. Storage area(s) and containers shall be clearly labeled to indicate the type of materials accepted.

Response: Collection bins will denote materials per standard hauler labeling.

(.04) Access Standards.

A. Access to storage areas can be limited for security reasons. However, the storage area shall be accessible to users at convenient times of the day and to collect service personnel on the day and approximate time they are scheduled to provide collection service.

Response: The primary gates for hauler access will be open during operating hours. Any requirements with hauler will be coordinated to ensure proper access for collection is maintained.

B. Storage areas shall be designed to be easily accessible to collection trucks and equipment, considering paving, grade and vehicle access. A minimum of ten (10) feet horizontal clearance and eight feet of vertical clearance is required if the storage area is covered.

Response: The enclosure gates are inline with a drive aisle provide clearance for the collection truck to pull directly to the gate for access to the bins. There are no vertical projects at the enclosure.

- C. Storage areas shall be accessible to collection vehicles without requiring backing out of a driveway onto a public street. If only a single access point is available to the storage area, adequate turning radius shall be provided to allow collection vehicles to safely exit the site in a forward motion. (Added by Ordinance #426, April 4, 1994.)

Response: The enclosure is inline with a drive aisle providing direct straight movement access to the enclosure. To leave the site the collection vehicle can proceed in a forward direction through the looped parking to the second driveway. Given the enclosure placement there is no requirement for the collection vehicle to back into the public right-of-way.

Section 4.440. Procedure.

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

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

Response: The submitted drawing package includes a scaled site plan on sheet A0.1 which indicates all proposed improvements on the site including, parking, circulation and building placement.

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

Response: For AAI spoke with Dan Pauly and we are required to show 6" cal. Trees. 3/15/19 tkl

- C. Architectural drawings or sketches, drawn to scale, including floor plans, in sufficient detail to permit computation of yard requirements and showing all elevations of the proposed structures and other improvements as they will appear on completion of construction. Floor plans shall also be provided in

sufficient detail to permit computation of yard requirements based on the relationship of indoor versus outdoor living area, and to evaluate the floor plan's effect on the exterior design of the building through the placement and configuration of windows and doors.

Response: The submitted drawing package includes scaled floor plans on sheets A1.1 which show the proposed layout of interior spaces. These plans depict room uses and layout doorways and windows.

D. A Color Board displaying specifications as to type, color, and texture of exterior surfaces of proposed structures. Also, a phased development schedule if the development is constructed in stages.

Response: A color board of representative colors is included with the submittal package. Phased development schedule is included in submittal package.

E. A sign Plan, drawn to scale, showing the location, size, design, material, color and methods of illumination of all exterior signs.

Response: The site plan indicates sign locations on the development. Elevation drawings provide detailed information on building mounted sign faces.

F. The required application fee.

Response: In coordination with City Staff, the following fees were noted as applicable for our project development.

The fees for the land use applications would be as follows:

Stage I Master Plan Revision - \$2,188

Zone Change - \$3,215

Stage II Final Plan Revision – \$10,098

Site Design Review - \$5,314

Type C Tree Removal Plan – \$160

Class III Sign Plan - \$800

Total = \$ 18,881

- (.02) As soon as possible after the preparation of a staff report, a public hearing shall be scheduled before the Development Review Board. In accordance with the procedures set forth in Section 4.010(2) and 4.012, the Development Review Board shall review and approve, approve with conditions, or deny the proposed architectural, site development, landscaping or sign plans of the applicant. If the Board finds that additional information or time are necessary to render a decision, the matter may be continued to a date certain. The applicant shall be immediately notified in writing of any such continuation or delay together with the scheduled date of review.

Response: Applicant representatives will be in attendance the DRB hearing.

Section 4.441. Effective Date of Decisions.

A decision of the Board shall become effective fourteen (14) calendar days after the date of the decision, unless the decision is appealed to, or called up by, the Council. If the decision of the Board is appealed to, or called up by, the City Council, the decision of the Council shall become effective immediately.

Response: The applicant understands the associated appears timeline.

Section 4.442. Time Limit on Approval.

Site design review approval shall be void after two (2) years unless a building permit has been issued and substantial development pursuant thereto has taken place; or an extension is granted by motion of the Board.

Response: The applicant is aware of the expiration timeframes relative building permit issuances and development of the project.

Section 4.443. Preliminary Consideration.

An applicant may request preliminary consideration by the Board of general plans prior to seeking a building permit. When seeking preliminary consideration, the applicant shall submit a site plan showing the proposed structures, improvements and parking, together with a general description of the plans. The Board shall approve or reject all or part of the applicant's general plan within the normal time requirements of a formal application. Preliminary approval shall be deemed to be approval of the final plan to the extent that the final design contains the characteristics of the preliminary design.

Response: The application includes design development plans for the building remodel and addition. The application is not seeking preliminary consideration with this application.

Section 4.450. Installation of Landscaping.

- (.01) All landscaping required by this section and approved by the Board shall be installed prior to issuance of occupancy permits, unless security equal to one hundred and ten percent (110%) of the cost of the landscaping as determined by the Planning Director is filed with the City assuring such installation within six (6) months of occupancy. "Security" is cash, certified check, time certificates of deposit, assignment of a savings account or such other assurance of completion as shall meet with the approval of the City Attorney. In such cases the developer shall also provide written authorization, to the satisfaction of the City Attorney, for the City or its designees to enter the property and complete the landscaping as approved. If the installation of the landscaping is not completed within the six-month period, or within an extension of time authorized by the Board, the security may be used by the City to complete the installation. Upon completion of the installation, any portion of the remaining security deposited with the City shall be returned to the applicant.

Response: The applicant assumes this requirement will be listed as a condition of approval similar to previous experience and understanding of construction schedules that may necessitate this requirement.

- (.02) Action by the City approving a proposed landscape plan shall be binding upon the applicant. Substitution of plant materials, irrigation systems, or other aspects of an approved landscape plan shall not be made without official action of the Planning Director or Development Review Board, as specified in this Code.

Response: Pending unforeseen conditions, the proposed development, once approved by the Board will be developed with substantial conformance to the design package. The applicant will coordinate with the city updates to the design to determine those adjustment which require review through the DRB.

- (.03) All landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing, in a substantially similar manner as originally approved by the Board, unless altered with Board approval.

Response: Owner shall continually maintain landscaping.

- (.04) If a property owner wishes to add landscaping for an existing development, in an effort to beautify the property, the Landscape Standards set forth in Section 4.176 shall not apply and no Plan approval or permit shall be required. If the owner wishes to modify or remove landscaping that has been accepted or approved through the City's development review process, that removal or modification must first be approved through the procedures of Section 4.010.

Response: N/A, No existing development.

TREE PRESERVATION AND PROTECTION

Section 4.600. Purpose and Declaration

- (.01) Rapid growth, the spread of development, need for water and increasing demands upon natural resources have the effect of encroaching upon, despoiling, or eliminating many of the trees, other forms of vegetation, and natural resources and processes associated therewith which, if preserved and maintained in an undisturbed and natural condition, constitute important physical, aesthetic, recreational and economic assets to existing and future residents of the City of Wilsonville.
- (.02) Specifically, the City Council finds that:
- A. Woodland growth protects public health through the absorption of air pollutants and contamination, through the reduction of excessive noise and mental and physical damage related to noise pollution, and through its cooling effect in the summer months, and insulating effects in winter;
 - B. Woodlands provide for public safety through the prevention of erosion, siltation, and flooding; and
 - C. Trees make a positive contribution to water quality and water supply by absorbing rainfall, controlling surface water run-off, and filtering and assisting in ground water recharge; and
 - D. Trees and woodland growth are an essential component of the general welfare of the City of Wilsonville by producing play areas for children and natural beauty, recreation for all ages and an irreplaceable heritage for existing and future City residents.
- (.03) Therefore, the purposes of this subchapter are:
- A. To preserve Significant Resource Overlay Zone areas, recognizing that development can and will occur.
 - B. To provide for the protection, preservation, proper maintenance and use of trees and woodlands in order to protect natural habitat and prevent erosion.
 - C. To protect trees and other wooded areas for their economic contribution to local property values when preserved, and for their natural beauty and ecological or historical significance.
 - D. To protect water quality, control surface water run-off, and protect ground water recharge.
 - E. To reflect the public concern for these natural resources in the interest of health, safety and general welfare of Wilsonville residents.
 - F. To encourage replanting where trees are removed.

Section 4.600.20. Applicability of Subchapter

- (.01) The provisions of this subchapter apply to the United States and the State of Oregon, and to their agencies and subdivisions, including the City of Wilsonville, and to the employees and agents thereof.
- (.02) By this subchapter, the City of Wilsonville regulates forest practices on all lands located within its urban growth boundary, as provided by ORS 527.722.
- (.03) The provisions of this subchapter apply to all land within the City limits, including property designated as a Significant Resource Overlay Zone or other areas or trees designated as protected by the Comprehensive Plan, City zoning map, or any other law or ordinance; except that any tree activities in the Willamette River Greenway that are regulated by the provisions of WC 4.500 - 4.514 and requiring a conditional use permit shall be reviewed by the DRB under the application and review procedures set forth for Tree Removal Permits.

Response: Noted.

Section 4.600.30. Tree Removal Permit Required

- (.01) Requirement Established. No person shall remove any tree without first obtaining a Tree Removal Permit (TRP) as required by this subchapter.
- (.02) Tree Removal Permits will be reviewed according to the standards provided for in this subchapter, in addition to all other applicable requirements of Chapter 4.
- (.03) Although tree activities in the Willamette River Greenway are governed by WC 4.500 - 4.514, the application materials required to apply for a conditional use shall be the same as those required for a Type B or C permit under this subchapter, along with any additional materials that may be required by the Planning Department. An application for a Tree Removal Permit under this section shall be reviewed by the Development Review Board.

Response: Proposed development will require the removal of trees.

Section 4.600.40. Exceptions

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

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

Section 4.600.50. Application For Tree Removal Permit

- (.01) Application for Permit. A person seeking to remove one or more trees shall apply to the Director for a Tree Removal Permit for a Type A, B, C, or D permit, depending on the applicable standards as provided in this subchapter.
- (A) An application for a tree removal permit that does not meet the requirements of Type A may be submitted as a Type B application.
- (.02) Time of Application. Application for a Tree Removal Permit shall be made before removing or transplanting trees, except in emergency situations as provided in WC 4.600.40 (1)(B) above. Where the site is proposed for development necessitating site plan or plat review, application for a Tree Removal Permit shall be made as part of the site development application as specified in this subchapter.
- (.03) Fees. A person applying for a Tree Removal Permit shall pay a non-refundable application fee; as established by resolution of the City Council.
- A. By submission of an application, the applicant shall be deemed to have authorized City representatives to have access to applicant's property as may be needed to verify the information provided, to observe site conditions, and if a permit is granted, to verify that terms and conditions of the permit are followed.

[Response: Development will require a Type C.](#)

Section 4.610.00. Application Review Procedure

- (.01) The permit applicant shall provide complete information as required by this subchapter in order for the City to review the application.
- (.02) Departmental Review. All applications for Tree Removal Permits must be deemed complete by the City Planning Department before being accepted for review. When all required information has been supplied, the Planning Department will verify whether - the application is complete. Upon request of either the applicant or the City, the City may conduct a field inspection or review meeting. City departments involved in the review shall submit their report and recommendations to the Planning Director who shall forward them to the appropriate reviewing authority.
- (.03) Reviewing Authority.
- A. Type A or B. Where site plan review or plat approval by the Development Review Board is not required by City ordinance, the grant or denial of the Tree Removal Permit application shall be the responsibility of the Planning Director. The Planning Director has the authority to refer a Type B permit application to the DRB under the Class II administrative review procedures of this Chapter. The decision to grant or deny a permit shall be governed by the applicable review standards enumerated in WC 4.610.10

- B. Type C. Where the site is proposed for development necessitating site plan review or plat approval by the Development Review Board, the Development Review Board shall be responsible for granting or denying the application for a Tree Removal Permit, and that decision may be subject to affirmance, reversal or modification by the City Council, if subsequently reviewed by the Council.
 - C. Type D. Type D permit applications shall be subject to the standards and procedures of Class I administrative review and shall be reviewed for compliance with the Oregon Forest Practice Rules and Statutes. The Planning Director shall make the decision to grant or deny an application for a Type D permit.
 - D. Review period for complete applications. Type A permit applications shall be reviewed within 10 (ten) working days. Type B permit applications shall be reviewed by the Planning Director within thirty (30) calendar days, except that the DRB shall review any referred application within sixty (60) calendar days. Type C permit applications shall be reviewed within the time frame established by this Chapter. Type D permit applications shall be reviewed within 15 calendar days.
- (.04) Notice. Before the granting of a Type C Tree Removal Permit, notice of the application shall be sent by regular mail to all owners within two hundred fifty feet (250') of the property where the trees are located as provided for in WC 4.010. The notice shall indicate where the application may be inspected and when a public hearing on the application will be held.
- (.05) Denial of Tree Removal Permit. Whenever an application for a Tree Removal Permit is denied, the permit applicant shall be notified, in writing, of the reasons for denial.
- (.06) Grant of a Tree Removal Permit. Whenever an application for a Type B, C or D Tree Removal Permit is granted, the reviewing authority shall:
- A. Conditions. Attach to the granting of the permit any reasonable conditions considered necessary by the reviewing authority including, but not limited to, the recording of any plan or agreement approved under this subchapter, to ensure that the intent of this Chapter will be fulfilled and to minimize damage to, encroachment on or interference with natural resources and processes within wooded areas;
 - B. Completion of Operations. Fix a reasonable time to complete tree removal operations; and
 - C. Security. Require the Type C permit grantee to file with the City a cash or corporate surety bond or irrevocable bank letter of credit in an amount determined necessary by the City to ensure compliance with Tree Removal Permit conditions and this Chapter.

1. This requirement may be waived by the Planning Director if the tree removal must be completed before a plat is recorded, and the applicant has complied with WC 4.264(1) of this Code.

Response: Noted.

Section 4.610.10. Standards For Tree Removal, Relocation Or Replacement

- (.01) Except where an application is exempt, or where otherwise noted, the following standards shall govern the review of an application for a Type A, B, C or D Tree Removal Permit:
- A. Standard for the Significant Resource Overlay Zone. The standard for tree removal in the Significant Resource Overlay Zone shall be that removal or transplanting of any tree is not inconsistent with the purposes of this Chapter.
 - B. Preservation and Conservation. No development application shall be denied solely because trees grow on the site. Nevertheless, tree preservation and conservation as a design principle shall be equal in concern and importance to other design principles.
 - C. Developmental Alternatives. Preservation and conservation of wooded areas and trees shall be given careful consideration when there are feasible and reasonable location alternatives and design options on-site for proposed buildings, structures or other site improvements.
 - D. Land Clearing. Where the proposed activity requires land clearing, the clearing shall be limited to designated street rights-of-way and areas necessary for the construction of buildings, structures or other site improvements.
 - E. Residential Development. Where the proposed activity involves residential development, residential units shall, to the extent reasonably feasible, be designed and constructed to blend into the natural setting of the landscape.
 - F. Compliance With Statutes and Ordinances. The proposed activity shall comply with all applicable statutes and ordinances.
 - G. Relocation or Replacement. The proposed activity shall include necessary provisions for tree relocation or replacement, in accordance with WC 4.620.00, and the protection of those trees that are not to be removed, in accordance with WC 4.620.10.
 - H. Limitation. Tree removal or transplanting shall be limited to instances where the applicant has provided completed information as required by this Chapter and the reviewing authority determines that removal or transplanting is necessary based on the criteria of this subsection.
 1. Necessary For Construction. Where the applicant has shown to the satisfaction of the reviewing authority that removal or transplanting is

necessary for the construction of a building, structure or other site improvement, and that there is no feasible and reasonable location alternative or design option on-site for a proposed building, structure or other site improvement; or a tree is located too close to existing or proposed buildings or structures, or creates unsafe vision clearance.

2. Disease, Damage, or Nuisance, or Hazard. Where the tree is diseased, damaged, or in danger of falling, or presents a hazard as defined in WC 6.208, or is a nuisance as defined in WC 6.200 et seq., or creates unsafe vision clearance as defined in this Code.
 - (a) As a condition of approval of Stage II development, filbert trees must be removed if they are no longer commercially grown or maintained.
 3. Interference. Where the tree interferes with the healthy growth of other trees, existing utility service or drainage, or utility work in a previously dedicated right-of-way, and it is not feasible to preserve the tree on site.
 4. Other. Where the applicant shows that tree removal or transplanting is reasonable under the circumstances.
- I. Additional Standards for Type C Permits.
1. Tree survey. For all site development applications reviewed under the provisions of Chapter 4 Planning and Zoning, the developer shall provide a Tree Survey before site development as required by WC 4.610.40, and provide a Tree Maintenance and Protection plan, unless specifically exempted by the Planning Director or DRB, prior to initiating site development.
 2. Platted Subdivisions. The recording of a final subdivision plat whose preliminary plat has been reviewed and approved after the effective date of Ordinance 464 by the City and that conforms with this subchapter shall include a Tree Survey and Maintenance and Protection Plan, as required by this subchapter, along with all other conditions of approval.
 3. Utilities. The City Engineer shall cause utilities to be located and placed wherever reasonably possible to avoid adverse environmental consequences given the circumstances of existing locations, costs of placement and extensions, the public welfare, terrain, and preservation of natural resources. Mitigation and/or replacement of any removed trees shall be in accordance with the standards of this subchapter.
- J. Exemption. Type D permit applications shall be exempt from review under standards D, E, H and I of this subsection.

Response: Noted.

Section 4.610.20. Type A Permit

- (.01) Approval to remove one to three trees within a twelve (12) month period on any property shall be granted if the application meets all of the following requirements:
 - A. The trees subject to removal are not located in the Significant Resource Overlay Zone; and
 - B. The trees subject to removal are not located in the Willamette River Greenway;
 - C. The trees subject to removal are not Heritage Trees.
 - D. The trees subject to removal are not street trees;
 - E. The trees subject to removal must not be retained as a condition of site development approval.
- (.02) Where the City determines that an application to remove a tree or trees does not meet the criteria of 1(A) - (E) of this section, then the application may be submitted as a Type B application.
- (.03) An application for a Type A Permit shall contain the following information:
 - A. A brief statement explaining why tree removal is necessary.
 - B. A brief description of the trees proposed for removal or relocation, including common name, approximate height, diameter (or circumference) at four and one-half (4 1/2) feet d.b.h. above grade, and apparent health.
 - C. A drawing that depicts where trees are located and provides sufficient detail to indicate to a City reviewer where removal or relocation will occur.
 - D. The name of the person who will perform the removal or transplanting, if known, and the approximate date of removal.
 - E. Additional supporting information which the Planning Department requests, in order to determine whether an application meets the requirements of this section.
- (.04) The City shall accept a Type A permit application under the following procedure:
 - A. Review Period. Completed Type A permit applications shall be reviewed within ten (10) working days. The grant or denial of the Tree Removal Permit application shall be the responsibility of the Planning Director.
 - B. The Type A permit application shall be reviewed under the standards of Class I administrative review and applicable requirements of this subchapter.

Response: N/A

Section 4.610.30. Type B Permit

- (.01) An applicant may apply for a Type B Permit based on the following criteria:

- A. The applicant proposes to remove four (4) or more trees on property not subject to site development review; or
 - B. The applicant proposes major or minor changes in a condition or conditions of a development permit previously approved under the provisions of this Chapter; or
 - C. The applicant is a homeowners' association that proposes to remove trees on property previously approved by the City for development.
 - 1. A Tree Maintenance and Protection Plan submitted for approval-under (1)(C) of this subsection shall meet the following criteria:
 - a. The Development Review Board shall review the Covenants, Conditions and Restrictions (CC&R's) to verify that the homeowners' association is designated and authorized by the CC&R's to review tree maintenance, removal, and planting requests.
 - b. A request for tree removal shall indicate the reason for the request, as well as the location, size, species and health of tree.
 - c. Decisions on requests and actions taken are documented and retained and shall be made available to the City's Development Review Board upon request.
 - d. A replanting program is established and reviewed on an annual basis. Where such a program is approved, mitigation under this Chapter shall not be required.
 - 2. Any permit approved under this subsection shall require that all maintenance, planting, and removal be performed to the standards established in this subchapter and in Wilsonville Code.
 - 3. Failure of a homeowners' association to meet the requirements of this subsection shall be grounds for revocation of a Type B permit.
- (.02) Application for the Type B permit shall consist of the information required for a Type A Permit, as provided in WC 4.610.20, and a Tree Maintenance and Protection Plan, which shall contain the following information:
- A. An accurate topographical survey, subdivision map or plat map, that bears the signature of a qualified, registered surveyor or engineer, and which shows:
 - 1. the shape and dimensions of the property, and the location of any existing and proposed structure or improvement,
 - 2. the location of the trees on the site, and indicating species, approximate height, d.b.h. diameter, canopy spread and common name,
 - 3. the location of existing and proposed easements, as well as setbacks required by existing zoning requirements.
 - B. In lieu of the map or survey, an applicant proposing to remove trees under (1)(B) or (1)(C) of this subsection may provide aerial photographs with overlays, GIS

documentation, or maps approved by the Planning Director, and clearly indicating the information required by (2)(A) of this subsection.

- C. Arborist Report. The report shall describe the health and condition of all trees subject to removal or transplanting, and shall include information on species, common name, diameter at four and one-half (4 1/2) feet d.b.h., approximately height and age.
- D. Tree Protection. Unless specifically exempted by the Planning Director, a statement describing how trees intended to remain will be protected during tree removal, and how remaining trees will be maintained.
- E. Tree Identification. Unless specifically exempted by the Planning Director, a statement that any trees proposed for removal will be identified by a method obvious to a site inspector, such as tagging, painting, or flagging, in addition to clear identification on construction documents.
- F. Replacement Trees. A description of the proposed tree replacement program with a detailed explanation including the number, size, and species, and cost. In lieu of replacing trees, the applicant may propose to pay into the City Tree Fund an amount equivalent to the value of the replacement trees after installation, as provided in this subchapter.
- G. Covenants, Conditions and Restrictions (CC&R's). Where the applicant is proposing to remove trees on common areas, the applicant shall provide a copy of the applicable CC&R's, including any landscaping provisions.
- H. Waiver of documentation. The Planning Director may waive an application document where the required information has already been made available to the City, or where the Director determines the information is not necessary to review the application.

(.03) Review.

- A. The Type B permit application, including major or minor changes in a condition or conditions of a development permit previously approved under the provisions of this chapter, shall be reviewed under the standards of Class II administrative review and the requirements of this subchapter. Where site plan review or plat approval by the Development Review Board is not required by City ordinance, the grant or denial of the Type B permit shall be the responsibility of the Planning Director. The Planning Director has the authority to refer a Type B permit application to DRB under the Class II administrative review procedures of this Chapter.
- B. The DRB shall review and render a decision on any application referred by the Planning Director within sixty (60) days. The Planning Director shall review a completed permit application within thirty (30) days.
- C. The decision to grant or deny a Type B permit shall be governed by the standards established in WC 4.610.10.

Response: N/A

Section 4.610.40. Type C Permit

- (.01) Approval to remove any trees on property as part of a site development application may be granted in a Type C permit. A Type C permit application shall be reviewed by the standards of this subchapter and all applicable review criteria of Chapter 4. Application of the standards of this section shall not result in a reduction of square footage or loss of density, but may require an applicant to modify plans to allow for buildings of greater height. If an applicant proposes to remove trees and submits a landscaping plan as part of a site development application, an application for a Tree Removal Permit shall be included. The Tree Removal Permit application will be reviewed in the Stage II development review process, and any plan changes made that affect trees after Stage II review of a development application shall be subject to review by DRB. Where mitigation is required for tree removal, such mitigation may be considered as part of the landscaping requirements as set forth in this Chapter. Tree removal shall not commence until approval of the required Stage II application and the expiration of the appeal period following that decision. If a decision approving a Type C permit is appealed, no trees shall be removed until the appeal has been settled.
- (.02) The applicant must provide ten copies of a Tree Maintenance and Protection Plan completed by an arborist that contains the following information:
- A. A plan, including a topographical survey bearing the stamp and signature of a qualified, registered professional containing all the following information:
1. Property Dimensions. The shape and dimensions of the property, and the location of any existing and proposed structure or improvement.

Response: Please see Landscape sheets L1.1 and L1.2.

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

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

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

Response: Please see Landscape sheets L1.1 and L1.2 for tree survey and evaluation by Northwest Tree Specialists and attached tree report.

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

Response: Please see Landscape sheets L1.1 and L1.2 for tree survey and evaluation by Northwest Tree Specialists and attached tree report.

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

Response: Please see Landscape sheets L1.1 and L1.2.

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

Response: Please see Landscape sheets L1.1 and L1.2.

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

Response: NA

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

Response: NA

Section 4.610.50. Type D Permit

- (.01) The owner or operator of a commercial woodlot shall apply and receive approval for a Type D Permit before beginning harvesting operations of more than three (3) trees within any twelve (12) month period. Type D permit applications shall be subject to the standards and procedures of Class I administrative review and shall be reviewed for compliance with the Oregon Forest Practice Rules. The removal of three (3) or

- fewer trees in a commercial woodlot within any twelve (12) month period shall not require a tree removal permit.
- (.02) Sites which meet the following criteria on the effective date of this regulation shall be designated as commercial woodlots by the Planning Director:
- A. The site is at least 30,000 square feet.
 - B. Trees have been maintained on the site for the purpose of harvesting.
 - C. The property from which the forest species are to be harvested are in a property tax deferred status based on agricultural and/or forest use under state law provisions for Farm Deferral, Forest Land Deferral, or Small Woodlands Deferral.
- (.03) All other sites which potentially meet the criteria of WC 4.610.50(B) shall be reviewed by the Development Review Board, which shall determine whether a site meets the criteria for a commercial woodlot designation when an application is submitted for a tree removal permit.
- (.04) Approval to remove trees as part of a commercial harvest shall be granted if a plan meets all of the following criteria:
- A. Trees will be grown and maintained according to an established plan.
 - B. Approved forestry practices will be followed. Forest practices include the administrative rules as adopted by the Oregon Department of Forestry.
 - C. Harvested trees will be replanted according to an established plan. Where trees are proposed to be removed as a final harvest and no further planting, maintenance, or rotation of trees will occur after trees are removed, the applicant shall propose an erosion control and revegetation plan for review.

Response: N/A

Section 4.620.00. Tree Relocation, Mitigation, Or Replacement

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

Response: Trees will be planted as part of the development.

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

allow the use of replacement Oregon white oaks and other uniquely valuable trees with a smaller diameter.

Response: 25 trees with a min. 2" cal. are proposed throughout the parking lot, 16 trees with a min. 2" cal. are proposed in the rain gardens. Another 16 multi stemmed trees with a min. of one stem being 1" cal. are proposed in the rain gardens. The total tree count for the project is 57 proposed trees. Please see landscape plans L1.3, L1.4 and L2.0.

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

A. Replacement trees shall have shade potential or other characteristics comparable to the removed trees, shall be appropriately chosen for the site from an approved tree species list supplied by the City, and shall be state Department of Agriculture Nursery Grade No. 1 or better.

Response: Please see Landscape sheets L1.3, L1.4 and L2.0

B. Replacement trees must be staked, fertilized and mulched, and shall be guaranteed by the permit grantee or the grantee's successors-in-interest for two (2) years after the planting date.

Response: Please see Landscape sheets L2.0 for tree staking detail.

C. A "guaranteed" tree that dies or becomes diseased during that time shall be replaced.

Response: Noted

D. Diversity of tree species shall be encouraged where trees will be replaced, and diversity of species shall also be maintained where essential to preserving a wooded area or habitat.

Response: 6 species of trees are specified to create diversity, two of the tree species are native.

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

Response: Noted

(.05) Replacement Tree Location.

A. City Review Required. The City shall review tree relocation or replacement plans in order to provide optimum enhancement, preservation and protection of wooded areas. To the extent feasible and desirable, trees shall be relocated or replaced on-site and within the same general area as trees removed.

Response: Noted

- B. Relocation or Replacement Off-Site. When it is not feasible or desirable to relocate or replace trees on-site, relocation or replacement may be made at another location-approved by the City.

Response: Noted

- (.06) City Tree Fund. Where it is not feasible to relocate or replace trees on site or at another approved location in the City, the Tree Removal Permit grantee shall pay into the City Tree Fund, which fund is hereby created, an amount of money approximately the value as defined by this subchapter, of the replacement trees that would otherwise be required by this subchapter. The City shall use the City Tree Fund for the purpose of producing, maintaining and preserving wooded areas and heritage trees, and for planting trees within the City.
 - A. The City Tree Fund shall be used to offer trees at low cost on a first-come, first-serve basis to any Type A Permit grantee who requests a tree and registers with the City Tree Fund.
 - B. In addition, and as funds allow, the City Tree Fund shall provide educational materials to assist with tree planting, mitigation, and relocation.

Response: NA

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

Response: NA

Section 4.620.10. Tree Protection During Construction

- (.01) Where tree protection is required by a condition of development under Chapter 4 or by a Tree Maintenance and Protection Plan approved under this subchapter, the following standards apply:
 - A. All trees required to be protected must be clearly labeled as such.
 - B. Placing Construction Materials Near Tree. No person may conduct any construction activity likely to be injurious to a tree designated to remain, including, but not limited to, placing solvents, building material, construction equipment, or depositing soil, or placing irrigated landscaping, within the drip line, unless a plan for such construction activity has been approved by the Planning Director or Development Review Board based upon the recommendations of an arborist.

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

Response: Please see landscape sheets L1.1 and L1.2 for tree removal, tree protection fence detail, and tree protection notes.

Section 4.620.20. Maintenance And Protection Standards

- (.01) The following standards apply to all activities affecting trees, including, but not limited to, tree protection as required by a condition of approval on a site development application brought under this Chapter or as required by an approved Tree Maintenance and Protection Plan.
 - A. Pruning activities shall be guided by the most recent version of the ANSI 300 Standards for Tree, Shrub, and Other Woody Plant Maintenance. Information on these standards shall be available upon request from the Planning Department.

Response: Pruning will be guided by ANSI 300 standards for tree, shrub, and other woody plant maintenance. Please see landscape specifications sheet L3.0.

- B. Topping is prohibited.
 - 1. Exception from this section may be granted under a Tree Removal Permit if necessary for utility work or public safety.

Response: Noted

Section 4.630.00. Appeal

- (.01) The City shall not issue a Tree Removal Permit until approval has been granted by either the Planning Director or the DRB. Any applicant denied a Type A or B permit may appeal the decision as provided for in review of Class I Development Applications, or Class II Development Applications, whichever is applicable. Decisions by the Planning Director may be appealed to the DRB as provided in WC 4.022. Decisions by the DRB may be appealed to the City Council as provided in WC 4.022.
- (.02) The City shall not issue a Tree Removal Permit approved by the Development Review Board until fifteen (15) calendar days have passed following the approval. The grant or denial of a Tree Removal Permit may be appealed to the City Council in the same manner as provided for in WC 4.022. An appeal must be filed in writing, within the fifteen (15) calendar day period following the decision being appealed. The timely filing of an appeal shall have the effect of suspending the issuance of a permit pending the outcome of the appeal. The City Council, upon review, may affirm, reverse or modify the decision rendered by the Development Review Board based upon the same standards of review specified for the DRB in the Wilsonville Code.

Response: Noted.

Section 4.630.10. Display Of Permit; Inspection

The Tree Removal Permit grantee shall conspicuously display the permit on-site. The permit grantee shall display the permit continuously while trees are being removed or replaced or while activities authorized under the permit are performed. The permit grantee shall allow City representatives to enter and inspect the premises at any reasonable time, and failure to allow inspection shall constitute a violation of this subchapter.

Response: Noted.

Section 4.630.20. Variance For Hardship

Any person may apply for a variance of this subchapter as provided for in Section 4.196 of this Chapter.

Response: Noted.

Section 4.630.30. Severability

If any part of this ordinance is found by a court of competent jurisdiction to be invalid, that part shall be severable and the remainder of this ordinance shall not be affected.

Response: Noted.

Section 4.640.00. Violation; Enforcement

- (.01) The cutting, damaging, or removal of any individual tree without a permit as required by this ordinance constitutes a violation punishable as a separate infraction under WC 1.013. In addition, each violation of a condition or a violation of any requirement of this Chapter shall constitute a separate infraction.
- (.02) Retroactive Permit. A person who removes a tree without obtaining a Type A or Type B permit may apply retroactively for a permit. In addition to all application requirements of this Chapter, the person must be able to demonstrate compliance with all requirements of this subchapter, in addition to paying a triple permit fee and a penalty per tree in an amount established by resolution of City Council. Mitigation requirements of this subchapter apply to all retroactive permits.
- (.03) Nuisance Abatement. Removal of a tree in violation of this Chapter is a nuisance and may be abated as provided in Sections 6.230 to 6.244, 6.250, and 6.260 of the Wilsonville Code.
- (.04) Withholding Certificate of Occupancy. The City Building Official has the authority to issue a stop-work order, withhold approval of a final plat, or withhold issuance of a certificate of occupancy, permits or inspections until the provisions of this Chapter, including any conditions attached to a Tree Removal Permit, have been fully met.
- (.05) Fines. Fines for a violation shall be imposed according to WC 1.012.
- (.06) Mitigation. The City shall require the property owner to replace illegally removed or damaged trees. The City may also require a combination of payment and tree replacement.
 - A. The City shall notify the property owner in writing that a violation has occurred and mitigation is required. Within thirty (30) days of the date of mailing of the notice, the property owner shall provide a mitigation plan to the City. The plan shall provide for replacement of a tree of similar species and size taking into account the suitability of the site and nursery stock availability.
 - B. Replacement will be on an inch-for-inch basis computed by adding the total diameter measured at d.b.h. in inches of the illegally removed or damaged trees. The City may use any reasonable means to estimate the tree loss if destruction of the illegally removed or damaged trees prevents exact measurement. All replaced trees must be a minimum two-inch (2") caliper. If the mitigation requirements cannot be completed on the property, the City may require completion at another approved location. Alternatively, the City may require payment into the City Tree Fund of the value of the removed tree as established by the Planning Department.

Response: Noted.

Section 4.640.10. Alternative Enforcement

- (.01) In the event that a person commits more than one violation of WC 4.600.30 to WC 4.630.00, the following alternative sentence may be imposed:
- A. If a person has gained money or property through the commission of an offense under this section, then upon conviction thereof, the court, in lieu of imposing a fine, may sentence the person to pay an amount, fixed by the court, not to exceed double the amount of the gain from the commission of the offense.
 - B. “Gain” is defined as the amount of money or value of property derived from the commission of the violation, less the amount of money or value of property seized by or surrendered to the City. “Value” shall be the greater of the market value or replacement cost as determined by a licensed professional in the tree, nursery, or landscape field.
 - C. Any fines collected by the City under this section shall accrue to the City Tree Fund.

Response: Noted.

Section 4.640.20. Responsibility For Enforcement.

Compliance with this Chapter shall be enforced by the City Attorney, the City Attorney’s designee, and Clackamas County or Washington County law enforcement officers.

Response: Noted.

Prepared for



Wilsonville Industrial Focus

Transportation Impact Analysis



Prepared by



January 2019



January 25, 2019

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dksassociates.com

Steve Adams
City of Wilsonville
29799 Town Center Loop East
Wilsonville, OR 97070

Subject: Wilsonville Industrial Focus Transportation Impact Study

P18005-007

Dear Steve,

DKS Associates is pleased to submit this transportation impact study for the proposed Industrial Focus development located on Boones Ferry Road in Wilsonville. Please feel free to call if you have any questions or comments regarding this study.

Sincerely,
DKS Associates

Scott Mansur, P.E., PTOE
Transportation Engineer

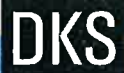


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CHAPTER 1: INTRODUCTION

This study evaluates the transportation impacts associated with the proposed Industrial Focus development located on the south side of Boeckman Road between Boones Ferry Road and Boberg Road in Wilsonville, Oregon (tax parcels 31W14A 0500 and 31W14A 0300). Based on the information provided by the project sponsor, this phased project consists of building three 32,000 square-foot industrial/flex buildings, with each building constituting a phase of the project. Each building will accommodate 16,000 square feet of office-technology, 8,000 square feet of manufacturing and 8,000 square feet of warehouse.

The purpose of this transportation impact analysis is to identify potential mitigation measures needed to offset transportation impacts that the proposed development may have on the nearby transportation network. The impact analysis is focused on the study intersections, which were selected for evaluation in coordination with City staff. The intersections are shown in Figure 1 and listed below:

- Boeckman Road/Boberg Road
- Boones Ferry Road/Barber Street

This chapter introduces the proposed development. Table 1 lists important characteristics of the study area and proposed project.

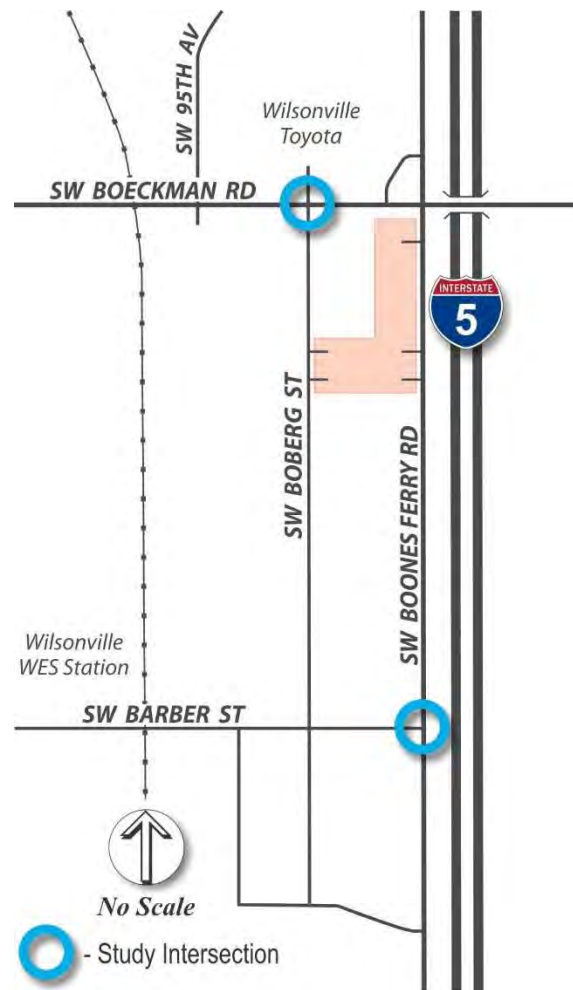


Figure 1: Study Area Map

Table 1: Key Study Area and Proposed Development Characteristics

Characteristics	Information
Study Area	
Number of Study Intersections	2
Analysis Period	Weekday PM Peak Hour (Peak hour between 4-6 PM)
Project Site	
Existing Land Use	Vacant
Proposed Development	Three industrial/flex buildings of 32,000 square-feet each
Proposed Project Accesses	Three full access driveways on Boones Ferry Road and two full access driveways on Boberg Road (full project buildout)

CHAPTER 2: EXISTING CONDITIONS

This chapter provides documentation of existing study area conditions, including the study area roadway network, pedestrian and bicycle facilities, and existing traffic volumes and operations. Supporting details for volumes and operations are provided in the appendix.

Project Site

The project sponsor plans to build three 32,000 square-foot buildings, each building constituting a project phase. Each building will accommodate 16,000 square feet of office-technology, 8,000 square feet of manufacturing and 8,000 square feet of warehouse. The site will be located south of Boeckman Road between Boberg Road and Boones Ferry Road.

Study Area Roadway Network

Key roadways in the study area are summarized in Table 2 along with their existing (or proposed) roadway characteristics. Adjacent to the site Boeckman Road is identified as a Major Arterial, and both Boones Ferry Road and Boberg Streets as Collector level roadways. The functional classifications for City of Wilsonville streets are provided in the *City of Wilsonville Transportation System Plan (TSP)*.¹

Table 2: Study Area Roadway Characteristics (within the Study Area)

Roadway	Classification	No. of Lanes	Posted Speed	Sidewalks	Bike Lanes	On-Street Parking
Boeckman Road	Major Arterial	2-3	40 mph	Partial ^b	Yes	No
Boones Ferry Road	Collector	2	35 mph - 45 mph ^a	Partial ^c	No	No
Boberg Road	Collector	2	40 mph	Partial ^d	Yes	No
Barber Street	Collector	2	35 mph	Yes	Yes	No

^a Posted speed limit is 35 mph south of Barber Street and 45 mph north of Barber Street.

^b No sidewalk present east of Boberg Road.

^c Sidewalk present (west side only) south of Barber Street, adjacent to Pacific Pride Fueling and Marion Carpets, and from the Boeckman Road overpass for approximately 350 feet to the south on the west side of Boones Ferry Road only.

^d Sidewalk gap fronting proposed project site.

Pedestrian and Bicycle Facilities

Near the project site, Boeckman Road is classified by the City as a major arterial but is unimproved and does not currently have curbs, gutters, or bike lanes east of Boberg Road. On Boberg Road, sidewalk is present along the roadway except fronting the proposed project site. Boones Ferry Road has sidewalks on the west side near the Boeckman Road overpass for

¹ Figure 3-2, *Wilsonville Transportation System Plan*, Adopted by Council, June 2016.

approximately 350 feet to the south. There are also no bike lanes along Boones Ferry Road in the study area. The traffic counts showed a total of two pedestrians and three bicyclists during the PM peak hour at the intersection of Boeckman Road/Boberg Road. There were zero pedestrians and two bicyclists observed at the Boones Ferry Road/Barber Street intersection. The counts were collected in December and do not reflect peak pedestrian and bicyclist volumes which might be seen in the summer months.

Public Transit Service

South Metro Area Regional Transit (SMART) operates several fixed routes that serve Wilsonville and the surrounding area.² Route 6 travels on Boeckman Road and Boberg Road and provides service between the SMART Central Station in Wilsonville to Argyle Square. There are multiple stops along Boberg Road going in both directions for Route 6. There is one southbound stop that is located at the proposed project site.

Future Planned Projects

Higher Priority Projects

The following is a list of higher priority projects included in the Wilsonville TSP³. A map of these improvements can be seen in the appendix.

- **RW-01 Boeckman Road Bridge and Corridor Improvements:** Widen Boeckman Road from Boberg Road to 500 feet east of Parkway Avenue to include additional travel lanes in both directions along with bike lanes and sidewalks; project includes reconstruction of the bridge over I-5 and improvements at Boeckman Road/Boberg Road and Boeckman road/Parkway Avenue intersections.
- **BW-03 Boberg Road Sidewalk Infill:** Fill in gaps in the sidewalk network on the east side of the roadway from Boeckman Road to Barber Street, and construct transit stop improvements.
- **BW-09 Town Center Loop Bike/Pedestrian Bridge:** Construct bike/pedestrian bridge over I-5 approximately aligned with Barber Street to improve connectivity of Town Center area with businesses and neighborhoods on west side of I-5; include aesthetic design treatments.

Additional Planned Projects

The following is a planned but unfunded project included in the Wilsonville TSP near the project site. A map of this improvement location can be seen in the appendix.

² South Metro Area Regional Transit (SMART) operates several fixed routes that serve Wilsonville and make connections to TriMet in Portland, Cherriots in Salem, and Canby Area Transit. The City's transit center, "SMART Central at Wilsonville Station," provides connections to all SMART routes and to TriMet's Westside Express Service (WES) commuter rail station.

³ Figure 5-2, Wilsonville Transportation System Plan, Amended June 2016.

- **UU-P2B Boones Ferry Road Urban Upgrade:** Upgrade Boones Ferry Road from Wilsonville Road to Ridder Road with bike lanes on both sides and sidewalks on west side only.

Existing Traffic Volumes and Operations

Existing PM peak hour traffic operations were analyzed at the following study intersections based on coordination with city staff⁴:

- Boeckman Road/Boberg Road
- Boones Ferry Road/Barber Street

Intersection turn movement volumes were collected⁵ at these intersections during two consecutive PM peak periods when schools were in session. The most conservative set of volumes between the two days was used in the intersection operations analysis and is shown in Figure 2. The following sections describe intersection performance measures, required operating standards, and existing operating conditions.

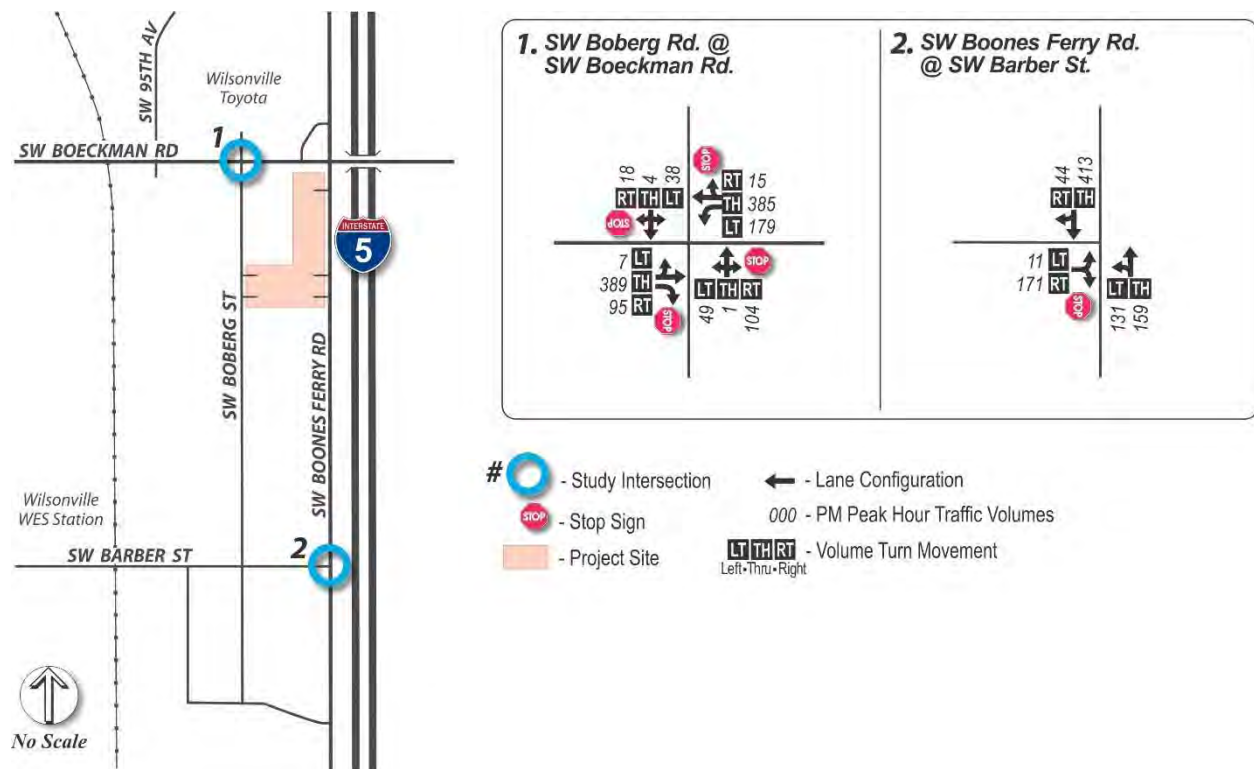


Figure 2: Existing PM Peak Hour Traffic Volumes

⁴ Phone call with Steve Adams, November 13, 2018.

⁵ Traffic data for all study intersections was collected on December 4th and December 5th, 2018 by Key Data Network.

Intersection Performance Measures

Level of service (LOS) ratings and volume-to-capacity (v/c) ratios are two commonly used performance measures that provide a good picture of intersection operations.

- **Level of service (LOS):** A “report card” rating (A through F) based on the average delay experienced by vehicles at the intersection.⁶ LOS A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. LOS D and E are progressively worse operating conditions. LOS F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity.
- **Volume-to-capacity (v/c) ratio:** A decimal representation (typically between 0.00 and 1.00) of the proportion of capacity that is being used at a turn movement, approach leg, or intersection. It is determined by dividing the peak hour traffic volume by the hourly capacity of a given intersection or movement. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases, and performance is reduced. If the ratio is greater than 1.00, the turn movement, approach leg, or intersection is oversaturated and usually results in excessive queues and long delays.

Required Operating Standards

The City of Wilsonville requires study intersections on public streets to meet its minimum acceptable level of service (LOS) standard, which is LOS D per overall intersection for peak periods.⁷

Existing Operating Conditions

Existing traffic operations at the study intersections were determined for the PM peak hour based on the 2010 Highway Capacity Manual (HCM) methodology for unsignalized intersections.⁸ The results were then compared with the City of Wilsonville’s minimum acceptable level of service (LOS) operating standard of LOS D or better. Table 3 lists the estimated delay, LOS, and v/c ratio of each study intersection. The existing study intersections currently meet operating standards.

⁶ A description of Level of Service (LOS) is provided in the appendix and includes a list of the delay values (in seconds) that correspond to each LOS designation.

⁷ *City of Wilsonville Code*, City of Wilsonville Section 4.140(.09)J.2., p.166.

⁸ *2000 & 2010 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2000/2010.

Table 3: Existing PM Peak Study Intersection Operations

Intersection	Operating Standard	Existing PM Peak		
		Delay	LOS	v/c
Boeckman Road/Boberg Road	LOS D	26.4	D/B	0.76
Boones Ferry Road/Barber Street	LOS D	14.9	A/B	0.35

Unsignalized Intersections:

Delay = Average Stopped Delay per Vehicle (sec) at Worst Movement

LOS = Level of Service of Major Street/Minor Street

v/c = Volume-to-Capacity Ratio of Worst Movement

CHAPTER 3: PROJECT IMPACTS

This chapter reviews the impacts that the proposed Industrial Focus development may have on the study area transportation system. This analysis includes site plan evaluation, trip generation, trip distribution, and future year traffic volumes and operating conditions for the two study intersections.

Proposed Development

The proposed development involves building three 32,000 square-foot industrial/flex buildings, with each building constituting a phase of the project. Each building will accommodate 16,000 square feet of office-technology, 8,000 square feet of manufacturing and 8,000 square feet of warehouse. The site will be located south of Boeckman Road between Boberg Road and Boones Ferry Road. This development proposes five full access points: two accesses on Boberg Road and three accesses on Boones Ferry Road. The most northern access on Boones Ferry Road will not be built until the completion of Phase 3 (full development).

Future Analysis Scenarios

Two future project scenarios were selected for this analysis: Phase 1 and Full Development. The Phase 1 analysis scenario assumes that one 32,000 square-foot building is built and occupied. The Full Development assumes all three phases (all three buildings) have been built and occupied.

All future analysis scenarios assume a two-way stop-controlled intersection at Boeckman Road/Boberg Road. The existing all-way stop-control was intended to be an interim traffic control device to reduce minor street delays while the Kinsman Road extension improvement project (between Barber Street and Boeckman Road) was being designed and built.⁹ Now that the Kinsman Road improvement project is complete, northbound traffic volume has shifted off of Boberg Road and onto Kinsman Road and the intersection does not meet all-way stop warrants as discussed in the All-Way Stop Control Warrant section in this report. Additionally, traffic volumes on Boeckman Road have been increasing due to the construction of the Villebois developments. Therefore, a two-way stop-controlled intersection was used as the basis of future analysis.

Trip Generation

Trip generation is the method used to estimate the number of vehicles added to site roadways and the adjacent roadway network by a development during a specified period (i.e., such as the PM peak hour). For this study, typical ITE 10th Edition trip generation data was used which is based on national land use data.

⁹ Wilsonville Commuter Rail Park and Ride TIS – Revised Mitigation Summary, DKS Associates, February 2011.

Table 4 provides the trip generation for the proposed development. As shown, the development is expected to generate approximately 26 total (4 in, 22 out) PM peak hour trips at the end of Phase 1. The trip generation for all three phases was also calculated and the development is anticipated to generate approximately 78 total (15 in, 63 out) PM peak hour trips at the end of Phase 3 (Full Development). Note that the trip rate for General Office Building (710) is back-calculated based on the non-linear ITE trip generation equation for that land use.

Table 4: PM Peak Hour Primary Trip Generation

Land Use (ITE Code)	Size	PM Peak Hour				Daily Trips
		Trip Rate	In	Out	Total	
General Office Building (710)	16 KSF	1.19 Trips/KSF ^{1,2}	3	16	19	179
Warehousing (150)	8 KSF	0.19 Trips/KSF	0	2	2	14
Manufacturing (140)	8 KSF	0.67 Trips/KSF	1	4	5	31
Phase 1 Total Trips			4	22	26	224
General Office Building (710)	48 KSF	1.19 Trips/KSF ¹	9	48	57	521
Warehousing (150)	24 KSF	0.19 Trips/KSF	1	4	5	42
Manufacturing (140)	24 KSF	0.67 Trips/KSF	5	11	16	94
Full Development Total Trips			15	63	78	657

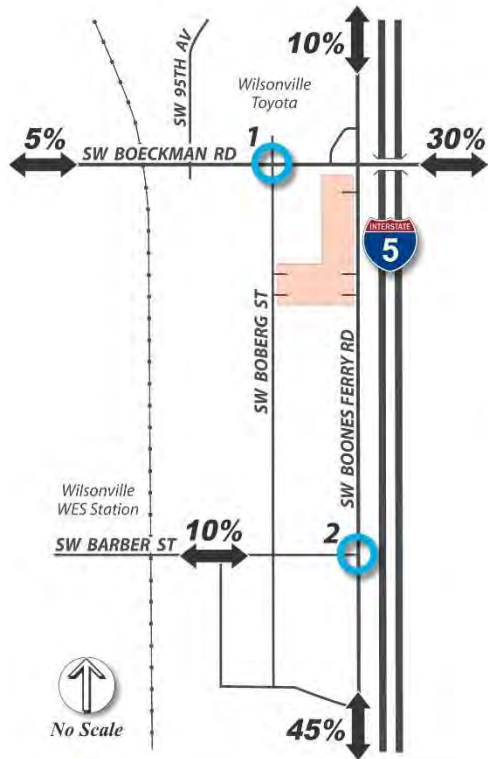
¹Rate back-calculated from ITE fitted curve equation.

²KSF= 1,000 square feet

Trip Distribution

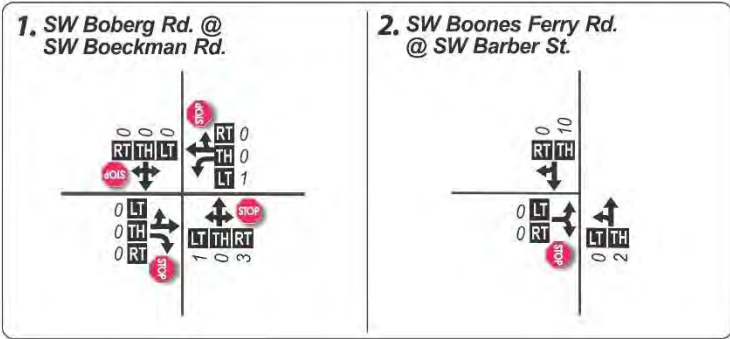
Trip distribution provides an estimate of where project-related trips would be coming from and going to. It is given as percentages at key gateways to the study area and is used to route project trips through the study intersections. Figure 3 on the following page shows the expected trip distribution and project trip routing for the additional traffic generated by the Industrial Focus project. The distribution shows 45% of trips traveling south of the project site via Boones Ferry Road and 10% trips will travel north. Approximately 5% of trips will travel west on Boeckman Road and 30% will travel east on Boeckman Road. The distribution assumes that 10% of the trips will use Barber Street. The trip distribution was estimated using the City of Wilsonville travel demand model.¹⁰

¹⁰ Wilsonville Travel Forecast Model, select zone model run for TAZ 4029.



- # - Study Intersection
- Stop Sign
- Project Site
- Lane Configuration
- 000 - PM Peak Hour Traffic Volumes
- Volume Turn Movement
Left-Thru-Right

Phase 1



Full Project

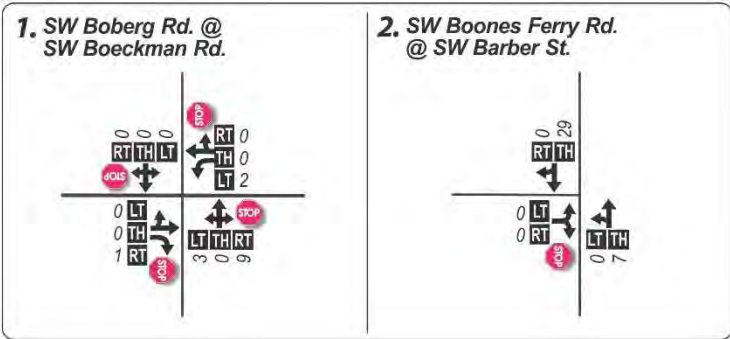


Figure 3: Trip Distribution and Project Trips

Project Trips Through City of Wilsonville Interchange Areas

The project trips through the two City of Wilsonville I-5 interchange areas were estimated based on the trip generation and distribution assumptions as discussed prior.

The proposed Industrial Focus development is expected to generate three PM peak hour trips through the I-5/Elligsen Road interchange area and 12 PM peak hour trips through the I-5/Wilsonville Road interchange area for Phase 1.

For full development buildout, the development is expected to generate 8 PM peak hour trips through the I-5/Elligsen Road interchange area and 36 PM peak hour trips through the I-5/Wilsonville Road interchange area.

Future Traffic Volumes and Operating Conditions

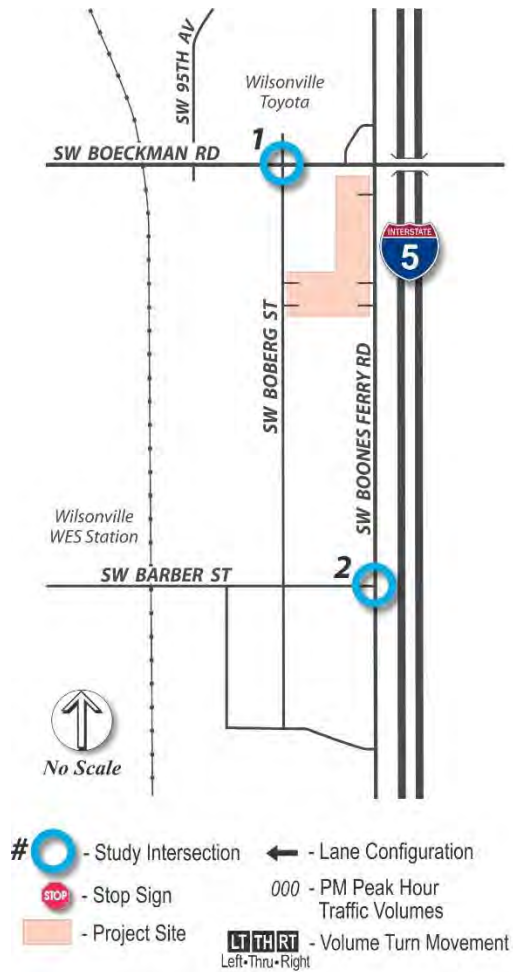
Future operating conditions were analyzed at the study intersections for the following future traffic scenarios. The comparison of the following scenarios enables the assessment of project impacts:

- Existing + Stage II ¹¹
- Existing + Phase 1
- Existing + Stage II + Phase 1
- Existing + Full Development
- Existing + Stage II + Full Development

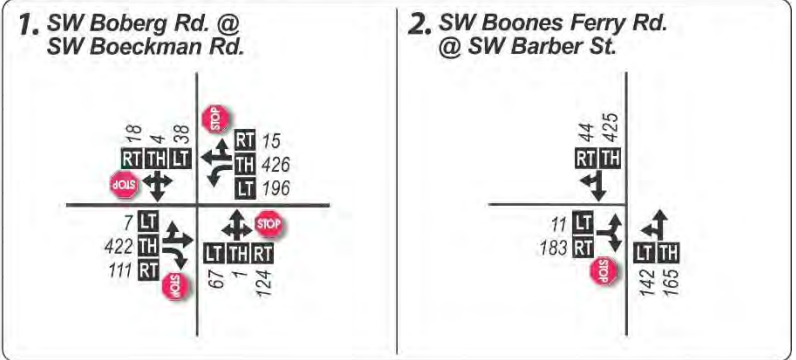
Future traffic volumes were estimated at the study intersections for each scenario. The future operating scenarios include various combinations of three types of traffic: existing, Phase 1, Full Development, and Stage II. Stage II development trips are estimated based on the list of currently approved Stage II developments provided by City staff.¹² The Stage II list and the corresponding PM peak hour trip generation estimates for these developments are included in the appendix. Figure 4 on the following pages show the PM peak hour traffic volumes used to analyze the future scenarios.

¹¹ Stage II includes traffic from other developments with Stage II approval or developments that are under construction.

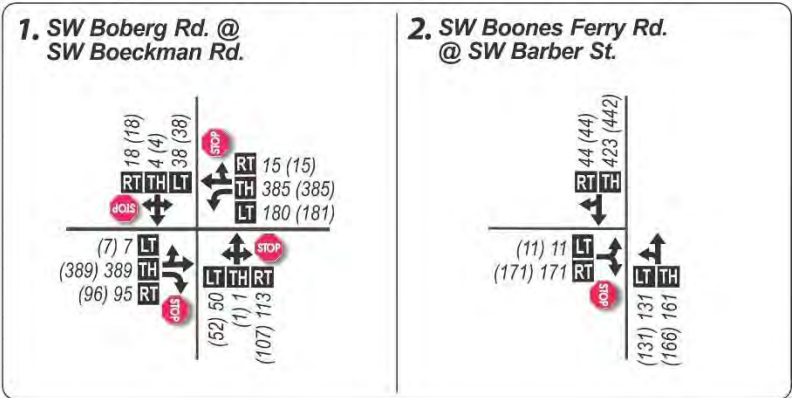
¹² Email from Daniel Pauly, City of Wilsonville, December 21, 2018.



Existing + Stage II



Existing + Phase 1 (Existing + Full Buildout)



Existing + Stage II + Phase 1 (Existing + Stage II + Full Buildout)

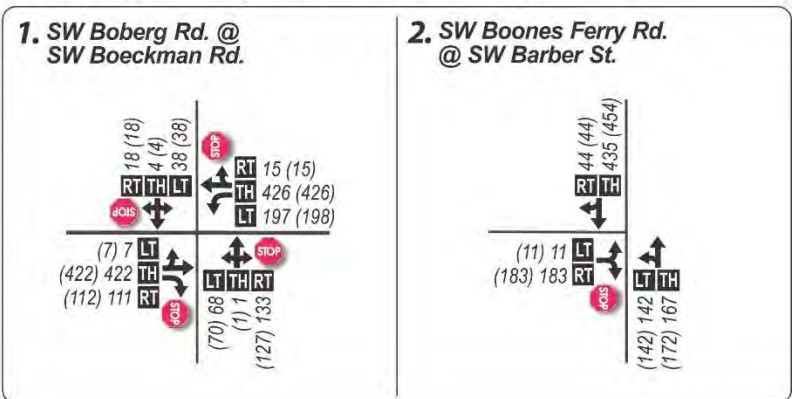


Figure 4: Future PM Peak Hour Traffic Volumes

Intersection Operations

All future analysis scenarios assume a two-way stop-controlled intersection at Boeckman Road/Boberg Road as discussed in the *Future Analysis Scenarios* section earlier.

The study intersection operating conditions for the project trips after Phase 1 and future Stage II developments are listed in Table 5. All study intersections meet operating standards for all scenarios shown below.

Table 5: Future Phase 1 and Stage II Intersection Operations Comparison

Intersection	Operating Standard	Existing + Stage II			Existing + Phase 1			Existing + Stage II + Phase 1		
		Delay	LOS	v/c	Delay	LOS	v/c	Delay	LOS	v/c
Boeckman Road/ Boberg Road	LOS D	24.4	A/C	0.53	18.3	A/C	0.38	24.8	A/C	0.54
Boones Ferry Road/ Barber Street	LOS D	15.6	A/C	0.38	15.2	A/C	0.36	15.9	A/C	0.39

Unsignalized Intersections:

Delay = Average Stopped Delay per Vehicle (sec) at Worst Movement

LOS = Level of Service of Major Street/Minor Street

v/c = Volume-to-Capacity Ratio of Worst Movement

Bold/Highlighted: Intersection fails to meet operating standard

The study intersection operating conditions for the project trips after all three phases (full development) and future Stage II developments are listed in Table 6. All study intersections meet operating standards for all scenarios shown below.

Table 6: Future Full Development and Stage II Intersection Operations Comparison

Intersection	Operating Standard	Existing + Full Development			Existing + Full Development + Stage II		
		Delay	LOS	v/c	Delay	LOS	v/c
Boeckman Road/Boberg Road	LOS D	18.8	A/C	0.40	25.6	A/D	0.56
Boones Ferry Road/Barber Street	LOS D	15.7	A/C	0.37	16.4	A/C	0.40

Unsignalized Intersections:

Delay = Average Stopped Delay per Vehicle (sec) at Worst Movement

LOS = Level of Service of Major Street/Minor Street

v/c = Volume-to-Capacity Ratio of Worst Movement

Bold/Highlighted: Intersection fails to meet operating standard

It should be noted that the operations shown in the two tables above for intersection of Boeckman Road/Boberg Road do not include the operations for the north leg, which is the private driveway to the Wilsonville Toyota development. This approach operates at LOS F in the

future scenarios, but since the approach is privately owned, it is not required to meet the City's operational standards.

All-Way Stop Control Warrant Analysis

The intersection of Boeckman Road/Boberg Road was previously analyzed and converted to an all-way stop prior to the construction of the Kinsman Road extension that was recently constructed between Barber Street and Boeckman Road. This roadway extension provided a primary arterial connection that is parallel to Boberg Road that would remove traffic volumes from Boberg Road, therefore, an all-way stop evaluation has been prepared to determine if the existing all-way stop should be removed and replaced with two-way stop control on the north and south minor street approaches and uncontrolled on the Boeckman Road arterial approaches.

An all-way stop warrant evaluation was conducted as outlined in the Manual on Uniform Traffic Control Devices (MUTCD)¹³. The MUTCD guidance provides a series of thresholds that are based on vehicle and pedestrian volumes and collision history. Each of the multi-way stop thresholds were evaluated for the Boeckman Road/Boberg Road intersection based on collision data provided by the Oregon Department of Transportation (ODOT) and 24-hour tube counts data.¹⁴

The multi-way stop vehicular volume warrant threshold recommends a vehicular volume of 300 vehicles per hour (vph) on the major street and 200 vph on the minor street for the *same* eight hours of an average day. As shown in the table below, none of the three scenarios that were analyzed meet the volume criteria. None of these scenarios generate enough traffic to meet the all-way stop criteria for the minor street approaches. Therefore, the all-way stop control at this intersection does not meet volume warrants at this location under existing, Phase 1, or full development build out conditions.

Table 7: All-Way Stop Warrant – Volume Criteria

Scenario	Hours Met		Warrant Met?
	Major Street Volume (minimum 300 vph)	Minor Street Volume (minimum 200 vph)	
Existing (2018)	14	2	No
Future (Existing + Stage II + Phase 1)	14	5	No
Future (Existing + Stage II + Full Development)	14	5	No

¹³ Manual on Uniform Traffic Control Devices, Federal Highway Administration, 2009 Edition.

¹⁴ 24-hour traffic data was collected by the City of Wilsonville on January 8, 9 and 10th, 2019.

The collision history warrant requires five or more crashes in a 12-month period that may be corrected by a multi-way stop intersection. Currently, the Boeckman Road/Boberg Road intersection has not experienced any collisions in the last 12 months of available collision data¹⁵, therefore the collision history warrant is not met. The complete all-way stop warrant analysis is shown in the Appendix.

Site Plan Evaluation

Because this project is proposed to be built in phases, there are two site plans provided by the project sponsor, Phase 1 site plan and the Master development site plan that shows all three phases. Both site plans showing the proposed development can be found in the appendix.

Site Access and Circulation

There are four proposed site access for Phase 1, two full-access driveways on Boones Ferry Road and two full-access driveways on Boberg Road. For the full project buildout, there is an additional proposed full-access driveway on Boones Ferry Road at the north end of the project site.

The City has minimum driveway clear drive aisle length standards. For driveways with more than 100 average daily traffic (ADT), the minimum clear drive aisle length shall be 100 feet. The current site plans show approximately 20-foot driveway aisles at all five driveways, failing to meet standards. It recommended that the clear drive aisle lengths be shown at a minimum 100 feet at all proposed driveways.

The site plans show sufficient space for two-way motor vehicle circulation throughout the parking lot (24-foot wide aisles).

Pedestrian and Bicycle Facilities

The site plans show sidewalks along all building frontages and along Boones Ferry Road and Boberg Road fronting the project site. Marked pedestrian walking areas are delineated on the both site plans at each of the buildings' entrances, providing clear guidance for pedestrians to safely cross through the parking lot. It is recommended to construct all sidewalks to meet ADA requirements.

It is also recommended to improve Boones Ferry Road along the project site frontage to meet the City's collector standards as discussed in the TSP¹⁶. This includes building 5-foot sidewalks, a six-foot bike lane, and widening the street to include a median/turn lane on the western half of the street.

¹⁵ Collision data provided by Oregon Department of Transportation for analysis period 1/1/2017 to 12/31/2017.

¹⁶ Figure 3-8, City of Wilsonville TSP, City of Wilsonville, Amended June 2016.

Access Spacing and Sight Distance

All proposed access points are required to meet the City's required spacing between intersections and driveways. According to the Public Works Standards¹⁷, the desired access spacing on collectors is 300 feet, and the minimum access spacing is 100 feet. Boones Ferry Road and Boberg Road are both classified as collectors. The three proposed accesses on Boones Ferry Road are approximately 225 - 250 feet apart from each other and the two proposed accesses on Boberg Road are approximately 250 feet apart from each other.

However, on Boberg Road, north of the site, there is a driveway for another development only 50 feet north of the proposed driveway; whereas south of the project site the next driveway is 320 feet away. The proposed northern driveway on Boberg Road does not meet access spacing standards and should either be removed or a waiver from the City Engineer would need to be granted.

Additionally, the Walnut Park exit driveway is located 100 feet to the south of the proposed south driveway on Boones Ferry Road. In order to meet the desired access spacing standard (300 feet), it is recommended to close the proposed south driveway on Boones Ferry Road. The trip generation does not show a need for more than two driveways on Boones Ferry Road.

Preliminary sight distance was evaluated at the proposed project driveways. With the required roadway improvements, the driveways on Boones Ferry Road would be set back approximately 20 feet. The foliage near the Walnut Park site may block sight distance for the proposed south driveway. Prior to occupancy, sight distance at any proposed access points will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon to assure that buildings, signs or landscaping does not restrict sight distance.

Parking

The proposed project buildings are required to comply with the City of Wilsonville Planning and Land Development code for the number of vehicular parking stalls and bicycle parking spaces that are provided on site.¹⁸ Table 8 lists the vehicular and bicycle parking requirements for both Phase 1 and the full development scenarios. The parking requirements are based on the building types and square footage of the various building uses. The table also lists the peak parking demand, which is estimated based on parking data published by the Institute of Transportation Engineers (ITE).¹⁹

¹⁷ Table 2.12, Public Works Standards, City of Wilsonville, 2015.

¹⁸ City of Wilsonville, Planning and Land Development Ordinance, Sections 4.154-4.198, Updated Feb. 2004.

¹⁹ *Parking Generation*, 4th Edition, Institute of Transportation Engineers, 2010.

Table 8: Vehicular and Bicycle Parking Summary

Land Use (ITE Code)	Size (KSF ^a)	Estimated Peak Demand ^b	Spaces Required by City Code ^c		
			Vehicle Minimum	Vehicle Maximum	Bicycle Minimum
General Office Building (710)	16	45	43	66	3
Warehousing (150)	8	4	2	4	2
Manufacturing (140)	8	8	13	No limit	6
Total Phase 1	32	57	58	No limit	6
General Office Building (710)	48	136	130	197	10
Warehousing (150)	24	12	7	12	2
Manufacturing (140)	24	24	38	No limit	6
Total Full Development	96	172	175	No limit	10

^a KSF = 1,000 square feet

^b Estimated demand based on 85th percentile identified in the *Parking Generation, 4th Edition*, ITE, 2010.

^c City of Wilsonville, Planning and Land Development Ordinance, Section 4.155, Table 5, Updated June 2013.

As shown above, 58 vehicular stalls are needed to meet the minimum City Code requirements for Phase 1 and 57 stalls are needed to satisfy the estimated peak parking demand. For the full development, 175 vehicular stalls are needed to meet the minimum City Code requirements and 172 stalls are needed to satisfy the estimated peak parking demand. Because the site is expected to have 99 parking stalls with the implementation of Phase 1 and 294 parking stalls at the completion of the full development, the site is expected to have sufficient available parking.

The table above also indicates that 11 bicycle parking spaces are needed at the project site to meet the minimum City Code requirements for Phase 1 and 18 bicycle parking spaces for full development. The Phase 1 site plan shows six bicycle parking stalls; enough to meet the minimum requirement. The full development site plan does not currently show any bicycle parking stalls. At minimum, 10 bicycle parking spaces will need to be built on the project site at the completion of the full development and should be located near building entrances in order to provide convenient access.

Project Impact Summary

The Industrial Focus development is anticipated to result in the following impacts:

Trip Generation

- The development consists of three 32,000 square-foot buildings, to be built in three phases, with each building constituting a project phase.

- Phase 1 is expected to generate 26 total (4 in, 22 out) PM peak hour trips. The full development (through Phase 3) is anticipated to generate approximately 78 total (15 in, 63 out) PM peak hour trips.
- Of the 26 Phase 1 project trips, three new PM peak hour trips are estimated to pass through the I-5/SW Elligsen Road interchange area and 12 PM peak hour trips through the I-5/Wilsonville Road interchange area.
- Of the 78 full project buildout trips, 8 new PM peak hour trips are estimated to pass through the I-5/SW Elligsen Road interchange area and 36 PM peak hour trips through the I-5/Wilsonville Road interchange area.

Intersection Operations

- All study intersections meet City standards under all analysis scenarios.

Site Plan Evaluation

- It is recommended that the clear drive aisle lengths be shown at a minimum 100 feet at all proposed driveways.
- It is recommended to construct all sidewalks to meet ADA requirements.
- It is also recommended to improve Boones Ferry Road along the project site frontage (west side only) to meet the City's collector standards, including 5-foot sidewalks, 6-foot bike lanes, and widening the street to include a median/turn lane on the western half of the street.
- It is recommended that the proposed northern driveway on Boberg Road be removed to meet City access spacing standards (300 feet).
- It is recommended that the proposed southern driveway on Boones Ferry Road be removed to meet City access spacing and sight distance standards (300 feet).
- Prior to occupancy, sight distance at any proposed access points will need to be verified, documented, and stamped by a registered professional Civil or Traffic Engineer licensed in the State of Oregon to assure that buildings, signs or landscaping does not restrict sight distance.
- Both site plans (Phase 1 and Master development) show a sufficient number of vehicle parking stalls to meet the City's parking requirement.
- It is recommended that future site plans show the required number of bicycle parking stalls per the City's parking requirement.

APPENDIX

Appendix A – Site Plan

Appendix B – Existing Peak Hour Traffic Counts

Appendix C – Level of Service Description

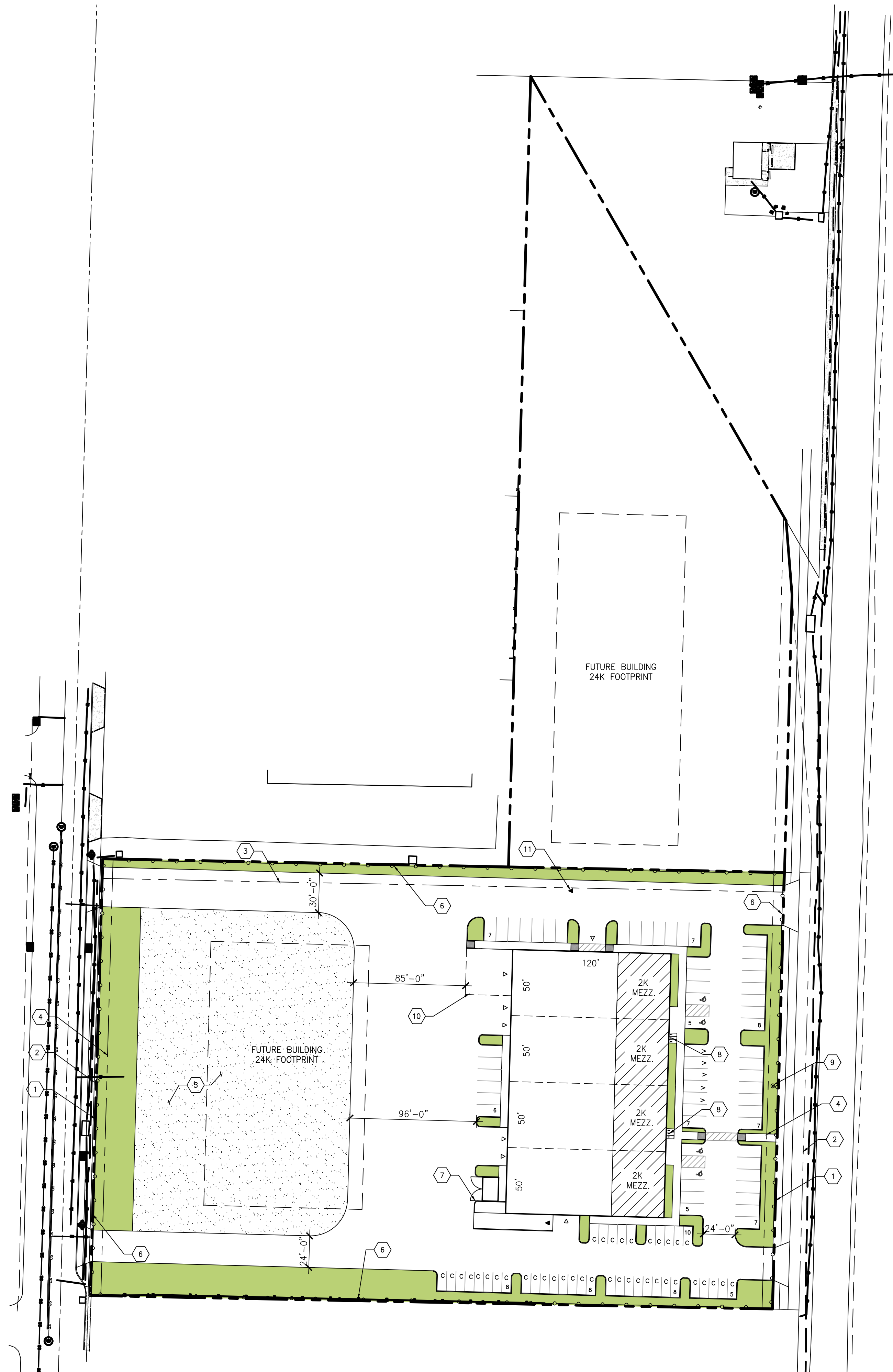
Appendix D – Stage II Project List

Appendix E – All-Way Stop Warrant Analysis

Appendix F – HCM Analysis Results

Appendix G – Transportation System Plan Projects

Appendix A – Site Plan



PROJECT INFO - PHASE 1

SITE AREA:	171,206 SF
BUILDING AREA:	34,000 SF 24,000 SF FOOTPRINT 8,000 SF MEZZANINE
LANDSCAPING AREA:	
LANDSCAPING AREA REQUIREMENTS:	25,681 = 15%
LANDSCAPING AREA PROVIDED:	25,812 = 15.1%
PARKING COUNTS:	
PARKING SPACE REQUIREMENTS:	58.4
PARKING SPACES PROVIDED:	99 SPACES (2.9 PER 1000 SF) 60 STANDARD 39 COMPACT (39.4%)
BICYCLE PARKING COUNT:	MIN. 6

GENERAL NOTES

- CONTRACTOR SHALL VERIFY AND CONFIRM EXISTING CONDITIONS SHOWN OR IMPLIED ON DRAWINGS PRIOR TO START OF CONSTRUCTION. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES.
- TYPICAL CURB RADIUS = 3' UNLESS NOTED OTHERWISE. PLEASE NOTE WHERE TYPICAL RADI ARE NOTED PLEASE REFERENCE SIMILAR ISLANDS OR CONDITIONS WHERE THESE OCCUR
- EXISTING CONDITIONS BASED ON BOUNDARY SURVEY BY WEDDLE SURVEYING INC. DATED SEPTEMBER 21, 2018

LEGEND

	ACCESSIBLE PARKING STALL
	COMPACT PARKING STALL
	VANPOOL PARKING STALL
	DRIVE IN
	DOCK HIGH
	ADA COMPLIANT DIAMOND TEXTURE SURFACE - PROVIDE AT ACCESSIBLE CURB RAMPS
	PAINT STRIPED ACCESSIBLE AISLE AND NO PARKING AREA

KEYNOTES

- 1 PROPERTY LINE
- 2 OLD PROPERTY LINE
- 3 15' WATER EASEMENT
- 4 8' UTILITY EASEMENT
- 5 40,000 SF GRAVEL STORAGE AREA
- 6 FENCE
- 7 TRASH ENCLOSURE
- 8 BIKE PARKING
- 9 FLAG POLE
- 10 1,225 SF COVERED WASH BAY
- 11 EXISTING WELL

**PRELIMINARY
PLAN
ONLY-NOT
FOR
CONSTRUCTION**

ISSUED DATE
1

CIDA
ARCHITECTURE
ENGINEERING
PLANNING
INTERIORS

15695 SW 72ND AVE SUITE 200
PORTLAND, OREGON 97224
TEL: 503.226.1285
FAX: 503.226.1670
WWW.CIDAINC.COM

(NEW CONSTRUCTION)
INDUSTRIAL FOCUS
28000 BLK BOBURG RD
WILSONVILLE, OR 97070

1 NORTH
A0.1 SITE PLAN - PHASE 1
1" = 50'-0"

SITE PLAN
A0.1
JOB NO. 180146.01

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PROJECT INFO

SITE AREA:	TAX LOT 500: 171,206 SF TAX LOT 300: 88,794 SF TOTAL: 260,200 SF
BUILDING AREA:	96,000 SF (32,000 PER BUILDING)
LANDSCAPING AREA:	39,030 = 15%
LANDSCAPING AREA REQUIREMENTS:	48,075 = 18.5%
LANDSCAPING AREA PROVIDED:	
PARKING COUNTS:	175.2 TOTAL SPACES (3.0 PER 1000 SF)
PARKING SPACES REQUIRED:	200 STANDARD
PARKING SPACES PROVIDED:	294 TOTAL SPACES (3.0 PER 1000 SF) 200 STANDARD 96 COMPACT (33%)

**PRELIMINARY
PLAN
ONLY-NOT
FOR
CONSTRUCTION**

ISSUED DATE
1

CIDA
ARCHITECTURE
ENGINEERING
PLANNING
INTERIORS

15895 SW 72ND AVE SUITE 200
PORTLAND, OREGON 97224
TEL: 503.226.1285
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WWW.CIDAINC.COM

(NEW CONSTRUCTION)
INDUSTRIAL FOCUS
28000 BLK BOBURG RD
WILSONVILLE, OR 97070

MASTER PLAN

JOB NO. 180146.01
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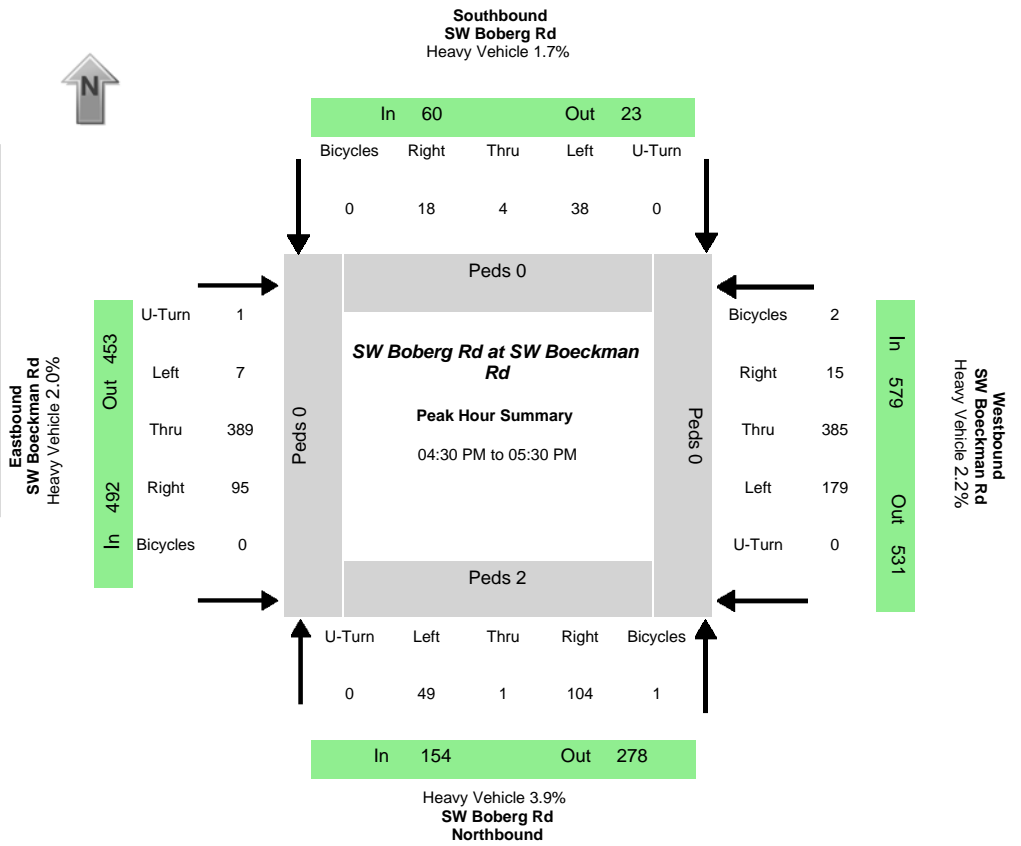
1 MASTER PLAN
1" = 50'-0"

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Appendix B – Existing Peak Hour Traffic Counts

Data Provided by K-D-N.com 503-594-4224

N/S street	SW Boberg Rd
E/W street	SW Boeckman Rd
City, State	Wilsonville OR
Site Notes	
Location	45.317427 - -122.772079
Start Date	Tuesday, December 04, 2018
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:30:00 PM
Peak 15 Min Start	05:05:00 PM
PHF (15-Min Int)	0.90



Peak-Hour Volumes (PHV)

Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
49	1	104	0	38	4	18	0	7	389	95	1	179	385	15	0	154	60	492	579	278	23	453	531
Percent Heavy Vehicles																							
4.1%	0.0%	3.8%	0.0%	0.0%	0.0%	5.6%	0.0%	0.0%	1.3%	5.3%	0.0%	2.8%	1.8%	6.7%	0.0%	3.9%	1.7%	2.0%	2.2%	3.6%	4.3%	2.2%	1.7%

PHV - Bicycles

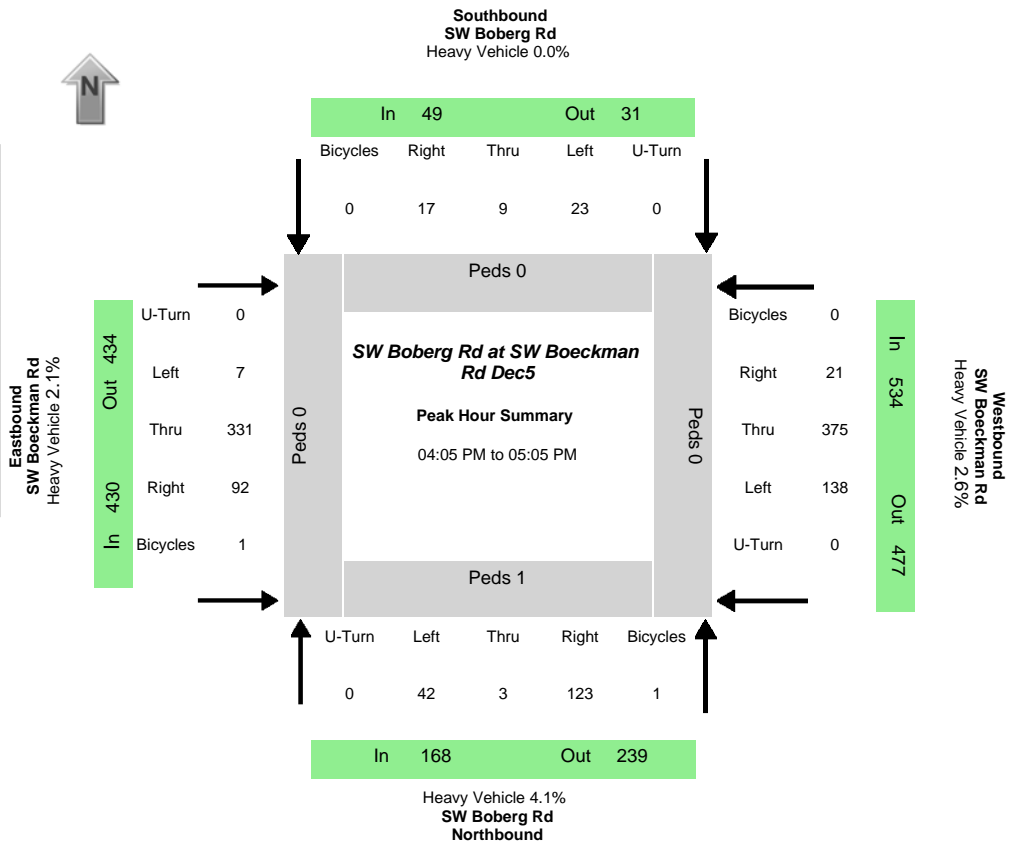
PHV - Bicycles																PHV - Pedestrians					
Northbound				Southbound				Eastbound				Westbound				in Crosswalk					
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	3	2	0	0	0	2

All Vehicle Volumes

Time	Northbound SW Boberg Rd				Southbound SW Boberg Rd				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				15 Min Sum	1 HR Sum
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		
04:00:00 PM	1	1	12	0	1	1	2	0	1	26	7	0	8	24	3	0		
04:05:00 PM	4	0	9	0	5	1	0	0	0	36	6	0	8	29	3	0		
04:10:00 PM	6	1	8	0	2	3	3	0	3	27	6	0	12	31	1	0	291	
04:15:00 PM	5	0	4	0	1	1	3	0	0	20	11	0	11	27	2	0	289	
04:20:00 PM	2	2	14	0	4	0	2	0	1	30	9	0	8	31	1	0	292	
04:25:00 PM	6	1	17	0	0	0	2	0	1	20	3	0	8	28	0	0	275	
04:30:00 PM	5	0	6	0	2	0	3	0	1	30	7	0	16	25	0	0	285	
04:35:00 PM	3	0	10	0	3	0	1	0	0	33	3	0	9	37	0	0	280	
04:40:00 PM	3	0	8	0	1	0	1	0	0	25	9	0	14	34	2	0	291	
04:45:00 PM	8	0	13	0	5	0	1	0	0	34	15	0	16	19	0	0	307	
04:50:00 PM	4	0	9	0	3	1	0	0	0	35	8	0	17	30	2	0	317	
04:55:00 PM	4	0	8	0	3	1	1	0	1	22	7	0	15	28	6	0	316	1173
05:00:00 PM	6	0	7	0	5	1	1	0	1	35	10	1	9	26	0	0	307	1188
05:05:00 PM	3	0	10	0	4	1	4	0	0	44	9	0	18	33	1	0	325	1214
05:10:00 PM	6	1	8	0	3	0	2	0	1	34	9	0	15	41	1	0	350	1232
05:15:00 PM	1	0	8	0	4	0	1	0	2	30	8	0	10	44	1	0	357	1256
05:20:00 PM	4	0	12	0	1	0	1	0	1	41	5	0	19	28	1	0	343	1265
05:25:00 PM	2	0	5	0	4	0	2	0	0	26	5	0	21	40	1	0	328	1285
05:30:00 PM	1	0	10	0	0	0	0	0	1	23	8	0	7	32	2	0	303	1274
05:35:00 PM	8	0	11	0	2	2	1	0	1	27	7	0	8	33	1	0	291	1276
05:40:00 PM	2	1	8	0	3	1	3	0	0	26	5	0	12	43	1	0	290	1284
05:45:00 PM	0	0	7	0	0	4	1	0	0	21	4	0	7	32	1	0	283	1250
05:50:00 PM	3	2	10	0	0	0	0	0	1	28	8	0	9	36	1	0	280	1239
05:55:00 PM	1	1	14	0	1	2	1	0	0	16	6	0	5	29	2	0	253	1221

Data Provided by K-D-N.com 503-594-4224

N/S street	SW Boberg Rd
E/W street	SW Boeckman Rd
City, State	Wilsonville OR
Site Notes	
Location	45.317427 - -122.772079
Start Date	Wednesday, December 05, 2018
Start Time	04:00:00 PM
Weather	
Study ID #	
Peak Hour Start	04:05:00 PM
Peak 15 Min Start	04:25:00 PM
PHF (15-Min Int)	0.93



Peak-Hour Volumes (PHV)																							
Northbound				Southbound				Eastbound				Westbound				Entering				Leaving			
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	NB	SB	EB	WB	NB	SB	EB	WB
42	3	123	0	23	9	17	0	7	331	92	0	138	375	21	0	168	49	430	534	239	31	434	477
Percent Heavy Vehicles																							
7.1%	0.0%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%	2.2%	0.0%	2.2%	2.7%	4.8%	0.0%	4.2%	0.0%	2.1%	2.6%	2.1%	3.2%	3.0%	2.3%

PHV - Bicycles														PHV - Pedestrians							
Northbound				Southbound				Eastbound				Westbound				in Crosswalk					
Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Sum	NB	SB	EB	WB	Sum
1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	1	0	0	0	1

Time	Northbound SW Boberg Rd				Southbound SW Boberg Rd				Eastbound SW Boeckman Rd				Westbound SW Boeckman Rd				15 Min Sum	1 HR Sum
	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn	Left	Thru	Right	Uturn		
04:00:00 PM	2	0	7	0	3	1	0	0	0	22	4	0	8	27	2	0		
04:05:00 PM	7	0	11	0	5	0	2	0	0	28	8	0	9	33	3	0		
04:10:00 PM	4	0	8	0	2	0	0	0	1	37	10	0	9	25	1	0	279	
04:15:00 PM	3	0	8	0	1	2	2	0	0	25	5	0	13	20	1	0	283	
04:20:00 PM	3	1	8	0	0	0	0	0	1	37	8	0	8	32	2	0	277	
04:25:00 PM	5	2	13	0	1	0	2	0	0	17	7	0	14	33	1	0	275	
04:30:00 PM	2	0	17	0	2	2	0	0	1	23	12	0	12	36	1	0	303	
04:35:00 PM	1	0	15	0	0	1	1	0	2	35	10	0	12	37	0	0	317	
04:40:00 PM	1	0	6	0	2	0	0	0	0	32	5	0	9	31	0	0	308	
04:45:00 PM	4	0	12	0	1	2	4	0	0	18	4	0	15	36	0	0	296	
04:50:00 PM	2	0	5	0	3	0	4	0	1	13	5	0	16	27	3	0	261	
04:55:00 PM	7	0	12	0	2	0	1	0	1	33	11	0	8	28	3	0	281	1143
05:00:00 PM	3	0	8	0	4	2	1	0	0	33	7	0	13	37	6	0	299	1181
05:05:00 PM	4	0	6	0	3	1	0	0	0	27	3	0	13	42	1	0	320	1175
05:10:00 PM	2	0	6	0	1	0	2	0	0	24	7	0	13	32	1	0	302	1166
05:15:00 PM	2	0	2	0	1	1	2	0	1	29	8	0	6	32	1	0	273	1171
05:20:00 PM	7	1	9	0	2	0	1	0	0	24	7	0	7	31	1	0	263	1161
05:25:00 PM	2	0	6	0	1	0	0	0	1	22	4	0	11	30	1	0	253	1144
05:30:00 PM	1	0	4	0	2	1	0	0	1	39	5	0	7	26	1	0	255	1123
05:35:00 PM	4	1	12	0	2	0	1	0	0	23	11	0	13	33	1	0	266	1110
05:40:00 PM	0	0	15	0	2	2	2	0	0	16	10	0	8	22	1	1	267	1103
05:45:00 PM	3	0	5	0	1	1	1	0	0	17	6	0	8	33	1	0	256	1083
05:50:00 PM	4	0	3	0	1	1	1	0	1	30	4	0	8	23	0	0	231	1080
05:55:00 PM	3	2	9	0	1	3	1	0	2	24	8	0	9	24	2	0	240	1062

Appendix C – Level of Service Description

TRAFFIC LEVELS OF SERVICE

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. For this, the concept of level of service has been developed to subjectively describe traffic performance. Level of service can be measured at intersections and along key roadway segments.

Levels of service categories are similar to report card ratings for traffic performance. Intersections are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is generally diminished in their vicinities. Levels of Service A, B and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Level of service D and E are progressively worse peak hour operating conditions and F conditions represent where demand exceeds the capacity of an intersection. Most urban communities set level of service D as the minimum acceptable level of service for peak hour operation and plan for level of service C or better for all other times of the day. The Highway Capacity Manual provides level of service calculation methodology for both intersections and arterials¹. The following two sections provide interpretations of the analysis approaches.

¹ *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2000, Chapter 16 and 17.

UNSIGNALIZED INTERSECTIONS (Two-Way Stop Controlled)

Unsignalized intersection level of service is reported for the major street and minor street (generally, left turn movements). The method assesses available and critical gaps in the traffic stream which make it possible for side street traffic to enter the main street flow. The 2010 Highway Capacity Manual describes the detailed methodology. It is not unusual for an intersection to experience level of service E or F conditions for the minor street left turn movement. It should be understood that, often, a poor level of service is experienced by only a few vehicles and the intersection as a whole operates acceptably.

Unsignalized intersection levels of service are described in the following table.

Level-of-Service Criteria: Automobile Mode

Control Delay (s/vehicle)	LOS by Volume-to-Capacity Ratio	
	$v/c \leq 1.0$	$v/c > 1.0$
0-10	A	F
>10-15	B	F
>15-25	C	F
>25-35	D	F
>35-50	E	F
>50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street.
LOS is not calculated for major-street approaches or for the intersection as a whole

SIGNALIZED INTERSECTIONS

For signalized intersections, level of service is evaluated based upon average vehicle delay experienced by vehicles entering an intersection. Control delay (or signal delay) includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In previous versions of this chapter of the HCM (1994 and earlier), delay included only stopped delay. As delay increases, the level of service decreases. Calculations for signalized and unsignalized intersections are different due to the variation in traffic control. The 2000 Highway Capacity Manual provides the basis for these calculations.

Level of Service	Delay (secs.)	Description
A	<10.00	Free Flow/Insignificant Delays: No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Most vehicles do not stop at all. Progression is extremely favorable and most vehicles arrive during the green phase.
B	10.1-20.0	Stable Operation/Minimal Delays: An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles. This level generally occurs with good progression, short cycle lengths, or both.
C	20.1-35.0	Stable Operation/Acceptable Delays: Major approach phases fully utilized. Most drivers feel somewhat restricted. Higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, and the number of vehicles stopping is significant.
D	35.1-55.0	Approaching Unstable/Tolerable Delays: The influence of congestion becomes more noticeable. Drivers may have to wait through more than one red signal indication. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. The proportion of vehicles not stopping declines, and individual cycle failures are noticeable.
E	55.1-80.0	Unstable Operation/Significant Delays: Volumes at or near capacity. Vehicles may wait through several signal cycles. Long queues form upstream from intersection. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are a frequent occurrence.
F	>80.0	Forced Flow/Excessive Delays: Represents jammed conditions. Queues may block upstream intersections. This level occurs when arrival flow rates exceed intersection capacity, and is considered to be unacceptable to most drivers. Poor progression, long cycle lengths, and v/c ratios approaching 1.0 may contribute to these high delay levels.

Source: 2000 Highway Capacity Manual, Transportation Research Board, Washington D.C.

Appendix D – Stage II Project List

Updated by D. Pauly 12.21.18

Stage II Approved									
Project	Land Use	Status	Size	Total PM Peak Trips	Trip Allocation Percentage		Net New (Primary + Diverted) PM Peak Hour Trips not yet active		
					Internal	Pass-By	In	Out	Total
Ash Park Subdivision	Residential	Under construction	12 units				8	4	12
Hydro-Temp: Recent agreement with the City, the project is vested and so are the traffic trips	Office/Flex-Space	Not built	60.8 KSF				44	46	90
Mercedes Benz (Phase 2)	Auto Dealership	Not built					20	26	46
Shredding Systems (SQFT does not including paint canopy and another canopy)	Industrial/Commercial	Not built	66.8 KSF				20	46	66
Town Center Ph III and trip dedication to Miller Paint store Uses marked with "*" have not been built and PM peak hr trip sum exceeds remaining vested trip level by 2 trips. It has yet to be determined how to allocate trips between remaining buildings.	EyeHealth NW Medical Office (Pad 2)	Under construction	7.7 KSF				7	18	25
	High Turnover Restaurant (Pad 1)	Not built	7.5 KSF				24	17	47
	Miller Paint store	Not built	5.0 KSF				6	6	15
	Remaining Approved Total								85
Wilsonville Road Business Park Phase II	Phase 2 - office (2-story building on west parcel)	Partially Built	21.7 KSF				15	71	86
Universal Health Services	Mental Health Facility	Not built	62K						
14-Lot Single-Family Subdivision at 28500 and 28530 SW Canyon Creek Rd. South	Residential	Under construction	14				9	5	14
SORT Bionergy *Minimal impact, no PM Peak indicated in traffic impact analysis	Industrial	Not built					*	*	*
Charbonneau Range 40-lot Subdivision	Residential	Partially Built, 1 home built and occupied	40 lots				28	17	45
Hilton Garden Inn	Hotel	Not built	118 units				15	15	30
Frog Pond-Stafford Meadows	Residential	Under construction	46 units				30	16	46
Frog Pond-Morgan Farm	Residential	Under construction	80 units				51	29	80
Fir Avenue Commons	Residential	Not built	10 units				7	3	10
Aspen Meadows II	Residential	Not built	5 units				2	3	5
Family Fun Center Expansion 2018	Commercial	Under construction	16 bowling lanes - 8 batting cages				4	-1	3
Grace Chapel	Religious	Not built	Replace commercial college with larger church including 11,705 addition				-71	-29	-100

Stage II Approved – Villebois													
Project	Phase	Status	Land Use					Total PM Peak Trips	Trip Allocation Percentage		Net New (Primary + Diverted) PM Peak Hour Trips not yet active		
			SF	Town.	Apt.	Retail	School		Internal	Pass-By	In	Out	Total
North (Entirety)	Residential	Partially built, 305 homes sold and occupied	466								103	60	163
Central	Residential	Partially Built, 642 homes (86 single family, 191 condo/row homes, 365 apartments) occupied	102	391	365	8.5 KSF					123	70	193
FOR REFERENCE SAP EAST			537	42									

FOR REFERENCE SAP SOUTH (Includes PDP 7 Grande Pointe) 560

Pending Projects for Which Traffic Analysis has been completed (except Villebois)											
Project	Land Use	Status	Size	Total PM Peak	Trip Allocation Percentage			Net New (Primary) PM Peak Hour Trips			
					Internal	Pass-By	Diverted	In	Out	Total	
Frog Pond Meadows (Phase 2 through 5)	Residential	Under land use review	128 net new sf residential (137-9 existing)						81	48	129

Appendix E – All-Way Stop Warrant Analysis

MUTCD Section 2B.07 Multi-Way Stop Applications

The decision to install multi-way stop control should be based on an engineering study. The following criteria should be considered in the engineering study for a multi-way STOP sign installation:

A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal

DKS Analysis: A traffic control signal is not justified; therefore, Criteria A is not met

B. Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.

DKS Analysis: No crashes at this intersection in the most recent 12-months of crash data available from ODOT (1/1/2017 – 12/31/2017)

C. Minimum volumes:

1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and

2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but

3. If the 85th percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2

DKS Analysis:

- C.1 is met. The future volumes were calculated by taking the existing hourly volumes and adding on the estimated Stage II project trips and the proposed project trips (for both Phase 1 and Full Project buildout). After this, fourteen hours of volumes exceeded 300 vehicles per hour for both Phase 1 and for Full Development buildout.
- C.2 criteria is not met. The future volumes for the minor street approach were calculated with the same method as the major street volumes. Only 5 hours of volumes met the 200 vph threshold.
- C.3 is unknown. The 85th percentile speed is unknown.

D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

DKS Analysis: Criteria D is not met because Criteria B is not met to 80 percent of the minimum values.

Option:

Other criteria that may be considered in an engineering study include:

- A. The need to control left-turn conflicts
- B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;
- C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and
- D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.

DKS Analysis:

- A. Option A did not appear to be an issue in the field.
- B. Option B is not an issue as the pedestrian and bicycle activity here is low.
- C. Option C is not an issue.
- D. Option D was not applicable

Appendix F – HCM Analysis Results

Intersection	
Intersection Delay, s/veh	20.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔			↔			↔	
Traffic Vol, veh/h	7	389	95	179	385	15	49	1	104	38	4	18
Future Vol, veh/h	7	389	95	179	385	15	49	1	104	38	4	18
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	0	1	5	3	2	7	4	0	4	0	0	6
Mvmt Flow	8	432	106	199	428	17	54	1	116	42	4	20
Number of Lanes	0	1	1	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	23.1	21.4	12.6	11.4
HCM LOS	C	C	B	B

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %		32%	2%	0%	100%	0%
Vol Thru, %		1%	98%	0%	0%	96%
Vol Right, %		68%	0%	100%	0%	4%
Sign Control		Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane		154	396	95	179	400
LT Vol		49	7	0	179	0
Through Vol		1	389	0	0	385
RT Vol		104	0	95	0	15
Lane Flow Rate		171	440	106	199	444
Geometry Grp		2	7	7	7	7
Degree of Util (X)		0.311	0.762	0.162	0.366	0.75
Departure Headway (Hd)		6.551	6.231	5.528	6.63	6.078
Convergence, Y/N		Yes	Yes	Yes	Yes	Yes
Cap		544	576	644	539	591
Service Time		4.647	4.011	3.307	4.408	3.856
HCM Lane V/C Ratio		0.314	0.764	0.165	0.369	0.751
HCM Control Delay		12.6	26.4	9.4	13.2	25
HCM Lane LOS		B	D	A	B	C
HCM 95th-tile Q		1.3	6.8	0.6	1.7	6.6

Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y		Y	↑	↑	
Traffic Vol, veh/h	11	171	131	159	413	44
Future Vol, veh/h	11	171	131	159	413	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	4	7	9	1	11
Mvmt Flow	12	182	139	169	439	47

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	910	463	486	0	-	0
Stage 1	463	-	-	-	-	-
Stage 2	447	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.263	-	-	-
Pot Cap-1 Maneuver	307	595	1051	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	649	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	266	595	1051	-	-	-
Mov Cap-2 Maneuver	266	-	-	-	-	-
Stage 1	554	-	-	-	-	-
Stage 2	649	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.9	4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1051	-	554	-	-
HCM Lane V/C Ratio	0.133	-	0.349	-	-
HCM Control Delay (s)	8.9	-	14.9	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.5	-	1.6	-	-

Intersection												
Int Delay, s/veh	8.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗			↕			↕	
Traffic Vol, veh/h	7	422	111	196	426	15	67	1	124	38	4	18
Future Vol, veh/h	7	422	111	196	426	15	67	1	124	38	4	18
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	450	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	1	5	3	2	7	4	0	4	0	0	6
Mvmt Flow	7	444	117	206	448	16	71	1	131	40	4	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	466	0	0	561	0	0	1338	1336	444	1453	1445	458
Stage 1	-	-	-	-	-	-	458	458	-	870	870	-
Stage 2	-	-	-	-	-	-	880	878	-	583	575	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.14	6.5	6.24	7.1	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.536	4	3.336	3.5	4	3.354
Pot Cap-1 Maneuver	1106	-	-	1005	-	-	129	155	610	109	133	595
Stage 1	-	-	-	-	-	-	579	570	-	349	372	-
Stage 2	-	-	-	-	-	-	339	368	-	502	506	-
Platoon blocked, %		-	-	-	-	-						
Mov Cap-1 Maneuver	1104	-	-	1005	-	-	102	122	610	72	105	594
Mov Cap-2 Maneuver	-	-	-	-	-	-	228	257	-	72	105	-
Stage 1	-	-	-	-	-	-	576	567	-	346	295	-
Stage 2	-	-	-	-	-	-	257	292	-	391	503	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			2.9			24.4			87.2		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	383	1104	-	-	1005	-	-	101
HCM Lane V/C Ratio	0.528	0.007	-	-	0.205	-	-	0.625
HCM Control Delay (s)	24.4	8.3	-	-	9.5	-	-	87.2
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	3	0	-	-	0.8	-	-	3

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	11	183	142	165	425	44
Future Vol, veh/h	11	183	142	165	425	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	4	7	9	1	11
Mvmt Flow	12	195	151	176	452	47

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	954	476	499	0	0
Stage 1	476	-	-	-	-
Stage 2	478	-	-	-	-
Critical Hdwy	6.4	6.24	4.17	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.263	-	-
Pot Cap-1 Maneuver	289	585	1040	-	-
Stage 1	629	-	-	-	-
Stage 2	628	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	247	585	1040	-	-
Mov Cap-2 Maneuver	247	-	-	-	-
Stage 1	538	-	-	-	-
Stage 2	628	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.6	4.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1040	-	543	-	-
HCM Lane V/C Ratio	0.145	-	0.38	-	-
HCM Control Delay (s)	9	-	15.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.5	-	1.8	-	-

Intersection												
Int Delay, s/veh	8.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗			↕			↕	
Traffic Vol, veh/h	7	422	111	197	426	15	68	1	127	38	4	18
Future Vol, veh/h	7	422	111	197	426	15	68	1	127	38	4	18
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	1	5	3	2	7	4	0	4	0	0	6
Mvmt Flow	7	444	117	207	448	16	72	1	134	40	4	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	466	0	0	561	0	0	1340	1338	444	1456	1447	458
Stage 1	-	-	-	-	-	-	458	458	-	872	872	-
Stage 2	-	-	-	-	-	-	882	880	-	584	575	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.14	6.5	6.24	7.1	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.536	4	3.336	3.5	4	3.354
Pot Cap-1 Maneuver	1106	-	-	1005	-	-	128	154	610	109	133	595
Stage 1	-	-	-	-	-	-	579	570	-	348	371	-
Stage 2	-	-	-	-	-	-	338	368	-	501	506	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1104	-	-	1005	-	-	101	121	610	71	105	594
Mov Cap-2 Maneuver	-	-	-	-	-	-	227	256	-	71	105	-
Stage 1	-	-	-	-	-	-	576	567	-	345	294	-
Stage 2	-	-	-	-	-	-	256	291	-	388	503	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			2.9			24.8			90.6		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	383	1104	-	-	1005	-	-	99
HCM Lane V/C Ratio	0.539	0.007	-	-	0.206	-	-	0.638
HCM Control Delay (s)	24.8	8.3	-	-	9.5	-	-	90.6
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	3.1	0	-	-	0.8	-	-	3.1

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	11	183	142	167	435	44
Future Vol, veh/h	11	183	142	167	435	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	4	7	9	1	11
Mvmt Flow	12	195	151	178	463	47

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	967	487	510	0	-	0
Stage 1	487	-	-	-	-	-
Stage 2	480	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.263	-	-	-
Pot Cap-1 Maneuver	284	576	1030	-	-	-
Stage 1	622	-	-	-	-	-
Stage 2	627	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	242	576	1030	-	-	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	531	-	-	-	-	-
Stage 2	627	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.9	4.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1030	-	534	-	-
HCM Lane V/C Ratio	0.147	-	0.386	-	-
HCM Control Delay (s)	9.1	-	15.9	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.5	-	1.8	-	-

Intersection												
Int Delay, s/veh	6.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗			↕			↕	
Traffic Vol, veh/h	7	389	96	181	385	15	52	1	113	38	4	18
Future Vol, veh/h	7	389	96	181	385	15	52	1	113	38	4	18
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	1	5	3	2	7	4	0	4	0	0	6
Mvmt Flow	7	409	101	191	405	16	55	1	119	40	4	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	423	0	0	510	0	0	1230	1228	409	1331	1321	415
Stage 1	-	-	-	-	-	-	423	423	-	797	797	-
Stage 2	-	-	-	-	-	-	807	805	-	534	524	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.14	6.5	6.24	7.1	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.536	4	3.336	3.5	4	3.354
Pot Cap-1 Maneuver	1147	-	-	1050	-	-	153	180	638	133	158	629
Stage 1	-	-	-	-	-	-	605	591	-	383	401	-
Stage 2	-	-	-	-	-	-	372	398	-	534	533	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1145	-	-	1050	-	-	124	146	638	92	128	628
Mov Cap-2 Maneuver	-	-	-	-	-	-	258	286	-	92	128	-
Stage 1	-	-	-	-	-	-	601	587	-	380	327	-
Stage 2	-	-	-	-	-	-	291	325	-	431	530	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			2.9			18.8			58.6		
HCM LOS							C			F		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	434	1145	-	-	1050	-	-	127
HCM Lane V/C Ratio	0.403	0.006	-	-	0.181	-	-	0.497
HCM Control Delay (s)	18.8	8.2	-	-	9.2	-	-	58.6
HCM Lane LOS	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	1.9	0	-	-	0.7	-	-	2.3

Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	11	171	131	166	442	44
Future Vol, veh/h	11	171	131	166	442	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	4	7	9	1	11
Mvmt Flow	12	182	139	177	470	47

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	949	494	517	0	-	0
Stage 1	494	-	-	-	-	-
Stage 2	455	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.263	-	-	-
Pot Cap-1 Maneuver	291	571	1024	-	-	-
Stage 1	617	-	-	-	-	-
Stage 2	643	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	251	571	1024	-	-	-
Mov Cap-2 Maneuver	251	-	-	-	-	-
Stage 1	533	-	-	-	-	-
Stage 2	643	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.7	4	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1024	-	530	-	-
HCM Lane V/C Ratio	0.136	-	0.365	-	-
HCM Control Delay (s)	9.1	-	15.7	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.5	-	1.7	-	-

Intersection												
Int Delay, s/veh	8.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↑	↗		↕			↕	
Traffic Vol, veh/h	7	422	112	198	426	15	70	1	133	38	4	18
Future Vol, veh/h	7	422	112	198	426	15	70	1	133	38	4	18
Conflicting Peds, #/hr	2	0	0	0	0	2	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	0	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	1	5	3	2	7	4	0	4	0	0	6
Mvmt Flow	7	444	118	208	448	16	74	1	140	40	4	19

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	466	0	0	562	0	0	1342	1340	444	1462	1450	458
Stage 1	-	-	-	-	-	-	458	458	-	874	874	-
Stage 2	-	-	-	-	-	-	884	882	-	588	576	-
Critical Hdwy	4.1	-	-	4.13	-	-	7.14	6.5	6.24	7.1	6.5	6.26
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.227	-	-	3.536	4	3.336	3.5	4	3.354
Pot Cap-1 Maneuver	1106	-	-	1004	-	-	128	154	610	108	132	595
Stage 1	-	-	-	-	-	-	579	570	-	347	370	-
Stage 2	-	-	-	-	-	-	337	367	-	499	505	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1104	-	-	1004	-	-	101	121	610	69	104	594
Mov Cap-2 Maneuver	-	-	-	-	-	-	226	255	-	69	104	-
Stage 1	-	-	-	-	-	-	576	567	-	344	293	-
Stage 2	-	-	-	-	-	-	255	290	-	381	502	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	3	25.6	94.1
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	384	1104	-	-	1004	-	-	97
HCM Lane V/C Ratio	0.559	0.007	-	-	0.208	-	-	0.651
HCM Control Delay (s)	25.6	8.3	-	-	9.5	-	-	94.1
HCM Lane LOS	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	3.3	0	-	-	0.8	-	-	3.2

Intersection						
Int Delay, s/veh	4.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↑	↑	
Traffic Vol, veh/h	11	183	142	172	454	44
Future Vol, veh/h	11	183	142	172	454	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	125	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	0	4	7	9	1	11
Mvmt Flow	12	195	151	183	483	47

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	992	507	530	0	-	0
Stage 1	507	-	-	-	-	-
Stage 2	485	-	-	-	-	-
Critical Hdwy	6.4	6.24	4.17	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.336	2.263	-	-	-
Pot Cap-1 Maneuver	275	562	1012	-	-	-
Stage 1	609	-	-	-	-	-
Stage 2	623	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	234	562	1012	-	-	-
Mov Cap-2 Maneuver	234	-	-	-	-	-
Stage 1	518	-	-	-	-	-
Stage 2	623	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.4	4.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1012	-	521	-	-
HCM Lane V/C Ratio	0.149	-	0.396	-	-
HCM Control Delay (s)	9.2	-	16.4	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.5	-	1.9	-	-

Appendix G – Transportation System Plan Projects

Table 5-3. Higher Priority Projects (Northeast Quadrant)

Project	Description	Cost
Roadway Extensions		
RE-11 Meridian Creek Middle School Site Improvements	Construct the collector roadways and site improvements associated with the proposed Meridian Creek Middle School site	\$1,600,000
RE-12A Frog Pond West Neighborhood Collector Roads	Construct the collector roadways within the west neighborhood as identified in the Frog Pond Area Plan	\$9,510,000
RE-12B Frog Pond South Neighborhood Collector Roads	Construct the collector roadways within the south neighborhood as identified in the Frog Pond Area Plan	\$2,650,000
Roadway Widening		
RW-01 Boeckman Road Bridge and Corridor Improvements	Widen Boeckman Road from Boberg Road to 500 feet east of Parkway Avenue to include additional travel lanes in both directions along with bike lanes and sidewalks; project includes reconstruction of the bridge over I-5 and improvements at Boeckman Road/Boberg Road and Boeckman Road/Parkway Avenue intersections and adjacent transit stops	\$13,600,000
Urban Upgrades		
UU-01 Boeckman Road Dip Improvements	Upgrade at vertical curve east of Canyon Creek Road to meet applicable cross-section standards (i.e., 3 lanes with bike lanes, sidewalks, and transit stop improvements); options should also be considered to make connections to the regional trail system and to remove the culvert and install a bridge	\$12,220,000
UU-02 Boeckman Road Urban Upgrade	Upgrade to meet applicable cross-section standards (i.e., 3 lanes with bike lanes, sidewalks, and transit stop improvements); project includes a traffic signal or roundabout at the Boeckman Road-Advance Road/Stafford Road-Wilsonville Road Intersection	\$2,100,000
UU-05 Parkway Avenue Urban Upgrade	Upgrade to meet applicable cross-section standards (i.e., 3 lanes with bike lanes, sidewalks, and transit stop improvements)	\$5,000,000
UU-06 Stafford Road Urban Upgrade	Upgrade to meet applicable cross-section standards (i.e., 3 lanes with bike lanes, sidewalks, and transit stop improvements)	\$4,200,000
UU-09 Printer Parkway Urban Upgrade	Upgrade Printer Parkway to a three-lane collector with bicycle lanes and multiuse path	\$3,600,000
UU-10 Advance Road Urban Upgrade	Upgrade Advance Road to collector standards starting at Stafford Road to the proposed 63 rd Avenue (entrance to proposed Meridian Creek Middle School)	\$3,175,000
Spot Improvements		
SI-03 Stafford Road/65th Avenue Intersection Improvements	Improve turn radii, sight distance and grade differential by combining intersections as either a roundabout or traffic signal	\$2,000,000 (Partial County funding)
Standalone Pedestrian and Bicycle Improvements (Bikeways and Walkways)		
BW-01 Canyon Creek Road Enhanced A/B Pedestrian Crossings	Install two new pedestrian crossings of Canyon Creek Road that include rectangular rapid flashing beacons (RRFBs), center pedestrian median island, signage, etc. (final locations to be determined)	\$130,000
BW-04 Boeckman Road Bike Lanes and Sidewalk Infill	Construct bike lanes (both sides of street) and sidewalks (south side of street) from Parkway Avenue to Canyon Creek Road	\$515,000
BW-12 Parkway Center Trail Connector	Construct shared-use path as development occurs; with connection to proposed regional trail (Wiedeman Road Trail) on the south	\$120,000
Standalone Pedestrian and Bicycle Improvements (Regional Trails)		
RT-01A Boeckman Creek Trail (North)	Construct north-south trail through east Wilsonville following Boeckman Creek, with connections to neighborhoods, parks, and intersecting roads (may need a boardwalk for various sections and would require a comprehensive public process)	\$850,000
RT-05 Wiedeman Road Trail	Construct east-west trail in north Wilsonville near the Xerox campus with City responsible for portion through developed land and future developer responsible for portion on future development site	\$340,000
RT-07 Revised Frog Pond Regional Trail	Construct the regional trail identified in the Frog Pond Area Plan	\$700,000

FIGURE 5-4. HIGHER PRIORITY PROJECTS (NORTHEAST QUADRANT)

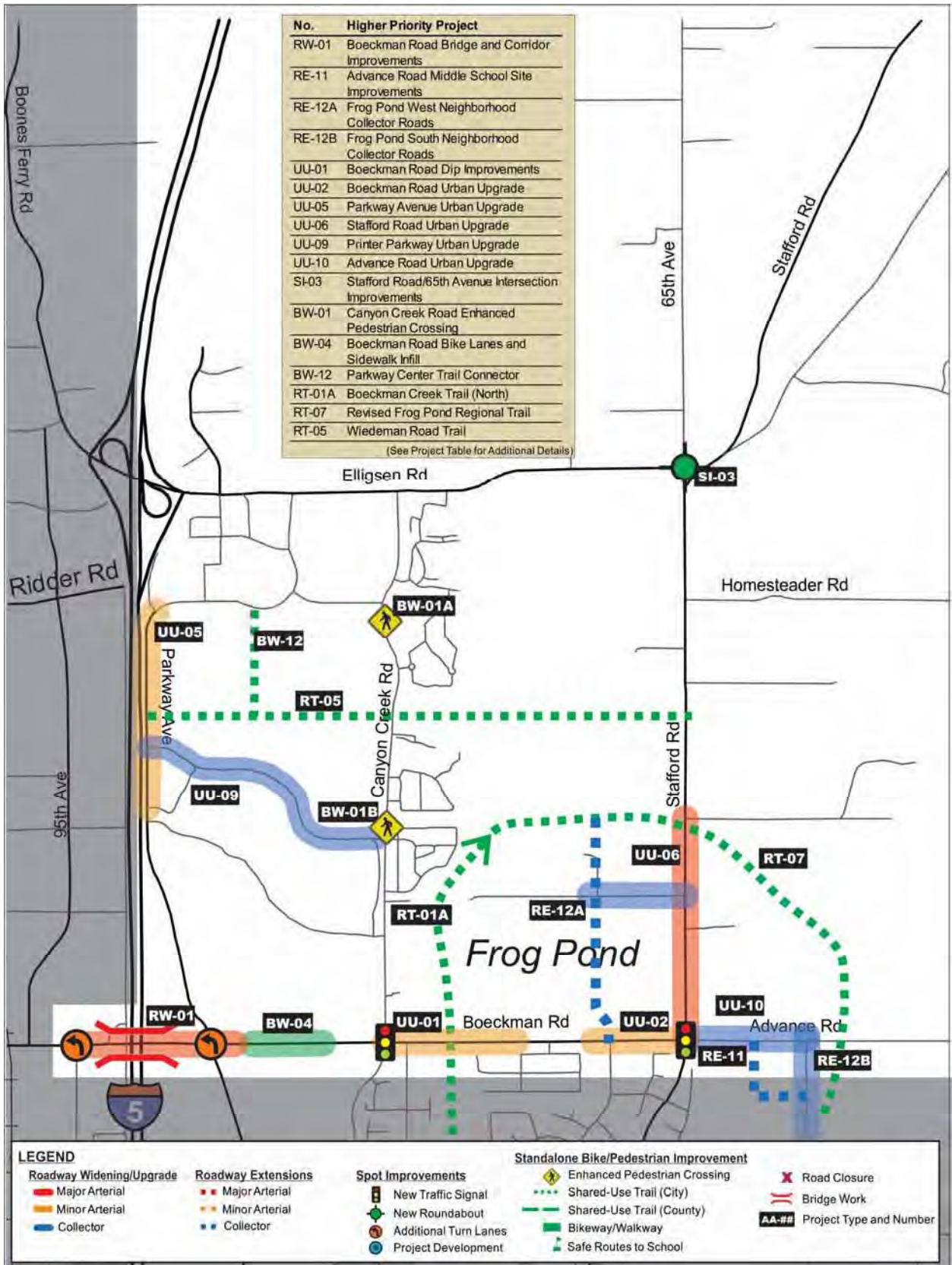


Table 5-4. Higher Priority Projects (Southwest Quadrant)

Project	Description	Cost
Roadway Extensions		
RE-01 Barber Street Extension	Construct 2-lane roadway with bridge, bike lanes, sidewalks, and transit stop improvements from Kinsman Road to Coffee Lake Drive to facilitate access and circulation to WES Station and Villebois	\$8,315,000
RE-02 Barber Street Extension (Part 2)	Construct remaining 2-lane roadway with bike lanes, sidewalks, and transit stop improvements from Coffee Lake Drive to Montebello Drive to facilitate access and circulation to WES Station and Villebois	\$400,000
RE-03 Barber Street through Villebois	Construct remaining 2-lane roadway with bike lanes, sidewalks, and transit stop improvements from Monte Carlo Avenue to Grahams Ferry Road	\$520,000
RE-04A Corridor Study for Brown Road Extension	Perform a corridor study to determine the recommended Brown Road extension alignment (i.e., connection at either Bailey Street or 5th Street)	\$20,000
RE-04B Brown Road Extension	Construct remaining 2-lane roadway with bike lanes, sidewalks, and transit stop improvements from Wilsonville Road to Boones Ferry Road (connect at either Bailey Street or 5th Street); includes roadway connection to Kinsman Road (with bike lanes and sidewalks), portion of Ice Age Tonquin Trail connecting to trial terminus on Arrowhead Creek Lane, and Brown Road/Kinsman Road intersection	\$15,200,000
RE-06 Costa Circle Loop Extension	Construct remaining 2-lane roadway with bike lanes, sidewalks, and transit stop improvements from Barber Street to Villebois Drive to Mont Blanc Street	\$3,000,000
RE-08 Kinsman Road Extension (South)	Construct 2-lane roadway with bike lanes, sidewalks, and transit stop improvements from Barber Street to Boeckman Road; project also includes a roundabout at Kinsman Road/Boeckman Road intersection	\$8,400,000
RE-09 Villebois Drive Extension	Construct 2-lane roadway with bike lanes, sidewalks, and transit stop improvements from Costa Circle to Coffee Lake Drive	\$390,000
RE-10 Villebois Drive Extension (Part 2)	Construct 2-lane roadway with bike lanes, sidewalks, and transit stop improvements from Coffee Lake Drive to Boeckman Road	\$250,000
Roadway Widening		
RW-03 Widen Wilsonville Road East of Boones Ferry Road	Widen eastbound SW Wilsonville Road east of SW Boones Ferry Road by removing the center median. This project involves lane configuration analysis to best address congestion.	\$500,000
Urban Upgrades		
UU-03 Brown Road Upgrades	Upgrade to meet cross-section standards (i.e., 3 lanes with bike lanes, sidewalks, and transit stops)	\$3,500,000
UU-04 Grahams Ferry Urban Upgrade	Upgrade to meet cross-section standards (i.e., 3 lanes with bike lanes, sidewalks, and transit stop improvements); includes roundabout at Grahams Ferry Road/Barber Street intersection	\$2,400,000
UU-07 Tooze Road Urban Upgrade	Upgrade to meet cross-section standards (i.e., 3 lanes with bike lanes, sidewalks, and transit stop improvements); includes roundabout at Grahams Ferry Road/Tooze Road intersection	\$7,900,000
Spot Improvements		
SI-05 Curb Extension Removal on Boones Ferry Road	Remove curb extension and add an additional northbound through lane on SW Boones Ferry Road starting at the southern SW Boones Ferry Road/Fred Meyer access and ending at the SW Boones Ferry Road/SW Wilsonville Road intersection where the curbside through lane will terminate into the existing right turn lane.	\$200,000
SI-06 Truck Turning Improvements SW Kinsman Road	Rebuild the northwest corner of the Wilsonville Road/Kinsman Road intersection to accommodate truck turning movements and improve pedestrian safety. Requires right-of-way acquisition, widening, pedestrian ramp replacement, and traffic signal pole relocation.	\$750,000
Standalone Pedestrian and Bicycle Improvements (Bikeways and Walkways)		
BW-03 Boberg Road Sidewalk Infill	Fill in gaps in the sidewalk network on the east side of the roadway from Boeckman Road to Barber Street, and construct transit stop improvements	\$375,000
BW-05 Willamette Way East Sidewalk Infill	Fill in gaps in the sidewalk network on the west side of the roadway from Chantilly to south of Churchill (part of Ice Age Tonquin Trail)	\$50,000
BW-06 Willamette Way West Sidewalk Infill	Construct a new sidewalk on west side of the roadway from Wilsonville Road to Paulina Drive	\$50,000
BW-07 Boones Ferry Road Sharrows	Stripe sharrows (shared travel lanes) from 5th Street to Boones Ferry Park; this will connect Ice Age Tonquin Trail (once the portion along the Brown Road Extension is completed) to Waterfront Trail	\$5,000
BW-13 Villebois Loop Trail	Construct shared-use path as part of Villebois development; include connections to Villebois Greenway, the Ice Age Tonquin Trail, and the Village Center	\$180,000
Standalone Pedestrian and Bicycle Improvements (Safe Routes to School)		
SR-02 Boones Ferry Primary Safe Routes to School Improvements	Construct shared-use path between Boones Ferry Primary and Wood Middle School, a bicycle parking shelter near the school, and a shared-use path connecting the bicycle shelter to the sidewalks along Wilsonville Road	\$200,000
SR-03 Lowrie Primary Safe Routes to School Improvements	Construct shared-use path from existing connection of Lowrie Primary School to Barber Street as part of Villebois development; include connections to new school, Ice Age Tonquin Trail, and Barber Street To future connections	\$150,000
SR-04 Wood Middle School Safe Routes to School Improvements	Construct a bicycle parking shelter near the school and a shared-use path connecting the bicycle shelter to the sidewalks along Wilsonville Road; also widen and stripe the Park at Merryfield Trail, which connects Wood Middle School to Camelot Street to the north	\$150,000
Standalone Pedestrian and Bicycle Improvements (Regional Trails)		
RT-03 Ice Age Tonquin Trail B/C (Villebois)	Construct the remaining sections of the Ice Age Tonquin Trail within Villebois Village in conjunction with development and adjacent roadway improvements	\$560,000
RT-06 Willamette River Bike/Pedestrian and Emergency Bridge Project Development	Perform feasibility study and project development for bike/pedestrian/emergency bridge over the Willamette River to provide a non-motorized alternative to the I-5 freeway deck	\$1,380,000 (Partial Regional funding)

FIGURE 5-5. HIGHER PRIORITY PROJECTS (SOUTHWEST QUADRANT)

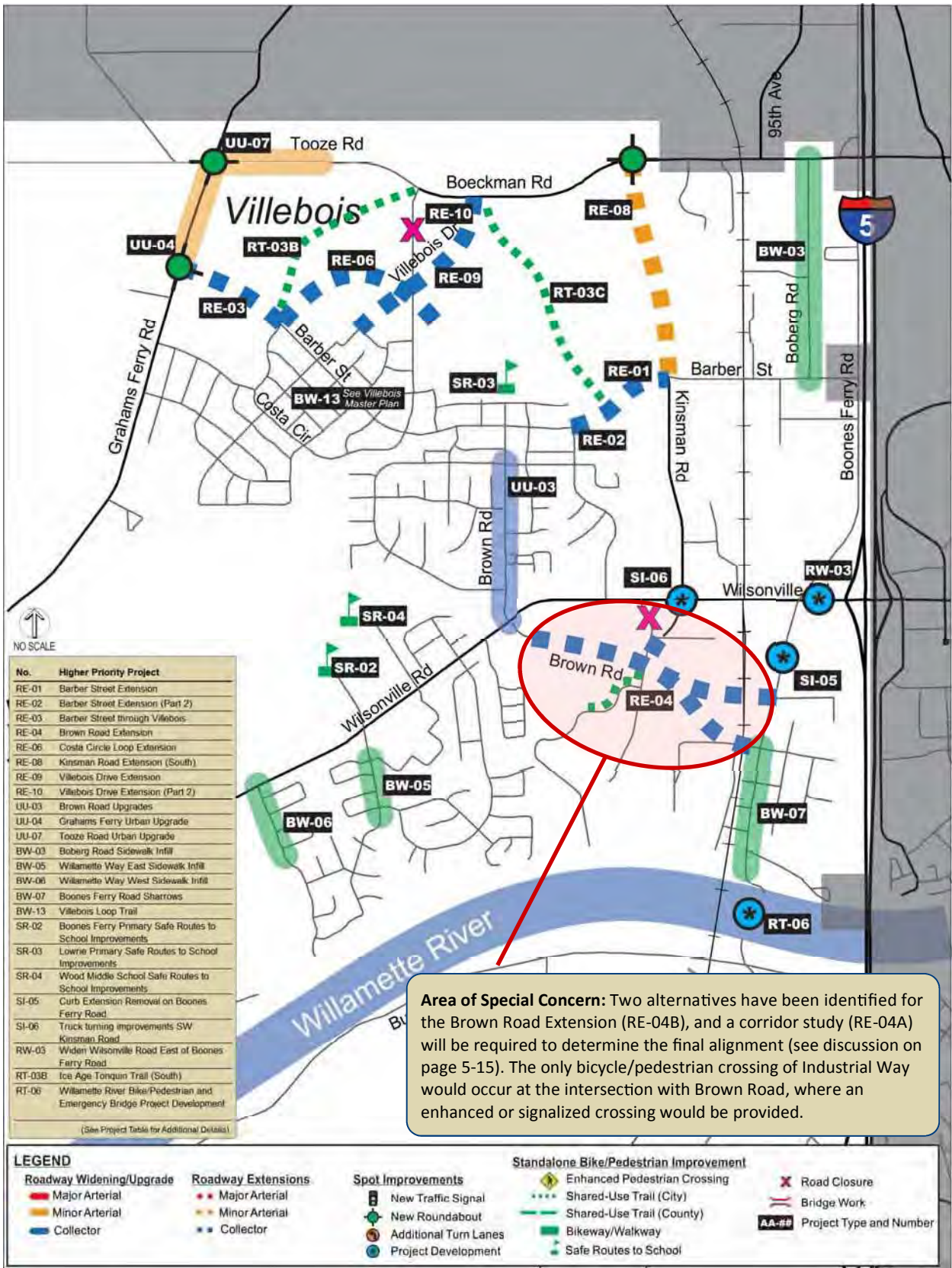


Table 5-5. Higher Priority Projects (Southeast Quadrant)

Project	Description	Cost
Roadway Extensions		
RE-05 Canyon Creek Road Extension	Construct remaining 3-lane roadway with bike lanes, sidewalks, and transit stop improvements from existing terminus to Town Center Loop East; project also includes realigning a portion of Vlahos Drive (so it intersects Canyon Creek Road) and installing a traffic signal at the Town Center Loop East/Canyon Creek Road intersection	\$3,500,000
Spot Improvements		
SI-04 Wilsonville Road/Town Center Loop West Intersection Improvements	Widen the north leg of the intersection and install a second southbound right-turn lane (dual lanes)	\$500,000
Standalone Pedestrian and Bicycle Improvements (Bikeways and Walkways)		
BW-08 Town Center Loop Pedestrian, Bicycle, and Transit Improvements	Create more direct connections between destinations within Town Center area, improve accessibility to civic uses and transit stops, retrofit sidewalks with curb ramps, highlight crosswalks with colored pavement, and construct other similar treatments that support pedestrian, bicycle, and transit access and circulation; also construct shared-use path along Town Center Loop West from Wilsonville Road to Parkway Avenue and restripe Town Center Loop East from Wilsonville Road to Parkway Avenue to a three-lane cross-section with bike facilities	\$500,000
BW-09 Town Center Loop Bike/Pedestrian Bridge	Construct bike/pedestrian bridge over I-5 approximately aligned with Barber Street to improve connectivity of Town Center area with businesses and neighborhoods on west side of I-5; include aesthetic design treatments	\$4,000,000
BW-10 Front Street Pathway	Construct 10-foot wide shared-use path along Front Street from County Mile to Miley Road or reconfigure existing roadway to remove a travel lane in each direction and add bicycle and pedestrian facilities	\$1,110,000
Standalone Pedestrian and Bicycle Improvements (Safe Routes to School)		
SR-01 Boeckman Creek Primary Safe Routes to School Improvements	Construct a bicycle parking shelter near the school and a new 10 to 12-foot bike path on the south side of the existing sidewalk that meanders south of the tree line and connects to the existing marked crosswalk near the school parking lot	\$65,000
Standalone Pedestrian and Bicycle Improvements (Local Trails)		
LT-01 Memorial Park Trail Improvements	Construct trails throughout Memorial Park, including the Memorial Park Center Loop Trail, the River Trail, Kolbe Homestead Trail, and Klein Homestead Trail	\$595,000
Standalone Pedestrian and Bicycle Improvements (Regional Trails)		
RT-01B Boeckman Creek Trail (South)	Construct north-south trail through east Wilsonville following Boeckman Creek, with connections to neighborhoods, parks, and intersecting roads (may need a boardwalk for various sections and would require a comprehensive public process)	\$1,150,000 (Partial Regional funding)
RT-04 Waterfront Trail Improvements	Improve the condition of the shared-use path as it passes underneath the I-5 Boone Bridge by removing the Jersey barriers, installing bollards, widening the trail, adding appropriate pedestrian features such as benches and lighting, and altering the grade of the path underneath the underpass to make it more easily accessible	\$125,000

FIGURE 5-6. HIGHER PRIORITY PROJECTS (SOUTHEAST QUADRANT)

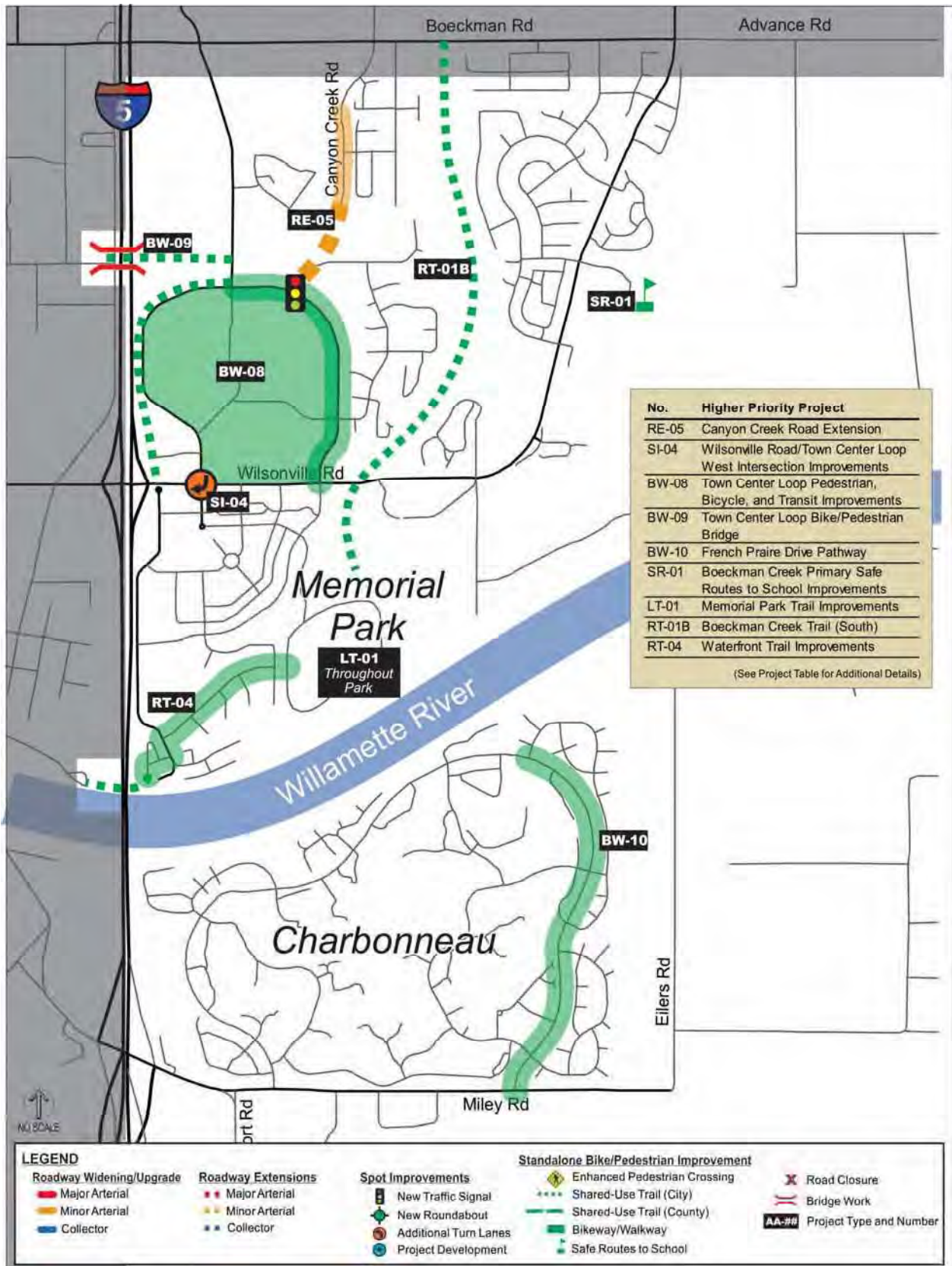
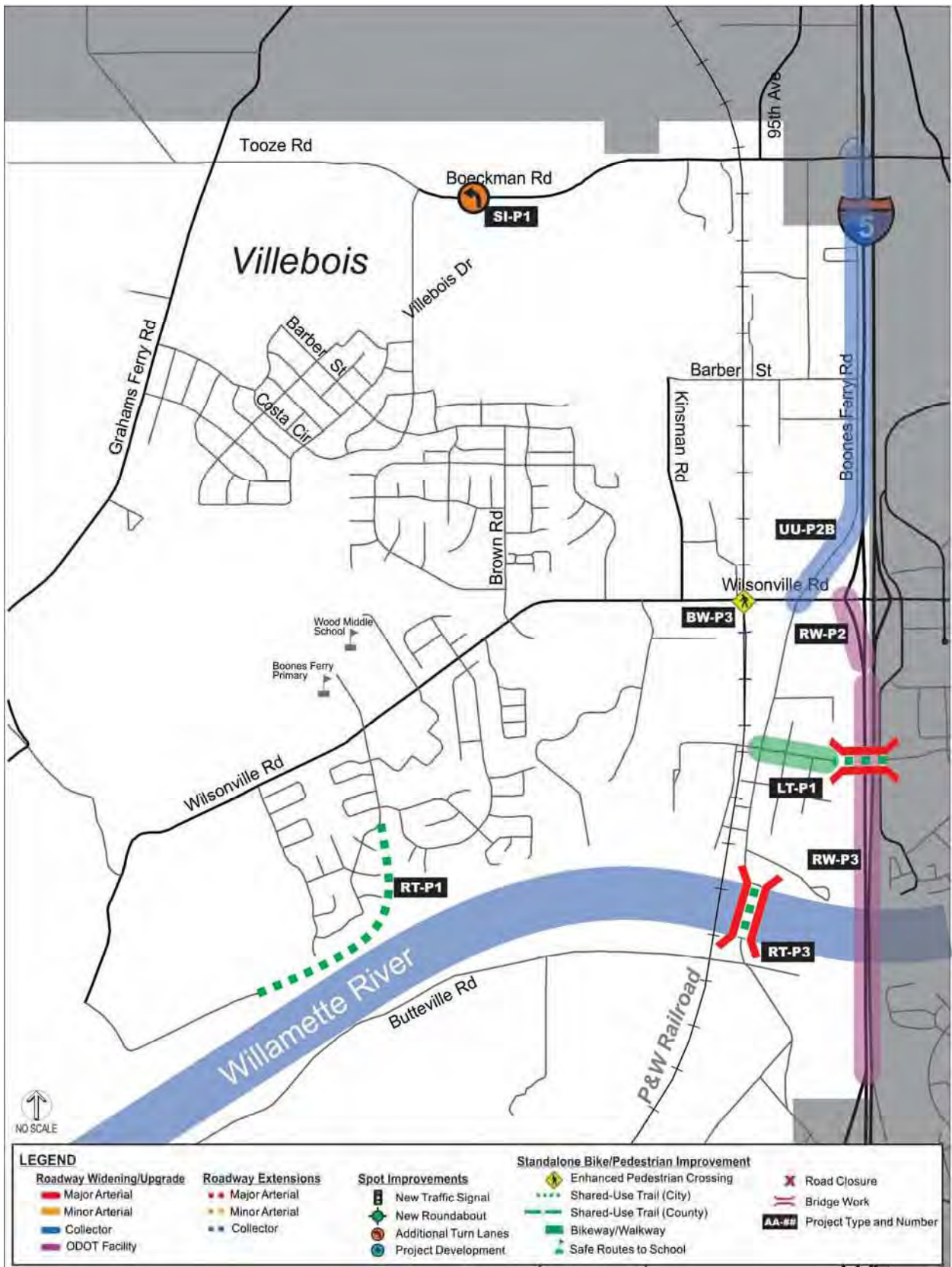


Table 5-11. Additional Planned Projects (Southwest Quadrant)

Project	Description	Why Not Higher Priority?	Cost	
Urban Upgrades				
UU-P2B	Boones Ferry Road Urban Upgrade	Upgrade Boones Ferry Road from Wilsonville Road to Ridder Road with bike lanes on both sides and sidewalks on west side only	High cost with limited additional connectivity benefits due to alternative parallel routes (i.e., Kinsman Road extension); project would become more beneficial once bike and pedestrian bridge is built over I-5 connecting Barber Street to Town Center Loop West	\$5,900,000
Spot Improvements				
SI-P1	Boeckman Road/Villebois Drive Roundabout Widening	Expand roundabout by adding a westbound slip lane to accommodate two westbound travel lanes on Boeckman Road	Potential improvement need expected to be triggered by future regional traffic traveling east-west through Wilsonville	\$500,000
Standalone Pedestrian and Bicycle Improvements (Bikeways and Walkways)				
BW-P3	Wilsonville Road Enhanced Pedestrian Crossing at Railroad Track	Install new pedestrian crossing adjacent to the railroad tracks that includes rectangular rapid flashing beacons (RRFBs), center pedestrian median island, signage, etc.	Not critical until land south of Wilsonville Road Develops	\$70,000
Standalone Pedestrian and Bicycle Improvements (Local Trails)				
LT-P1	5th Street Bike/Pedestrian Bridge and Connections	Construct bike/pedestrian bridge over I-5 approximately aligned with 5 th Street; also construct bike lanes and sidewalks on 5 th Street connecting the new bridge to Boones Ferry Road	High cost and recent improvements to Wilsonville Road Interchange have improved East/West pedestrian connectivity	\$6,400,000
Standalone Pedestrian and Bicycle Improvements (Regional Trails)				
RT-P1	Rivergreen Trail	Natural Trail from Ice Age Tonquin Trail/SW Willamette Way to Waterfront Trail	Low priority as it is needed after other critical trail and pathway connections are completed (i.e. Ice Age Tonquin Trail)	\$260,000
RT-P3	Willamette River Bike/Pedestrian and Emergency Bridge	Construct bridge over Willamette River for bike, pedestrian, and emergency access to provide an alternative to the I-5 freeway deck; Higher Priority project list includes project development portion of this project (costs are separate)	High cost; next step is to determine feasibility within planning horizon	\$14,000,000
Roadway Widening				
RW-P2	Additional Queuing Lane on Southbound I-5 Ramp	Construct a third queuing lane on the southbound I-5 ramp at the I-5/Wilsonville Road interchange.	I-5 is an ODOT facility and therefore high priority has not been identified.	\$1,280,000
RW-P3	Auxiliary Lane Across Boone Bridge	Construct a northbound auxiliary lane on I-5 beginning at the Charbonneau northbound entrance ramp and terminating just north of the Wilsonville Road Interchange.	I-5 is an ODOT facility and therefore high priority has not been identified.	N/A

FIGURE 5-10. ADDITIONAL PLANNED PROJECTS (SOUTHWEST QUADRANT)





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Waiver Request:

Driveway Distance to Adjacent Driveway & Drive Aisles Placed Within 50 Feet of ROW

Project No: 180146.01 **Date:** February 18, 2019
Project Name: Industrial Focus **Revised** March 27, 2019
Subject: Access Driveway Waivers
By: Gavin Russell
To: City of Wilsonville

The DKS Transportation Impact Analysis dated January 25, 2019 for the proposed Industrial Focus development indicates conflicts with City of Wilsonville Public Work Standards (driveway spacing and clear drive aisle length). Based on further investigation of recommended alterations and subsequent discussions with the City of Wilsonville we have modified drive aisles and parking stalls as shown on the revised Site Master Plan (attached), and we are requesting waivers for the following:

Variance Request I: A variance is requested from Public Works Standards Section 201.2.23.g that stipulates minimum 100-foot spacing between nearest edge of driveway drops for driveways with more than 100 average daily trips. The requested variance is for the spacing to be reduced to 20.0-foot between the proposed north Boberg Road driveway and the existing driveway on the adjacent property.

The Transportation Impact Analysis notes that the proposed northern driveway on Boberg Road does not meet access spacing standards (201.2.23. g). Boberg Road is designated a collector and a minimum of 100-foot driveway separation is recommended, with 300-foot separation desired. The proposed driveway is approximately 20 feet from edge of driveway to edge of the existing adjacent driveway.

This standard cannot be met due to the proximity of the existing adjacent driveway relative to the shared property line and the need to provide for proper truck maneuvering on the subject site. The site has approximately 330' of frontage along Boberg Road. Flow through circulation is required for safe truck traffic on the site, which requires the two driveways along the Boberg Road frontage. The two proposed driveways are approximately 270 feet apart, which are as close to the desired 300-foot standard as possible. Positioning the north driveway farther south would force truck traffic through the future passenger vehicle parking area, creating a safety issue. This layout would also provide inadequate maneuverability for the larger vehicles, disrupt internal traffic flow and increase the potential for accidents.

We believe that approval of the variance will not result in additional traffic issues. Although SW Boberg Road is designated as a collector street, it has relatively light industrial traffic for a collector. This will minimize the potential for conflicts along this street frontage as a result of the reduced access spacing. Moreover, precedent has already been established for driveways located closer than the prescribed 100 feet along this stretch of SW Boberg Road. For example, adjacent lots 31W14A00402, 31W14A00400, 31W14A00403 and 31W14A00401 all have driveways approximately 20 feet apart.

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The proposed driveway locations will also align, to the greatest extent practical, with the existing driveways for the property on the west side of Boberg opposite this lot.

Variance Request 2: A variance is requested from Public Works Standards Section 201.2.23.m from 50 to 100-foot spacing (edge of right-of-way to edge of drive aisle, depending on ADT) to 27 feet as allowed in Public Works Standards Sec. 201.2.23.m.4.

The Transportation Impact Analysis notes the minimum clear drive aisle length shall be 100 feet for projects with Average Daily Trips (ADT) over 100 (201.2.23.m). There are 224 ADT anticipated on Table 4 of the traffic analysis report for Phase (1).

The standard cannot be met as it would force passenger traffic into the truck maneuvering areas of the site, creating an impractical and unsafe circulation condition. The proposed site layout includes passenger vehicle parking lots, positioned in front of the buildings along the street frontages and adjacent to the building entries, while the industrial loading areas are located at the back of the buildings, to allow separation of these modalities. The proposed driveway aisles submitted for the traffic study have both intersecting aisles and parking stalls within the 100-foot parking lot driveway aisles. If the access aisle were eliminated along the 100' length, the proposed parking circulation would be cut off from a direct route to site access driveways and the adjoining lot. This would force internal circulation around the back of the building and through potentially dangerous traffic at loading areas.

In response to the recommendations brought up in the traffic study, the parking stall adjacent to the main drive aisles and intersection drive aisle have been pulled back or eliminated. On the revised site plan, no parking spaces are located within 60' of the back of sidewalk or right of way line, whichever is greater.

The proposed variance does not present an issue, since the site plan provides for various options for both truck and passenger car queuing and clear circulation routes for both. The revised plan maintains at least a 20' length of queue area at all sides of each of the drive aisle intersections. The plan also does not create any dead end situations, even if there is a queue that exceeds the parking lot drive aisle. Additionally, although not addressed in the code, the three proposed driveways for Phase (1) would provide options for vehicle access and in theory disperse the ADT. If split equally between driveways the ADT per driveway would be under 100, requiring only a 50-foot clear aisle. Logically, more driveways will reduce queuing.

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Industrial Focus

PRELIMINARY STORMWATER REPORT & CALCULATIONS

Wilsonville, Oregon

May 22, 2019

The information contained in this report was prepared by
and under direct supervision of the undersigned:

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Appendices

Appendix A

Existing Conditions

Appendix B

Site Plan

Appendix C

Storm Plan

Appendix D

BMP Sizing Tool Report

Industrial Focus

I. Project Summary

This report has been prepared to outline the existing and proposed on-site and off-site stormwater conditions for the Industrial Focus project. This report is based on existing topographic survey, geotechnical report and site investigation.

The project site is located in Wilsonville, Oregon. The total pre-developed site is approximately 178,370 square feet (4.09 acres). The site currently consists of a grass field. The current site slopes from east to west.

See Appendix A – Existing Conditions

The primary purpose of this project is to develop the site for a proposed building, parking and drive aisles. The onsite improvements will be approximately 142,365 square feet (3.27 acres) of total impervious area. Right of way improvements will also be developed which will include half street improvements along Boones Ferry Rd. The improvements will be approximately 12,840 square feet (0.29 acres) of total impervious area.

See table 2.1 – Site Basin Properties

TABLE 2.1: Onsite Basin Properties

Basin	Drainage Source	Impervious Area (sf)	Connected Treatment Type
1	Asphalt/Concrete Pavement	82,165	Storm Facility
2	Roof	25,225	Storm Facility
3	Gravel Surface	34,975	Storm Facility
Total		142,365	

The total site will be approximately 171,250 (3.93 acres) after dedication. In addition to the site improvements, stormwater conveyance, water quality treatment, detention, and flow control devices are also included in the proposed design.

See Appendix B – Site Plan and Appendix C – Storm Plan

II. Stormwater Calculations

The stormwater quality and quantity required for this project are designed according to the requirements of the City of Wilsonville and the BMP sizing tool. Due to limitations from low infiltration rates onsite and the low impact development approach, the onsite stormwater facilities have been modeled as 3 filtration swale and 3 filtration planters in order to meet the treatment and flow control requirements for above ground detention. The area of the filtration swales that were outputted by the BMP sizing tool was also modified by a 25% reduction due to our facilities adding an additional 6” of growing medium.

Industrial Focus

The offsite facilities have been modeled as filtration planters in order to meet treatment and flow control requirements for above ground detention.

TABLE 2.2: Facility Areas

Facility	BMP Size (sf)	25% Reduction Size (sf)	Design Size
Swale - SW	4,200	3,150	3,240
Swale - NW	835	626	657
Swale - NE	470	352	352
Planter - North	280	N/A	280
Planter - Middle	260	N/A	260
Planter - South	270	N/A	270
Planter - Offsite	535	N/A	535

See Appendix D – BMP Sizing Tool Report

III. Stormwater Design

The proposed stormwater facilities are designed to capture all runoff from the proposed site improvements. No runoff from adjacent properties is anticipated to be captured by the proposed facilities. In addition, all site impervious runoff will be completely managed on site and will not drain onto adjacent properties.

All stormwater runoff has been collected by catch basins, downspouts, and/or flow through curb cuts into the storm facilities at different locations onsite. The onsite stormwater management will be accomplished with 3 filtration swale and 3 filtration planters that serves to meet the water quality and flow control requirements of the project for the 10-year design stormwater event. Water quality treatment is achieved by flowing through 18” to 24” of growing medium (24” for the filtration swales and 18” for the filtration planters). The stormwater will then enter a 6” perforated pipe embedded in 15” of drain rock that will ultimately outfall into the public storm system via a flow control device located inside the overflow structures.

The offsite stormwater has been modeled to be captured by curb inlets. The stormwater management will be accomplished by maximizing the landscape area with filtration planters along the frontage that serve to meet the water quality and flow control requirements of the project for the 10-year design stormwater event. Water quality treatment is achieved by flowing through 18” of growing medium. The stormwater will then enter a 6” perforated pipe embedded in 15” drain rock that will ultimately outfall into the public storm system via a flow control device located inside the overflow structure at the southern-most facility.

IV. Conveyance Calculations

Conveyance calculations will be included with the permit submittal and will be sized for the 25-year storm event.

Industrial Focus

V. Downstream Analysis

No negative impacts are anticipated downstream as post-developed flow is being limited to pre-developed flow.

VI. Operations and Maintenance

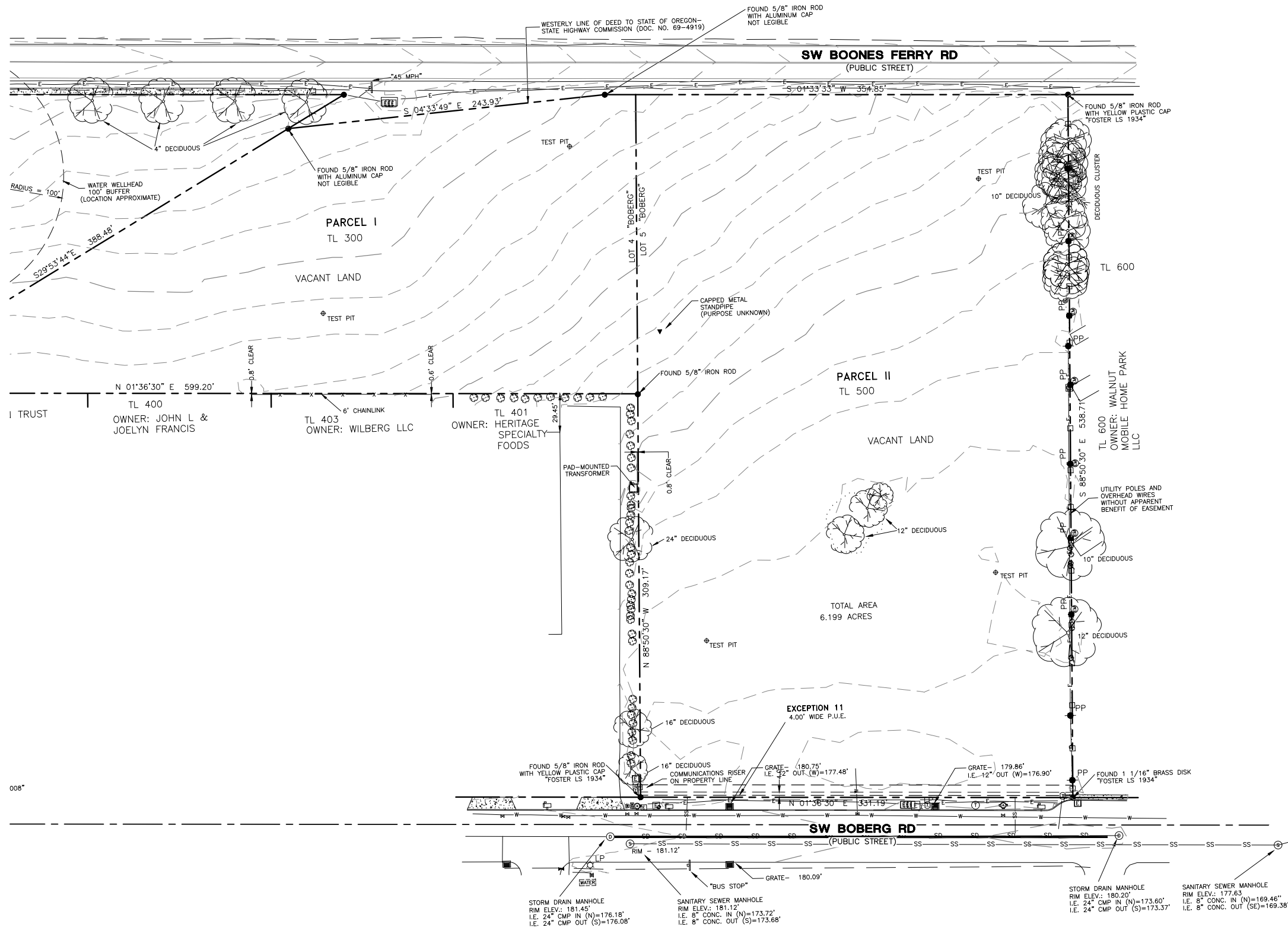
A completed Operations and Maintenance plan will be included with the permit submittal.

VII. Engineering Conclusion

Based on the requirements of using low impact development and the BMP sizing tool the proposed site facilities are adequately designed to manage the proposed development conditions and should be approved as designed.

Appendix A

Existing Conditions

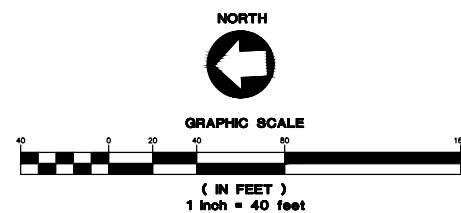


SHEET NOTES

- 1 THE BASIS OF BEARING FOR THIS SURVEY IS PER SURVEY NO. SN2015-164, CLACKAMAS COUNTY RECORDS. THIS IS NOT A RECORDABLE SURVEY.
- 2 UNDERGROUND UTILITIES ARE SHOWN PER SURFACE MARKINGS AND AS-BUILT INFORMATION PROVIDED BY THE CONTROLLING JURISDICTIONS. THE SURVEYOR MAKES NO GUARANTEE AS TO THE EXACT LOCATION, EXISTENCE, NON-EXISTENCE OR COMPLETENESS OF ANY SUBSURFACE UTILITIES SHOWN, OR NOT SHOWN ON THE MAP. CALL 811 BEFORE DIGGING.
- 3 THE BENCHMARK USED FOR THIS SURVEY IS AN OPUS GPS DERIVED ELEVATION ON A NAIL NEAR THE NW PROPERTY CORNER. ELEVATION: 181.11' (NAVD 88)

LEGEND

- BOLLARD
- CABLE TELEVISION VAULT
- COLUMN
- COMMUNICATIONS RISER
- CURB INLET
- DECIDUOUS TREE
- FIRE HYDRANT
- FOUND MONUMENT AS NOTED
- GPS OCCUPATION
- MAILBOX
- GAS VALVE
- LIGHT POLE
- POWER POLE
- POWER METER
- POWER PANEL
- POWER VAULT
- PUBLIC UTILITY EASEMENT
- SANITARY SEWER MANHOLE
- SHRUB
- SIGN AS INDICATED
- STORM SEWER MANHOLE
- TELEPHONE MANHOLE
- TEST PIT
- TRANSFORMER
- UTILITY VAULT
- WATER METER
- WATER VALVE
- WATER VAULT
- BUILDING
- BUILDING OVERHANG
- FENCE
- GAS LINE
- OVERHEAD POWER
- SANITARY SEWER
- STORM SEWER
- UNDERGROUND TELEVISION
- WATER LINE
- CONCRETE



ISSUE DATE: 04/04/19
DESIGN REVIEW: 1

AAI ENGINEERING
4875 SW Griffin Drive | Suite 300 | Beaverton, OR 97005
503.620.3020 | www.aai-engineering.com

CIDA
ARCHITECTURE
ENGINEERING
PLANNING
INTERIORS

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PORTLAND, OREGON 97224
TEL: 503.226.1285
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WWW.CIDAINC.COM

NEW CONSTRUCTION
INDUSTRIAL FOCUS - PHASE 1
NO SITUS - 31W14A.00500
WILSONVILLE, OREGON 97070

EXISTING CONDITIONS
C0.2
180146.01
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Appendix B

Site Plan



ISSUE DATE: 04/04/19
DESIGN REVIEW: 1



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NEW CONSTRUCTION
INDUSTRIAL FOCUS - PHASE 1
NO SITUS - 31W14A.00500
WILSONVILLE, OREGON 97070

HARDSCAPE PLAN
C1.0
180146.01
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SHEET NOTES

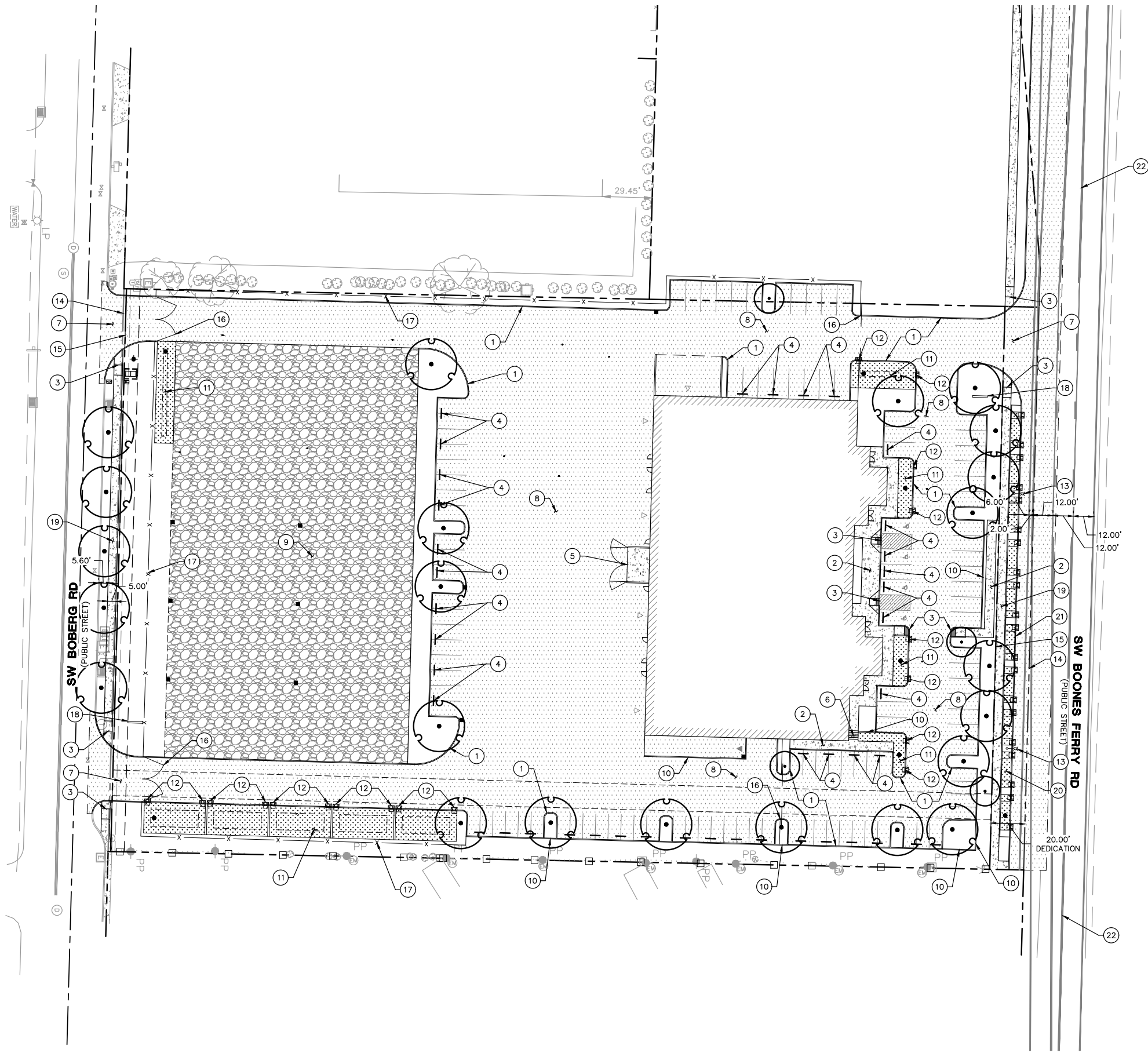
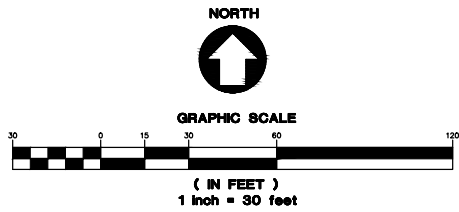
- SEE SHEET C0.1 FOR GENERAL SHEET NOTES.
- SEE ARCHITECTURAL PLANS FOR ADDITIONAL SITE INFORMATION.
- THE CONTRACTOR SHALL HAVE A FULL SET OF THE CURRENT APPROVED CONSTRUCTION DOCUMENTS INCLUDING ADDENDA ON THE PROJECT SITE AT ALL TIMES.
- THE CONTRACTOR SHALL KEEP THE ENGINEER AND JURISDICTION INFORMED OF CONSTRUCTION PROGRESS TO FACILITATE SITE OBSERVATIONS AT REQUIRED INTERVALS. 24-HOUR NOTICE IS REQUIRED.

CONSTRUCTION NOTES

- INSTALL PRIVATE CURB
- INSTALL PRIVATE SIDEWALK
- INSTALL ADA RAMP
- INSTALL WHEELSTOP
- INSTALL TRASH ENCLOSURE, SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION
- INSTALL STAIRS, SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION
- INSTALL DRIVEWAY
- INSTALL ASPHALT SURFACING
- INSTALL GRAVEL SURFACING
- INSTALL WALL, DESIGN BY OTHERS
- INSTALL PRIVATE STORMWATER FACILITY. SEE SHEET C3.0 FOR ADDITIONAL INFORMATION
- INSTALL CONCRETE INLET
- INSTALL PUBLIC LIGHTPOLE
- EXISTING PROPERTY LINE TO BE ABANDONED
- PROPOSED PROPERTY LINE
- INSTALL GATE, SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION
- INSTALL FENCE, SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION
- INSTALL SIGN, SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION
- INSTALL PUBLIC SIDEWALK
- INSTALL PUBLIC STORMWATER FACILITY
- INSTALL PUBLIC CURB
- OFFSITE IMPROVEMENT NOT ADJACENT TO THE PROPOSED PROJECT ARE SHOWN FOR REFERENCE ONLY. CONTINUED COORDINATION WITH THE CITY WILL BE COMPLETED PRIOR TO PERMIT SUBMITTAL

LEGEND

PROPERTY LINE	
CONCRETE SIDEWALK SURFACING	
ASPHALT SURFACING	
GRAVEL SURFACING	



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Appendix C

Storm Plan



04/04/19
ISSUE DATE
DESIGN REVIEW
1



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WILSONVILLE, OREGON 97070

STORM PLAN

C3.0
180146.01

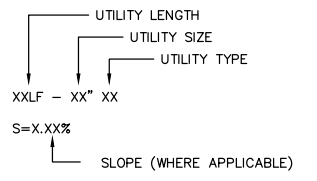
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SHEET NOTES

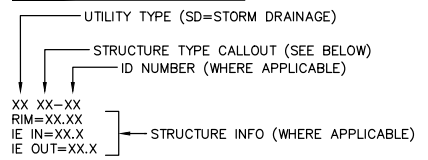
- SEE C0.1 FOR GENERAL SHEET NOTES.
- STRUCTURES HORIZONTAL LOCATIONS AND PIPE INVERTS ARE BASED ON THE CENTER OF THE STRUCTURE.
- ALL STORM PIPING SHALL BE PVC 3034 OR APPROVED EQUAL AT 1.0% MIN SLOPE, UNLESS NOTED OTHERWISE.
- PIPE BEDDING AND BACKFILL FOR ALL UTILITIES SHALL BE DONE.
- THIS PLAN IS GENERALLY DIAGRAMMATIC. IT DOES NOT SHOW EVERY JOINT, BEND, FITTING, OR ACCESSORY REQUIRED FOR CONSTRUCTION.
- CLEAN OUTS SHALL BE INSTALLED IN CONFORMANCE WITH UPC CHAPTER SEVEN, SECTION 707 AND SECTION 719. NOT ALL REQUIRED CLEAN OUTS ARE SHOWN.
- UTILITIES WITHIN FIVE FEET OF A BUILDING SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR INTERIOR USE AS DESCRIBED IN THE CURRENT EDITION OF THE UPC.
- CHANGES IN DIRECTION OF DRAINAGE PIPING SHALL BE MADE BY THE APPROPRIATE USE OF APPROVED FITTINGS AND SHALL BE OF THE ANGLES PRESENTED BY ONE-SIXTEENTH BEND, ONE-EIGHTH BEND, ONE-SIXTH BEND OR OTHER APPROVED FITTINGS OF EQUIVALENT SWEEP.
- INLETS AND OUTLETS TO ON-SITE MANHOLES SHALL HAVE FLEXIBLE CONNECTION NO CLOSER THAN 12" AND NO FARTHER THAN 36" FROM THE MANHOLE.

LABEL LEGEND

PIPE LABELS



STRUCTURE LABELS



STRUCTURE TYPES

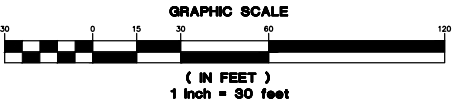
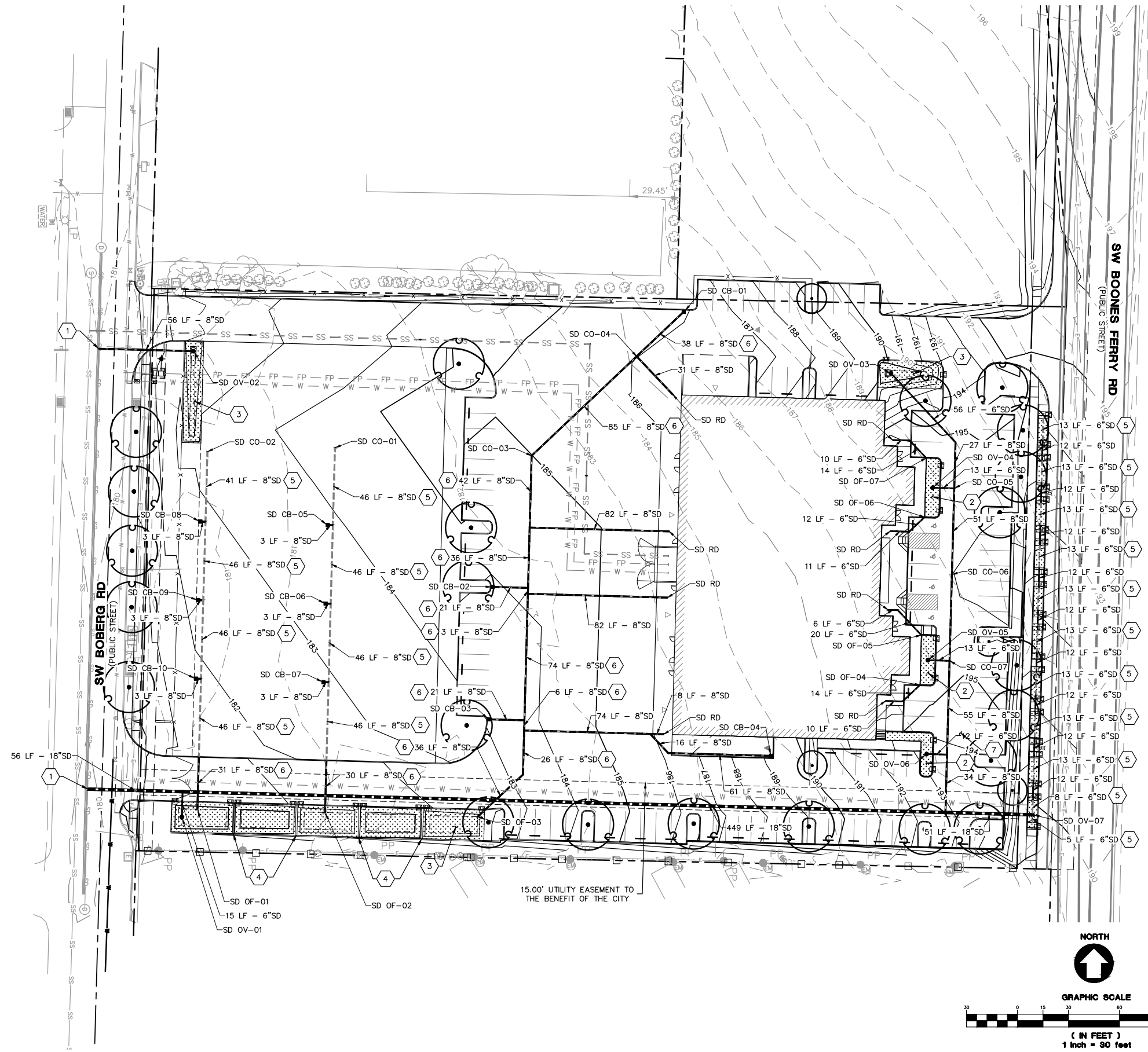
CALLOUT	DESCRIPTION
CB	CATCH BASIN
CO	CLEANOUT
OF	OUTFALL
OV	OVERFLOW
RD	ROOF DRAIN CONNECTION

LEGEND



STORM NOTES

- CONNECT TO EXISTING STORM MAIN
- INSTALL PRIVATE FILTRATION PLANTER
- INSTALL PRIVATE FILTRATION SWALE
- INSTALL CHECK DAM
- INSTALL PERFORATED PIPE DRAIN
- INSTALL DUCTILE IRON PIPE
- INSTALL PUBLIC FILTRATION PLANTER



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Appendix D

BMP Sizing Tool Report

WES BMP Sizing Report

Project Information

Project Name	Industrial Focus
Project Type	Commercial
Location	
Stormwater Management Area	167508
Project Applicant	
Jurisdiction	CCSD1NCSA

Drainage Management Area

Name	Area (sq-ft)	Pre-Project Cover	Post-Project Cover	DMA Soil Type	BMP
Sidewalk and Asphalt - SW	46,505	Grass	ConventionalConcrete	C	Swale - SW
Gravel Lot - S	28,475	Grass	CrushedAggregate	C	Swale - SW
Roof -W	12,000	Grass	Roofs	C	Swale - SW
Pervious - SW	9,400	Grass	Grass	C	Swale - SW
Imperv - 1	5,710	Grass	ConventionalConcrete	C	Swale - NE
Roof - 1	3,305	Grass	Roofs	C	Swale - NE
Perv - 1	1,390	Grass	Grass	C	Swale - NE
Imperv - 2	3,525	Grass	ConventionalConcrete	C	Planter - North
Roof -2	3,305	Grass	Roofs	C	Planter - North
Perv - 2	535	Grass	Grass	C	Planter - North
Imperv - 3	3,060	Grass	ConventionalConcrete	C	Planter - Middle
Roof - 3	3,305	Grass	Roofs	C	Planter - Middle
Perv - 3	350	Grass	Grass	C	Planter - Middle
Imperv - 4	3,275	Grass	ConventionalConcrete	C	Planter - South
Roof - 4	3,305	Grass	Roofs	C	Planter - South
Asphalt - NW	11,190	Grass	ConventionalConcrete	C	Swale - NW
Perv - 4	415	Grass	Grass	C	Planter - South
Gravel - N	6,500	Grass	CrushedAggregate	C	Swale - NW
Pervious - NW	1,100	Grass	Grass	C	Swale - NW

Impervious - Offsite	12,840	Grass	Conventional Concrete	C	Planter - Offsite
Pervious - Offsite	1,540	Grass	Grass	C	Planter - Offsite

LID Facility Sizing Details

LID ID	Design Criteria	BMP Type	Facility Soil Type	Minimum Area (sq-ft)	Planned Areas (sq-ft)	Orifice Diameter (in)
Planter - North	Flow Control and Treatment	Stormwater Planter - Filtration	C1	279.4	280.0	0.8
Planter - Middle	Flow Control and Treatment	Stormwater Planter - Filtration	C1	258.7	260.0	0.8
Planter - South	Flow Control and Treatment	Stormwater Planter - Filtration	C1	268.0	270.0	0.8
Planter - Offsite	Flow Control and Treatment	Stormwater Planter - Filtration	C1	531.5	535.0	1.1
Swale - NE	Flow Control and Treatment	Vegetated Swale - Filtration	C1	470.9	471.0	1.0
Swale - NW	Flow Control and Treatment	Vegetated Swale - Filtration	C1	835.5	877.0	1.3
Swale - SW	Flow Control and Treatment	Vegetated Swale - Filtration	C1	4,200.6	4,320.0	2.9

Pond Sizing Details

1. FCWQT = Flow control and water quality treatment, WQT = Water quality treatment only
2. Depth is measured from the bottom of the facility and includes the three feet of media (drain rock, separation layer and growing media).
3. Maximum volume of the facility. Includes the volume occupied by the media at the bottom of the facility.
4. Maximum water storage volume of the facility. Includes water storage in the three feet of soil media assuming a 40 percent porosity.

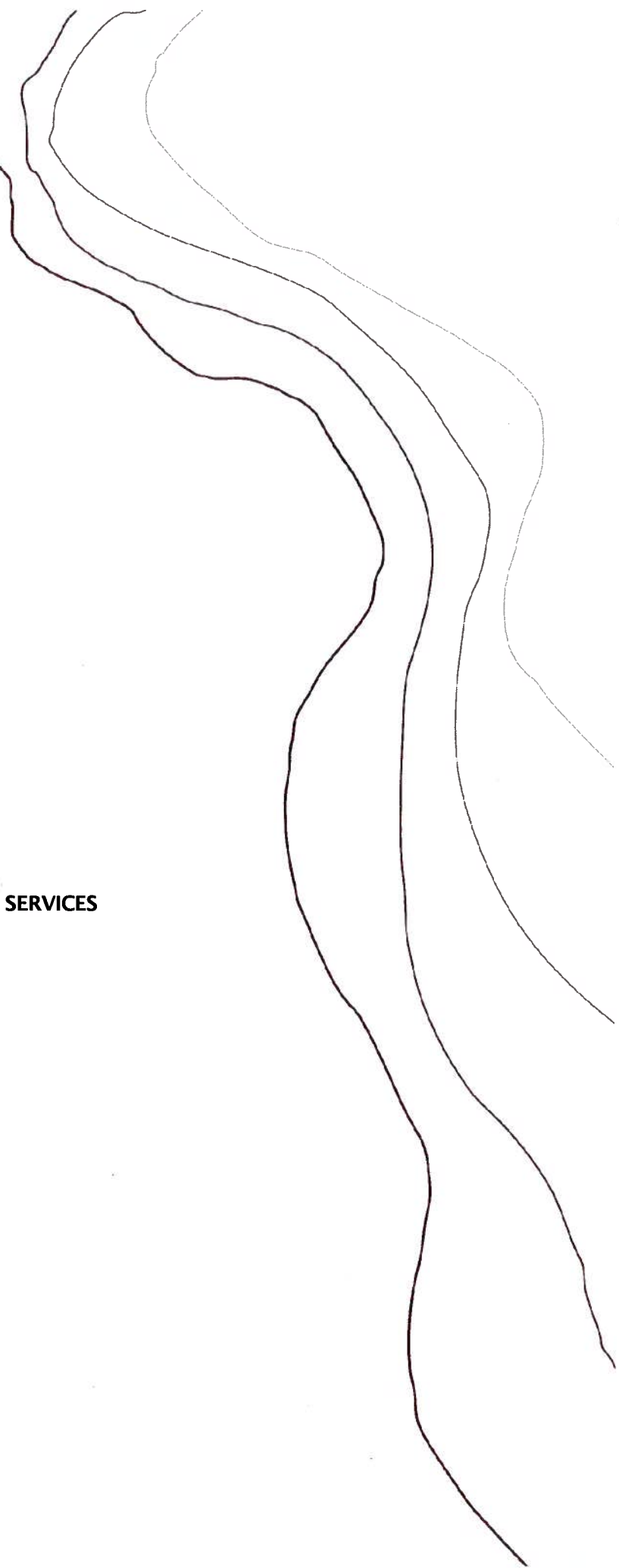
GEODESIGN^{INC}

REPORT OF GEOTECHNICAL ENGINEERING SERVICES

Wilsonville Facilities
Tax Lots 300 and 500
Wilsonville, Oregon

For
D.P. Nicoli, Inc.
November 14, 2018

GeoDesign Project: DPNicoli-5-01





November 14, 2018

D.P. Nicoli, Inc.
PO Box 2401
Lake Oswego, OR 97035

Attention: Stephanie Nanna and Dave Nicoli

Report of Geotechnical Engineering Services
Wilsonville Facilities
Tax Lots 300 and 500
Wilsonville, Oregon
GeoDesign Project: DPNicoli-5-01

GeoDesign, Inc. is pleased to submit this report of geotechnical engineering services for the proposed development, which includes Tax Lots 300 and 500 of Clackamas County Tax Map 3S1W14A in Wilsonville, Oregon. Our services for this project were conducted in accordance with our proposal dated August 27, 2018.

We appreciate the opportunity to be of service to you. Please call if you have questions regarding this report.

Sincerely,

GeoDesign, Inc.

A handwritten signature in blue ink, appearing to read "G. Saunders", is written over a faint circular stamp.

George Saunders, P.E., G.E.
Principal Engineer

cc: Tara Lund, CIDA, Inc. (via email only)
Craig Harris, AAI Engineering (via email only)

JLM:TVS:GPS:kt

Attachments

One copy submitted (via email only)

Document ID: DPNicoli-5-01-111418-geor.docx

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EXECUTIVE SUMMARY

In our opinion, the site can be developed as we have identified in the "Project Understanding" section provided the recommendations in this report are incorporated into design and implemented during construction. This summary is an overview and the report should be referenced for a more thorough discussion of the subsurface conditions and geotechnical recommendations for the project. The following factors will have an impact on design and construction of the proposed development:

- A formal grading plan had not been developed by the time of this report; however, preliminary estimates are that cuts and fills will likely be in the 3- to 5-foot range.
- Assuming the distributed floor slab live loads, foundation loads, and the preliminary finished floor grade provided in this report, our analysis indicates that post-construction settlements will be within typical structural tolerances and the proposed structures can be supported by conventional shallow foundations.
- The footings should bear on granular pads underlain by firm, undisturbed native soil or on structural fill overlying firm, undisturbed native soil. Excavations up to 2.0 feet BGS may be required to remove disturbed native soil or undocumented fill material from the influence zones of footings.
- The site was previously used for agricultural purposes. Consequently, a tilled zone is present at the ground surface. We recommend that subgrade for floor slabs and pavements be improved as described in the "Site Preparation" section.
- The fine-grained soil at the site is sensitive to small changes in moisture content and difficult, if not impossible, to adequately compact during wet weather or when the moisture content of the soil is more than a couple percent above the optimum moisture content required for compaction.

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ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
AC	asphalt concrete
ACI	American Concrete Institute
ACP	asphalt concrete pavement
ADTT	average daily truck traffic
ASTM	American Society for Testing and Materials
BGS	below ground surface
CBR	California Bearing Ratio
DCP	dynamic cone penetrometer
ESAL	equivalent single-axle load
FHWA	Federal Highway Administration
g	gravitational acceleration (32.2 feet/second ²)
H:V	horizontal to vertical
IBC	International Building Code
MCE	maximum considered earthquake
NA	not applicable
ODOT	Oregon Department of Transportation
OSHA	Occupational Safety and Health Administration
OSSC	Oregon Standard Specifications for Construction (2018)
PCC	portland cement concrete
pcf	pounds per cubic foot
pci	pounds per cubic inch
psi	pounds per square inch
PG	performance grade
psf	pounds per square foot
SOSSC	State of Oregon Structural Specialty Code
SPT	standard penetration test
USACE	U.S. Army Corps of Engineers

1.0 INTRODUCTION

GeoDesign, Inc. is pleased to submit this report providing geotechnical engineering recommendations for use in design and construction of the proposed development, which includes Tax Lots 300 and 500 of Clackamas County Tax Map 3S1W14A in Wilsonville, Oregon. Figure 1 shows the site relative to existing topographic and physical features. Figure 2 shows the proposed site layout and the approximate locations of our explorations. Acronyms and abbreviations used herein are defined above, immediately following the Table of Contents.

2.0 PROJECT UNDERSTANDING

The proposed development consists of two parcels that are oriented north and south of each other and located south of SW Boeckman Road between SW Boberg Road and SW Boones Ferry Road. The north and south parcels encompass 2.09 and 4.07 acres, respectively. We understand that three industrial facilities are proposed to be constructed with loading docks and surrounding paved driveways and parking areas. The preliminary site plan indicates that the buildings are 22,000, 30,000, and 32,250 square feet. We understand that, initially, only one or two buildings will be constructed and the undeveloped area will be used as a yard for storing shoring elements.

It is our understanding that the buildings will be concrete tilt-up structures. Column and wall loads were not provided at the time of this report. Based on our experience with similar structures, we anticipate maximum column and wall loads to be less than 150 kips and 5 kips per lineal foot, respectively. We anticipate floor slab loads will be less than 300 psf.

Based on preliminary grading estimates from Craig Harris of AAI Engineering, we understand that cuts and fills are expected to be less than 3 to 5 feet.

3.0 PURPOSE AND SCOPE

The purpose of our services was to explore subsurface conditions at the site and provide geotechnical engineering recommendations for design and construction of the proposed facilities. Specifically, we completed the following scope of services:

- Reviewed readily available geologic maps and our in-house files for existing information on subsurface conditions in the site vicinity, including review of our previous explorations at nearby surrounding sites.
- Coordinated and managed the field explorations, including utility locates and scheduling subcontractors and GeoDesign field staff.
- Conducted the following explorations:
 - Five borings within the proposed building areas to a depth of 21.5 feet BGS.
 - Two borings at the site to a depth of 31.5 feet BGS.
- Classified the material encountered in the explorations and maintained a detailed log of each exploration.
- Collected disturbed and undisturbed soil samples for laboratory testing at select depths from the explorations.

- Performed one field infiltration test in one boring at a depth 5.5 feet BGS.
- Performed DCP testing at all boring locations.
- Performed the following laboratory tests on select samples collected from the explorations:
 - Twenty-three natural moisture content determinations
 - Three particle-size analyses
 - One Atterberg limits test
 - One consolidation test to evaluate soil compressibility
- Provided recommendations for site preparation, grading and drainage, stripping depths, fill type for imported material, compaction criteria, trench excavation and backfill, use of on-site soil, and wet/dry weather earthwork.
- Provided recommendations for design and construction of shallow spread foundations, including allowable design bearing pressure, minimum footing depth and width, passive resistance capacity, and coefficient of friction.
- Provided recommendations for preparation of floor slab subgrade.
- Provided design criteria recommendations for retaining walls, including lateral earth pressures, backfill, compaction, and drainage.
- Provided infiltration test results and recommendations for design infiltration rates.
- Provided recommendations for the management of identified groundwater conditions that may affect the performance of structures.
- Provided design and construction recommendations for on-site pavement for access roads, parking areas, and the storage yard for shoring elements. Our design recommendations include the following:
 - Standard pavement sections consisting of AC supported on aggregate base
 - Pavement sections consisting of AC supported on cement-amended soil for access roads and parking areas
 - Pavement sections with surfacing that consists of gravel, AC, or PCC for the storage yard (underlain with aggregate base for the AC and PCC options)
 - Pavement sections of gravel, AC, or PCC on cement-amended soil
- Provided recommendations for subsurface drainage of foundations and pavements.
- Provided recommendations for IBC seismic coefficients and provided a discussion of potential geologic hazards at the site.
- Provided this report summarizing the results of our geotechnical evaluation.

4.0 SITE CONDITIONS

4.1 SURFACE CONDITIONS

The proposed development includes Tax Lots 300 and 500 of Clackamas County Tax Map 3S1W14A and encompasses a cumulative 6.16 acres of vacant land. Based on historical aerial photographs in our project files, between at least the early 1900s and 2005 the site was used for agricultural purposes and a tilled (cultivated) zone is anticipated at the ground surface. The properties gradually slope from north to the south. In general, the surrounding properties of the site are industrial. At the time of our explorations, standing water was not observed at the ground surface of the site.

4.2 SUBSURFACE CONDITIONS

4.2.1 General

Our knowledge of subsurface conditions at the site is based on drilling seven borings (B-1 through B-7). The borings were drilled using mud rotary methods to depths between 21.5 and 31.5 feet BGS. The top 5 feet of boring B-4 was drilled using a 4-inch-diameter hollow-stem auger to facilitate infiltration testing. Figure 2 shows the approximate exploration locations. The exploration logs and laboratory test results are presented in Appendix A.

Based on historical aerial photographs in our project files, between at least the early 1900s and 2005 the site was used for agricultural purposes and a tilled (cultivated) zone is anticipated at the ground surface. In general, the subsurface conditions consist of silt underlain by layers of gravel, clay, and sand. The following sections provide a summary of the soil units encountered.

4.2.2 Silt

Silt was encountered in all of borings from the ground surface to depths between 14 and 18 feet BGS. Root zones encountered in our borings vary between 3 and 4 inches thick. In most cases, the root zone includes fine roots and rootlets up to ¼-inch diameter. Based on SPT blow counts, the silt is medium stiff to stiff near the ground surface and is very soft to soft at depths between 7 and 18 feet BGS in borings B-1 through B-6. Medium stiff conditions were observed throughout the surficial silt layer in boring B-7. A layer of medium stiff silt was observed between depths of 23 and 28 feet BGS in boring B-1. Laboratory testing of select samples indicates the silt had in-place moisture contents between 26 and 42 percent at the time of our explorations and moderate to high compressibility.

4.2.3 Gravel

Gravel with varying sand and silt content was encountered beneath the silt at depths between 14 and 18 feet BGS in borings B-1 and B-4 through B-6. Based on SPT blow counts, the gravel is medium dense to dense. Laboratory testing of select samples indicates the gravel unit had in-place moisture contents between 15 and 27 percent at the time of our explorations.

4.2.4 Fat Clay

In general, we encountered fat clay beneath the silt and gravel layers at depths between 17 and 18.5 feet BGS in borings B-1 through B-5. A deeper second layer of clay was encountered in boring B-4 between depths of 25.5 and 29 feet BGS. Based on SPT blow counts, the clay is medium stiff to stiff and varies in sand content. Laboratory testing of select samples indicates the fat clay had in-place moisture contents between 38 and 44 percent at the time of our explorations.

4.2.5 Sand

We encountered layers of sand with silt at depths extending between 24 and 31.5 feet BGS in borings B-1 and B-4. We also encountered a layer of sand with silt and gravel at a depth of 15 feet BGS in boring B-7. Based on SPT blow counts, the sand is primarily medium dense. One of the two layers of sand with silt encountered in boring B-4 is loose. Field observations indicated the sand layers were moist at the time of our explorations.

4.2.6 Groundwater

Groundwater could not be measured directly in the mud rotary borings due to the presence of drilling fluid and groundwater was not encountered during the initial 5 feet of drilling of B-4 using hollow-stem drilling methods. Drill logs available from the Oregon Water Resources Department webpage indicated that groundwater is encountered at depths of 10 to 15 feet BGS at sites in the general vicinity of the subject site. Based on our experience in the area, groundwater may rise to within approximately 5 to 7 feet BGS following prolonged winter wet weather and shallower perched water should be expected. The depth to groundwater may fluctuate in response to seasonal changes, water levels in nearby bodies of water, changes in surface topography, and other factors not observed in this study.

4.3 DCP TESTING

We performed DCP testing at each boring location on September 4 and 5, 2018. Approximate locations of the tests are shown on Figure 2. Details of our test program and plots of the summarized data are presented in Appendix B. A summary of the estimated subgrade resilient modulus at each test location is presented in Table 1.

Table 1. DCP Test Results

Boring Number	Estimated Resilient Modulus (psi)
B-1	6,870
B-2	6,280
B-3	6,450
B-4	6,430
B-5	6,590
B-6	6,510
B-7	5,560

4.4 INFILTRATION TESTING

We completed a falling-head infiltration test in boring B-4 at a depth of 5.5 feet BGS. We saturated the underlying soil before taking measurements under low-head conditions of approximately 12 inches or less of water. Table 2 summarizes the measured infiltration rate.

Table 2. Observed Infiltration Rates

Boring	Depth (feet BGS)	Soil Type at Test Depth	Observed Infiltration Rate (inches per hour)
B-4	5.5	SILT, minor sand	0.4

The infiltration rate provided above is an unfactored measured rate with no factor of safety. We recommend a minimum factor of safety of 2 and correction factors should be applied as well by the civil engineer during design to account for the degree of long-term maintenance and influent/pre-treatment control, as well as the potential for long-term clogging due to siltation and bio-buildup, depending on the proposed length, location, and type of infiltration facility. If built,

we recommend that the installation of the stormwater basins be observed by a qualified geotechnical engineer to confirm that the soil conditions are consistent with our observations during our explorations.

4.5 GEOLOGICAL HAZARDS

4.5.1 Liquefaction and Lateral Spreading

Liquefaction is a phenomenon caused by a rapid increase in pore water pressure that reduces the effective stress between soil particles to near zero. The excessive buildup of pore water pressure results in the sudden loss of shear strength in a soil. Granular soil, which relies on inter-particle friction for strength, is susceptible to liquefaction until the excess pore pressures can dissipate. Sand boils and flows observed at the ground surface after an earthquake are the result of excess pore pressures dissipating upwards, carrying soil particles with the draining water. In general, loose, saturated sandy soil with low silt and clay content is the most susceptible to liquefaction. Thin layers of sand were encountered during the explorations; however, given thickness and/or relative density of the material, we estimate that liquefaction-induced settlement (if present) will be less than 1 inch and we do not anticipate liquefaction to be a site hazard.

Lateral spreading is a liquefaction-related seismic hazard and occurs on gently sloping or flat sites underlain by liquefiable sediment adjacent to an open face, such as a riverbank. Since there are no nearby open faces, lateral spreading is not considered a hazard at the site.

4.5.2 Fault Surface Rupture

The closest mapped fault to the site is the Canby-Molalla fault. It is mapped approximately 4 miles to the east (USGS, 2018). Since faults are not mapped beneath the site, we conclude that the probability of surface fault rupture beneath the site is low.

5.0 CONCLUSIONS

In our opinion, the site can be developed as we have identified in the "Project Understanding" section provided the recommendations in this report are incorporated into design and implemented during construction. A summary of the geotechnical factors impacting the design and construction of the proposed development are provided in the "Executive Summary." The following sections present specific recommendations for use in design and construction of the proposed development.

6.0 SITE DEVELOPMENT RECOMMENDATIONS

6.1 SITE PREPARATION

6.1.1 Grubbing and Stripping

The existing root zone should be stripped and removed from the site in all proposed building and pavement areas. Based on our explorations, the depth of stripping will be 4 inches. Greater stripping depths may be required to remove localized zones of loose or organic soil. The actual stripping depth should be based on field observations at the time of construction. Stripped material should be transported off site for disposal or used in landscaped areas.

6.1.2 Tilled Zone

Based on historical aerial photographs in our project files, between at least the early 1900s and 2005 the site was used for agricultural purposes and a tilled (cultivated) zone is anticipated at the ground surface. Typically, tilled zones are approximately 12 to 16 inches deep. Reliable strength properties are extremely difficult to predict for the tilled zone material. There is a high risk for poor performance of floor slabs and pavement established directly over loosened soil. To reduce the risk of settlement, we recommend the tilled zone be improved during site preparation in areas where planned cuts do not extend to the bottom of the tilled zone. Prior to fill placement and construction, the tilled zone should be improved by removing and replacing with structural fill or scarifying and re-compacting to structural fill requirements.

As discussed in the "Structural Fill" section, the native soil can be sensitive to small changes in moisture content and will be difficult, if not impossible, to compact adequately during wet weather. While scarification and compaction of the subgrade is the best option for subgrade improvement, it will likely only be possible during extended dry periods and following moisture conditioning of the soil. As discussed further on in this report, cement amendment is an option for conditioning the soil for use as structural fill during periods of wet weather or when drying the soil is not an option.

6.1.3 Subgrade Preparation and Evaluation

Following stripping and subgrade stabilization and prior to placing fill, pavement, or building improvements, the exposed subgrade should be evaluated by proof rolling. The subgrade should be proof rolled with a fully loaded dump truck or similar heavy, rubber tire construction equipment to identify soft, loose, or unsuitable areas. A member of our geotechnical staff should observe proof rolling to evaluate yielding of the ground surface. Soft or loose zones identified during proof rolling should be excavated and replaced with compacted structural fill. Areas that appear too wet or soft to support proof rolling equipment should be prepared in accordance with recommendations for wet weather construction provided in the "Construction Considerations" section.

6.2 CONSTRUCTION CONSIDERATIONS

Fine-grained soil present on this site is easily disturbed during the wet season. If not carefully executed, earthwork activity can create extensive soft areas and significant repair costs can result. Earthwork planning should include considerations for minimizing subgrade disturbance.

If construction occurs during the wet season, or if the moisture content of the soil is more than a few percentage points above optimum, site stripping and cutting may need to be accomplished using track-mounted equipment, loading removed material into trucks supported on granular haul roads.

The base rock thickness for pavement areas is intended to support post-construction design traffic loads and not intended to support construction traffic. The thickness of the granular material for haul roads and staging areas will depend on the amount and type of construction traffic and should be the responsibility of the contractor. Generally, a 12- to 18-inch-thick mat of granular material is sufficient for light staging areas and the basic building pad but is generally not expected to be adequate to support heavy equipment or truck traffic. The granular mat for

haul roads and areas with repeated heavy construction traffic typically needs to be increased to between 18 and 24 inches. The actual thickness of haul roads and staging areas should be based on the contractor's approach to site development and the amount and type of construction traffic. The material used to construct haul roads and staging areas should also be selected by the contractor.

As an alternative to thickened crushed rock sections, haul roads and utility work zones may be constructed using cement-amended subgrades overlain by a crushed rock wearing surface. If this approach is used, the thickness of granular material in staging areas and along haul roads can typically be reduced to between 6 and 9 inches. This recommendation is based on an assumed minimum unconfined compressive strength of 100 psi for subgrade amended to a depth of 12 to 16 inches. The actual thickness of the amended material and imported granular material will depend on the contractor's means and methods and, accordingly, should be the contractor's responsibility. Cement amendment is discussed in the "Structural Fill" section.

6.3 EXCAVATION

6.3.1 Excavation and Shoring

Temporary excavation sidewalls should stand vertical to a depth of approximately 4 feet, provided groundwater seepage is not observed in the sidewalls. Open excavation techniques may be used to excavate trenches with depths between 4 and 8 feet, provided the walls of the excavation are cut at a slope of 1.5H:1V and groundwater seepage is not present. At this inclination, the slopes with sand may ravel and require some ongoing repair. Excavations should be flattened if excessive sloughing or raveling occurs. In lieu of large and open cuts, approved temporary shoring may be used for excavation support. A wide variety of shoring and dewatering systems are available. Consequently, we recommend the contractor be responsible for selecting the appropriate shoring and dewatering systems.

If box shoring is used, it should be understood that box shoring is a safety feature used to protect workers and does not prevent caving. If the excavations are left open for extended periods of time, caving of the sidewalls may occur. The presence of caved material will limit the ability to properly backfill and compact the trenches. The contractor should be prepared to fill voids between the box shoring and the sidewalls of the trenches with sand or gravel before caving occurs.

If shoring is used, we recommend that the type and design of the shoring system be the responsibility of the contractor, who is in the best position to choose a system that fits the overall plan of operation. All excavations should be made in accordance with applicable OSHA and state regulations.

6.3.2 Trench Dewatering

Shallow excavations could encounter perched groundwater, and significant dewatering operations may be necessary during the rainy season. If stormwater runoff seeps into trenches, it should be removed by pumping from a sump. Water should be routed to a suitable discharge point.

If groundwater is present at the base of utility trench excavations, we recommend placing up to 12 inches of stabilization material at the base of the excavations. Trench stabilization material should meet the requirements provided in the "Structural Fill" section.

We note that these recommendations are for guidance only. The dewatering of excavations is the sole responsibility of the contractor, as the contractor is in the best position to select these systems based on their means and methods.

6.3.3 Safety

All excavations should be made in accordance with applicable OSHA requirements and regulations of the state, county, and local jurisdiction. While this report describes certain approaches to excavation and dewatering, the contract documents should specify that the contractor is responsible for selecting excavation and dewatering methods, monitoring the excavations for safety, and providing shoring (as required) to protect personnel and adjacent structural elements.

6.4 STRUCTURAL FILL

Structural fill includes fill beneath foundations, slabs, pavements, any other areas intended to support structures, or within the influence zones of structures. Structural fill should be free of organic matter and other deleterious material and, in general, should consist of particles no larger than 3 inches in diameter. Recommendations for suitable fill material are provided in the following sections.

6.4.1 On-Site Native Soil

The on-site native soil will be suitable for use as structural fill only if it can be moisture conditioned. The on-site silty soil is sensitive to small changes in moisture content and may be difficult, if not impossible, to compact adequately during wet weather or when its moisture content is more than a few percentage points above optimum. This soil may require extensive drying if it becomes wet. Extended dry weather may be required to adequately condition the on-site silty soil for use as structural fill. We recommend using imported granular material for structural fill if the on-site silty soil cannot be moisture conditioned to within 3 percentage points of its optimum moisture content. Native soil should be placed in lifts with a maximum uncompacted thickness of 8 inches and compacted to not less than 92 percent of the maximum dry density, as determined by ASTM D1557.

6.4.2 Imported Granular Material

Imported granular material should be pit- or quarry-run rock, crushed rock, or crushed gravel and sand that is fairly well graded between coarse and fine and has less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve. All granular material must be durable such that there is no degradation of the material during and after installation as structural fill. The percentage of fines can be increased to 12 percent if the fill is placed during dry weather; will be used for general fill and not for staging or haul roads, or floor slab or pavement aggregate base; and provided the fill material is moisture conditioned, as necessary, for proper compaction. The material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by

ASTM D1557. During the wet season or when wet subgrade conditions exist, the initial lift should have a maximum thickness of 15 inches and should be compacted with a smooth-drum roller without the use of vibratory action.

6.4.3 Floor Slab Base Rock

Imported durable, granular material placed beneath building floor slabs should be clean crushed rock or crushed gravel and sand that is fairly well graded between coarse and fine. The granular material should have a maximum particle size of 1½ inches, have less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve, and have at least two mechanically fractured surfaces. The imported base rock should be placed in one lift and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

6.4.4 Recycled Concrete

Recycled concrete can be used for structural fill, provided the concrete is processed to a relatively well-graded material with a maximum particle size of 3 inches. This material can be used as trench backfill and general structural fill if it meets the requirements for imported granular material, which would require a smaller maximum particle size. The material should be placed in lifts with a maximum uncompacted thickness of 12 inches and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

6.4.5 Trench Backfill

Trench backfill for the utility pipe base and pipe zone should consist of durable, well-graded, granular material containing no organic or other deleterious material, should have a maximum particle size of ¾ inch, and should have less than 8 percent by dry weight passing the U.S. Standard No. 200 sieve.

Backfill for the pipe base and to the spring line of the pipe should be placed in maximum 12-inch-thick lifts and compacted to not less than 90 percent of the maximum dry density, as determined by ASTM D1557, or as recommended by the pipe manufacturer. Backfill above the spring line of the pipe should be placed in maximum 12-inch-thick lifts and compacted to not less than 92 percent of the maximum dry density, as determined by ASTM D1557. Trench backfill located within 2 feet of finish subgrade elevation should be placed in maximum 12-inch-thick lifts and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

6.4.6 Drain Rock

Drain rock should consist of angular, granular material with a maximum particle size of 2 inches and should meet OSSC 00430.11 (Granular Drain Backfill Material). The material should be free of roots, organic matter, and other unsuitable materials and have less than 2 percent by dry weight passing the U.S. Standard No. 200 sieve (washed analysis). The drain rock should be wrapped in a Type 1 drainage geotextile that meets the specifications provided in OSSC Table 02320-1. The geotextile should be installed in conformance with OSSC 00350 (Geosynthetic Installation). Drain rock should be compacted to a firm condition.

6.4.7 Stabilization Material

If perched groundwater is encountered and is present at the base of utility excavations, we recommend placing trench stabilization material at the base of the excavation consisting of at least 2 feet of well-graded gravel, crushed gravel, or crushed rock with a minimum particle size of 4 inches and less than 5 percent by dry weight passing the U.S. Standard No. 4 sieve. The material should be free of organic matter and other deleterious material and should be placed in one lift and compacted until "well keyed."

6.4.8 Cement Amendment

6.4.8.1 General

In conjunction with an experienced contractor, the on-site soil can be amended with portland cement to obtain suitable support properties. Successful use of soil amendment depends on the use of correct mixing techniques, soil moisture content, and amendment quantities. Soil amending should be conducted in accordance with the specifications provided in OSSC 00344 (Treated Subgrade). The amount of cement used during treatment should be based on an assumed soil dry unit weight of 100 pcf.

Portland cement-amended soil is hard and has low permeability; therefore, this soil does not drain well and it is not suitable for planting. Future planted areas should not be cement amended, if practical, or accommodations should be planned for drainage and planting.

6.4.8.2 Stabilization

Specific recommendations based on exposed site conditions for soil amending can be provided if necessary. However, for preliminary design purposes, we recommend a target seven-day unconfined compressive strength for cement-amended subgrade for building and pavement subbase (below aggregate base) soil of 100 psi. The amount of cement used to achieve this target generally varies with moisture content and soil type. It is difficult to predict field performance of soil to cement amendment due to variability in soil response, and we recommend laboratory testing to confirm expectations. Generally, 5 percent cement by weight of dry soil can be used when the soil moisture content does not exceed approximately 20 percent. If the soil moisture content is in the range of 25 to 35 percent, 6 to 8 percent by weight of dry soil is recommended. The amount of cement added to the soil may need to be adjusted based on field observations and performance. Moreover, depending on the time of year and moisture content levels during amendment, water may need to be applied during tilling to appropriately condition the soil moisture content.

For building and pavement subbase, we recommend assuming a minimum cement ratio of 6 percent (by dry weight). If the soil moisture content exceeds 30 percent, a cement ratio of 7 to 8 percent will likely be needed.

A minimum curing of four days is required between treatment and construction traffic access. Construction traffic should not be allowed on unprotected, cement-amended subgrade. To protect the cement-amended surfaces from abrasion or damage, the finished surface should be covered with 4 to 6 inches of imported granular material. The crushed rock typically becomes contaminated with soil during construction. Contaminated base rock should be removed and replaced with clean rock in pavement areas.

Treatment depths for buildings, haul roads, and staging areas are typically on the order of 12, 16, and 18 inches, respectively. The actual thickness of the amended material and imported granular material for haul roads and staging areas will depend on the anticipated construction traffic as well as the contractor's means and methods and, accordingly, should be the contractor's responsibility. Treatment depths for pavements are provided in the "Pavement Recommendations" section.

6.4.8.3 Structural

On-site soil that would not otherwise be suitable for structural fill may be amended and placed as fill over a subgrade prepared in conformance with the "Site Preparation" section. The cement ratio for general cement-amended fill can generally be reduced by 1 percent (by dry weight). Typically, a minimum curing of four days is required between treatment and construction traffic access. Consecutive lifts of fill may be treated immediately after the previous lift has been amended and compacted (e.g., the four-day wait period does not apply). However, where the final lift of fill is a building or roadway subgrade, the four-day wait period is in effect.

6.4.8.4 Compaction

A static, sheepsfoot or segment pad roller with a minimum static weight of 40,000 pounds should be used for compaction of fine-grained soil followed by final compaction using a smooth-drum roller with a minimum applied lineal force of 700 pounds per inch. The amended soil should be compacted to at least 92 percent of the achievable dry density at the moisture content of the material, as defined by ASTM D1557.

6.4.8.5 Specifications Recommendations

We recommend the following comments be included in the specifications for the project:

- **Mixing Equipment**
 - Use a pulverizer/mixer capable of uniformly mixing the cement into the soil to the design depth. Blade mixing will not be allowed.
 - Pulverize the soil-cement mixture such that 100 percent by dry weight passes a 1-inch sieve and a minimum of 70 percent passes a No. 4 sieve, exclusive of gravel or stone retained on these sieves. If water is required, the pulverizer should be equipped to inject water to a tolerance of ¼ gallon per square foot of surface area.
 - Use machinery that will not disturb the subgrade, such as using low-pressure "balloon" tires on the pulverizer/mixer vehicle. If subgrade is disturbed, the tilling/treatment depth shall extend the full depth of the disturbance.
 - Multiple "passes" of the tiller will likely be required to adequately blend the cement and soil mixture.
- **Spreading Equipment**
 - Use a spreader capable of distributing the cement uniformly on the ground to within 5 percent variance of the specified application rate.
 - Use machinery that will not disturb the subgrade, such as using low-pressure "balloon" tires on the spreader vehicle. If subgrade is disturbed, the tilling/treatment depth shall extend the full depth of the disturbance.

- **Compaction Equipment**
 - Use a static, sheepsfoot or segmented pad roller with a minimum static weight of 40,000 pounds for initial compaction of fine-grained soil (silt and clay) or an alternate approved by the geotechnical engineer.
 - Use a vibratory, smooth-drum roller with a minimum applied lineal force of 600 pounds per inch for final compaction or an alternate approved by the geotechnical engineer.

6.5 TEMPORARY SLOPES

Temporary slopes should be no steeper than 1.5H:1V. If slopes greater than 10 feet high are required, GeoDesign should be contacted to make additional recommendations. All cut slopes should be protected from erosion by covering them during wet weather. If sloughing or instability is observed, the slope should be flattened or the cut supported by shoring.

6.6 EROSION CONTROL

The on-site soil is moderately susceptible to erosion. Consequently, we recommend that slopes be covered with an appropriate erosion control product if construction occurs during periods of wet weather. We recommend that all slope surfaces be planted as soon as practical to minimize erosion. Surface water runoff should be collected and directed away from slopes to prevent water from running down the slope face. Erosion control measures such as straw bales, sediment fences, and temporary detention and settling basins should be used in accordance with local and state ordinances.

7.0 FOUNDATION SUPPORT RECOMMENDATIONS

A formal grading plan had not been developed by the time of this report; however, preliminary estimates are that cuts and fills will likely be in the 3- to 5-foot range. Assuming the distributed floor slab live loads, foundation loads, and the preliminary finished floor grade provided in the "Project Understanding" section, our analysis indicates that the proposed structures can be supported by conventional shallow foundations. The planned structures may be supported by continuous wall and isolated column footings founded on firm, undisturbed native soil or on structural fill overlying firm, undisturbed native soil. Our recommendations for use in foundation design and construction are provided in the following sections.

7.1 SPREAD FOOTINGS

7.1.1 Bearing Capacity

If encountered, undocumented fill and disturbed native soil should be removed from the influence zones of footings. The excavations should be backfilled with granular structural fill that extends beyond the footing perimeter by 6 inches for every foot they extend beneath the footing subgrade. The structural fill should meet the requirements of the "Imported Granular Material" section and compacted to at least 95 percent of the maximum dry density, as determined by ASTM D1557. Due to the presence of an agricultural tilled zone at the site, we recommend that we be retained to observe the footing subgrades.

We recommend that footings be sized based on an allowable bearing pressure of 2,500 psf. This is a net bearing pressure; the weight of the footing and overlying backfill can be ignored in calculating footing sizes. The recommended allowable bearing pressure applies to the total of

dead plus long-term live loads. Continuous wall and spread footings should be at least 18 and 24 inches wide, respectively. The bottom of exterior footings should be at least 18 inches below the lowest adjacent final grade. The bottom of interior footings should be placed at least 12 inches below the base of the floor slab.

Total post-construction settlement is expected to be less than 1½ inches. Differential settlement is expected to be less than ½ inch over 50 feet. We recommend that GeoDesign review the final grading plan to re-evaluate the settlement estimates. A preload or surcharge plan may be necessary if the finished floor grades are more than 5 feet above existing site grades.

7.1.2 Lateral Resistance

Lateral loads on footings can be resisted by passive earth pressure on the sides of the footings and by friction on the base of the footings. The available passive earth pressure for footings confined by native soil and structural fill is 250 pcf. Adjacent floor slabs, pavements, or the upper 12-inch depth of adjacent unpaved areas should not be considered when calculating passive resistance. For computing the friction capacity of building foundations, we recommend friction coefficients of 0.35 for footings bearing on native soil and 0.45 for footings bearing on gravel or crushed rock.

8.0 SLABS ON GRADE

A minimum 6-inch-thick layer of base rock should be placed and compacted over the prepared subgrade to assist as a capillary break. The base rock should be crushed rock or crushed gravel and sand meeting the requirements outlined in the "Structural Fill" section. The imported granular material should be placed in one lift and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557. A subgrade modulus of 120 pci can be used to design the floor slab. Floor slab base rock should be replaced if it becomes contaminated with excessive fines (greater than 5 percent by dry weight passing the U.S. Standard No. 200 sieve).

Vapor barriers are often required by flooring manufacturers to protect flooring and flooring adhesives. Many flooring manufacturers will warrant their product only if a vapor barrier is installed according to their recommendations. Selection and design of an appropriate vapor barrier (if needed) should be based on discussions among members of the design team. We can provide additional information to assist you with your decision.

9.0 RETAINING STRUCTURES

9.1 ASSUMPTIONS

Our retaining wall design recommendations are based on the following assumptions: (1) the walls consist of conventional, cantilevered retaining walls, (2) the walls are less than 8 feet in height, (3) the backfill is drained and consists of imported granular materials, and (4) the backfill has a slope flatter than 4H:1V. Re-evaluation of our recommendations will be required if the retaining wall design criteria for the project varies from these assumptions.

9.2 WALL DESIGN PARAMETERS

For unrestrained retaining walls, an active pressure of 35 pcf equivalent fluid pressure should be used for design. For embedded building walls, a superimposed seismic lateral force should be calculated based on a dynamic force of $7H^2$ pounds per lineal foot of wall (where H is the height of the wall in feet) and applied a distance of 0.6H from the base of the wall. Where retaining walls are restrained from rotation prior to being backfilled, a pressure of 55 pcf equivalent fluid pressure should be used for design.

If surcharges (e.g., retained slopes, building foundations, vehicles, steep slopes, terraced walls, etc.) are located within a horizontal distance from the back of a wall equal to twice the height of the wall, additional pressures will need to be accounted for in the wall design. Our office should be contacted for appropriate wall surcharges based on the actual magnitude and configuration of the applied loads.

The base of the wall footing excavations should extend a minimum of 18 inches below lowest adjacent grade. The footing excavations should then be lined with a minimum 6-inch-thick layer of compacted imported granular material, as described in the "Structural Fill" section.

The wall footings should be designed in accordance with the guidelines provided in the "Foundation Support Recommendations" section.

9.3 WALL DRAINAGE AND BACKFILL

The above design parameters have been provided assuming that back-of-wall drains will be installed to prevent buildup of hydrostatic pressures behind all walls. If a drainage system is not installed, our office should be contacted for revised design forces.

Backfill material placed behind retaining walls and extending a horizontal distance of $\frac{1}{2}H$ (where H is the height of the retaining wall) should consist of well-graded sand or gravel, with not more than 5 percent by dry weight passing the U.S. Standard No. 200 sieve and meeting OSSC 00510.12 (Granular Wall Backfill). We recommend the select granular wall backfill be separated from general fill, native soil, and/or topsoil using a geotextile fabric that meets the requirements provided in OSSC 00350 (Geosynthetic Installation) and OSSC 02320 (Geosynthetics) for drainage geotextiles.

Alternatively, the native, silty soil can be used as backfill material provided a minimum 2-foot-wide column of angular drain rock wrapped in a geotextile is placed against the wall and the native soil can be adequately moisture conditioned for compaction. The rock column should extend from the perforated drainpipe or foundation drains to within approximately 1 foot of the ground surface. The angular drain rock should meet the requirements provided in the "Structural Fill" section.

The wall backfill should be compacted to a minimum of 95 percent of the maximum dry density, as determined by ASTM D1557. However, backfill located within a horizontal distance of 3 feet from a retaining wall should only be compacted to approximately 90 percent of the maximum dry density, as determined by ASTM D1557. Backfill placed within 3 feet of the wall should be compacted in lifts less than 6 inches thick using hand-operated tamping equipment (such as a

jumping jack or vibratory plate compactor). If flatwork (sidewalks or pavements) will be placed atop the wall backfill, we recommend that the upper 2 feet of material be compacted to 95 percent of the maximum dry density, as determined by ASTM D1557.

Perforated collector pipes should be placed at the base of the granular backfill behind the walls. The pipe should be embedded in a minimum 2-foot-wide zone of angular drain rock. The drain rock should meet specifications provided in the "Structural Fill" section. The drain rock should be wrapped in a geotextile fabric that meets the specifications provided in OSSC 00350 (Geosynthetic Installation) and OSSC 02320 (Geosynthetics) for drainage geotextiles. The collector pipes should discharge at an appropriate location away from the base of the wall. Unless measures are taken to prevent backflow into the drainage system of the wall, the discharge pipe should not be tied directly into stormwater drain systems.

Settlement of up to 1 percent of the wall height commonly occur immediately adjacent to the wall as the wall rotates and develops active lateral earth pressures. Consequently, we recommend that construction of flatwork adjacent to retaining walls be postponed at least four weeks after backfilling of the wall, unless survey data indicates that settlement is complete prior to that time.

10.0 DRAINAGE CONSIDERATIONS

10.1 TEMPORARY

During grading at the site, the contractor should be made responsible for temporary drainage of surface water as necessary to prevent standing water and/or erosion at the working surface. During rough and finished grading of the building site, the contractor should keep all footing excavations and building pads free of water.

10.2 SURFACE

The finished ground surface around buildings should be sloped away from their foundations at a minimum 2 percent gradient for a distance of at least 5 feet. Downspouts or roof scuppers should discharge into a storm drain system that carries the collected water to an appropriate stormwater system. Trapped planter areas should not be created adjacent to the buildings without providing means for positive drainage (i.e., swales or catch basins).

The site will include unpaved gravel surfaces, which unless the subgrade is graded to drain and route stormwater, will result in areas of ponding following moderate to heavy rainfall.

10.3 SUBSURFACE

We recommend that GeoDesign review the final grading plan to determine whether footing drains will be required around portions of the proposed buildings within cut areas. We do not anticipate that floor slab drains will be needed but will depend on review of the final grading plan. Footing drains should be considered in areas where landscaping planters are placed approximate to the foundations or where surface grades cannot be completed as outlined above.

If installed, the footing drains should consist of a filter fabric-wrapped, drain rock-filled trench that extends at least 12 inches below the lowest adjacent grade (i.e., slab subgrade elevation). A

perforated pipe should be placed at the base to collect water that gathers in the drain rock. The drain rock and filter fabric should meet specifications outlined in the "Structural Fill" section. Discharge for the footing drain should not be tied directly into the stormwater drainage system, unless mechanisms are installed to prevent backflow.

11.0 SEISMIC DESIGN CRITERIA

Seismic design is prescribed by the 2015 IBC and 2014 SOSSC. Table 3 presents the site design parameters prescribed by the 2015 IBC for the site.

Table 3. IBC Seismic Design Parameters

Parameter	Short Period ($T_s = 0.2$ second)	1 Second Period ($T_1 = 1.0$ second)
MCE Spectral Acceleration, S	$S_s = 0.928$ g	$S_1 = 0.410$ g
Site Class	D	
Site Coefficient, F	$F_a = 1.129$	$F_v = 1.590$
Adjusted Spectral Acceleration, S_M	$S_{MS} = 1.047$ g	$S_{M1} = 0.652$ g
Design Spectral Response Acceleration Parameters, S_D	$S_{DS} = 0.698$ g	$S_{D1} = 0.435$ g

12.0 PAVEMENT RECOMMENDATIONS

We developed pavement design recommendations for the storage yard as well for the other pavement areas at the site. We used the following design standards and software for developing our pavement recommendations:

- Design of Aggregate Surfaced Roads and Airfields (Department of the Army, 1990)
- Gravel Roads Construction & Maintenance Guide (FHWA, 2015)
- AASHTO Guide for Design of Pavement Structures (AASHTO, 1993; AASHTO guide)
- Pavement Designer design tools for streets, local roads, parking lots, and intermodal/ industrial facilities (Pavement Designer, 20180)
- ODOT Pavement Design Guide (ODOT, 2011; ODOT guide)
- Guide for the Design and Construction of Concrete Parking Lots (ACI, 2008; ACI guide)
- Guide for Mechanistic-Empirical Design of New and Rehabilitated Pavement Structures (ARA, 2004)
- PCASE version 2.09, herein referred to as PCASE (USACE, 2010)

12.1 DESIGN ASSUMPTIONS AND PARAMETERS

The design subgrade resilient modulus and CBR values are based on field explorations and DCP testing. Traffic loading in the storage area is based on information provided by you and forecasted for future traffic loading for design periods of 10, 15, and 20 years. Traffic loading in

the other pavement areas is based on assumed traffic and forecasted for a design period of 20 years. Additional details of our input parameters are summarized below. If any of our design assumptions are incorrect, our office should be contacted with the appropriate information so that the pavement designs can be revised.

12.1.1 Traffic Loading

Based on instructions from you, we used the traffic operations presented in our geotechnical and pavement engineering services report (GeoDesign, 2018) for your Seattle yard to represent traffic operations for the proposed storage yard at the Wilsonville site. Aside from this information we do not have specific information on the types and frequencies of vehicles expected in other areas at the site. Accordingly, we assumed a breakdown of the types and frequencies of vehicles likely to use the other areas of the site. Additional details regarding traffic loading based on pavement usage is presented below.

12.1.1.1 Storage Yard

We used the traffic operations for your Seattle yard to represent traffic operations for the proposed storage yard at the Wilsonville site. For convenience, a duplicate of estimated traffic operations by design period is shown in Table 4. Additional details of our estimation methodology, as well as truck axle configurations and loads, are presented in Appendix C of our 2018 geotechnical and pavement engineering services report for your Seattle yard (GeoDesign, 2018).

Table 4. Estimated Total Passes of Loaded Trucks by Design Life

Truck Type	Estimated Total Passes of Loaded Trucks for Indicated Design Life		
	10 Years	15 Years	20 Years
Five-Axle Haul Truck	65,000	97,500	130,000
Hyster H230HD2 Forklift	260,000	390,000	520,000

We used a conservative estimate of a fully loaded five-axle truck to represent loads imparted by the haul trucks. We used half the payload load capacity of the Hyster forklift truck added to its unladen weight for a total load of 45,144 pounds to represent average loading conditions imparted by the forklift truck to the storage yard pavement.

12.1.1.2 Other Pavement Areas

In areas other than the storage yard, we understand the site will include pavement areas for passenger vehicle parking and drive aisles for access to the proposed buildings. We have assumed traffic in these other pavement areas will consist of passenger cars in parking areas and a mixture of cars and trucks in the drive aisles. In addition, we have assumed the access road to the site and to the storage yard will need to accommodate haul truck traffic for shoring elements in addition to car and truck traffic to the other on-site pavement areas. Due to differences in design procedures used for flexible versus rigid pavement design, we estimated traffic differently for each pavement type. Further details of our assumptions for traffic loading are presented below.

Flexible Pavement Traffic Loading

We used the AASHTO guide for flexible pavement design for pavement areas other than in the storage yard, which requires an estimate of anticipated ESALs over the design period. Estimating ESALs, in turn, requires an estimate of the types and frequencies of trucks that will traffic the pavement. Regarding the types of trucks, and aside from the haul trucks for shoring elements, we have estimated the other on-site truck traffic will be comprised of the following:

- 50 percent two axle (FHWA Class 5)
- 30 percent three axle (FHWA Class 6)
- 10 percent four axle (FHWA Class 8)
- 10 percent five axle (FHWA Class 9)

Based on the above distribution of trucks and assuming a range of daily truck traffic, our estimate of 20-year flexible pavement ESALs by ADTT and pavement type is presented in Table 5. We used the methodology presented in the ODOT guide to estimate the ESAL values assuming no growth and construction will occur in the year 2019. The ESAL estimates for the access road are based on traffic comprised of haul trucks for shoring elements in addition to car and truck traffic to the other on-site pavement areas. We used two passes for each truck in drive aisles to account for the possibility that drivers will retrace their inbound path on the outbound trip.

Table 5. Estimated 20-Year Flexible Pavement ESALs by ADTT and Pavement Type

ADTT	Passenger Vehicle Parking	Truck Passes per Day		20-Year ESALs	
		Drive Aisles ¹	Access Road ²	Drive Aisles	Access Road
0	10,000	NA	NA	NA	NA
10	NA	20	35	84,000	147,000
25	NA	50	50	210,000	210,000
50	NA	100	75	419,000	314,000

1. Two passes per truck in drive aisles.
2. One pass per haul truck to the storage yard area plus one pass per truck to other pavement areas.

Rigid Pavement Traffic Loading

We used the Pavement Designer design tool for rigid pavement design for pavement areas other than in the storage yard, which requires an estimate of the number of axles of an imposed load on the pavement per 1,000 trucks. We based the axle-load distributions on traffic Category B presented in the ACI guide. However, we adjusted the number of axles per 1,000 trucks for each axle load so that the resulting ESALs are similar to those calculated using the methodology presented in the ODOT guide for rigid pavements using the same number of truck passes per day as listed in Table 5 for flexible pavements. The axle-load distributions we used for designing rigid pavements are presented in Table 6 and the approximate 20-year rigid pavement ESALs by ADTT and pavement type are presented in Table 7. We assumed a 6-inch concrete slab depth and a terminal serviceability of 3.0 in approximating the ESALs based on the axle-load distributions listed in Table 6.

Table 6. Axle-Load Distributions Used for Designing Rigid Pavements

Axle Load (kips)	Number of Axles per 1,000 Trucks	
	Single Axles	Tandem Axles
4	1693.31	31.90
6	732.28	---
8	483.10	85.59
10	204.96	---
12	124.00	139.30
14	56.11	---
16	38.02	75.02
18	15.81	---
20	4.23	57.10
22	0.96	---
24	---	39.18
26	---	---
28	---	68.48
32	---	69.59
36	---	4.19

Table 7. Approximate 20-Year Rigid Pavement ESALs by ADTT and Pavement Type

ADTT	Passenger Vehicle Parking	Truck Passes per Day		Approximate 20-Year ESALs	
		Drive Aisles ¹	Access Road ²	Drive Aisles	Access Road
0	10,000	NA	NA	NA	NA
10	NA	20	35	108,740	190,300
25	NA	50	50	271,850	271,850
50	NA	100	75	543,700	407,780

1. Two passes per truck in drive aisles.
2. One pass per haul truck to the storage yard area plus one pass per truck to other pavement areas.

12.1.2 Pavement Layer and Subgrade Properties

All the methods we used for pavement design require stiffness or strength parameters for each pavement layer as well as for the subgrade soil. In addition to stiffness/strength parameters, PCASE requires the Poisson's ratio for each layer as well as interlayer slip, which simulates friction between layers, for flexible and rigid pavement design. Pavement layer and subgrade properties used in our designs are presented in Table 8.

Table 8. Pavement Layer and Subgrade Properties Used for Design

Layer	Resilient Modulus (psi)	CBR Value	Poisson's Ratio	Interlayer Slip
AC	450,000	NA	0.35	0 (complete adhesion)
PCC ¹	4,000,000	NA	0.15	1,000 (no adhesion)
Gravel Surfacing	NA	100	NA	NA
Aggregate Base	20,000	100	0.35	0 (complete adhesion)
Cement-Amended Soil	120,000	100	0.25	0 (complete adhesion)
Subgrade	6,380	4	0.40	0 (complete adhesion)

1. PCC with minimum 28-day flexural strength of 600 psi.

12.1.3 Other Design Parameters

Other pavement design parameters used in our analyses are summarized as follows:

- Reliability of 80 percent
- Overall standard deviation of 0.49 for flexible pavement design using the AASHTO method
- Initial and terminal serviceability of 4.2 and 2.7, respectively, for flexible pavement design using the AASHTO method
- Drainage coefficient of 1.0 for aggregate base
- Jointed concrete pavement with dowel bars for the storage yard and without dowels for the other pavement areas
- PCC slabs have edge support
- Percent of cracked slabs at end of design life of 1 percent

12.2 DESIGN METHODS

We used various design methods for developing our recommendations. We used the method that, in our opinion, is appropriate for the types of pavement layers considered and the types of traffic loads expected. The design methods we used for each pavement area and pavement type are summarized in Table 9.

Table 9. Pavement Design Method by Pavement Area and Pavement Type

Pavement Area	Design Method by Pavement Type		
	Gravel Surfacing	Flexible Pavement	Rigid Pavement
Storage Yard	PCASE	PCASE	PCASE
Access Road	NA	AASHTO	Pavement Designer
Drive Aisles	NA	AASHTO	Pavement Designer
Parking Area	NA	AASHTO	Pavement Designer

12.3 PAVEMENT SECTIONS

Our recommendations for pavement sections apply to the proposed storage yard and other proposed pavement areas at the site. We offer sections for flexible and rigid pavements for all

pavement areas. We also offer sections comprised of crushed rock gravel surfacing, in addition to the flexible and rigid pavement sections, for the storage yard. Our recommendations for minimum pavement sections are presented below. In all cases, the materials recommended should conform to the requirements presented in the "Pavement Materials" section.

12.3.1 Storage Yard

12.3.1.1 Crushed Rock Gravel Surfacing Sections for the Storage Yard

Our recommendations for sections comprised of crushed rock gravel surfacing for the storage yard are presented in Table 10. The PCASE reports for each design are presented in Appendix C.

Table 10. Recommended Minimum Crushed Rock Gravel Surfacing Sections for the Storage Yard

Design Life (years)	Gravel Surfacing		Gravel Surfacing on Cement-Amended Soil	
	Crushed Rock Gravel Surfacing (inches)	Aggregate Base ¹ (inches)	Crushed Rock Gravel Surfacing (inches)	Cement Amendment ² (inches)
10	6.0	13.0	7.0	12.0
15	6.0	14.0	8.0	12.0
20	6.0	14.0	8.0	12.0

1. Place a subgrade geotextile over the prepared subgrade prior to placing the aggregate base.
2. Assumes a minimum seven-day unconfined compressive strength of 100 psi.

12.3.1.2 Flexible Pavement Sections for the Storage Yard

Our recommendations for flexible pavement sections for the storage yard are presented in Table 11. The PCASE reports for each design are presented in Appendix C.

Table 11. Recommended Minimum Flexible Pavement Sections for the Storage Yard

Design Life (years)	Conventional Flexible Pavement		AC on Cement-Amended Soil		
	AC (inches)	Aggregate Base ¹ (inches)	AC (inches)	Aggregate Base (inches)	Cement Amendment ² (inches)
10	8.5	16.0	6.0	4.0	12.0
15	9.0	16.0	6.5	4.0	12.0
20	9.5	16.0	7.0	4.0	12.0

1. Place a subgrade geotextile over the prepared subgrade prior to placing the aggregate base.
2. Assumes a minimum seven-day unconfined compressive strength of 100 psi.

12.3.1.3 Rigid Pavement Sections for the Storage Yard

Our recommendations for rigid pavement sections for the storage yard are presented in Table 12. The PCASE reports for each design are presented in Appendix C. Additional recommendations for PCC slab construction are provided in the "Pavement Construction Considerations" section.

Table 12. Recommended Minimum Rigid Pavement Sections for the Storage Yard

Design Life (years)	Conventional Rigid Pavement		PCC on Cement-Amended Soil		
	PCC (inches)	Aggregate Base ¹ (inches)	PCC (inches)	Aggregate Base (inches)	Cement Amendment ² (inches)
10	11.3	6.0	10.7	4.0	16.0
15	11.5	6.0	10.9	4.0	16.0
20	11.7	6.0	11.0	4.0	16.0

1. Place a subgrade geotextile over the prepared subgrade prior to placing the aggregate base.
2. Assumes a minimum seven-day unconfined compressive strength of 100 psi.

12.3.2 Other Pavement Areas

12.3.2.1 Flexible Pavement Sections for Other Pavement Areas

Our recommendations for flexible pavement sections for other pavement areas apply to the passenger vehicle parking areas, drive aisles around and between the proposed buildings, and the access road to the site. Our recommendations for flexible pavement sections on native soil and on cement-amended soil are presented in Tables 13 and 14, respectively. We note that if the flexible pavements over cement-amended soil option is used, the soil amendment and paving should be completed during dry weather. Our calculation sheets for each design are presented in Appendix C.

Table 13. Recommended Minimum Flexible Pavement Sections on Native Soil for Other Pavement Areas

ADTT	Passenger Vehicle Parking		Drive Aisles		Access Road	
	AC (inches)	Aggregate Base ¹ (inches)	AC (inches)	Aggregate Base ¹ (inches)	AC (inches)	Aggregate Base ¹ (inches)
0	2.5	6.0	NA	NA	NA	NA
10	NA	NA	3.5	9.0	4.0	9.0
25	NA	NA	4.5	9.0	4.5	9.0
50	NA	NA	5.0	10.0	4.5	10.0

1. Place a subgrade geotextile over the prepared subgrade prior to placing the aggregate base. We recommend that the soil amendment and paving be completed during dry weather.

**Table 14. Recommended Minimum Flexible Pavement Sections
on Cement-Amended Soil for Other Pavement Areas**

ADTT	Passenger Vehicle Parking		Drive Aisles		Access Road	
	AC (inches)	Cement Amended ¹ (inches)	AC (inches)	Cement Amended ¹ (inches)	AC (inches)	Cement Amended ¹ (inches)
0	2.5	12.0	NA	NA	NA	NA
10	NA	NA	3.0	12.0	4.0	12.0
25	NA	NA	4.0	12.0	4.5	12.0
50	NA	NA	4.5	12.0	5.0	12.0

1. Assumes a minimum seven-day unconfined compressive strength of 100 psi. We recommend that the soil amendment and paving be completed during dry weather.

12.3.2.2 Rigid Pavement Sections for Other Pavement Areas

Our recommendations for rigid pavement sections for other pavement areas apply to the passenger vehicle parking areas, drive aisles around and between the proposed buildings, and the access road to the site. Our recommendations for rigid pavement sections on native soil and on cement-amended soil are presented in Tables 15 and 16, respectively. The Pavement Designer Reports are presented in Appendix C.

**Table 15. Recommended Minimum Rigid Pavement Sections
on Native Soil for Other Pavement Areas**

ADTT	Passenger Vehicle Parking		Drive Aisles and Access Road	
	PCC (inches)	Aggregate Base ¹ (inches)	PCC (inches)	Aggregate Base ¹ (inches)
0	5.0	6.0	NA	NA
10	NA	NA	6.0	6.0
25	NA	NA	6.0	6.0
50	NA	NA	6.3	6.0

1. Place a subgrade geotextile over the prepared subgrade prior to placing the aggregate base.

**Table 16. Recommended Minimum Rigid Pavement Sections
on Cement-Amended Soil for Other Pavement Areas**

ADTT	Passenger Vehicle Parking			Drive Aisles and Access Road		
	PCC (inches)	Aggregate Base (inches)	Cement Amended' (inches)	PCC (inches)	Aggregate Base (inches)	Cement Amended' (inches)
0	5.0	4.0	12.0	NA	NA	NA
10	NA	NA	NA	5.5	4.0	12.0
25	NA	NA	NA	5.8	4.0	12.0
50	NA	NA	NA	5.8	4.0	12.0

1. Assumes a minimum seven-day unconfined compressive strength of 100 psi.

12.4 PAVEMENT CONSTRUCTION CONSIDERATIONS

12.4.1 Drainage

The performance of the pavement sections will depend on providing positive drainage for the unbound materials (aggregate base and gravel surfacing) within the pavement structures. Accordingly, grading of the subgrade during construction operations should be completed to facilitate drainage of unbound layers. If cement amendment of the subgrade is performed in planned pavement areas, final grading of the cement-amended soil should also facilitate drainage of any unbound layers placed over the amended material.

12.4.2 Subgrade Preparation

The pavement subgrade should be prepared in accordance with the "Site Preparation" and "Structural Fill" sections. If the subgrade soil is not amended with cement, then the top 12 inches of subgrade below the pavement should be compacted to at least 92 percent of the maximum dry density, as determined by ASTM D1557, or until proof rolling with a fully loaded dump or water truck indicates an unyielding, non-pumping subgrade is present.

12.4.3 Wet Weather Construction

The designs of the recommended pavement sections are based on the assumption that construction will be completed during an extended period of dry weather. Wet weather construction could require an increased thickness of aggregate base. In addition, to prevent strength loss during curing, cement-amended soil should be allowed to cure for at least four days prior to construction traffic or placing the base rock. Lastly, the amended subgrade should be protected with a minimum of 4.0 inches of base rock prior to construction traffic access. Base rock to protect the amended subgrade can become contaminated by construction operations. Accordingly, base rock contaminated during construction operations should be removed and replaced prior to construction of overlying layers.

12.4.4 Construction Traffic

Construction traffic should be limited to non-building, unpaved portions of the site or haul roads. Construction traffic should not be allowed on new pavements. If construction traffic is to be allowed on newly constructed pavement sections, an allowance for this additional traffic will need

to be made in the design pavement sections. The base rock thickness for pavement areas is intended to support post-construction design traffic loads and not designed to support construction traffic (see the "Construction Consideration" section).

12.4.5 PCC Slab Construction

Additional recommendations for construction of the PCC pavement slabs are as follows:

- Dowel bars meeting OSSC 02510.40 (Dowels) should be placed in accordance with OSSC 00756.43 (Placing Dowel Bars and Tie Bars) at all transverse joints. We recommend dowel bars with a diameter of 1¼ inches and a length of 18 inches. Dowel bars should be placed at mid-depth in the slabs, spaced at 12 inches on-center, and centered across the joint.
- Tie bars meeting OSSC 02510.10 (Deformed Bars Reinforcement) should be placed in accordance with OSSC 00756.43 (Placing Dowel Bars and Tie Bars) at all longitudinal joints. We recommend #5 tie bars 40 inches in length for Grade 60 steel and spaced a maximum of 36 inches apart on-center. If constructed, curb and gutter should be tied to adjoining slabs.
- Adjust joints to meet utility structures and place an isolation joint around the structures.
- Wherever possible, lay out joints to create slabs of approximately square shape (length-to-width ratio between 0.80 and 1.25). Where this is not possible, lay out joints to create slabs of triangular shape. Avoid angles less than 60 degrees (approximately 90 degrees is best). Avoid slabs less than 1 foot in any dimension.
- Maximum joint spacing is 20 feet in any direction.
- PCC slabs abutting AC pavement should be constructed with a thickened edge along the edge abutting the AC pavement. We recommend thickening the PCC slab depth by 20 percent at the joint and tapering the thickness over a minimum distance of 4.5 feet and a maximum distance of 7.0 feet.

12.5 PAVEMENT MATERIALS

A submittal should be made for each pavement material prior to the start of paving operations. Each submittal should include the test information necessary to evaluate the degree to which the properties of the materials comply with the properties that were recommended or specified. The geotechnical engineer and other appropriate members of the design team should review each submittal.

12.5.1 AC

The AC should be Level 2, ½-inch, dense ACP as described in OSSC 00744 (Asphalt Concrete Pavement). The AC should be placed in one lift and compacted to at least 92 percent of the theoretical maximum density of the material, as determined by AASHTO T 209. Asphalt binder should be performance graded. For typical Level 2 ACP we recommend PG 64-22 binder; however, the binder grade should be adjusted depending on the aggregate gradation and amount of reclaimed asphalt pavement and/or recycled asphalt shingles in the contractor's mix design submittal.

In general, AC paving is not recommended during the cold weather (temperatures less than 40 degrees Fahrenheit). Compacting under these conditions can result in low compaction and premature pavement distress.

Each AC mix design has a recommended compaction temperature range that is specific for the particular AC binder used. In colder temperatures, it is more difficult to maintain the temperature of the AC mix as it can lose heat while stored in the delivery truck, as it is placed, and in the time between placement and compaction. In Oregon, the AC surface temperature during paving should be at least 40 degrees Fahrenheit for lift thickness greater than 2.5 inches and at least 50 degrees Fahrenheit for lift thickness between 2.0 and 2.5 inches.

If paving activities must take place during cold weather construction as defined above, the project team should be consulted and a site meeting should be held to discuss ways to lessen low compaction risks.

12.5.2 PCC

PCC should be Class 4000-1½ (Paving) concrete according to OSSC 02001 (Concrete) with a with a maximum water/cementitious material ratio of 0.40 and a minimum 28-day flexural strength of 600 psi and placed in accordance with OSSC 00756 (Plain Concrete Pavement). Placement of tie bars and dowel bars should conform to OSSC 00756.43 (Placing Dowel Bars and Tie Bars). Reinforcing steel, if used, should conform to OSSC 02510 (Reinforcement) and placed in accordance with OSSC 0758.43 (Placing Reinforcement).

12.5.3 Aggregate Base

Imported granular material used as aggregate base should be clean, crushed rock or crushed gravel and sand that are dense-graded. The aggregate base should meet the gradation defined in OSSC 00641 (Aggregate Subbase, Base, and Shoulders), with the exception that the aggregate has less than 5 percent by dry weight passing the U.S. Standard No. 200 sieve, a maximum particle size of 1½ inches, and at least two mechanically fractured faces. The aggregate base should be compacted to not less than 95 percent of the maximum dry density, as determined by AASHTO T 99.

12.5.4 Crushed Rock Gravel Surfacing

Imported granular material used as gravel surfacing should be relatively clean, crushed rock or crushed gravel and sand that are dense graded. The aggregate base should meet the gradation defined in OSSC 00641 (Aggregate Subbase, Base, and Shoulders), with the exception that the aggregate has less than 8 percent by dry weight passing the U.S. Standard No. 200 sieve, a maximum particle size of ¾ inch, and at least two mechanically fractured faces. The aggregate base should be compacted to not less than 95 percent of the maximum dry density, as determined by AASHTO T 99.

12.5.5 Cement-Amended Soil

See "Cement Amendment" under the "Structural Fill" section.

12.5.6 Subgrade Geotextile

The subgrade geotextile should meet the requirements in OSSC 02320 (Geosynthetics) for subgrade geotextiles and be installed in conformance with OSSC 00350 (Geosynthetic Installation).

13.0 OBSERVATION OF CONSTRUCTION

Satisfactory earthwork and foundation performance depends to a large degree on the quality of construction. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions often requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated. In addition, sufficient observation of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications.

14.0 LIMITATIONS

We have prepared this report for use by D.P. Nicoli and their consultants. The data and report can be used for estimating purposes, but our report, conclusions, and interpretations should not be construed as a warranty of the subsurface conditions and are not applicable to other sites.

Soil explorations indicate soil conditions only at specific locations and only to the depths penetrated. They do not necessarily reflect soil strata or water level variations that may exist between exploration locations. If subsurface conditions differing from those described are noted during the course of excavation and construction, re-evaluation will be necessary.

The site development plans and design details were not finalized at the time this report was prepared. When the design has been finalized and if there are changes in the site grades or location, configuration, design loads, or type of construction, the conclusions and recommendations presented may not be applicable. If design changes are made, we should be retained to review our conclusions and recommendations and to provide a written evaluation or modification.

The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design.

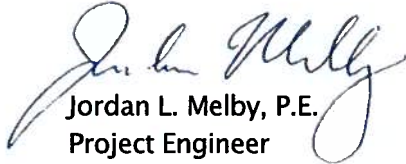
Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

◆ ◆ ◆

We appreciate the opportunity to be of service to you. Please contact us if you have questions regarding this report.

Sincerely,


GeoDesign, Inc.



Jordan L. Melby, P.E.
Project Engineer



Todd V. Scholz P.E., Ph.D.
Senior Associate Engineer



George Saunders, P.E., G.E.
Principal Engineer



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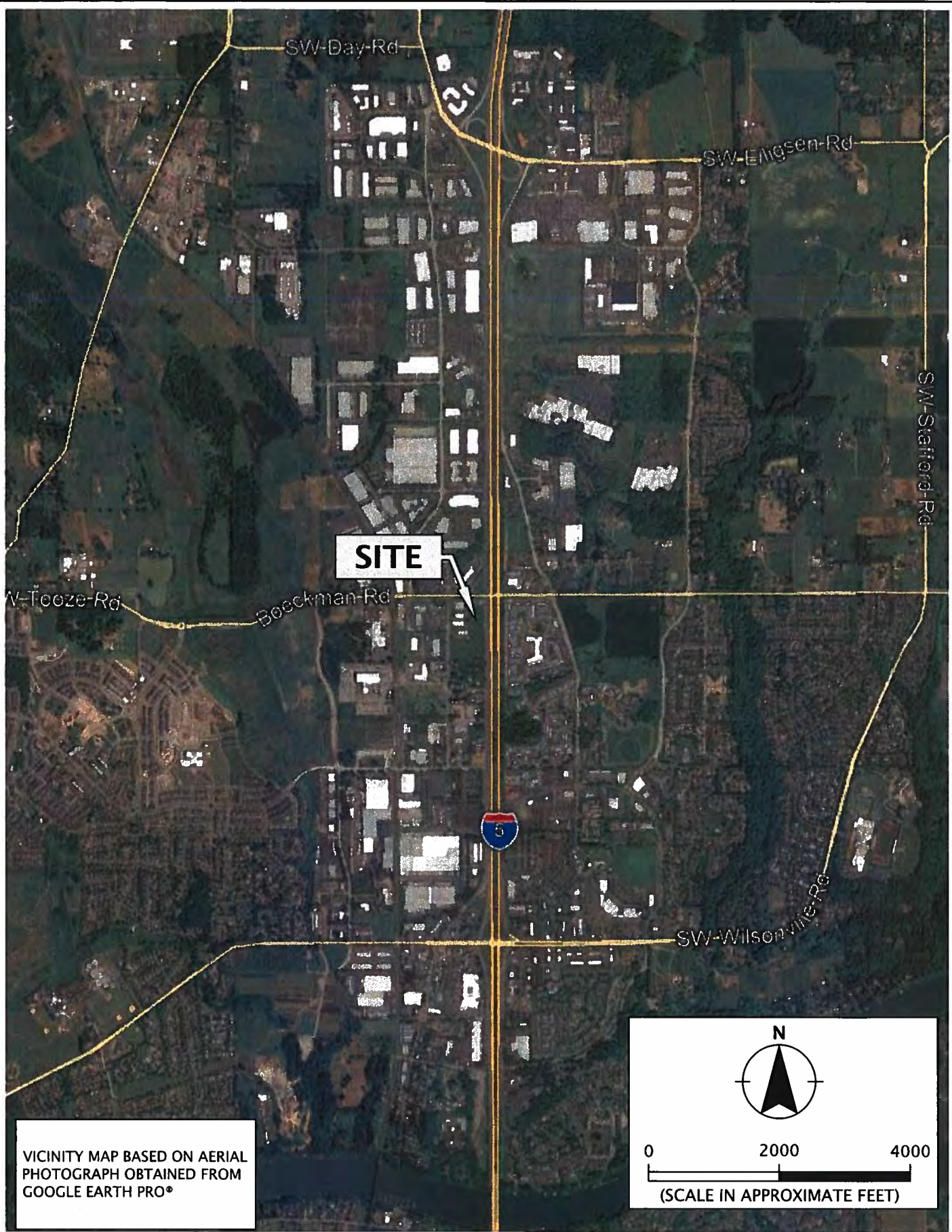
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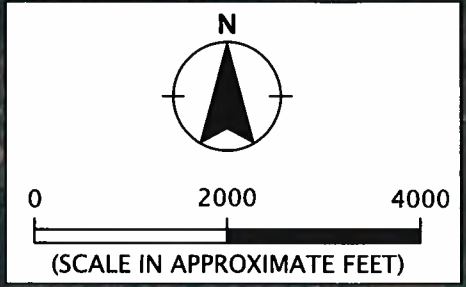
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FIGURES



VICINITY MAP BASED ON AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO®



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 NOVEMBER 2018

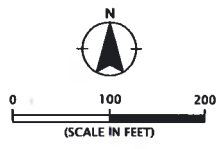
VICINITY MAP
 WILSONVILLE FACILITIES
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FIGURE 1


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LEGEND:
B-1 BORING



SITE PLAN BASED ON AERIAL PHOTOGRAPH
OBTAINED FROM GOOGLE EARTH PRO®,
SEPTEMBER 12, 2018

 GEO DESIGN 11125 W. UNIVERSITY AVENUE WILSONVILLE, OR 97158 503.568.8717 www.geodesign.com	DPNICOUL-5-01	SITE PLAN	FIGURE 2
	NOVEMBER 2018	WILSONVILLE FACILITIES WILSONVILLE, OR	

APPENDIX A

APPENDIX A

FIELD EXPLORATIONS

GENERAL

We explored subsurface conditions at the site by drilling seven borings (B-1 through B-7) to depths between 21.5 and 31.5 feet BGS. The explorations were completed by Western States Soil Conservation, Inc. of Hubbard, Oregon, on September 4 and 5, 2018 using mud rotary methods. The top 5 feet of boring B-4 was drilled using a 4-inch-diameter, hollow-stem auger to facilitate infiltration testing. The exploration logs are presented in this appendix.

The locations of the explorations were determined in the field by pacing from existing site features. This information should be considered accurate to the degree implied by the method used.

SOIL SAMPLING

Samples were collected from the borings using a 1½-inch-inside diameter (SPT) split-spoon sampler in general accordance with ASTM D1586. The split-spoon samplers were driven into the soil with a 140-pound hammer free-falling 30 inches. The samplers were driven a total distance of 18 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the boring logs, unless otherwise noted. Higher quality, relatively undisturbed samples were collected using a standard Shelby tube in general accordance with ASTM D1587. Sampling methods and intervals are shown on the exploration logs.

The average efficiency of the automatic SPT hammer used by Western States Soil Conservation, Inc. was 90.4 percent. The calibration testing results are presented at the end of this appendix.

SOIL CLASSIFICATION

The soil samples were classified in accordance with the "Exploration Key" (Table A-1) and "Soil Classification System" (Table A-2), which are presented in this appendix. The exploration logs indicate the depths at which the soil or its characteristics change, although the change actually could be gradual. If the change occurred between sample locations, the depth was interpreted. Classifications are shown on the exploration logs.

LABORATORY TESTING

CLASSIFICATION

The soil samples were classified in the laboratory to confirm field classifications. The laboratory classifications are shown on the exploration logs if those classifications differed from the field classifications.

MOISTURE CONTENT

We determined the natural moisture content of select soil samples in general accordance with ASTM D2216. The natural moisture content is a ratio of the weight of the water to soil in a test sample and is expressed as a percentage. The test results are presented in this appendix.

CONSOLIDATION TESTING










A one-dimensional consolidation test was completed on one relatively undisturbed soil sample in general accordance with ASTM D2435. The test measures the volume change (consolidation) of a soil sample under predetermined loads. The test results are presented in this appendix.

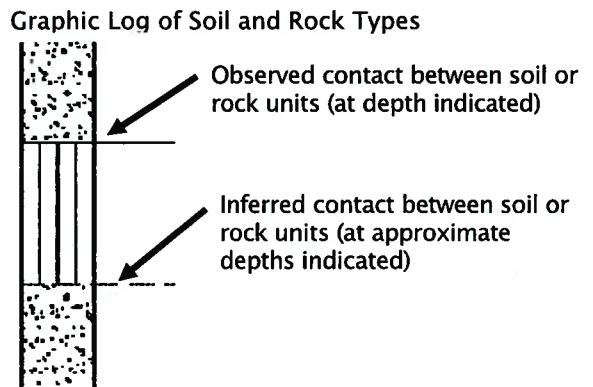
ATTERBERG LIMITS TESTING

The plastic limit and liquid limit (Atterberg limits) of a select soil sample were determined in accordance with ASTM D4318. The Atterberg limits and the plasticity index were completed to aid in the classification of the soil. The plastic limit is defined as the moisture content, in percent, where the soil becomes brittle. The liquid limit is defined as the moisture content where the soil begins to act similar to a liquid. The plasticity index is the difference between the liquid and plastic limits. The test results are presented in this appendix.

PARTICLE-SIZE ANALYSIS

We completed particle-size analyses on select soil samples in accordance with ASTM D1140. The tests determined percent fines (passing the U.S. Standard No. 200 Sieve) only. The test results are presented in this appendix.

SYMBOL	SAMPLING DESCRIPTION
	Location of sample obtained in general accordance with ASTM D 1586 Standard Penetration Test with recovery
	Location of sample obtained using thin-wall Shelby tube or Geoprobe® sampler in general accordance with ASTM D 1587 with recovery
	Location of sample obtained using Dames & Moore sampler and 300-pound hammer or pushed with recovery
	Location of sample obtained using Dames & Moore and 140-pound hammer or pushed with recovery
	Location of sample obtained using 3-inch-O.D. California split-spoon sampler and 140-pound hammer
	Location of grab sample
	Rock coring interval
	Water level during drilling
	Water level taken on date shown



GEOTECHNICAL TESTING EXPLANATIONS

ATT	Atterberg Limits	P	Pushed Sample
CBR	California Bearing Ratio	PP	Pocket Penetrometer
CON	Consolidation	P200	Percent Passing U.S. Standard No. 200 Sieve
DD	Dry Density	RES	Resilient Modulus
DS	Direct Shear	SIEV	Sieve Gradation
HYD	Hydrometer Gradation	TOR	Torvane
MC	Moisture Content	UC	Unconfined Compressive Strength
MD	Moisture-Density Relationship	VS	Vane Shear
NP	Nonplastic	kPa	Kilopascal
OC	Organic Content		

ENVIRONMENTAL TESTING EXPLANATIONS

CA	Sample Submitted for Chemical Analysis	ND	Not Detected
P	Pushed Sample	NS	No Visible Sheen
PID	Photoionization Detector Headspace Analysis	SS	Slight Sheen
ppm	Parts per Million	MS	Moderate Sheen
		HS	Heavy Sheen

RELATIVE DENSITY - COARSE-GRAINED SOIL

Relative Density	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)
Very Loose	0 - 4	0 - 11	0 - 4
Loose	4 - 10	11 - 26	4 - 10
Medium Dense	10 - 30	26 - 74	10 - 30
Dense	30 - 50	74 - 120	30 - 47
Very Dense	More than 50	More than 120	More than 47

CONSISTENCY - FINE-GRAINED SOIL

Consistency	Standard Penetration Resistance	Dames & Moore Sampler (140-pound hammer)	Dames & Moore Sampler (300-pound hammer)	Unconfined Compressive Strength (tsf)
Very Soft	Less than 2	Less than 3	Less than 2	Less than 0.25
Soft	2 - 4	3 - 6	2 - 5	0.25 - 0.50
Medium Stiff	4 - 8	6 - 12	5 - 9	0.50 - 1.0
Stiff	8 - 15	12 - 25	9 - 19	1.0 - 2.0
Very Stiff	15 - 30	25 - 65	19 - 31	2.0 - 4.0
Hard	More than 30	More than 65	More than 31	More than 4.0

PRIMARY SOIL DIVISIONS

GROUP SYMBOL

GROUP NAME

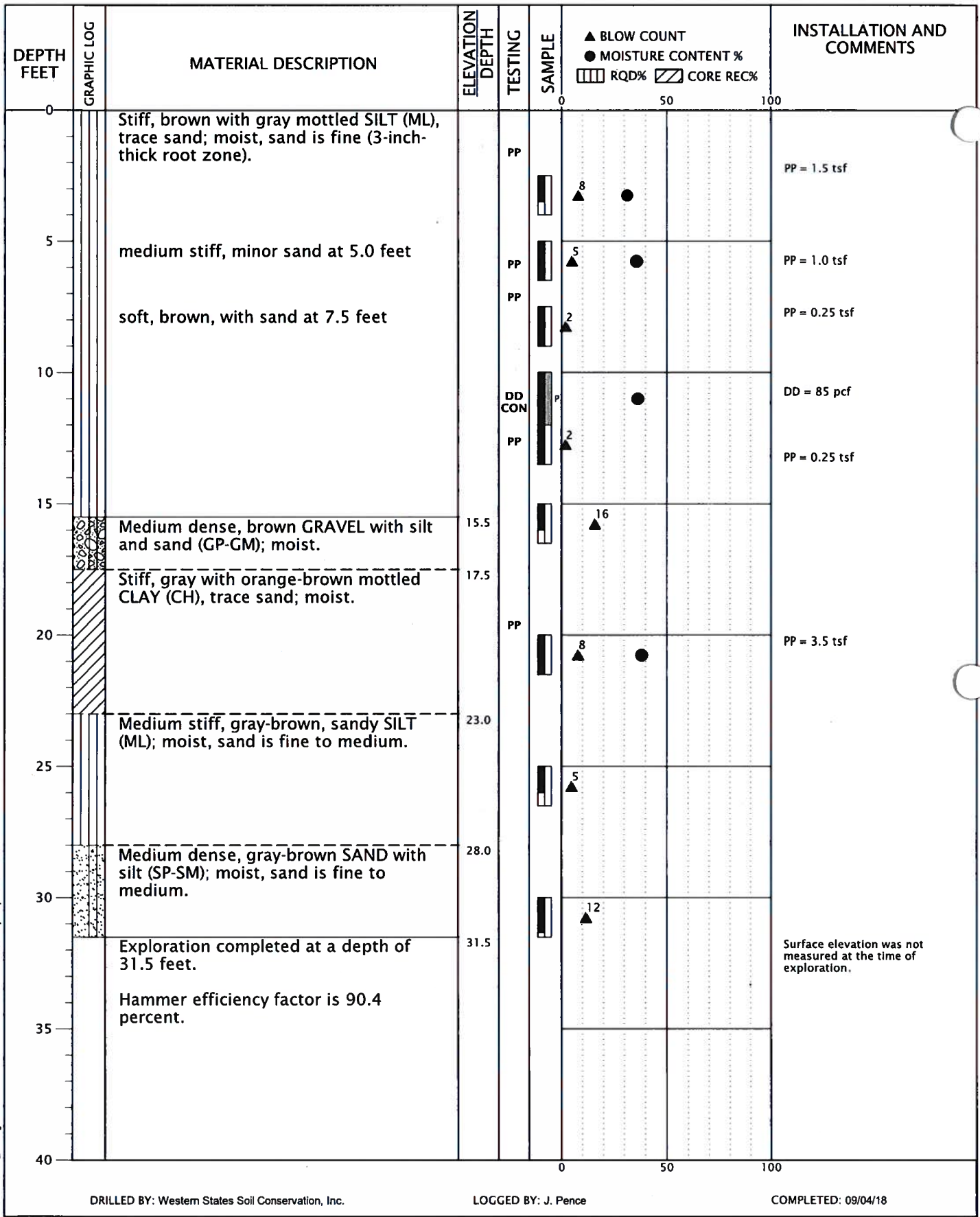
COARSE-GRAINED SOIL (more than 50% retained on No. 200 sieve)	GRAVEL (more than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (< 5% fines)	GW or GP	GRAVEL
		GRAVEL WITH FINES (≥ 5% and ≤ 12% fines)	GW-GM or GP-GM	GRAVEL with silt
			GW-GC or GP-GC	GRAVEL with clay
		GRAVEL WITH FINES (> 12% fines)	GM	silty GRAVEL
	GC		clayey GRAVEL	
	GC-GM		silty, clayey GRAVEL	
	SAND (50% or more of coarse fraction passing No. 4 sieve)	CLEAN SAND (<5% fines)	SW or SP	SAND
		SAND WITH FINES (≥ 5% and ≤ 12% fines)	SW-SM or SP-SM	SAND with silt
			SW-SC or SP-SC	SAND with clay
		SAND WITH FINES (> 12% fines)	SM	silty SAND
SC			clayey SAND	
SC-SM			silty, clayey SAND	
FINE-GRAINED SOIL (50% or more passing No. 200 sieve)	Liquid limit less than 50	ML	SILT	
		CL	CLAY	
		CL-ML	silty CLAY	
		OL	ORGANIC SILT or ORGANIC CLAY	
	Liquid limit 50 or greater	MH	SILT	
		CH	CLAY	
		OH	ORGANIC SILT or ORGANIC CLAY	
		PT	PEAT	

HIGHLY ORGANIC SOIL

MOISTURE CLASSIFICATION

ADDITIONAL CONSTITUENTS

Term	Field Test	Secondary granular components or other materials such as organics, man-made debris, etc.					
		Percent	Silt and Clay In:		Percent	Sand and Gravel In:	
Fine-Grained Soil	Coarse-Grained Soil		Fine-Grained Soil	Coarse-Grained Soil			
dry	very low moisture, dry to touch	< 5	trace	trace	< 5	trace	trace
moist	damp, without visible moisture	5 - 12	minor	with	5 - 15	minor	minor
wet	visible free water, usually saturated	> 12	some	silty/clayey	15 - 30	with	with
					> 30	sandy/gravelly	Indicate %



BORING LOG DPNICOLI-5-01-B1-7.GPJ GEODESIGN.GDT PRINT DATE: 11/14/18:KM:KT

DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: J. Pence COMPLETED: 09/04/18

BORING METHOD: mud rotary (see document text) BORING BIT DIAMETER: 3 inches



DPNICOLI-5-01
NOVEMBER 2018

BORING B-1
WILSONVILLE FACILITIES
WILSONVILLE, OR

FIGURE A-1

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	▲ BLOW COUNT ● MOISTURE CONTENT % ▨ RQD% ▩ CORE REC%			INSTALLATION AND COMMENTS
						0	50	100	
0		Stiff, brown with gray mottled SILT (ML), trace sand; moist, sand is fine (3-inch-thick root zone).							
5		medium stiff, minor sand at 5.0 feet		PP	8				PP = 1.0 tsf
7		soft, brown, with sand at 7.0 feet		PP	5				PP = 1.0 tsf
10				PP	3				PP = 0.5 tsf
15		soft to medium stiff, brown with orange-brown mottles; sand is fine to medium at 15.0 feet		PP	3				PP = 0.5 tsf
18.0		Medium stiff, gray with orange-brown mottled CLAY (CH), trace sand; moist.	18.0	PP	4				
21.5		Exploration completed at a depth of 21.5 feet. Hammer efficiency factor is 90.4 percent.	21.5	ATT	4				PP = 3.0 tsf LL = 69% PL = 26% Surface elevation was not measured at the time of exploration.
25									
30									
35									
40									

DRILLED BY: Western States Soil Conservation, Inc.

LOGGED BY: J. Pence

COMPLETED: 09/04/18

BORING METHOD: mud rotary (see document text)

BORING BIT DIAMETER: 3 inches



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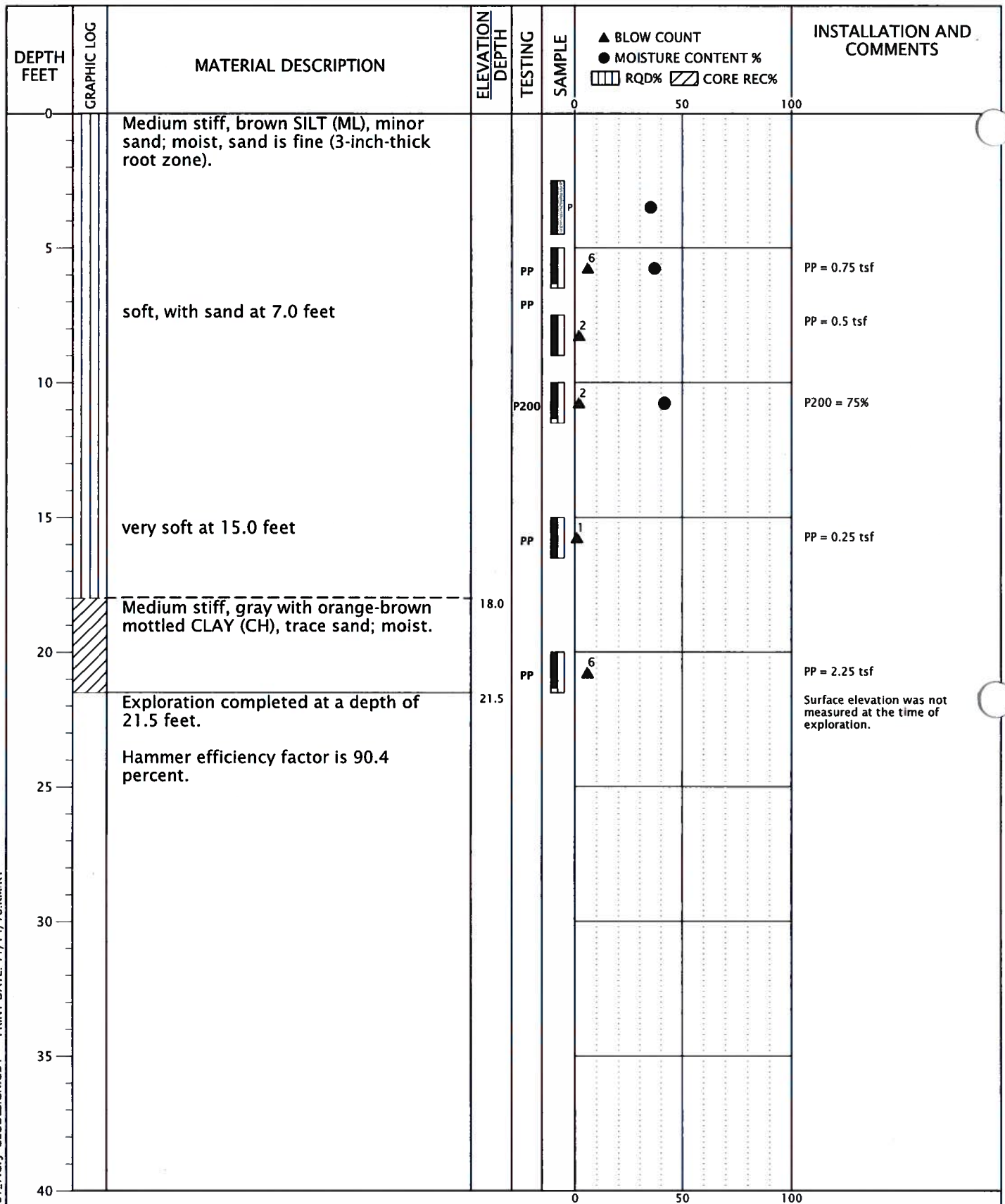
BORING B-2

NOVEMBER 2018

WILSONVILLE FACILITIES
WILSONVILLE, OR

FIGURE A-2

BORING LOG DPNICOLI-5-01-81_7.CPJ GEODESIGN.GDT PRINT DATE: 11/14/18 KM:KT



DRILLED BY: Western States Soil Conservation, Inc.

LOGGED BY: J. Pence

COMPLETED: 09/04/18

BORING METHOD: mud rotary (see document text)

BORING BIT DIAMETER: 3 inches

BORING LOG DPNICOLI-5-01-B1_7.GPJ GEODESIGN.GDT PRINT DATE: 11/14/18:KM:KT



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BORING B-3

WILSONVILLE FACILITIES
WILSONVILLE, OR

FIGURE A-3

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	▲ BLOW COUNT ● MOISTURE CONTENT % ▨ RQD% ▩ CORE REC%			INSTALLATION AND COMMENTS
						0	50	100	
0		Stiff, brown with gray mottled SILT (ML), minor sand, trace organics; moist, sand is fine (3-inch-thick root zone).							
5		medium stiff at 5.0 feet		PP	9				PP = 1.5 tsf
10		soft, brown, with sand, without organics at 10.0 feet		P200 PP	6				P200 = 82% PP = 1.0 tsf Infiltration test at 5.5 feet.
15		Medium dense, brown, silty GRAVEL with sand (GM); wet, gravel is subrounded, sand is fine to medium.	14.0	PP	2				PP = 0.5 tsf
20		Medium stiff, gray with orange-brown mottled CLAY (CH), minor sand; moist.	17.0	PP	6				PP = 1.0 tsf
25		Loose, brown SAND with silt (SP-SM); moist.	24.0		11				
30		Stiff, gray with orange-brown mottled CLAY (CH), minor sand; moist.	25.5	PP	23				PP = 1.0 tsf
35		Medium dense, gray with brown mottled SAND with silt (SP-SM); moist.	29.0						
40		Exploration completed at a depth of 31.5 feet. Hammer efficiency factor is 90.4 percent.	31.5						Surface elevation was not measured at the time of exploration.

BORING LOG DPNICOLI-5-01-B1-7.GPJ GEODESIGN.GDT PRINT DATE: 11/14/18:KM:KT

DRILLED BY: Western States Soil Conservation, Inc. LOGGED BY: J. Pence COMPLETED: 09/04/18

BORING METHOD: hollow-stem auger and mud rotary (see document text) BORING BIT DIAMETER: 4 inches/3 inches

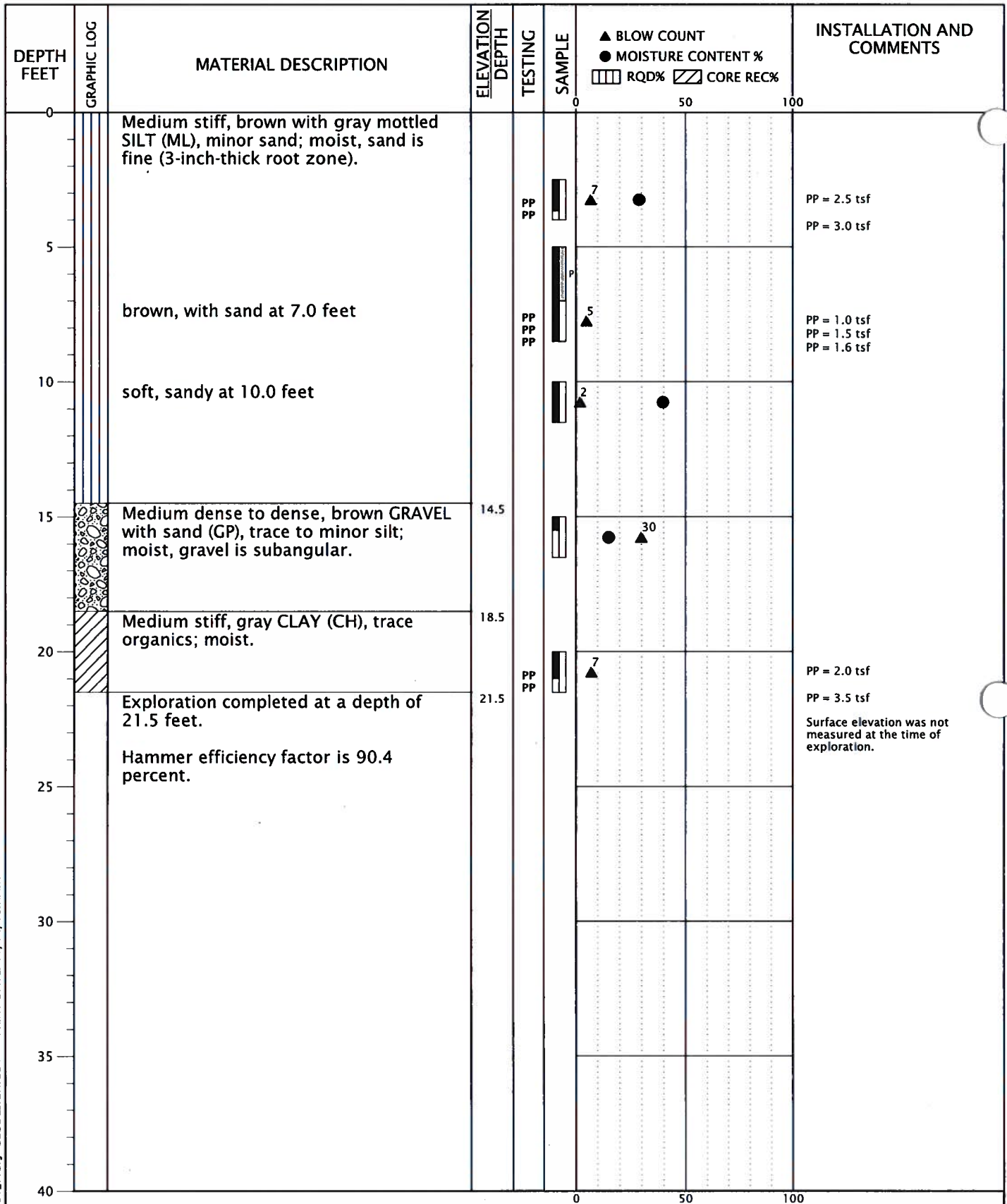


DPNICOLI-5-01
NOVEMBER 2018

BORING B-4
WILSONVILLE FACILITIES
WILSONVILLE, OR

FIGURE A-4

BORING LOG DPNICOLI-5-01-B1-7.GPJ GEODESIGN.GDT PRINT DATE: 11/14/18 KM:KT



DRILLED BY: Western States Soil Conservation, Inc.

LOGGED BY: T. Hainley

COMPLETED: 09/05/18

BORING METHOD: mud rotary (see document text)

BORING BIT DIAMETER: 3 inches



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BORING B-5

WILSONVILLE FACILITIES
WILSONVILLE, OR

FIGURE A-5

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	ELEVATION DEPTH	TESTING	SAMPLE	▲ BLOW COUNT ● MOISTURE CONTENT % ▨ RQD% ▩ CORE REC%	INSTALLATION AND COMMENTS
0		Stiff, brown SILT (ML), trace sand; moist, sand is fine (4-inch-thick-root zone).					
5		medium stiff, trace organics (carbonized wood) at 5.0 feet		PP PP	9		PP = 2.0 tsf PP = 1.8 tsf
7.5		soft to medium stiff, sandy at 7.5 feet		PP PP	7		PP = 0.8 tsf PP = 0.5 tsf
10		sandy, without organics; sand is fine to medium at 10.0 feet		PP PP	4		PP = 0.4 tsf PP = 0.6 tsf
15		medium stiff at 15.0 feet with gravel at 16.3 feet			4		P200 = 64%
18.0		Medium dense, gray-brown with orange mottled, silty GRAVEL with sand (GM), trace clay; moist to wet.	18.0		14		Driller Comment: gravel at approximately 14.5 feet.
21.5		Exploration completed at a depth of 21.5 feet. Hammer efficiency is 90.4 feet.	21.5		14		Surface elevation was not measured at the time of exploration.

DRILLED BY: Western States Soil Conservation, Inc.

LOGGED BY: T. Hainley

COMPLETED: 09/05/18

BORING METHOD: mud rotary (see document text)

BORING BIT DIAMETER: 3 inches



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DPNICOLI-5-01

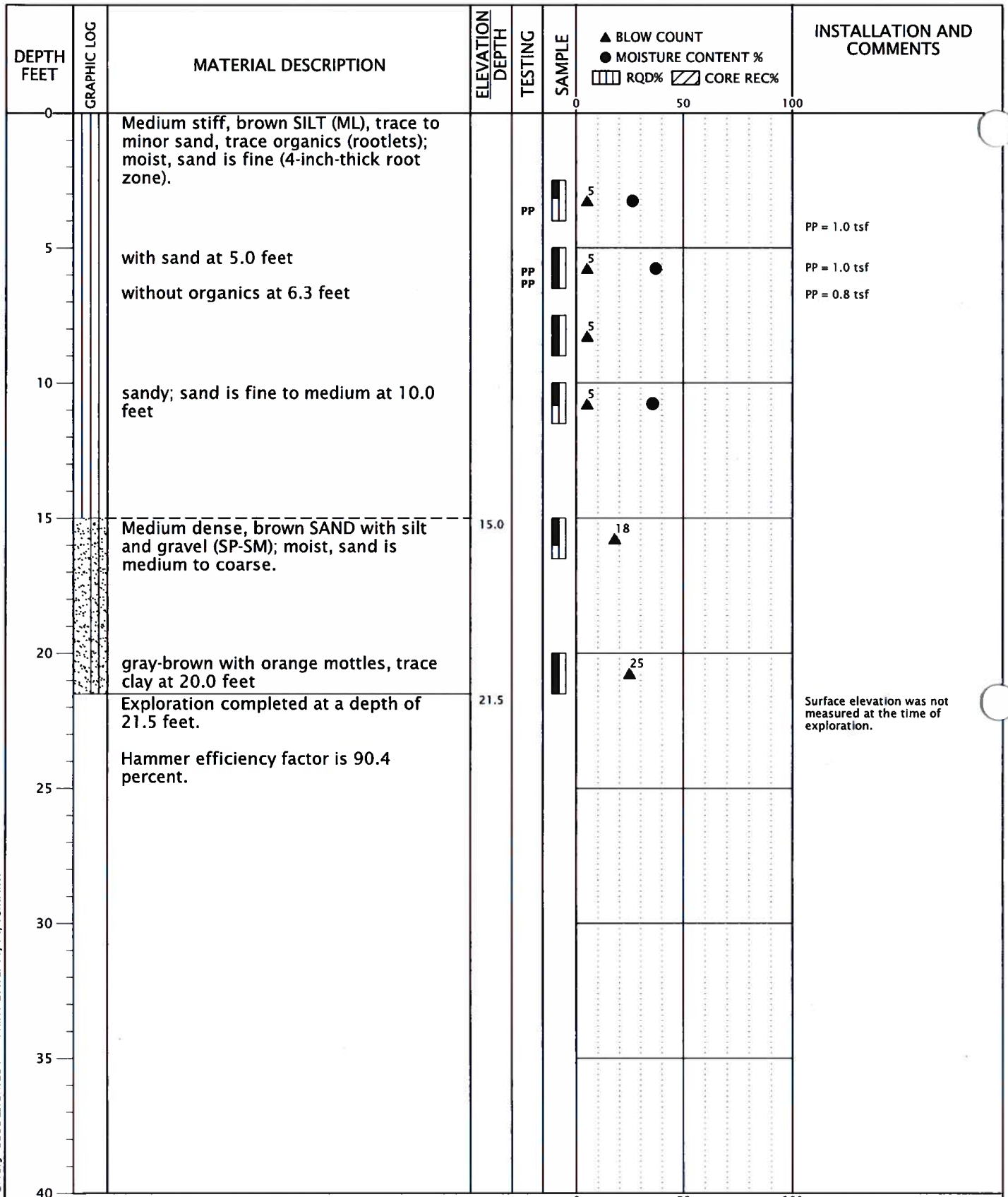
BORING B-6

NOVEMBER 2018

WILSONVILLE FACILITIES
WILSONVILLE, OR

FIGURE A-6

BORING LOG DPNICOLI-5-01-B1-7.GPJ GEODESIGN.GDT PRINT DATE: 11/14/18:KM:KT



DRILLED BY: Western States Soil Conservation, Inc.

LOGGED BY: T. Hainley

COMPLETED: 09/05/18

BORING METHOD: mud rotary (see document text)

BORING BIT DIAMETER: 3 inches

BORING LOG DPNICOLI-5-01-B1_7.GPJ GEODESIGN.GDT PRINT DATE: 11/14/18 KM:KT



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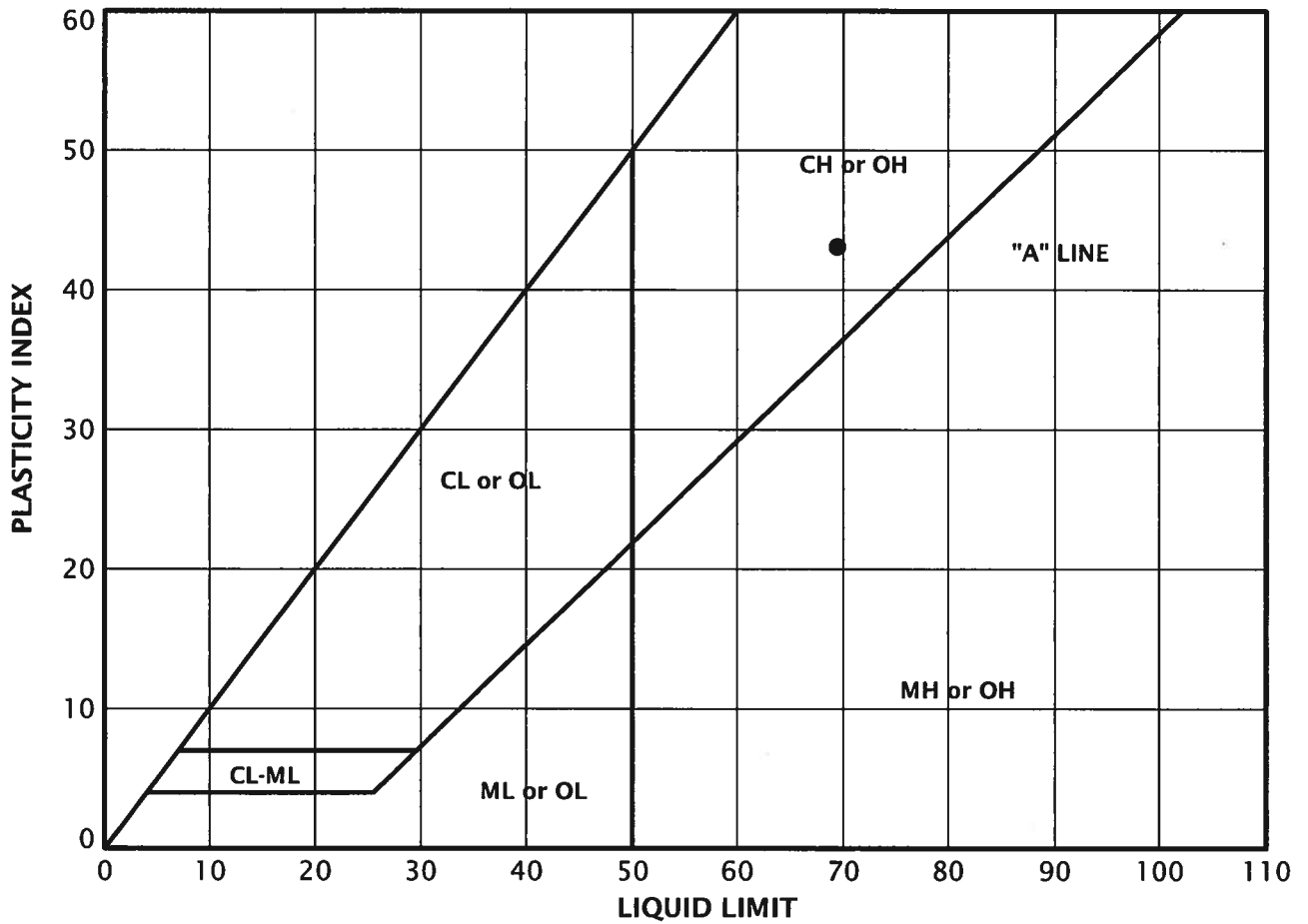
DPNICOLI-5-01

NOVEMBER 2018

BORING B-7

WILSONVILLE FACILITIES
WILSONVILLE, OR

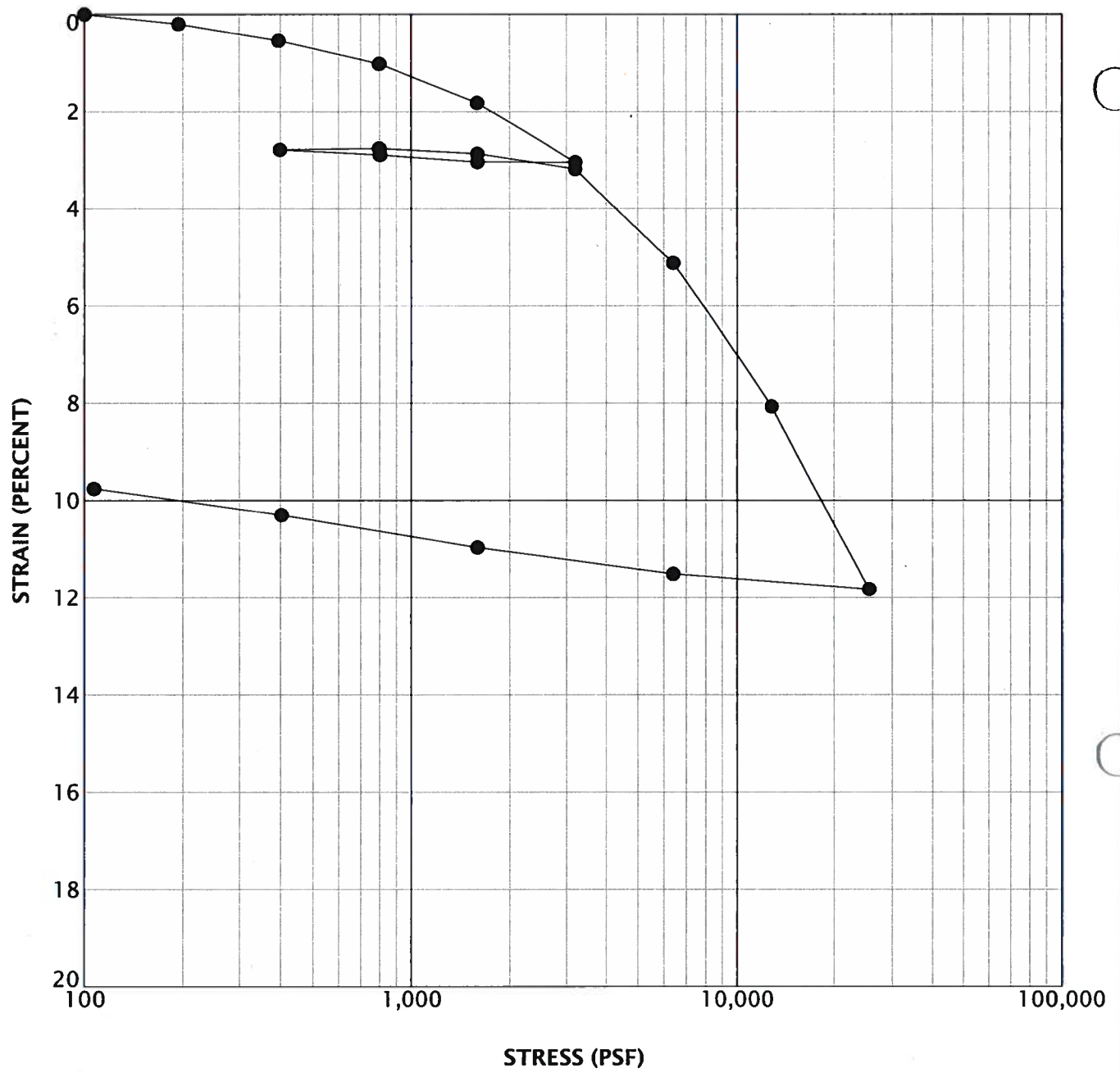
FIGURE A-7



KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
●	B-2	20.0	44	69	26	43

ATTERBERG_LIMITS 7 DPNICOLI-5-01-81_7.GPJ GEODESIGN.GDT PRINT DATE: 11/13/18:KT

CONSOL_STRAIN_100K_DPNICOLI-5-01-B1_7.GPJ GEODESIGN.GDT PRINT DATE: 11/13/18:KT



KEY	EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)
●	B-1	10.0	37	85

SAMPLE INFORMATION			MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)			GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
B-1	2.5		31							
B-1	5.0		36							
B-1	10.0		37	85						
B-1	20.0		38							
B-2	2.5		26							
B-2	7.5		38							
B-2	20.0		44				69	26	43	
B-3	2.5		35							
B-3	5.0		37							
B-3	10.0		42			75				
B-4	2.5		27							
B-4	5.0		33			82				
B-4	10.0		40							
B-4	15.0		27							
B-5	2.5		29							
B-5	10.0		40							
B-5	15.0		15							
B-6	2.5		30							
B-6	5.0		36							
B-6	10.0		37			64				
B-7	2.5		26							
B-7	5.0		37							
B-7	10.0		36							

LAB SUMMARY DPNICOLI-5-01-B1-7.GPJ GEODESIGN.GDT PRINT DATE: 11/13/18:KT

(This section is intentionally left blank for additional notes or data.)

Pile Dynamics, Inc.
SPT Analyzer Results

RIG 5
PDA-S Ver. 2017.22 - Printed: 1/26/2018

Summary of SPT Test Results

Project: WSSC-8-02, Test Date: 12/29/2017

EMX: Maximum Energy				ETR: Energy Transfer Ratio - Rated			
Instr. Length ft	Start Depth ft	Final Depth ft	N Value	N60 Value	Average EMX ft-lb	Average ETR %	
15.00	0.00	0.00	0	0	317	90.4	
Overall Average Values:					317	90.4	
Standard Deviation:					10	2.8	
Overall Maximum Value:					335	95.7	
Overall Minimum Value:					293	83.7	

APPENDIX B

APPENDIX B

DCP TESTING

DCP DATA

GeoDesign performed DCP testing of the base material and subgrade soil at each boring location on September 4 and 5, 2018. We conducted tests in general accordance with ASTM D6951. We recorded penetration depth of the cone for each blow of the hammer and terminated testing when at refusal of penetration or end of rod length. We summarized the data by plotting depth of penetration versus blow count. Plots of the summarized DCP test data are presented in this appendix.

RESILIENT MODULUS ESTIMATION

Using the summarized DCP test data, we visually assessed where slopes of the data are relatively constant and at which depths they change significantly. We used changes in slope with depth to identify transitions between soil strata with differing shear resistance characteristics. We used least squares regression to determine the slopes and the equation shown on the data sheets to estimate the resilient modulus of each stratum using a correction factor $C_f = 0.35$ for subgrade soil. In cases where we encountered strata with distinctly different shear resistance characteristics, we used Odemark's Method of Equivalent Thickness to estimate an equivalent resilient modulus of the combined strata.

DYNAMIC CONE PENETROMETER RESULTS - BORING B-1

Layer	Layer Type and Location	Slope (mm/blow)	C _f	M _R (psi)
1	Subgrade below AC and aggregate base	5.3	0.35	8,980
2	Subgrade below AC and aggregate base	12.1	0.35	6,480
3		---	---	---
Equivalent subgrade modulus based on Odemark's Method of Equivalent Thickness				6,870



$$M_R = C_f \times 49023 \times S^{-0.39}$$

M_R = resilient modulus (pounds per square inch)

C_f = conversion coefficient

S = slope (millimeters per blow)

References:

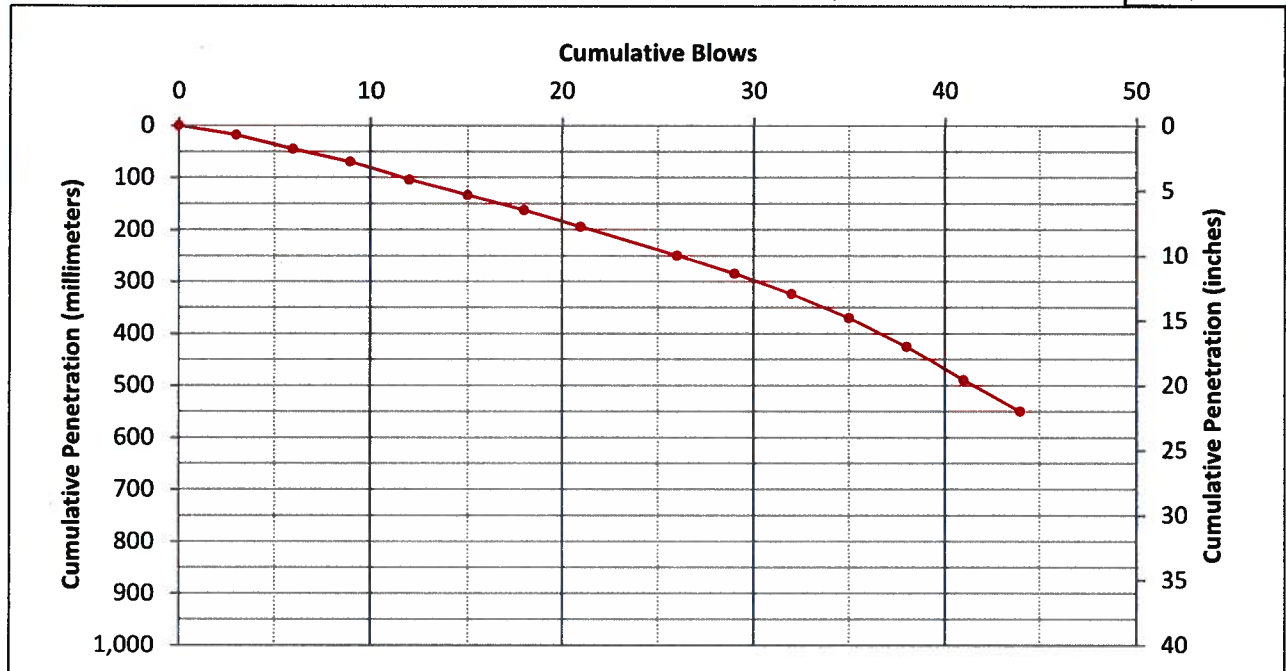
ODOT Pavement Design Guide, Pavement Services Unit, Oregon Department of Transportation, April 2011.

Jianzhou Chen, Mustaque Hossain, and Todd M. LaTorella, "Use of Falling Weight Deflectometer and Dynamic Cone Penetrometer in Pavement Evaluation," *Paper No. 99-1007*, Transportation Research Record 1655, pp 145-151, Transportation Research Board, Washington, D.C., 1999.

Per Ullidtz, *Modelling Flexible Pavement Response and Performance*, Tech Univ. of Denmark Polytekn, 1998.

DYNAMIC CONE PENETROMETER RESULTS - BORING B-2

Layer	Layer Type and Location	Slope (mm/blow)	C_f	M_R (psi)
1	Subgrade below AC and aggregate base	10.2	0.35	6,930
2	Subgrade below AC and aggregate base	19.1	0.35	5,430
3		---	---	---
Equivalent subgrade modulus based on Odemark's Method of Equivalent Thickness				6,280



$$M_R = C_f \times 49023 \times S^{-0.39}$$

M_R = resilient modulus (pounds per square inch)

C_f = conversion coefficient

S = slope (millimeters per blow)

References:

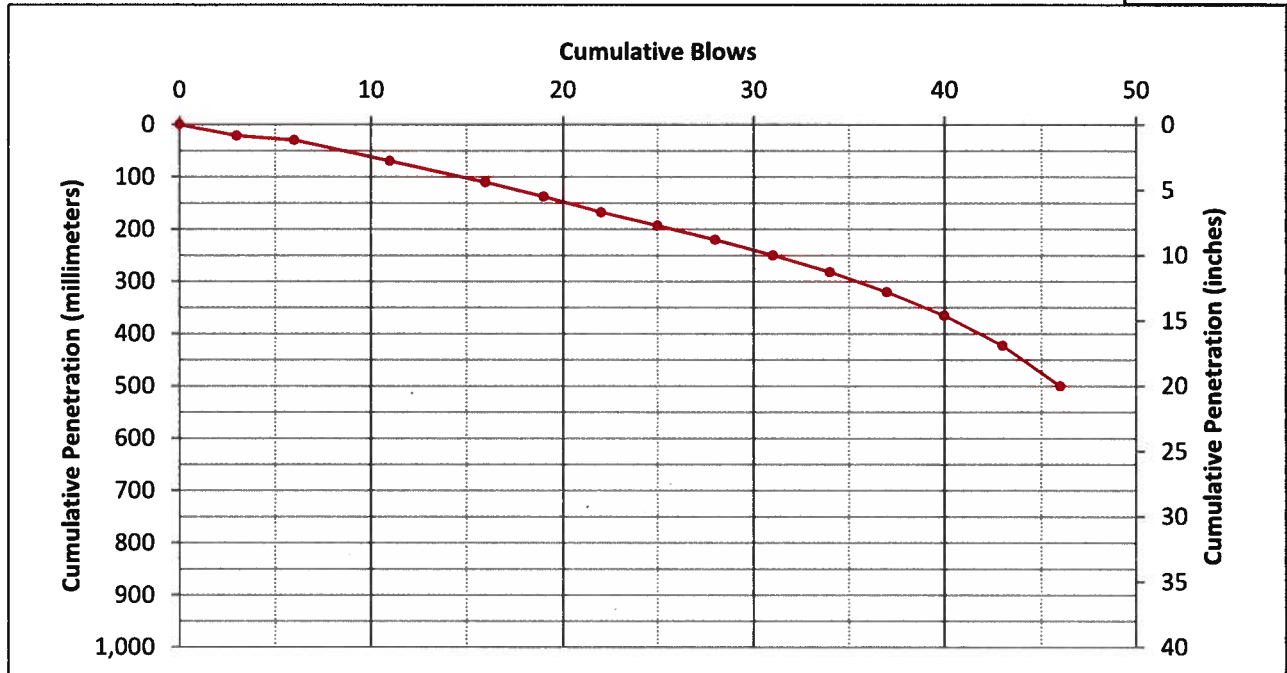
ODOT Pavement Design Guide, Pavement Services Unit, Oregon Department of Transportation, April 2011.

Jianzhou Chen, Mustaque Hossain, and Todd M. LaTorella, "Use of Falling Weight Deflectometer and Dynamic Cone Penetrometer in Pavement Evaluation," *Paper No. 99-1007*, Transportation Research Record 1655, pp 145-151, Transportation Research Board, Washington, D.C., 1999.

Per Ullidtz, *Modelling Flexible Pavement Response and Performance*, Tech Univ. of Denmark Polytekn, 1998.

DYNAMIC CONE PENETROMETER RESULTS - BORING B-3

Layer	Layer Type and Location	Slope (mm/blow)	C_f	M_R (psi)
1	Subgrade below AC and aggregate base	9.2	0.35	7,210
2	Subgrade below AC and aggregate base	19.9	0.35	5,340
3	---	---	---	---
Equivalent subgrade modulus based on Odemark's Method of Equivalent Thickness				6,450



$$M_R = C_f \times 49023 \times S^{-0.39}$$

M_R = resilient modulus (pounds per square inch)

C_f = conversion coefficient

S = slope (millimeters per blow)

References:

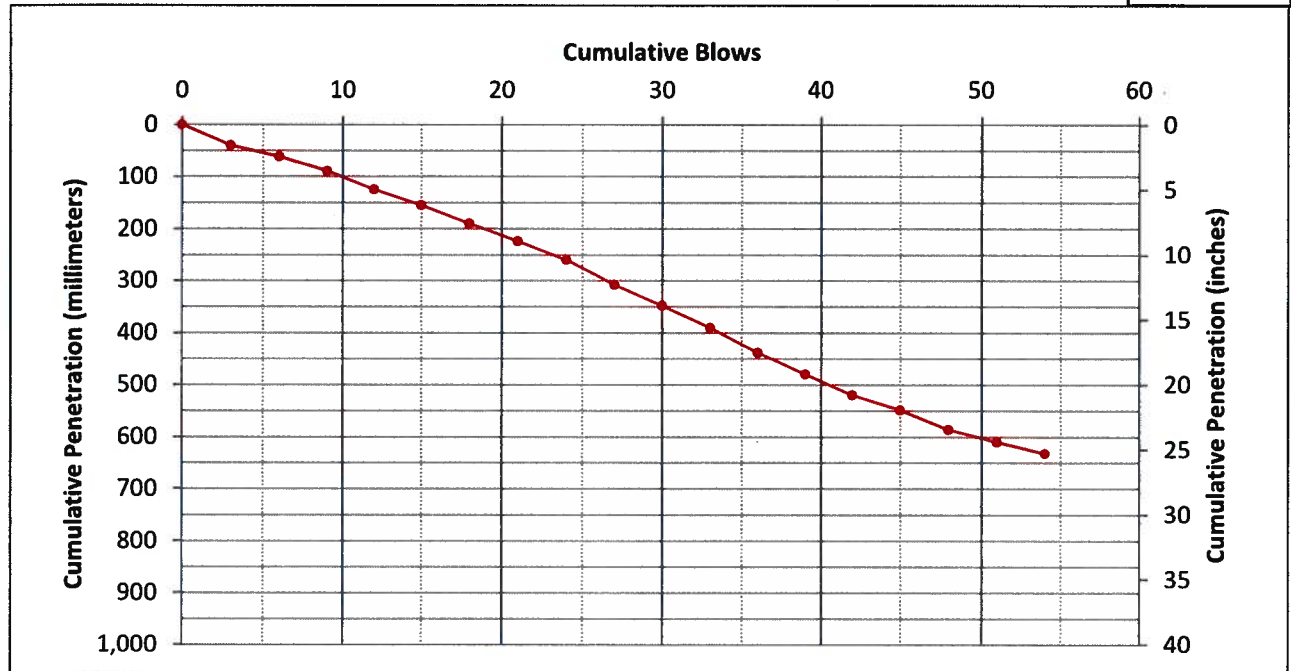
ODOT Pavement Design Guide, Pavement Services Unit, Oregon Department of Transportation, April 2011.

Jianzhou Chen, Mustaque Hossain, and Todd M. LaTorella, "Use of Falling Weight Deflectometer and Dynamic Cone Penetrometer in Pavement Evaluation," *Paper No. 99-1007*, Transportation Research Record 1655, pp 145-151, Transportation Research Board, Washington, D.C., 1999.

Per Ullidtz, *Modelling Flexible Pavement Response and Performance*, Tech Univ. of Denmark Polytekn, 1998.

DYNAMIC CONE PENETROMETER RESULTS - BORING B-4

Layer	Layer Type and Location	Slope (mm/blow)	C _f	M _R (psi)
1	Subgrade below AC and aggregate base	12.4	0.35	6,430
2		---	---	---
3		---	---	---
Equivalent subgrade modulus based on Odemark's Method of Equivalent Thickness				---



$$M_R = C_f \times 49023 \times S^{-0.39}$$

M_R = resilient modulus (pounds per square inch)

C_f = conversion coefficient

S = slope (millimeters per blow)

References:

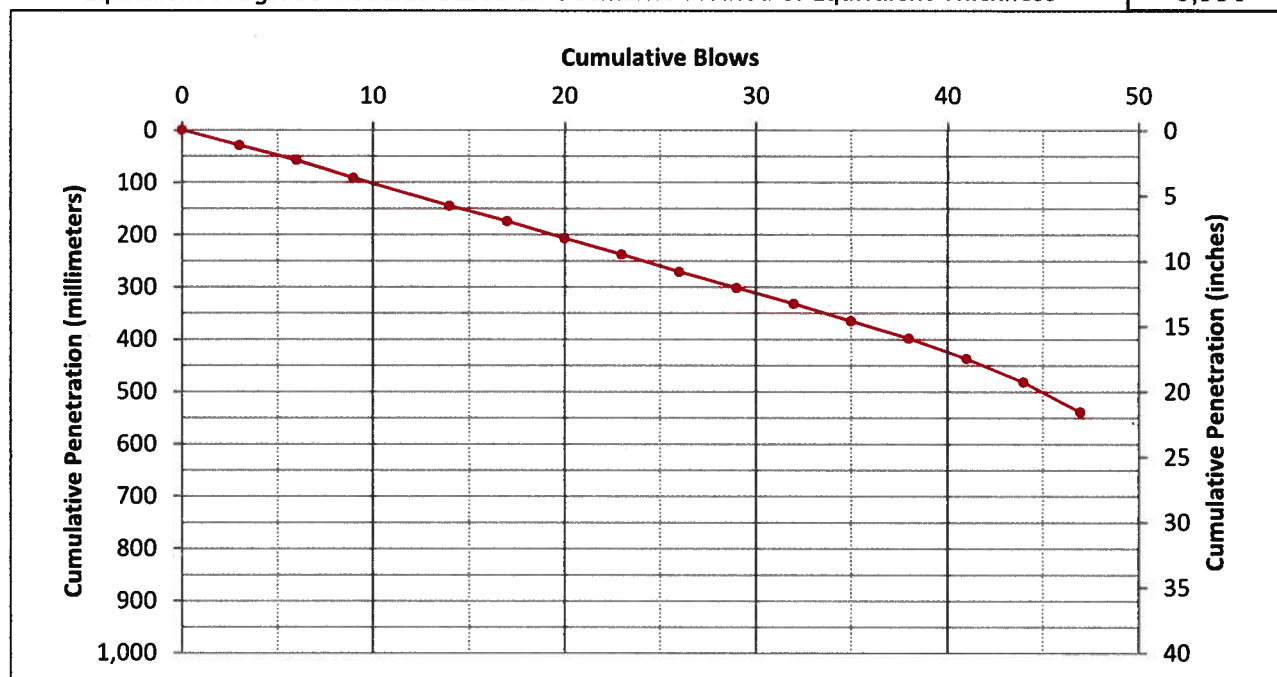
ODOT Pavement Design Guide, Pavement Services Unit, Oregon Department of Transportation, April 2011.

Jianzhou Chen, Mustaque Hossain, and Todd M. LaTorella, "Use of Falling Weight Deflectometer and Dynamic Cone Penetrometer in Pavement Evaluation," *Paper No. 99-1007*, Transportation Research Record 1655, pp 145-151, Transportation Research Board, Washington, D.C., 1999.

Per Ullidtz, *Modelling Flexible Pavement Response and Performance*, Tech Univ. of Denmark Polytekn, 1998.

DYNAMIC CONE PENETROMETER RESULTS - BORING B-5

Layer	Layer Type and Location	Slope (mm/blow)	C_f	M_R (psi)
1	Subgrade below AC and aggregate base	10.5	0.35	6,860
2	Subgrade below AC and aggregate base	15.6	0.35	5,880
3		---	---	---
Equivalent subgrade modulus based on Odemark's Method of Equivalent Thickness				6,590



$$M_R = C_f \times 49023 \times S^{-0.39}$$

M_R = resilient modulus (pounds per square inch)

C_f = conversion coefficient

S = slope (millimeters per blow)

References:

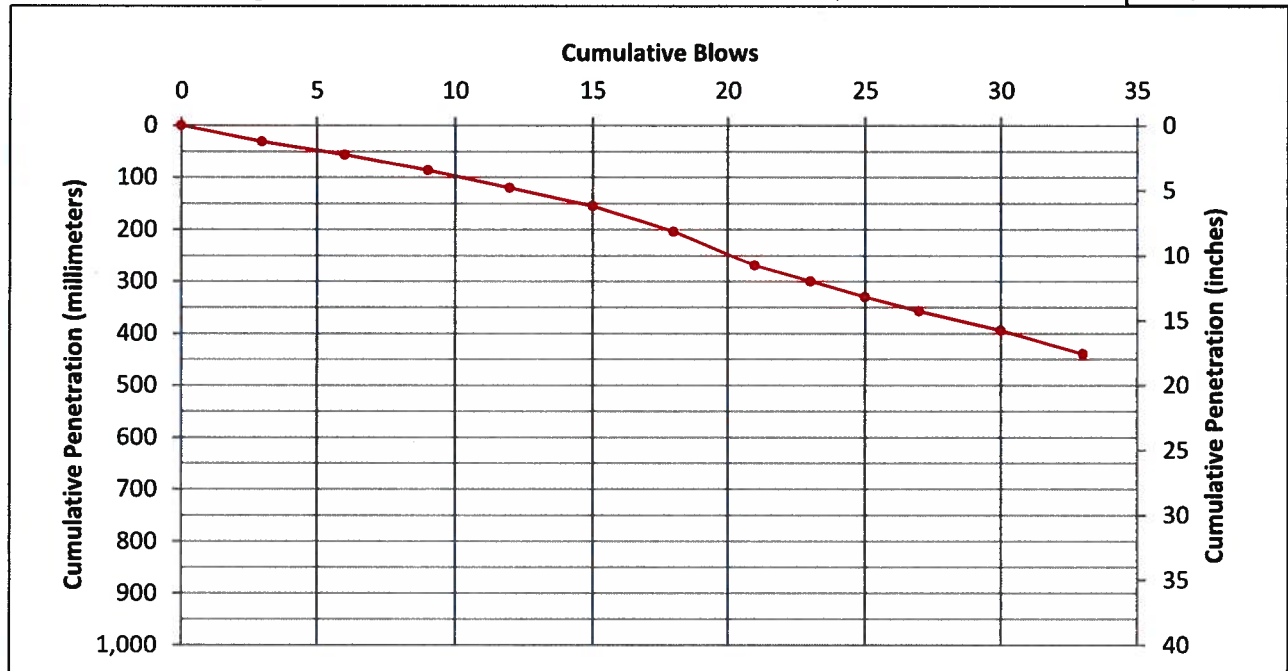
ODOT Pavement Design Guide, Pavement Services Unit, Oregon Department of Transportation, April 2011.

Jianzhou Chen, Mustaque Hossain, and Todd M. LaTorella, "Use of Falling Weight Deflectometer and Dynamic Cone Penetrometer in Pavement Evaluation," *Paper No. 99-1007*, Transportation Research Record 1655, pp 145-151, Transportation Research Board, Washington, D.C., 1999.

Per Ullidtz, *Modelling Flexible Pavement Response and Performance*, Tech Univ. of Denmark Polytekn, 1998.

DYNAMIC CONE PENETROMETER RESULTS - BORING B-6

Layer	Layer Type and Location	Slope (mm/blow)	C_f	M_R (psi)
1	Subgrade below AC and aggregate base	10.2	0.35	6,930
2	Subgrade below AC and aggregate base	13.9	0.35	6,140
3		---	---	---
Equivalent subgrade modulus based on Odemark's Method of Equivalent Thickness				6,510



$$M_R = C_f \times 49023 \times S^{-0.39}$$

M_R = resilient modulus (pounds per square inch)

C_f = conversion coefficient

S = slope (millimeters per blow)

References:

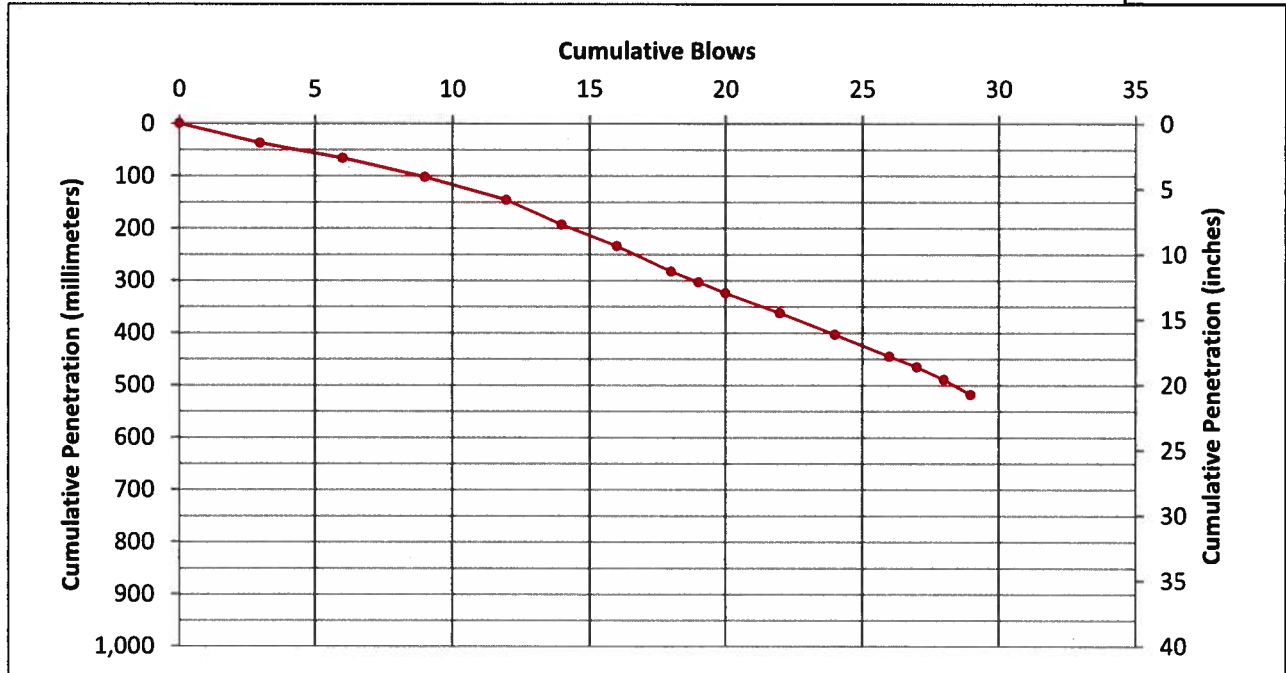
ODOT Pavement Design Guide, Pavement Services Unit, Oregon Department of Transportation, April 2011.

Jianzhou Chen, Mustaque Hossain, and Todd M. LaTorella, "Use of Falling Weight Deflectometer and Dynamic Cone Penetrometer in Pavement Evaluation," *Paper No. 99-1007*, Transportation Research Record 1655, pp 145-151, Transportation Research Board, Washington, D.C., 1999.

Per Ullidtz, *Modelling Flexible Pavement Response and Performance*, Tech Univ. of Denmark Polytekn, 1998.

DYNAMIC CONE PENETROMETER RESULTS - BORING B-7

Layer	Layer Type and Location	Slope (mm/blow)	C _f	M _R (psi)
1	Subgrade below AC and aggregate base	11.9	0.35	6,530
2	Subgrade below AC and aggregate base	21.3	0.35	5,210
3		---	---	---
Equivalent subgrade modulus based on Odemark's Method of Equivalent Thickness				5,560



$$M_R = C_f \times 49023 \times S^{-0.39}$$

M_R = resilient modulus (pounds per square inch)

C_f = conversion coefficient

S = slope (millimeters per blow)

References:

ODOT Pavement Design Guide, Pavement Services Unit, Oregon Department of Transportation, April 2011.

Jianzhou Chen, Mustaque Hossain, and Todd M. LaTorella, "Use of Falling Weight Deflectometer and Dynamic Cone Penetrometer in Pavement Evaluation," *Paper No. 99-1007*, Transportation Research Record 1655, pp 145-151, Transportation Research Board, Washington, D.C., 1999.

Per Ullidtz, *Modelling Flexible Pavement Response and Performance*, Tech Univ. of Denmark Polytekn, 1998.

APPENDIX C

APPENDIX C

PAVEMENT DESIGN REPORTS AND CALCULATION SHEETS

STORAGE YARD

We performed our pavement designs for the storage yard using PCASE. The reports generated by PCASE are presented in this appendix. Acronyms and abbreviations used in the PCASE reports are listed below.

CBR	California Bearing Ratio
in	inches
LED	layered-elastic design
N/A	not applicable
NFS	non-frost susceptible
Pr	Poisson's ratio
psi	pounds per square inch
SCI	structural condition index

OTHER PAVEMENT AREAS

We used the methods presented in the AASHTO guide for flexible pavement design and the Pavement Designer design tools for rigid pavement design for the other pavement areas. The AASHTO method calculation sheets and the Pavement Designer reports are presented in this appendix.

Pavement Design Report
 U.S. Army Corps of Engineers
PCASE Version 2.09.05
 Date : 11/1/2018

Design Name : GRVL_10YR
 Design Type : Roads
 Pavement Type : Unsurfaced
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : CBR
 Depth of Frost (in) : 0
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Frost Code	Analysis	Non frost Design Thickness (in)	Reduced Subgrade Strength (in)	Limited Subgrade Penetration (in)	CBR Strength
Unsurfaced	Unbound Aggregate	NFS	Compute	18.75	0	0	100
Natural Subgrade	Cohesive Cut	NFS	Manual	0	0	0	4

Traffic Information

Pattern Name : YARD(10-YEAR)

Vehicles	Weight (lb)	Passes per Life Span	Equivalent Passes
5-AXLE TRUCK	80000	65000	1
HYSTER H230HD2 - HALF LOAD	45144	260000	260000
HYSTER H230HD2 - HALF LOAD	45144		260001

Pavement Design Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : GRVL_15YR
 Design Type : Roads
 Pavement Type : Unsurfaced
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : CBR
 Depth of Frost (in) : 0
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Frost Code	Analysis	Non frost Design Thickness (in)	Reduced Subgrade Strength (in)	Limited Subgrade Penetration (in)	CBR Strength
Unsurfaced	Unbound Aggregate	NFS	Compute	19.41	0	0	100
Natural Subgrade	Cohesive Cut	NFS	Manual	0	0	0	4

Traffic Information

Pattern Name : YARD(15-YEAR)

Vehicles	Weight (lb)	Passes per Life Span	Equivalent Passes
5-AXLE TRUCK	80000	97500	1
HYSTER H230HD2 - HALF LOAD	45144	390000	390000
HYSTER H230HD2 - HALF LOAD	45144		390001

Pavement Design Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : GRVL_20YR
 Design Type : Roads
 Pavement Type : Unsurfaced
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : CBR
 Depth of Frost (in) : 0
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Frost Code	Analysis	Non frost Design Thickness (in)	Reduced Subgrade Strength (in)	Limited Subgrade Penetration (in)	CBR Strength
Unsurfaced	Unbound Aggregate	NFS	Compute	19.87	0	0	100
Natural Subgrade	Cohesive Cut	NFS	Manual	0	0	0	4

Traffic Information

Pattern Name : YARD(20-YEAR)

Vehicles	Weight (lb)	Passes per Life Span	Equivalent Passes
5-AXLE TRUCK	80000	130000	1
HYSTER H230HD2 - HALF LOAD	45144	520000	520000
HYSTER H230HD2 - HALF LOAD	45144		520001

Pavement Design Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : 3RVL_CAS_10YR
 Design Type : Roads
 Pavement Type : Unsurfaced
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : CBR
 Depth of Frost (in) : 0
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Frost Code	Analysis	Non frost Design Thickness (in)	Reduced Subgrade Strength (in)	Limited Subgrade Penetration (in)	CBR Strength
Unsurfaced	Unbound Aggregate	NFS	Compute	6.75	0	0	100
Stabilized Subbase	PCC Stab- ML,MH,CL,CH	NFS	Manual	12	0	0	100
Natural Subgrade	Cohesive Cut	NFS	Manual	0	0	0	4

Traffic Information

Pattern Name : YARD(10-YEAR)

Vehicles	Weight (lb)	Passes per Life Span	Equivalent Passes
5-AXLE TRUCK	80000	65000	1
HYSTER H230HD2 - HALF LOAD	45144	260000	260000
HYSTER H230HD2 - HALF LOAD	45144		260001

Pavement Design Report
 U.S. Army Corps of Engineers
PCASE Version 2.09.05
 Date : 11/1/2018

Design Name : 3RVL_CAS_15YR
 Design Type : Roads
 Pavement Type : Unsurfaced
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : CBR
 Depth of Frost (in) : 0
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Frost Code	Analysis	Non frost Design Thickness (in)	Reduced Subgrade Strength (in)	Limited Subgrade Penetration (in)	CBR Strength
Unsurfaced	Unbound Aggregate	NFS	Compute	7.41	0	0	100
Stabilized Subbase	PCC Stab-ML,MH,CL,CH	NFS	Manual	12	0	0	100
Natural Subgrade	Cohesive Cut	NFS	Manual	0	0	0	4

Traffic Information

Pattern Name : YARD(15-YEAR)

Vehicles	Weight (lb)	Passes per Life Span	Equivalent Passes
5-AXLE TRUCK	80000	97500	1
HYSTER H230HD2 - HALF LOAD	45144	390000	390000
HYSTER H230HD2 - HALF LOAD	45144		390001

Pavement Design Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : 3RVL_CAS_20YR
 Design Type : Roads
 Pavement Type : Unsurfaced
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : CBR
 Depth of Frost (in) : 0
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Frost Code	Analysis	Non frost Design Thickness (in)	Reduced Subgrade Strength (in)	Limited Subgrade Penetration (in)	CBR Strength
Unsurfaced	Unbound Aggregate	NFS	Compute	7.87	0	0	100
Stabilized Subbase	PCC Stab-ML,MH,CL,CH	NFS	Manual	12	0	0	100
Natural Subgrade	Cohesive Cut	NFS	Manual	0	0	0	4

Traffic Information

Pattern Name : YARD(20-YEAR)

Vehicles	Weight (lb)	Passes per Life Span	Equivalent Passes
5-AXLE TRUCK	80000	130000	1
HYSTER H230HD2 - HALF LOAD	45144	520000	520000
HYSTER H230HD2 - HALF LOAD	45144		520001

Pavement Thickness Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : FLEX_10YR
 Design Type : Roads
 Pavement Type : Flexible
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Analysis	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
Asphalt	Asphalt	Manual	8.5	Yes	450000	0.35	0
Base	Unbound Crushed Stone	Compute	15.9	N/A	20000	0.35	0
Natural Subgrade	Cohesive Cut	Manual	0	Yes	6380	0.40	0

Traffic Information

Pattern Name : YARD(10-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	65000
HYSTER H230HD2 - HALF LOAD	45144	260000

Pavement Thickness Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : FLEX_15YR
 Design Type : Roads
 Pavement Type : Flexible
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Analysis	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
Asphalt	Asphalt	Manual	9	Yes	450000	0.35	0
Base	Unbound Crushed Stone	Compute	15.83	N/A	20000	0.35	0
Natural Subgrade	Cohesive Cut	Manual	0	Yes	6380	0.40	0

Traffic Information

Pattern Name : YARD(15-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	97500
HYSTER H230HD2 - HALF LOAD	45144	390000

Pavement Thickness Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : FLEX_20YR
 Design Type : Roads
 Pavement Type : Flexible
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Analysis	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
Asphalt	Asphalt	Manual	9.5	Yes	450000	0.35	0
Base	Unbound Crushed Stone	Compute	15.37	N/A	20000	0.35	0
Natural Subgrade	Cohesive Cut	Manual	0	Yes	6380	0.40	0

Traffic Information

Pattern Name : YARD(20-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	130000
HYSTER H230HD2 - HALF LOAD	45144	520000

Pavement Thickness Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : FLEX_CAS_10YR
 Design Type : Roads
 Pavement Type : Flexible
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Analysis	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
Asphalt	Asphalt	Compute	6	Yes	450000	0.35	0
Base	Unbound Crushed Stone	Compute	4	N/A	20000	0.35	0
Stabilized Subbase	PCC Stab- ML,MH,CL,CH	Manual	12	N/A	120000	0.25	0
Natural Subgrade	Cohesive Cut	Manual	0	Yes	6380	0.40	0

Traffic Information

Pattern Name : YARD(10-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	65000
HYSTER H230HD2 - HALF LOAD	45144	260000

Pavement Thickness Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : FLEX_CAS_15YR
 Design Type : Roads
 Pavement Type : Flexible
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Analysis	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
Asphalt	Asphalt	Compute	6.5	Yes	450000	0.35	0
Base	Unbound Crushed Stone	Compute	4	N/A	20000	0.35	0
Stabilized Subbase	PCC Stab- ML,MH,CL,CH	Manual	12	N/A	120000	0.25	0
Natural Subgrade	Cohesive Cut	Manual	0	Yes	6380	0.40	0

Traffic Information

Pattern Name : YARD(15-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	97500
HYSTER H230HD2 - HALF LOAD	45144	390000

Pavement Thickness Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : FLEX_CAS_20YR
 Design Type : Roads
 Pavement Type : Flexible
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35

Layer Information

Layer Type	Material Type	Analysis	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
Asphalt	Asphalt	Compute	6.93	Yes	450000	0.35	0
Base	Unbound Crushed Stone	Compute	4	N/A	20000	0.35	0
Stabilized Subbase	PCC Stab- ML,MH,CL,CH	Manual	12	N/A	120000	0.25	0
Natural Subgrade	Cohesive Cut	Manual	0	Yes	6380	0.40	0

Traffic Information

Pattern Name : YARD(20-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	130000
HYSTER H230HD2 - HALF LOAD	45144	520000

Pavement Thickness Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
 Date : 11/1/2018

Design Name : RIGID_10YR
 Design Type : Roads
 Pavement Type : Rigid
 Traffic Area : N/A
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35
 % Load Transfer : 25
 Joint Spacing : 15 to 20 ft
 Dowel Spacing : 12.00 in
 Dowel Length : 16.00 in
 Dowel Diameter: 1.00 in

Layer Information

Layer Type	Material Type	Flexural Strength (psi)	Analysis	Minimum Thickness (in)	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
PCC	N/A	600	Compute	6	11.28	N/A	4000000	0.15	1000
Base	Unbound Crushed Stone	0	Manual	4	6	N/A	20000	0.35	0
Natural Subgrade	Cohesive Cut	0	Manual	4	0	No	6380	0.40	0

Traffic Information

Pattern Name : YARD(10-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	65000
HYSTER H230HD2 - HALF LOAD	45144	260000

Pavement Thickness Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
 Date : 11/1/2018

Design Name : RIGID_15YR
 Design Type : Roads
 Pavement Type : Rigid
 Traffic Area : N/A
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35
 % Load Transfer : 25
 Joint Spacing : 15 to 20 ft
 Dowel Spacing : 12.00 in
 Dowel Length : 16.00 in
 Dowel Diameter: 1.00 in

Layer Information

Layer Type	Material Type	Flexural Strength (psi)	Analysis	Minimum Thickness (in)	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
PCC	N/A	600	Compute	6	11.5	N/A	4000000	0.15	1000
Base	Unbound Crushed Stone	0	Manual	4	6	N/A	20000	0.35	0
Natural Subgrade	Cohesive Cut	0	Manual	4	0	No	6380	0.40	0

Traffic Information

Pattern Name : YARD(15-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	97500
HYSTER H230HD2 - HALF LOAD	45144	390000

Pavement Thickness Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : RIGID_20YR
 Design Type : Roads
 Pavement Type : Rigid
 Traffic Area : N/A
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35
 % Load Transfer : 25
 Joint Spacing : 15 to 20 ft
 Dowel Spacing : 12.00 in
 Dowel Length : 16.00 in
 Dowel Diameter: 1.00 in

Layer Information

Layer Type	Material Type	Flexural Strength (psi)	Analysis	Minimum Thickness (in)	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
PCC	N/A	600	Compute	6	11.65	N/A	4000000	0.15	1000
Base	Unbound Crushed Stone	0	Manual	4	6	N/A	20000	0.35	0
Natural Subgrade	Cohesive Cut	0	Manual	4	0	No	6380	0.40	0

Traffic Information

Pattern Name : YARD(20-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	130000
HYSTER H230HD2 - HALF LOAD	45144	520000

Pavement Thickness Report
U.S. Army Corps of Engineers
PCASE Version 2.09.05
Date : 11/1/2018

Design Name : RIGID_CAS_10YR
 Design Type : Roads
 Pavement Type : Rigid
 Traffic Area : N/A
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35
 % Load Transfer : 25
 Joint Spacing : 15 to 20 ft
 Dowel Spacing : 12.00 in
 Dowel Length : 16.00 in
 Dowel Diameter: 1.00 in

Layer Information

Layer Type	Material Type	Flexural Strength (psi)	Analysis	Minimum Thickness (in)	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
PCC	N/A	600	Compute	6	10.63	N/A	4000000	0.15	1000
Base	Unbound Crushed Stone	0	Manual	4	16	N/A	120000	0.25	0
Natural Subgrade	Cohesive Cut	0	Manual	4	0	No	6380	0.40	0

Traffic Information

Pattern Name : YARD(10-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	65000
HYSTER H230HD2 - HALF LOAD	45144	260000

Pavement Thickness Report
 U.S. Army Corps of Engineers
PCASE Version 2.09.05
 Date : 11/1/2018

Design Name : RIGID_CAS_15YR
 Design Type : Roads
 Pavement Type : Rigid
 Traffic Area : N/A
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35
 % Load Transfer : 25
 Joint Spacing : 15 to 20 ft
 Dowel Spacing : 12.00 in
 Dowel Length : 16.00 in
 Dowel Diameter: 1.00 in

Layer Information

Layer Type	Material Type	Flexural Strength (psi)	Analysis	Minimum Thickness (in)	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
PCC	N/A	600	Compute	6	10.87	N/A	4000000	0.15	1000
Base	Unbound Crushed Stone	0	Manual	4	16	N/A	120000	0.25	0
Natural Subgrade	Cohesive Cut	0	Manual	4	0	No	6380	0.40	0

Traffic Information

Pattern Name : YARD(15-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	97500
HYSTER H230HD2 - HALF LOAD	45144	390000

Pavement Thickness Report
 U.S. Army Corps of Engineers
PCASE Version 2.09.05
 Date : 11/1/2018

Design Name : RIGID_CAS_20YR
 Design Type : Roads
 Pavement Type : Rigid
 Traffic Area : N/A
 Road Type : Road
 Terrain Type : Flat
 Analysis Type : LED
 SCI : 50
 Wander Width (in) : 33.35
 % Load Transfer : 25
 Joint Spacing : 15 to 20 ft
 Dowel Spacing : 12.00 in
 Dowel Length : 16.00 in
 Dowel Diameter : 1.00 in

Layer Information

Layer Type	Material Type	Flexural Strength (psi)	Analysis	Minimum Thickness (in)	Design Thickness (in)	Calculate at this Depth	Modulus (psi)	Pr	Slip
PCC	N/A	600	Compute	6	11.03	N/A	4000000	0.15	1000
Base	Unbound Crushed Stone	0	Manual	4	16	N/A	120000	0.25	0
Natural Subgrade	Cohesive Cut	0	Manual	4	0	No	6380	0.40	0

Traffic Information

Pattern Name : YARD(20-YEAR)

Vehicles	Weight (lb)	Passes per Life Span
5-AXLE TRUCK	80000	130000
HYSTER H230HD2 - HALF LOAD	45144	520000

1993 AASHTO FLEXIBLE PAVEMENT DESIGN

Job ID: DPNicoli-5-01		AC on aggregate base			
Date: 23-Oct-18		Parking and Drive Aisles			
Design life (years) = 20					
INPUTS FOR STRUCTURAL NUMBER (SN) CALCULATIONS					
Variable	Value	Reference	Coefficient	Value	Reference
$S_0 =$	0.49	I-62, III-51	m_2 (Base) =	1.00	II-26
Subgrade $M_R =$	6,380	I-14	m_3 (Subbase) =	1.00	II-26
$p_0 =$	4.2	II-12	a_1 (AC) =	0.42	II-19
$p_t =$	2.5	II-12	a_2 (Base) =	0.10	II-20
$\Delta PSI =$	1.7	II-12	a_3 (Subbase) =	0.08	II-20
Design ESALs =	see below				

MINIMUM ASPHALT CONCRETE THICKNESS

Base Rock $M_R =$ 20,000 psi

	Parking	Drive,ADTT=10	Drive,ADTT=25	Drive,ADTT=50
Reliability (Ref II-9)	80	80	80	80
Z_R	-0.841	-0.841	-0.841	-0.841
ESALs	10,000	84,000	210,000	419,000
SN estimate	0.947	1.452	1.713	1.930
ESALs from SN est.	10,000	84,000	210,000	419,000
FINAL SN =	0.95	1.46	1.72	1.94
Min AC Thickness	2.26	3.48	4.10	4.62

	Parking	Drive,ADTT=10	Drive,ADTT=25	Drive,ADTT=50
Resilient Modulus	6,380	6,380	6,380	6,380
ESALs	10,000	84,000	210,000	419,000
SN estimate	1.597	2.302	2.681	3.007
ESALs from SN est.	10,000	84,000	210,000	419,000
FINAL SN =	1.60	2.31	2.69	3.01

If LOCK AC is set to "1", the Calc AC button will not change AC thickness value

NEW PAVEMENT ANALYSIS

					LOCK AC
New Pavement, Parking					0
10,000 ESALs					
$SN = a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$					
Coefficient	Value	Ref	Thickness	SN	Total SN
m_2 (Base)	1.00	II-26			
m_3 (Subbase)	1.00	II-26			
a_1 (AC)	0.42	II-19	2.5	1.05	1.05
a_2 (Base)	0.10	II-20	5.5	0.55	1.60
a_3 (Subbase)	0.08	II-20	0.0	0.00	1.60
Total Thickness			8.00		
					LOCK AC
New Pavement, Drive,ADTT=10					0
84,000 ESALs					
$SN = a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$					
Coefficient	Value	Ref	Thickness	SN	Total SN
m_2 (Base)	1.00	II-26			
m_3 (Subbase)	1.00	II-26			
a_1 (AC)	0.42	II-19	3.5	1.47	1.47
a_2 (Base)	0.10	II-20	8.5	0.85	2.32
a_3 (Subbase)	0.08	II-20	0.0	0.00	2.32
			12.00		

1993 AASHTO FLEXIBLE PAVEMENT DESIGN

Job ID: DPNicoli-5-01 Date: 23-Oct-18 Design life (years) = 20	AC on aggregate base Parking and Drive Aisles
--	---

				LOCK AC		
New Pavement, Drive,ADTT=25				210,000 ESALs		
				0		
Coefficient	Value	Ref	$SN=a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$			
m_2 (Base)	1.00	II-26				
m_3 (Subbase)	1.00	II-26	Thickness	SN	Total SN	
a_1 (AC)	0.42	II-19	4.5	1.89	1.89	
a_2 (Base)	0.10	II-20	8.5	0.85	2.74	
a_3 (Subbase)	0.08	II-20	0.0	0.00	2.74	
			13.00			

				LOCK AC		
New Pavement, Drive,ADTT=50				419,000 ESALs		
				0		
Coefficient	Value	Ref	$SN=a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$			
m_2 (Base)	1.00	II-26				
m_3 (Subbase)	1.00	II-26	Thickness	SN	Total SN	
a_1 (AC)	0.42	II-19	5.0	2.10	2.10	
a_2 (Base)	0.10	II-20	9.5	0.95	3.05	
a_3 (Subbase)	0.08	II-20	0.0	0.00	3.05	
			14.50			

1993 AASHTO FLEXIBLE PAVEMENT DESIGN

Job ID: DPNicoli-5-01		AC on aggregate base			
Date: 23-Oct-18		Access Road			
Design life (years) = 20					
INPUTS FOR STRUCTURAL NUMBER (SN) CALCULATIONS					
Variable	Value	Reference	Coefficient	Value	Reference
$S_0 =$	0.49	I-62, III-51	m_2 (Base) =	1.00	II-26
Subgrade $M_R =$	6,380	I-14	m_3 (Subbase) =	1.00	II-26
$p_0 =$	4.2	II-12	a_1 (AC) =	0.42	II-19
$p_t =$	2.5	II-12	a_2 (Base) =	0.10	II-20
$\Delta PSI =$	1.7	II-12	a_3 (Subbase) =	0.08	II-20
Design ESALs =	see below				

MINIMUM ASPHALT CONCRETE THICKNESS

Base Rock $M_R =$ 20,000 psi

	Access,ADTT=10	Access,ADTT=25	Access,ADTT=50	Alternative 4
Reliability (Ref II-9)	80	80	80	80
Z_R	-0.841	-0.841	-0.841	-0.841
ESALs	147,000	210,000	314,000	147,000
SN estimate	1.608	1.713	1.837	1.608
ESALs from SN est.	147,000	210,000	314,000	147,000
FINAL SN =	1.61	1.72	1.84	1.61
Min AC Thickness	3.83	4.10	4.38	3.83

	Access,ADTT=10	Access,ADTT=25	Access,ADTT=50	Alternative 4
Resilient Modulus	6,380	6,380	6,380	6,380
ESALs	147,000	210,000	314,000	147,000
SN estimate	2.527	2.681	2.867	2.527
ESALs from SN est.	147,000	210,000	314,000	147,000
FINAL SN =	2.53	2.69	2.87	2.53

If LOCK AC is set to "1", the Calc AC button will not change AC thickness value

NEW PAVEMENT ANALYSIS

New Pavement, Access,ADTT=10						147,000 ESALs	LOCK AC
						SN= $a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$	0
Coefficient	Value	Ref					
m_2 (Base)	1.00	II-26					
m_3 (Subbase)	1.00	II-26	Thickness	SN	Total SN		
a_1 (AC)	0.42	II-19	4.0	1.68	1.68		
a_2 (Base)	0.10	II-20	8.5	0.85	2.53		
a_3 (Subbase)	0.08	II-20	0.0	0.00	2.53		
Total Thickness			12.50				
New Pavement, Access,ADTT=25						210,000 ESALs	LOCK AC
						SN= $a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$	0
Coefficient	Value	Ref					
m_2 (Base)	1.00	II-26					
m_3 (Subbase)	1.00	II-26	Thickness	SN	Total SN		
a_1 (AC)	0.42	II-19	4.5	1.89	1.89		
a_2 (Base)	0.10	II-20	8.5	0.85	2.74		
a_3 (Subbase)	0.08	II-20	0.0	0.00	2.74		
			13.00				

1993 AASHTO FLEXIBLE PAVEMENT DESIGN

Job ID: DPNicoli-5-01	AC on aggregate base
Date: 23-Oct-18	Access Road
Design life (years) = 20	

New Pavement, Access,ADTT=50			314,000 ESALs		
			LOCK AC		
			0		
Coefficient	Value	Ref	$SN=a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$		
m ₂ (Base)	1.00	II-26			
m ₃ (Subbase)	1.00	II-26	Thickness	SN	Total SN
a ₁ (AC)	0.42	II-19	4.5	1.89	1.89
a ₂ (Base)	0.10	II-20	10.0	1.00	2.89
a ₃ (Subbase)	0.08	II-20	0.0	0.00	2.89
			14.50		

1993 AASHTO FLEXIBLE PAVEMENT DESIGN

Job ID: DPNicoli-5-01		AC on cement-amended soil			
Date: 23-Oct-18		Parking and Drive Aisles			
Design life (years) = 20					
INPUTS FOR STRUCTURAL NUMBER (SN) CALCULATIONS					
Variable	Value	Reference	Coefficient	Value	Reference
$S_0 =$	0.49	I-62, III-51	m_2 (Base) =	1.00	II-26
Subgrade $M_R =$	6,380	I-14	m_3 (Subbase) =	1.00	II-26
$p_0 =$	4.2	II-12	a_1 (AC) =	0.42	II-19
$p_t =$	2.5	II-12	a_2 (Base) =	0.10	II-20
$\Delta PSI =$	1.7	II-12	a_3 (Subbase) =	0.08	II-20
Design ESALs =	see below				

MINIMUM ASPHALT CONCRETE THICKNESS

Base Rock $M_R =$ 120,000 psi

	Parking	Drive,ADTT=10	Drive,ADTT=25	Drive,ADTT=50
Reliability (Ref II-9)	80	80	80	80
Z_R	-0.841	-0.841	-0.841	-0.841
ESALs	10,000	84,000	210,000	419,000
SN estimate	0.248	0.566	0.728	0.861
ESALs from SN est.	10,000	84,000	210,000	419,000
FINAL SN =	0.25	0.57	0.73	0.87
Min AC Thickness	0.60	1.36	1.74	2.07

	Parking	Drive,ADTT=10	Drive,ADTT=25	Drive,ADTT=50
Resilient Modulus	6,380	6,380	6,380	6,380
ESALs	10,000	84,000	210,000	419,000
SN estimate	1.597	2.302	2.681	3.007
ESALs from SN est.	10,000	84,000	210,000	419,000
FINAL SN =	1.60	2.31	2.69	3.01

If LOCK AC is set to "1", the Calc AC button will not change AC thickness value

NEW PAVEMENT ANALYSIS

					LOCK AC
New Pavement, Parking					0
			10,000 ESALs		
			$SN = a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$		
Coefficient	Value	Ref			
m_2 (Base)	1.00	II-26			
m_3 (Subbase)	1.00	II-26	Thickness	SN	Total SN
a_1 (AC)	0.42	II-19	2.5	1.05	1.05
a_2 (Base)	0.10	II-20	5.5	0.55	1.60
a_3 (Subbase)	0.08	II-20		0.00	1.60
Total Thickness			8.00		
					LOCK AC
New Pavement, Drive,ADTT=10					0
			84,000 ESALs		
			$SN = a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$		
Coefficient	Value	Ref			
m_2 (Base)	1.00	II-26			
m_3 (Subbase)	1.00	II-26	Thickness	SN	Total SN
a_1 (AC)	0.42	II-19	3.0	1.26	1.26
a_2 (Base)	0.10	II-20	10.5	1.05	2.31
a_3 (Subbase)	0.08	II-20		0.00	2.31
			13.50		

1993 AASHTO FLEXIBLE PAVEMENT DESIGN

Job ID: DPNicoli-5-01 Date: 23-Oct-18 Design life (years) = 20	AC on cement-amended soil Parking and Drive Aisles
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New Pavement, Drive,ADTT=25				210,000 ESALs		LOCK AC
						0
Coefficient	Value	Ref	$SN=a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$			
m_2 (Base)	1.00	II-26				
m_3 (Subbase)	1.00	II-26	Thickness	SN	Total SN	
a_1 (AC)	0.42	II-19	4.0	1.68	1.68	
a_2 (Base)	0.10	II-20	10.5	1.05	2.73	
a_3 (Subbase)	0.08	II-20	14.50	0.00	2.73	
			14.50			

New Pavement, Drive,ADTT=50				419,000 ESALs		LOCK AC
						0
Coefficient	Value	Ref	$SN=a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$			
m_2 (Base)	1.00	II-26				
m_3 (Subbase)	1.00	II-26	Thickness	SN	Total SN	
a_1 (AC)	0.42	II-19	4.5	1.89	1.89	
a_2 (Base)	0.10	II-20	11.5	1.15	3.04	
a_3 (Subbase)	0.08	II-20	16.00	0.00	3.04	
			16.00			

1993 AASHTO FLEXIBLE PAVEMENT DESIGN

Job ID: DPNicoli-5-01		AC on cement-amended soil			
Date: 23-Oct-18		Access Road			
Design life (years) = 20					
INPUTS FOR STRUCTURAL NUMBER (SN) CALCULATIONS					
Variable	Value	Reference	Coefficient	Value	Reference
$S_0 =$	0.49	I-62, III-51	m_2 (Base) =	1.00	II-26
Subgrade $M_R =$	6,380	I-14	m_3 (Subbase) =	1.00	II-26
$p_0 =$	4.2	II-12	a_1 (AC) =	0.42	II-19
$p_t =$	2.5	II-12	a_2 (Base) =	0.10	II-20
$\Delta PSI =$	1.7	II-12	a_3 (Subbase) =	0.08	II-20
Design ESALs =	see below				

MINIMUM ASPHALT CONCRETE THICKNESS

Base Rock $M_R =$ 120,000 psi

	Access,ADTT=10	Access,ADTT=25	Access,ADTT=50	Alternative 4
Reliability (Ref II-9)	80	80	80	80
Z_R	-0.841	-0.841	-0.841	-0.841
ESALs	147,000	210,000	314,000	147,000
SN estimate	0.663	0.728	0.804	0.663
ESALs from SN est.	147,000	210,000	314,000	147,000
FINAL SN =	0.67	0.73	0.81	0.67
Min AC Thickness	1.60	1.74	1.93	1.60

	Access,ADTT=10	Access,ADTT=25	Access,ADTT=50	Alternative 4
Resilient Modulus	6,380	6,380	6,380	6,380
ESALs	147,000	210,000	314,000	147,000
SN estimate	2.527	2.681	2.867	2.527
ESALs from SN est.	147,000	210,000	314,000	147,000
FINAL SN =	2.53	2.69	2.87	2.53

If LOCK AC is set to "1", the Calc AC button will not change AC thickness value

NEW PAVEMENT ANALYSIS						LOCK AC	
New Pavement, Access,ADTT=10					147,000 ESALs		0
Coefficient	Value	Ref	$SN = a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$				
m_2 (Base)	1.00	II-26					
m_3 (Subbase)	1.00	II-26	Thickness	SN	Total SN		
a_1 (AC)	0.42	II-19	3.5	1.47	1.47		
a_2 (Base)	0.10	II-20	11.0	1.10	2.57		
a_3 (Subbase)	0.08	II-20		0.00	2.57		
Total Thickness			14.50				
						LOCK AC	
New Pavement, Access,ADTT=25					210,000 ESALs		0
Coefficient	Value	Ref	$SN = a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$				
m_2 (Base)	1.00	II-26					
m_3 (Subbase)	1.00	II-26	Thickness	SN	Total SN		
a_1 (AC)	0.42	II-19	4.0	1.68	1.68		
a_2 (Base)	0.10	II-20	10.5	1.05	2.73		
a_3 (Subbase)	0.08	II-20		0.00	2.73		
			14.50				

1993 AASHTO FLEXIBLE PAVEMENT DESIGN

Job ID: DPNicoli-5-01		AC on cement-amended soil	
Date: 23-Oct-18		Access Road	
Design life (years) = 20			
New Pavement, Access,ADTT=50			LOCK AC
			0
			314,000 ESALs
Coefficient	Value	Ref	$SN=a_1 \times D_1 + a_2 \times D_2 \times m_2 + a_3 \times D_3 \times m_3$
m ₂ (Base)	1.00	II-26	
m ₃ (Subbase)	1.00	II-26	
a ₁ (AC)	0.42	II-19	Thickness
a ₂ (Base)	0.10	II-20	SN
a ₃ (Subbase)	0.08	II-20	Total SN
			16.00



DESIGN SUMMARY REPORT FOR
JOINTED-PLAIN CONCRETE PAVEMENT (JPCP)

DATE CREATED:

Sat Oct 27 2018 17:47:00 GMT-0700 (Pacific Daylight Time)

Project Description

Project Name: DPNicoli-5-01 Owner: D.P. Nicoli Zip Code:
 Designer's Name: TVS Route:
 Project Description:

Design Summary

	Doweled	Undoweled		Doweled	Undoweled
Recommended Design Thickness:	6.00 in.	6.00 in.	Maximum Joint Spacing:	10 ft.	10 ft.
Calculated Minimum Thickness:	5.77 in.	5.77 in.			

Pavement Structure

SUBBASE

Calculated Composite K-Value of Substructure: 327 psi/in

Layer Type	Resilient Modulus	Layer Thickness
JOINTED PLAIN CONCRETE SURFACE		
Granular Base	20,000 psi	6 in
SUBGRADE		

CONCRETE

28-Day Flex Strength: 600 psi Edge Support: Yes
 Modulus of Elasticity: 4000000 psi Macrobbers in Concrete: No

SUBGRADE

Known MRSG Value: 6.380 psi

Project Level

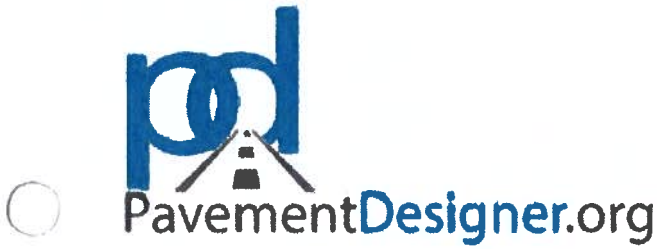
TRAFFIC	
Spectrum Type:	Custom Traffic Spectrum
Design Life:	20 years
USER DEFINED TRAFFIC	
Trucks Per Day:	20
Traffic Growth Rate %:	0 % per year
Directional Distribution:	100 %
Design Lane Distribution:	100 %

GLOBAL	
Reliability:	80 %
% Slabs Cracked at End of Design Life:	1 %

Avg Trucks/Day in Design Lane Over the Design Life:	20
Total Trucks in Design Lane Over the Design Life:	146,100

Design Method

The PCA design methodology from StreetPave, was used to produce these results.



DESIGN SUMMARY REPORT FOR
JOINTED-PLAIN CONCRETE PAVEMENT (JPCP)

DATE CREATED:

Sat Oct 27 2018 17:51:00 GMT-0700 (Pacific Daylight Time)

Project Description

Project Name: DPNicoli-5-01 Owner: D.P. Nicoli Zip Code:
 Designer's Name: TVS Route:
 Project Description:

Design Summary

	Doweled	Undoweled		Doweled	Undoweled
Recommended Design Thickness:	6.00 in.	6.00 in.	Maximum Joint Spacing:	10 ft.	10 ft.
Calculated Minimum Thickness:	5.91 in.	5.91 in.			

Pavement Structure

SUBBASE

Calculated Composite K-Value of Substructure: 327 psi/in

Layer Type	Resilient Modulus	Layer Thickness
JOINTED PLAIN CONCRETE SURFACE		
Granular Base	20,000 psi	6 in
SUBGRADE		

CONCRETE

28-Day Flex Strength: 600 psi Edge Support: Yes
 Modulus of Elasticity: 4000000 psi Macrofibers in Concrete: No

SUBGRADE

Known MRSG Value: 6,380 psi

Project Level

TRAFFIC
 Spectrum Type: Custom Traffic Spectrum
 Design Life: 20 years

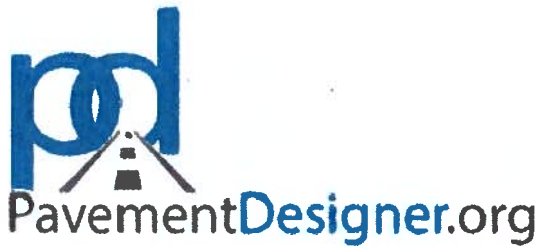
USER DEFINED TRAFFIC
 Trucks Per Day: 35
 Traffic Growth Rate %: 0 % per year
 Directional Distribution: 100 %
 Design Lane Distribution: 100 %

GLOBAL
 Reliability: 80 %
 % Slabs Cracked at End of Design Life: 1 %

Avg Trucks/Day in Design Lane Over the Design Life: 35
 Total Trucks in Design Lane Over the Design Life: 255,675

Design Method

The PCA design methodology from StreetPave, was used to produce these results.



DESIGN SUMMARY REPORT FOR
JOINTED-PLAIN CONCRETE PAVEMENT (JPCP)

DATE CREATED:

Sat Oct 27 2018 17:51:51 GMT-0700 (Pacific Daylight Time)

Project Description

Project Name: DPNicoli-5-01 Owner: D.P. Nicoli Zip Code:
 Designer's Name: TVS Route:
 Project Description:

Design Summary

	Doweled	Undoweled		Doweled	Undoweled
Recommended Design Thickness:	6.00 in.	6.00 in.	Maximum Joint Spacing:	10 ft.	10 ft.
Calculated Minimum Thickness:	6.00 in.	6.00 in.			

Pavement Structure

SUBBASE

Calculated Composite K-Value of Substructure: 327 psi/in

Layer Type	Resilient Modulus	Layer Thickness
JOINTED PLAIN CONCRETE SURFACE		
Granular Base	20,000 psi	6 in
SUBGRADE		

CONCRETE

28-Day Flex Strength: 600 psi Edge Support: Yes
 Modulus of Elasticity: 4000000 psi Macrobuffers in Concrete: No

SUBGRADE

Known MRSG Value: 6,380 psi

Project Level

TRAFFIC
 Spectrum Type: Custom Traffic Spectrum
 Design Life: 20 years

USER DEFINED TRAFFIC
 Trucks Per Day: 50
 Traffic Growth Rate %: 0 % per year
 Directional Distribution: 100 %
 Design Lane Distribution: 100 %

GLOBAL
 Reliability: 80 %
 % Slabs Cracked at End of Design Life: 1 %

Avg Trucks/Day in Design Lane Over the Design Life: 50
 Total Trucks in Design Lane Over the Design Life: 365,250

Design Method

The PCA design methodology from StreetPave, was used to produce these results.

Project Description

Project Name: DPNicoli-5-01 Owner: D.P. Nicoli Zip Code:
 Designer's Name: TVS Route:
 Project Description:

Design Summary

	Doweled	Undoweled		Doweled	Undoweled
Recommended Design Thickness:	6.25 in.	6.25 in.	Maximum Joint Spacing:	10 ft.	10 ft.
Calculated Minimum Thickness:	6.09 in.	6.09 in.			

Pavement Structure

SUBBASE

Calculated Composite K-Value of Substructure: 327 psi/in

Layer Type	Resilient Modulus	Layer Thickness
JOINTED PLAIN CONCRETE SURFACE		
Granular Base	20,000 psi	6 in
SUBGRADE		

CONCRETE

28-Day Flex Strength: 600 psi Edge Support: Yes
 Modulus of Elasticity: 4000000 psi Macrofibers in Concrete: No

SUBGRADE

Known MRSG Value: 6,380 psi

Project Level

TRAFFIC

Spectrum Type: Custom Traffic Spectrum
 Design Life: 20 years

USER DEFINED TRAFFIC

Trucks Per Day: 75
 Traffic Growth Rate %: 0 % per year
 Directional Distribution: 100 %
 Design Lane Distribution: 100 %

GLOBAL

Reliability: 80 %
 % Slabs Cracked at End of Design Life: 1 %

Avg Trucks/Day in Design Lane Over the Design Life: 75
 Total Trucks in Design Lane Over the Design Life: 547,875

Design Method

The PCA design methodology from StreetPave, was used to produce these results.



DESIGN SUMMARY REPORT FOR
JOINTED-PLAIN CONCRETE PAVEMENT (JPCP)

DATE CREATED:

Sat Oct 27 2018 17:53:25 GMT-0700 (Pacific Daylight Time)

Project Description

Project Name: DPNicoli-5-01 Owner: D.P. Nicoli Zip Code:
 Designer's Name: TVS Route:
 Project Description:

Design Summary

	Doweled	Undoweled		Doweled	Undoweled
Recommended Design Thickness:	6.25 in.	6.25 in.	Maximum Joint Spacing:	10 ft.	10 ft.
Calculated Minimum Thickness:	6.16 in.	6.16 in.			

Pavement Structure

SUBBASE

Calculated Composite K-Value of Substructure: 327 psi/in

Layer Type	Resilient Modulus	Layer Thickness
JOINTED PLAIN CONCRETE SURFACE		
Granular Base	20,000 psi	6 in
SUBGRADE		

CONCRETE

28-Day Flex Strength: 600 psi Edge Support: Yes
 Modulus of Elasticity: 4000000 psi Macrobuffers in Concrete: No

SUBGRADE

Known MRSG Value: 6,380 psi

Project Level

TRAFFIC
 Spectrum Type: Custom Traffic Spectrum
 Design Life: 20 years

USER DEFINED TRAFFIC
 Trucks Per Day: 100
 Traffic Growth Rate %: 0 % per year
 Directional Distribution: 100 %
 Design Lane Distribution: 100 %

GLOBAL
 Reliability: 80 %
 % Slabs Cracked at End of Design Life: 1 %

Avg Trucks/Day in Design Lane Over the Design Life: 100
 Total Trucks in Design Lane Over the Design Life: 730,500

Design Method

The PCA design methodology from StreetPave, was used to produce these results.



DESIGN SUMMARY REPORT FOR
JOINTED-PLAIN CONCRETE PAVEMENT (JPCP)

DATE CREATED:

Sat Oct 27 2018 17:56:26 GMT-0700 (Pacific Daylight Time)

Project Description

Project Name: DPNicoli-5-01 Owner: D.P. Nicoli Zip Code:
 Designer's Name: TVS Route:
 Project Description:

Design Summary

	Doweled	Undoweled		Doweled	Undoweled
Recommended Design Thickness:	5.50 in.	5.50 in.	Maximum Joint Spacing:	8 ft.	8 ft.
Calculated Minimum Thickness:	5.33 in.	5.33 in.			

Pavement Structure

SUBBASE

Calculated Composite K-Value of Substructure: 593 psi/in

Layer Type	Resilient Modulus	Layer Thickness
JOINTED PLAIN CONCRETE SURFACE		
Granular Base	20,000 psi	4 in
Cement Stabilized Subgrade	120,000 psi	12 in
SUBGRADE		

CONCRETE

28-Day Flex Strength: 600 psi Edge Support: Yes
 Modulus of Elasticity: 4000000 psi Macrofibers in Concrete: No

SUBGRADE

Known MRSG Value: 6,380 psi

Project Level

TRAFFIC
 Spectrum Type: Custom Traffic Spectrum
 Design Life: 20 years
USER DEFINED TRAFFIC
 Trucks Per Day: 20
 Traffic Growth Rate %: 0 % per year
 Directional Distribution: 100 %
 Design Lane Distribution: 100 %

GLOBAL
 Reliability: 80 %
 % Slabs Cracked at End of Design Life: 1 %
 Avg Trucks/Day in Design Lane Over the Design Life: 20
 Total Trucks in Design Lane Over the Design Life: 146,100

Design Method

The PCA design methodology from StreetPave, was used to produce these results.



DESIGN SUMMARY REPORT FOR
JOINTED-PLAIN CONCRETE PAVEMENT (JPCP)

DATE CREATED:

Sat Oct 27 2018 18:13:09 GMT-0700 (Pacific Daylight Time)

Project Description

Project Name: DPNicoli-5-01 Owner: D.P. Nicoli Zip Code:
 Designer's Name: TVS Route:
 Project Description:

Design Summary

	Doweled	Undoweled		Doweled	Undoweled
Recommended Design Thickness:	5.50 in.	5.50 in.	Maximum Joint Spacing:	8 ft.	8 ft.
Calculated Minimum Thickness:	5.46 in.	5.46 in.			

Pavement Structure

SUBBASE

Calculated Composite K-Value of Substructure: 593 psi/in

Layer Type	Resilient Modulus	Layer Thickness
JOINTED PLAIN CONCRETE SURFACE		
Granular Base	20,000 psi	4 in
Cement Stabilized Subgrade	120,000 psi	12 in
SUBGRADE		

CONCRETE

28-Day Flex Strength: 600 psi Edge Support: Yes
 Modulus of Elasticity: 4000000 psi Macrobbers in Concrete: No

SUBGRADE

Known MRSG Value: 6,380 psi

Project Level

TRAFFIC

Spectrum Type: Custom Traffic Spectrum
 Design Life: 20 years

USER DEFINED TRAFFIC

Trucks Per Day: 35
 Traffic Growth Rate %: 0 % per year
 Directional Distribution: 100 %
 Design Lane Distribution: 100 %

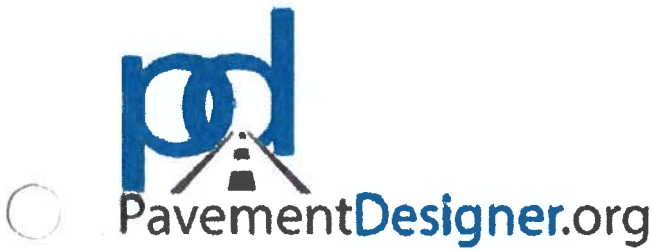
GLOBAL

Reliability: 80 %
 % Slabs Cracked at End of Design Life: 1 %

Avg Trucks/Day in Design Lane Over the Design Life: 35
 Total Trucks in Design Lane Over the Design Life: 255,675

Design Method

The PCA design methodology from StreetPave, was used to produce these results.



DESIGN SUMMARY REPORT FOR

JOINTED-PLAIN CONCRETE PAVEMENT (JPCP)

DATE CREATED:

Sat Oct 27 2018 18:14:38 GMT-0700 (Pacific Daylight Time)

Project Description

Project Name: DPNicoli-5-01 Owner: D.P. Nicoli Zip Code:
 Designer's Name: TVS Route:
 Project Description:

Design Summary

	Doweled	Undoweled		Doweled	Undoweled
Recommended Design Thickness:	5.75 in.	5.75 in.	Maximum Joint Spacing:	8 ft.	8 ft.
Calculated Minimum Thickness:	5.54 in.	5.54 in.			

Pavement Structure

SUBBASE

Calculated Composite K-Value of Substructure: 593 psi/in

Layer Type	Resilient Modulus	Layer Thickness
JOINTED PLAIN CONCRETE SURFACE		
Granular Base	20,000 psi	4 in
Cement Stabilized Subgrade	120,000 psi	12 in
SUBGRADE		

CONCRETE

28-Day Flex Strength: 600 psi Edge Support: Yes
 Modulus of Elasticity: 4000000 psi Macrofibers in Concrete: No

SUBGRADE

Known MRSG Value: 6,380 psi

Project Level

TRAFFIC

Spectrum Type: Custom Traffic Spectrum
 Design Life: 20 years

USER DEFINED TRAFFIC

Trucks Per Day: 50
 Traffic Growth Rate %: 0 % per year
 Directional Distribution: 100 %
 Design Lane Distribution: 100 %

GLOBAL

Reliability: 80 %
 % Slabs Cracked at End of Design Life: 1 %

Avg Trucks/Day in Design Lane Over the Design Life: 50
 Total Trucks in Design Lane Over the Design Life: 365,250

Design Method

The PCA design methodology from StreetPave, was used to produce these results.



DESIGN SUMMARY REPORT FOR

JOINTED-PLAIN CONCRETE PAVEMENT (JPCP)

DATE CREATED:

Sat Oct 27 2018 18:15:20 GMT-0700 (Pacific Daylight Time)

Project Description

Project Name: DPNicoli-5-01 Owner: D.P. Nicoli Zip Code:
 Designer's Name: TVS Route:
 Project Description:

Design Summary

	Doweled	Undoweled		Doweled	Undoweled
Recommended Design Thickness:	5.75 in.	5.75 in.	Maximum Joint Spacing:	8 ft.	8 ft.
Calculated Minimum Thickness:	5.63 in.	5.63 in.			

Pavement Structure

SUBBASE

Calculated Composite K-Value of Substructure: 593 psi/in

Layer Type	Resilient Modulus	Layer Thickness
JOINTED PLAIN CONCRETE SURFACE		
Granular Base	20,000 psi	4 in
Cement Stabilized Subgrade	120,000 psi	12 in
SUBGRADE		

CONCRETE

28-Day Flex Strength: 600 psi Edge Support: Yes
 Modulus of Elasticity: 4000000 psi Macrofibers in Concrete: No

SUBGRADE

Known MRSG Value: 6,380 psi

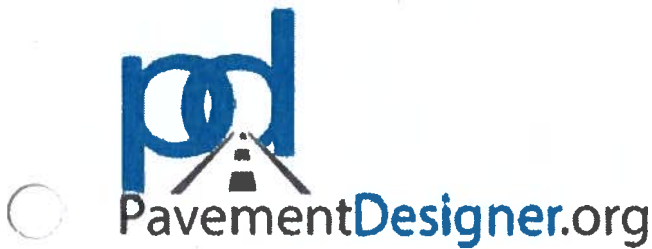
Project Level

TRAFFIC
 Spectrum Type: Custom Traffic Spectrum
 Design Life: 20 years
USER DEFINED TRAFFIC
 Trucks Per Day: 75
 Traffic Growth Rate %: 0 % per year
 Directional Distribution: 100 %
 Design Lane Distribution: 100 %

GLOBAL
 Reliability: 80 %
 % Slabs Cracked at End of Design Life: 1 %
 Avg Trucks/Day in Design Lane Over the Design Life: 75
 Total Trucks in Design Lane Over the Design Life: 547,875

Design Method

The PCA design methodology from StreetPave, was used to produce these results.



DESIGN SUMMARY REPORT FOR
JOINTED-PLAIN CONCRETE PAVEMENT (JPCP)

DATE CREATED:

Sat Oct 27 2018 18:16:02 GMT-0700 (Pacific Daylight Time)

Project Description

Project Name: DPNicoli-5-01 Owner: D.P. Nicoli Zip Code:
 Designer's Name: TVS Route:
 Project Description:

Design Summary

	Doweled	Undoweled		Doweled	Undoweled
Recommended Design Thickness:	5.75 in.	5.75 in.	Maximum Joint Spacing:	8 ft.	8 ft.
Calculated Minimum Thickness:	5.70 in.	5.70 in.			

Pavement Structure

SUBBASE

Calculated Composite K-Value of Substructure: 593 psi/in

Layer Type	Resilient Modulus	Layer Thickness
JOINTED PLAIN CONCRETE SURFACE		
Granular Base	20,000 psi	4 in
Cement Stabilized Subgrade	120,000 psi	12 in
SUBGRADE		

CONCRETE

28-Day Flex Strength: 600 psi Edge Support: Yes
 Modulus of Elasticity: 4000000 psi Macrofibers in Concrete: No

SUBGRADE

Known MRSG Value: 6,380 psi

Project Level

TRAFFIC

Spectrum Type: Custom Traffic Spectrum
 Design Life: 20 years

USER DEFINED TRAFFIC

Trucks Per Day: 100
 Traffic Growth Rate %: 0 % per year
 Directional Distribution: 100 %
 Design Lane Distribution: 100 %

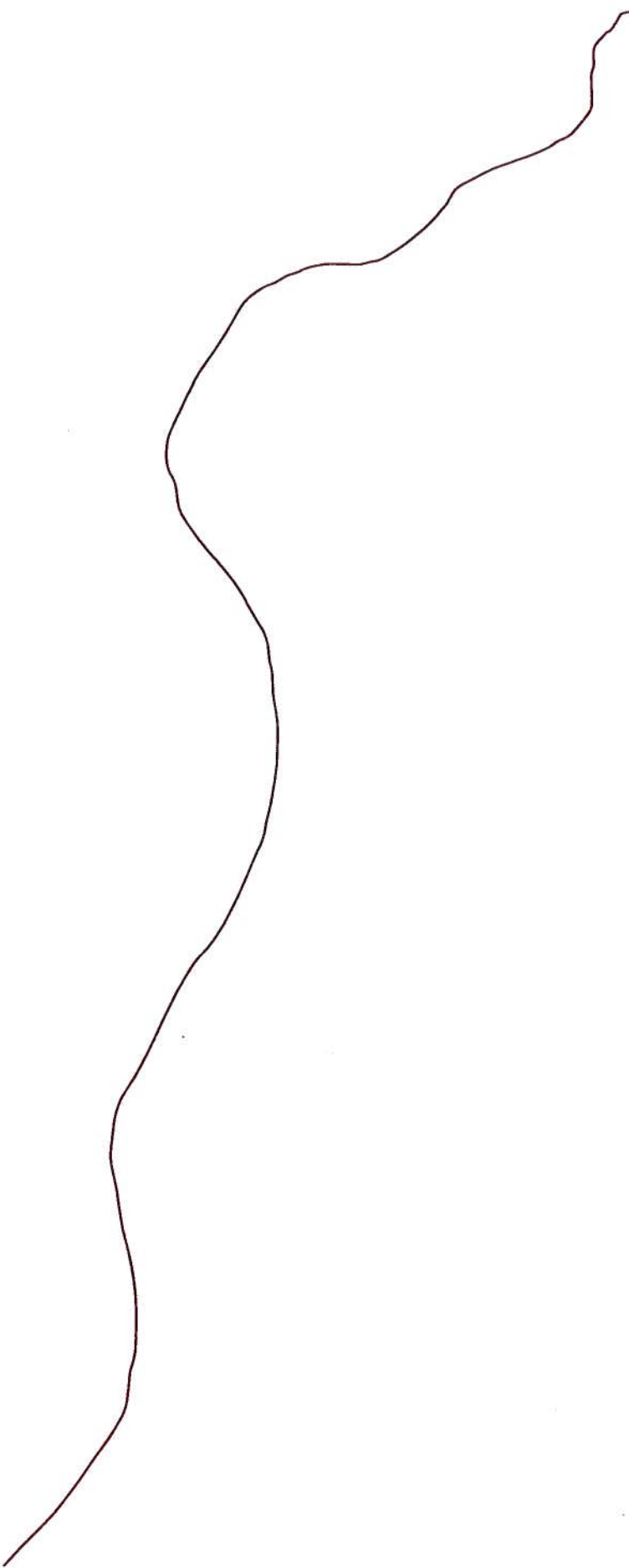
GLOBAL

Reliability: 80 %
 % Slabs Cracked at End of Design Life: 1 %

Avg Trucks/Day in Design Lane Over the Design Life: 100
 Total Trucks in Design Lane Over the Design Life: 730,500

Design Method

The PCA design methodology from StreetPave, was used to produce these results.





Certified Arboricultural Assessment

29 March 2019

Gavin Russell

CIDA

Industrial Focus

SW Boberg Rd and Boeckman Rd

Wilsonville, Or 97070

This letter is intended to summarize a visual arboricultural inspection of all trees located at the above address. The trees were inspected from ground level at approximately 3 pm on March 22, 2019. The assessments provided are intended to perform a general health evaluation as well as identification of species and size of trees on site. This tree evaluation is for possible development.

Observations

This site has 25 trees with a six inch or greater diameter at breast height.

Most trees are located along the south property line and are located under powerlines. For this survey, the power poles were used as south edge of inventory. Most of these trees had been removed and are now root suckers that have reached a diameter large enough to be considered a tree.

The Hawthorn and Black Locust trees, six of the trees, would be considered as invasive trees in most public jurisdictions.

Recommend to retain corresponds to long term health and safety for size, species, and locations of trees. There are multiple homes to the south near property line.

One tree to be aware of for development is a D. Fir with a 33" dbh. This tree is located south of the development site between tree 18 and 20 on the attached site plan. I recommend that all intended construction within 15 feet of this D. Fir tree be reviewed by site arborist as well as all construction activities be supervised within same distance.

Thank you and please let me know if there are further questions.

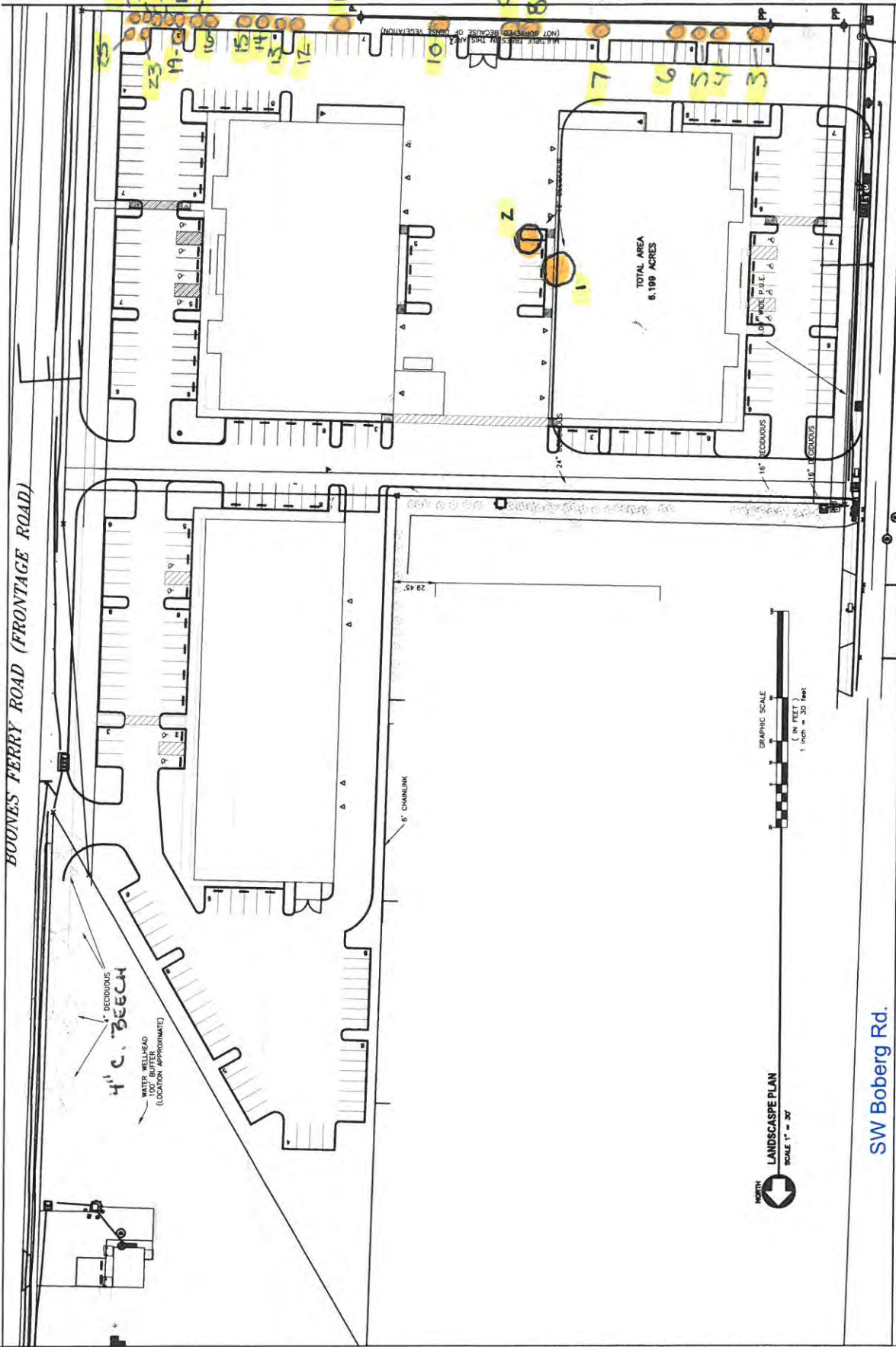
Sincerely,

Trevor March

Certified Arborist PN 5740 BM

503-380-6688

BOONES FERRY ROAD (FRONTAGE ROAD)



4" C. BEECH
 DECIDUOUS
 WATER WELL-HEAD
 (LOCATION APPROXIMATE)

8" CHANNEL

TOTAL AREA
 6.189 ACRES

GRAPHIC SCALE
 (IN FEET)
 1 inch = 30 feet

NORTH
 LANDSCAPE PLAN
 SCALE 1" = 30'

SW Boberg Rd.

AAI ENGINEERING
 4275 SW CENTER DRIVE | SUITE 300 | BEAVERTON, OR 97005
 503.525.3235 FAX | 503.525.3238 | WWW.AAIENGINEERING.COM

INDUSTRIAL FOCUS
 WILSONVILLE, OR

SHEET TITLE
PRELIMINARY PLAN
 DATE: 01/30/19
 DRAWN: NLS
 CHECKED: DSE
 RESPONSE:

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 PERMISSION OF AAI

SHEET NUMBER
L1.0

JOB NUMBER: A18234.10

01/30/2019 - PURPOSE STATEMENT

Beckman road

F:\2019\A18234-10 - Industrial Focus - L1.0\Drawings\18234-10.dwg : 19:11:18 - 4:27 PM 10/19

Tree Risk Assessment:

Trevor March



Friday, March 22, 2019

Tree #	Common Name	Scientific Name	DBH	Condition	Structure	Comments	Recommend to Retain
1	Red Oak	Quercus rubra	13.5"	Fair	Fair		
2	Red Oak	Quercus rubra	13.5"	Fair	Fair		
3	Hawthorn	Crataegus monogyna	22"	Poor	Poor	Poor structure, over mature, topped for powerline clearance	No
4	Big Leaf Maple	Acer macrophylla	27"	Poor	Poor	Poor structure and topped for powerline clearance	No
5	Hazelnut	Corylus americana	Multi-stem	Poor	Fair	Poor structure and topped for powerline clearance	No
6	Hazelnut	Corylus americana	Multi-stem	Poor	Fair	Poor structure and topped for powerline clearance	No
7	Hazelnut	Corylus americana	Multi-stem	Poor	Fair	Poor structure and topped for powerline clearance	No

Northwest Tree Specialists

21600 NW Mauzey Ct. Hillsboro, OR 97124

Phone: 503-380-6688 Email: Trevor@nwtreespecialists.com

Tree Risk Assessment:

Trevor March



Friday, March 22, 2019

Tree #	Common Name	Scientific Name	DBH	Condition	Structure	Comments	Recommend to Retain
8	Big Leaf Maple	Acer macrophyllum	6"	Fair	Poor	Tree has been topped for line clearance	N
9	Big Leaf Maple	Acer macrophyllum	6"	Fair	Poor	Trees are stump sprouts	N
10	Big Leaf Maple	Acer macrophyllum	6"	Fair	Poor	Tree has been topped for line clearance	N
11	Big Leaf Maple	Acer macrophyllum	16"	Fair	Poor	Trees are stump sprouts	N
12	Big leaf Maple	Acer macrophyllum	19"	Fair	Poor	Co-dominant with poor structure	N
13	Big Leaf Maple	Acer macrophyllum	17"	Fair	Poor	Tree has been topped for line clearance	N
14	Big Leaf Maple	Acer macrophyllum	15"	Fair	Poor	Trees are stump sprouts	N

Northwest Tree Specialists

21600 NW Mauzey Ct. Hillsboro, OR 97124

Phone: 503-380-6688 Email: Trevor@nwtreespecialists.com

Tree Risk Assessment:
Trevor March



Friday, March 22, 2019

Tree #	Common Name	Scientific Name	DBH	Condition	Structure	Comments	Recommend to Retain
15	Big Leaf Maple	Acer macrophyllum	21"	Fair	Poor	Trees are stump sprouts	N
16	Big Leaf Maple	Acer macrophyllum	8"	Fair	Poor	Trees are stump sprouts	N
17	Big Leaf Maple	Acer macrophyllum	18"	Fair	Poor	Trees are stump sprouts	N
18	Big Leaf Maple	Acer macrophyllum	6"	Fair	Poor	Trees are stump sprouts	N
19	Black Locust	Robinia pseudoacacia	19"	Fair	Poor	Tree has been trimmed for line clearance And has poor structure	N
20	Big Leaf Maple	Acer macrophyllum	14"	Fair	Poor	Trees are stump sprouts	N
21	Big Leaf Maple	Acer macrophyllum	6"	Fair	Poor	Trees are stump sprouts	N

Northwest Tree Specialists

21600 NW Mauzey Ct. Hillsboro, OR 97124

Phone: 503-380-6688 Email: Trevor@nwtreespecialists.com

Tree Risk Assessment:

Trevor March



Friday, March 22, 2019

Tree #	Common Name	Scientific Name	DBH	Condition	Structure	Comments	Recommend to Retain
22	Black Locust	Robinia pseudoacacia	11"	Fair	Poor	Trees are stump sprouts	N
23	Black Locust	Robinia pseudoacacia	8"	Fair	Poor	Trees are stump sprouts	N
24	Black Locust	Robinia pseudoacacia	12"	Fair	Poor	Trees are stump sprouts	N
25	Black Locust	Robinia pseudoacacia	8"	Fair	Poor	Trees are stump sprouts	N

Northwest Tree Specialists

21600 NW Mauzey Ct. Hillsboro, OR 97124

Phone: 503-380-6688 Email: Trevor@nwtreespecialists.com



10295 Southwest Ridder Road Wilsonville, OR 97070
o 503.570.0626 f 503.582.9307 republicservices.com

April 3, 2019

Gavin Russell
CIDA Inc. Architecture
15895 SW 72nd Ave, Suite 200
Portland, OR 97224

Re: Industrial Focus
SW Boeberg R./Boones Ferry Rd.
Wilsonville, OR 97970

Dear Gavin,

Thank you, for sending us the final site plans for this proposed development in Wilsonville Oregon.

My Company: Republic Services of Clackamas and Washington Counties has the franchise agreement to service this area with the City of Wilsonville. We will provide complete commercial waste removal and recycling services as needed on a weekly basis for this location

The location of the Trash and Recycle enclosure sent 4/3/2019 repositioned to the West side of the main building construction, and the traffic circulation defined to access the site from SW Boberg Road will allow safe access for our trucks.

The enclosure design dimensions sent 4/3/2019 which includes 20' wide gate post to gate post ID and 13' ID depth, and gate swing radius of 120 degrees, and backstop positioned at the rear of the enclosure to protect the back wall, are adequate for our trucks to safely service the containers.

Thanks Gavin for your help and concerns for our services prior to this project being developed.

Sincerely,

A handwritten signature in blue ink, appearing to read "Kelly Herrod", written over a light blue horizontal line.

Kelly Herrod
Operations Supervisor
Republic Services Inc.

STOREFRONT FRAMES

CORRUGATED METAL SIDING

GLAZING

SECONDARY FINISH

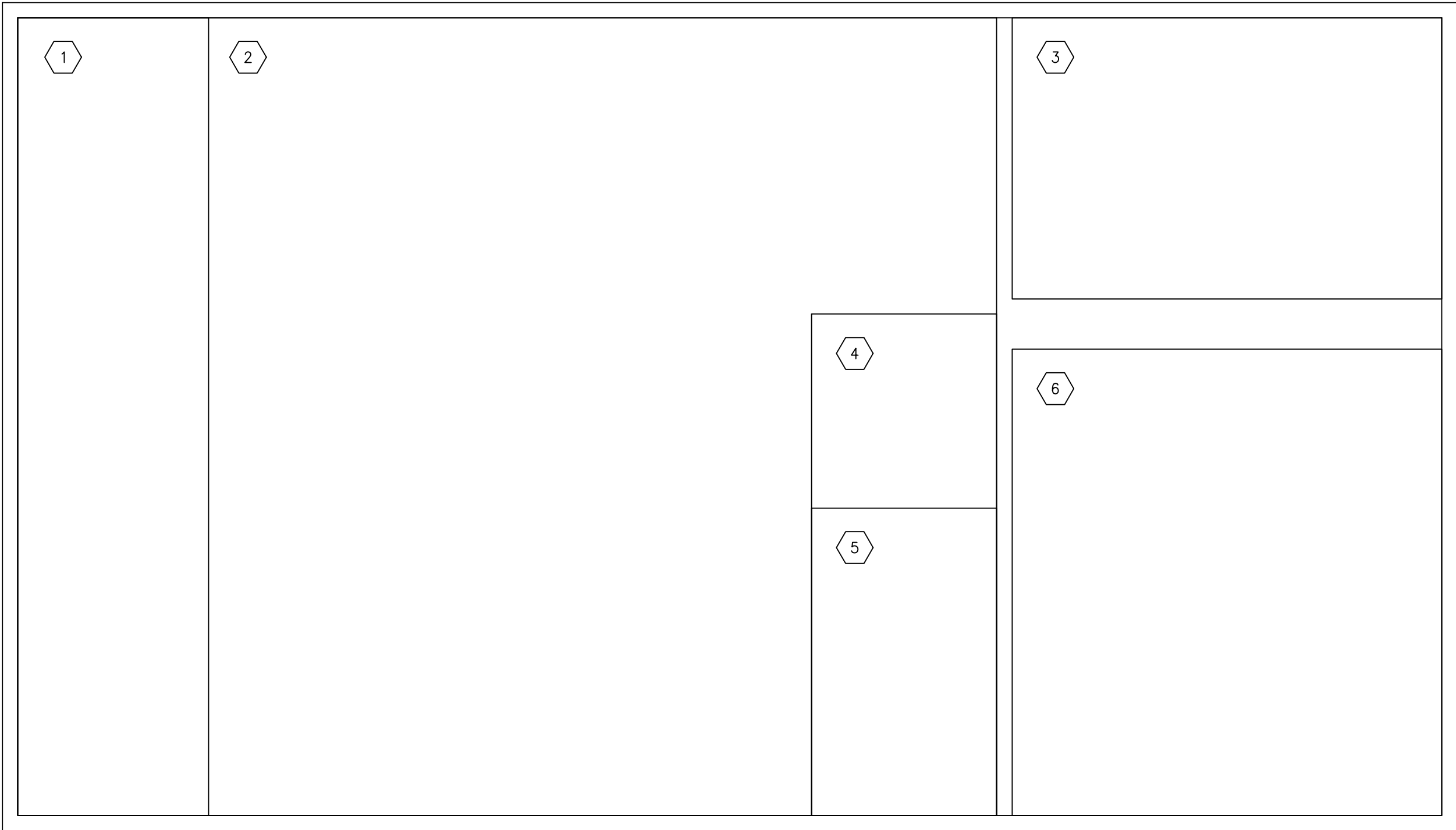
PRIMARY FINISH

ACCENT PANELING

SW 6001
Grayish

SOLARRAY® Glass + Glass Below It Insulating Glass Unit

Glass	U-Value	Solar Heat Gain Coefficient (SHGC)	U-Value Imperial (W/m²K)			
			Air	Argon	LSG	
6mm SOLARRAY®	4.4%	6%	1.02	N/A	0.58	0.76
SOLARRAY® 60 (3)	35%	7%	0.29	0.24	0.29	1.21
SOLARRAY® 67 (3)	27%	6%	0.29	0.24	0.26	1.04
SOLARRAY® 70X (3)	32%	7%	0.28	0.24	0.24	1.33
SOLARRAY® 90 (3)	25%	6%	0.29	0.24	0.22	1.14
SUNGLITE® 100 (3)	39%	7%	0.32	0.28	0.39	0.97



KEYNOTES

- 1 ALUMINUM STOREFRONT FRAME
FINISH: ANODIZED DARK BRONZE
- 2 CORRUGATED METAL SIDING
AEP SPAN: COOL ZINC GRAY
- 3 GLAZING
INSULATED GLAZING W/GRAY TONE
OUTER PANE
- 4 PRIMARY PAINT FINISH
SHERWIN WILLIAMS: GRAYISH SW6001
- 5 SECONDARY PAINT FINISH
SHERWIN WILLIAMS: PEPPERCORN SW7674
- 6 ACCENT PANELING
LONGBOARD: LIGHT CHERRY

ARCHITECTURAL
ENGINEERED
PRODUCTS



ARCHITECTURAL METAL PANELS

PRODUCT SELECTION GUIDE



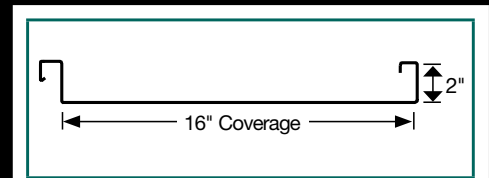
800-733-4955
www.aepspan.com

Span-Lok™ *hp* (Curved Span-Lok™ and SpanSeam™)



ENGINEERED WITH THE HARSHTEST ENVIRONMENTS IN MIND

Span-Lok *hp*, Curved Span-Lok, and SpanSeam are performance-rated architectural standing seam metal roof systems that have a mechanically seamed 2" high rib, providing aesthetic appeal and weather-tightness.



- 16" coverage roof panel, 12" coverage available in Span-Lok *hp*.
- Minimum recommended slope ¼:12.
- Gauges: 22ga and 24ga in standard finishes. (Refer to AEP Span Color Charts for full range of color options, prints, textures, finishes and paint systems).
- Custom manufactured sheet lengths from 6'-0" to 45'-0". (Lengths over 45' available for additional charge).
- Factory applied sealant is standard (Except for curved panels).
- 16" wide, 22ga Span-Lok available machine curved (factory or field).
- Subtle striations, two pencil ribs (16" only) available.
- Testing: ASTM E1592 (wind uplift), ASTM E1680 and ASTM E283 (air infiltration) and ASTM E1646 and ASTM E2140 (water infiltration).
- Meets UL580-Class 90 wind uplift requirements.
- 16" Span-Lok *hp* is Factory Mutual Class 1-75 (5' span) and Class 1-120 (2½' span) approved.
- Panel assemblies are also Class A Fire Rated per UL790 when installed in accordance to UL listings.
- Panel evaluated by accredited third party. All structural performance data is contained within an IBC/IRC 2015 code compliance report.
- Manufactured in Fontana, CA and Tacoma, WA.



**90° Field Seam
Spanlok *hp*,
Curved Span-Lok**



**180° Field Seam
SpanSeam**



Span-Lok *hp*



Oil Canning: All flat metal surfaces can display waviness commonly referred to as "oil canning". "Oil canning" is an inherent characteristic of steel products, not a defect, and therefore is not a cause for panel rejection.

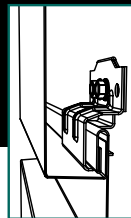
Flex Series



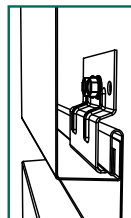
FLEXIBILITY TO CREATE STRIKING DESIGNS

Flex Series is a concealed fastener metal wall collection with various geometric boxed rib designs which can be combined to create unique linear patterns. Profiles are also ideal for fascia and equipment screen applications.

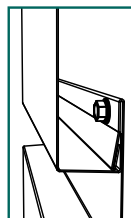
- 12" coverage wall panel.
- Gauges: 22ga and 24ga in standard finishes and 20ga in ZINCALUME® Plus.
(Refer to AEP Span Color Charts for full range of color options, prints, textures, finishes and paint systems).
- Custom manufactured sheet lengths: 5'-0" to 20'-0".
- Wall Installation: Horizontal or Vertical.
- Available in two panel attachment configurations – a directly attached fastening flange or clip interlocking hem.
- Flush Mount and 1/2" Standoff high performance clips available.
- ASTM E1592 (wind uplift), ASTM E283* (air infiltration) and ASTM E331* (water infiltration) tested.
- Manufactured in Fontana, CA and Anchorage, AK.



Shown with
standoff clip

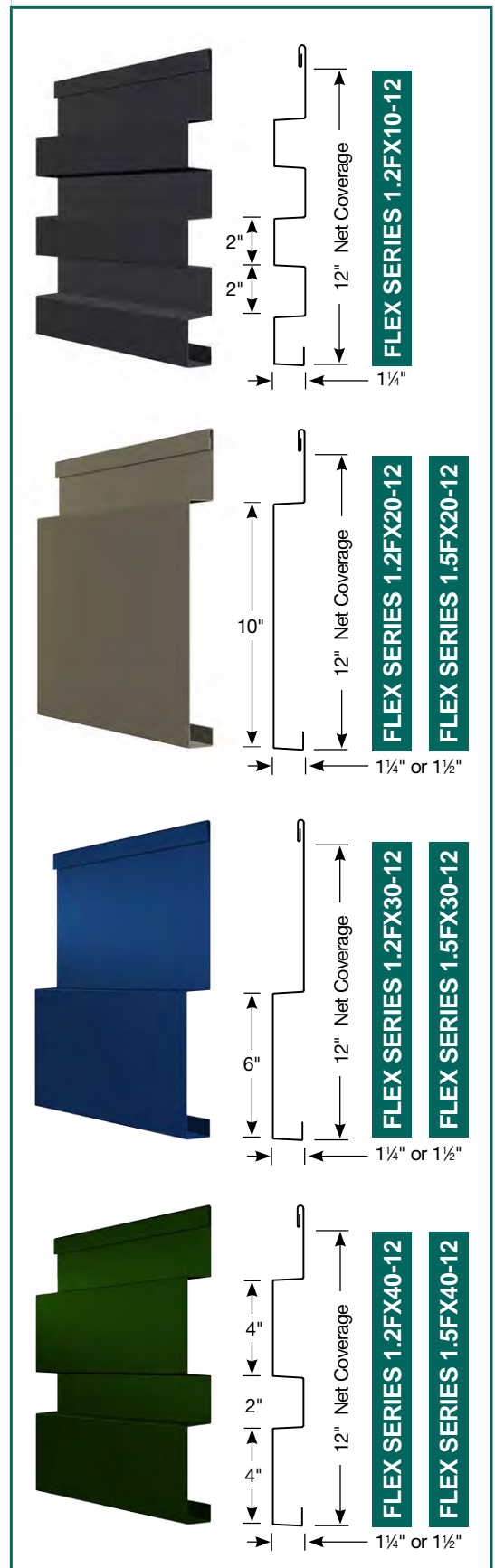


Shown with
flush clip



Shown as
direct fastened

*Requires field applied sealant.



Flex Series

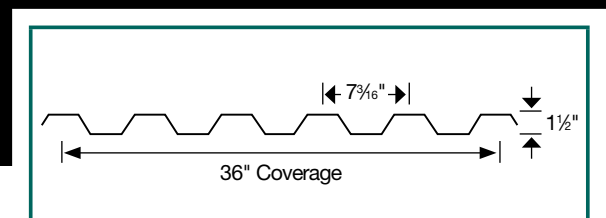
HR-36[®]



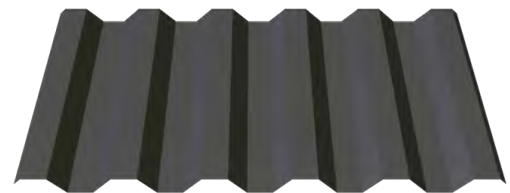
USE BOTH VERTICALLY OR HORIZONTALLY FOR A STUNNING EFFECT

HR-36 is an exposed fastener metal panel with full 36" coverage used predominantly in industrial roof and wall applications. The lighter gauge products are also popular in agricultural applications. Reverse HR-36 is for use in a wall application only.

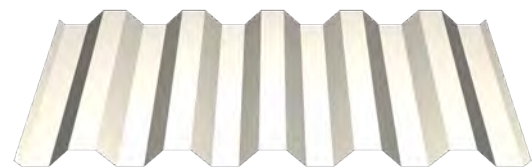
- 36" coverage roof and wall panel.
- Minimum recommended slope 1:12.
- Reversed HR-36 available for wall applications only.
- Gauges: 22ga, 24ga and 26ga in standard finishes and 20ga available in ZINCALUME[®] Plus. (Refer to AEP Span Color Charts for full range of color options, prints, textures, finishes and paint systems).
- Custom manufactured sheet lengths: 6'-0" to 50'-0".
- Crimp curving available for a unique appearance.
- Matching fiberglass panels available for HR-36 (Not available for Reversed HR-36).
- Testing: ASTM E283 (air infiltration) and ASTM E331 (water infiltration).
- Panel assemblies are Class A Fire Rated when installed on non-combustible deck or framing per IBC or IRC or when installed in accordance to UL listings per UL790. HR-36 also UL263 rated for walls.
- Manufactured in Fontana, CA and Tacoma, WA.



HR-36

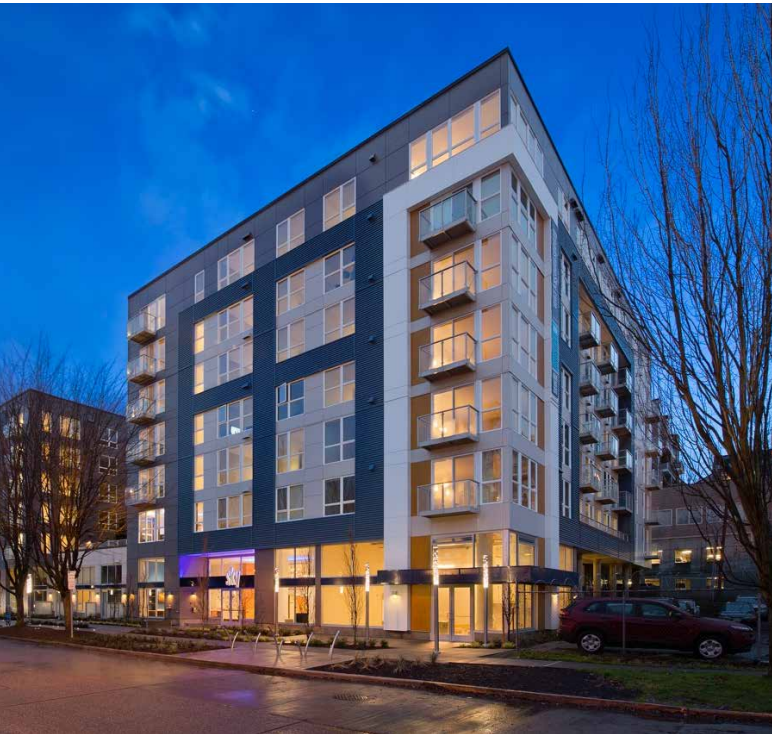


HR-36 (Roof and Wall)



Reverse HR-36 (Wall)

DESIGN FREEDOM. STRUCTURAL INTEGRITY



800-733-4955
www.aepspan.com





LONGBOARD®
INSPIRING FACADES

A photograph of a modern multi-story building facade. The building features a mix of materials, including light-colored concrete panels with small circular indentations, large windows with dark frames, and vertical wood slat accents. A balcony with a white metal railing is visible on the left. A young tree stands in the foreground. The sky is blue with light clouds.

INSPIRING FACADES
LONGBOARD®

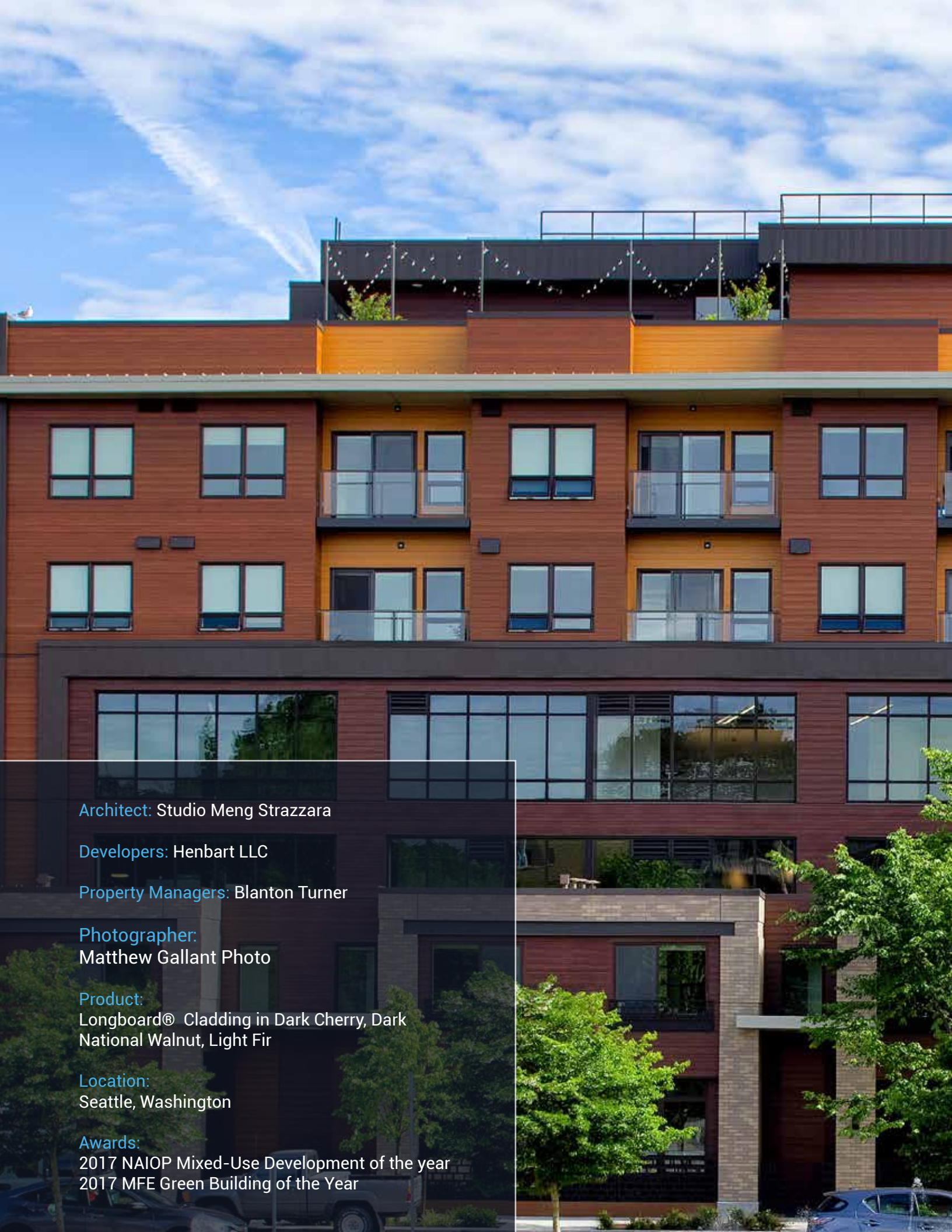


table of contents

siding + soffit

privacy screens + slats

SimpL-Clip system



Architect: Studio Meng Strazzara

Developers: Henbart LLC

Property Managers: Blanton Turner

Photographer:
Matthew Gallant Photo

Product:
Longboard® Cladding in Dark Cherry, Dark National Walnut, Light Fir

Location:
Seattle, Washington

Awards:
2017 NAIOP Mixed-Use Development of the year
2017 MFE Green Building of the Year



siding + soffit

- adaptable to most designs
- material delivered within 4 weeks
- easy tongue + groove fittings
- fire code compliant
- response time within 24 hours
- architectural grade finishes
- non-depreciating 15 year warranty
- health product declarations
- support for specifications + drawings



easy to use	quick delivery
solid warranty	durable finishes

longboardproducts.com





siding + soffit

Project:
The Towns at Emerald City

Location:
1 Forest Manor Rd in Henry Farm,
North York, Toronto

Developer:
Elad Canada

Architect:
WZMH Architects

Installer:
Frost Inc

Photographer:
Philip Castleton Photography Inc.

Product:
Longboard® 6" Channel Light Cherry

longboardproducts.com



Designer: Slater Design

Product:
Longboard® 1X3 Privacy Screen tubes in Light Cherry

Location: Phoenix, Arizona

Photographer: David Marquardt Architectural Photography



privacy screens + slats

- adaptable to most designs
- material delivered within 4 weeks
- back and side fittings for standardized installs
- fire code compliant
- response time within 24 hours
- architectural grade finishes
- non-depreciating 15 year warranty
- health product declarations
- support for specifications + drawings



easy to use	quick delivery
solid warranty	durable finishes

longboardproducts.com

STARBUCKS COFFEE





privacy screens + slats

Project:

Starbucks facade reno

Location:

CF Toronto Eaton Centre

Product:

Longboard® 1 X 3 Privacy Screen System in Light Cherry

Photographer:

Philip Castleton Photography Inc.

longboardproducts.com



LONGBOARD®
INSPIRING FACADES

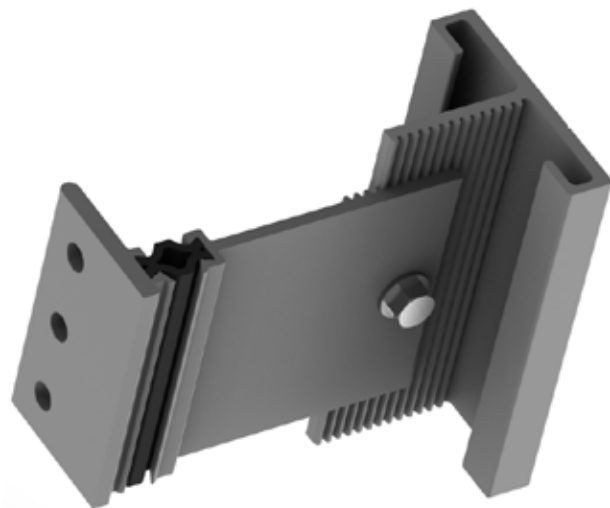


Vertical Spacing (inches)	Exterior Insulation Thickness (inches)	Exterior Insulation Nominal R-Value hroFft2/BTU(m2K/W)	Assembly U- Value hr°BTU/ hroFft2 (W/m2K)"	Assembly Effective R-Value hr°Fft2/BTU (m2K/W)
24	3	"R-12.6 (2.22)"	"0.048 (0.270)"	"R-21.0 (3.70)"
	4	"R-16.8 (2.96)"	"0.041 (0.232)"	"R-24.5 (4.32)"
	5	"R-21.0 (3.70)"	"0.036 (0.205)"	"R-27.7 (4.89)"
36	3	"R-12.6 (2.22)"	"0.047 (0.267)"	"R-21.3 (3.74)"
	4	"R-16.8 (2.96)"	"0.040 (0.228)"	"R-24.9 (4.39)"
	5	"R-21.0 (3.70)"	"0.035 (0.199)"	"R-28.5 (5.01)"
42	3	"R-12.6 (2.22)"	"0.047 (0.266)"	"R-21.4 (3.76)"
	4	"R-16.8 (2.96)"	"0.040 (0.226)"	"R-25.1 (4.42)"
	5	"R-21.0 (3.70)"	"0.035 (0.198)"	"R-28.7 (5.06)"



SimpL-Clip System

- thermally broken
- made of light weight aluminum
- supports continuous insulation
- creates a rain screen
- response time within 24 hours
- supports other cladding up to 8 lbs per sq ft.
- adjustable for sub-wall misalignment
- health product declarations
- support for specifications + drawings
- built for seismic zones



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quick delivery

solid
warranty

durable
finishes

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INDUSTRIAL FOCUS SIGNAGE

INTRODUCTION:

The proposed phased development includes (3) speculative industrial/flex buildings totaling approximately 96,000 square feet. There is frontage on both SW Boberg Road and SW Boones Ferry Road (parallel to Interstate 5). The site is proposed to be zoned PDI.

Phase 1 of this development is an approximately 53,000 square foot building and is proposed to accommodate (5) tenants. There are (4) tenant spaces over 10,000 square feet and (1) tenant space under 10,000. It is to be assumed Phase 2 & 3 will include at minimum two additional tenant spaces over 10,000 square feet and are included in the calculations for freestanding signs. Building mounted signage is limited to the proposed areas indicated on the provided elevations for Phase 1. Calculations for allowable sign area are provide below.

FREESTANDING SIGN CALUCLATION:

(2) Freestanding/monument style signs are allowed on this development. This development is a through lot and has frontages of 200 feet on both sides. Signs are to be double sided.

Freestanding sign located on Boberg Road:

Allowed height = (8) feet

- The sign is located in the PDI and is not along Interstate 5 frontage.

Allowed area = (80) square feet

- The sign is located in the PDI and is not along Interstate 5 frontage.

Freestanding sign located on Boones Ferry Road:

Allowed height = (35) feet

- Boones Ferry Road is parallel with Interstate 5. The (Phase 1) building has 4 tenant spaces over (10,000) square feet. In addition, (Phase 2) and (Phase 3) will each have additional tenant spaces over (10,000).
- Height = $20 + (6 \times 3) = 38$ feet. (limit 35)

Allowed area = (256) square feet

- The proposed sign on Boones Ferry Road runs parallel to Interstate 5. (Phase 1) has (4) 10,000 square foot tenant spaces. (Phase 2 &3) have at minimum (2) 10,000 square foot tenant spaces.

Area = $64 + (6 \times 32) = 256$ square feet.

BUILDING MOUNTED SIGN CALCULATION:

The building façade for (Phase 1) is eligible for signage placement on the east side. The first and second stories of the building have 200 lineal feet across the East. The third story has 120 lineal feet across the East face. The facade is proposed to be divided among (5) tenant spaces. See elevations for tenant area breakdown.

East Elevation @ I-5 frontage and parking:

- Tenant 1: Façade length = 50' Allowed area = 36 square feet
- Tenant 2: Façade length = 50' Allowed area = 36 square feet
- Tenant 3: Façade length = 50' Allowed area = 36 square feet
- Tenant 4: Façade length = 50' Allowed area = 36 square feet
- Tenant 5: Façade length = 120' Allowed area = 60 square feet

West Elevation:

- Tenant 1: Façade length = 50' Allowed area = 36 square feet
- Tenant 2: Façade length = 50' Allowed area = 36 square feet
- Tenant 3: Façade length = 50' Allowed area = 36 square feet
- Tenant 4: Façade length = 50' Allowed area = 36 square feet

INDUSTRIAL FOCUS SIGNAGE DESIGN GUIDELINES

Industrial Focus signage guidelines shall provide a consistent framework that establishes the parameters for location and size. Tenants shall have flexibility for signage font, logos and color. Approved locations are shown on accompanying site plan and elevations.

Address signage, either on the building (street number address) is excluded from the overall total of allowed signage area as well as sign permit fees.

Due to the speculative nature of this development the allocation of space and signage area may vary depending on future circumstances. Any modifications to the Master Sign Plan must be approved by building owner and follow the requirements of the Wilsonville 2015 Development Code, Section 4.156.01.

FREE STANDING SIGNS:

Freestanding signage is located on both SW Boberg Road and SW Boones Ferry Road. The Boberg Road sign is restricted to the development name and address. Tenant logos/names are permitted on the Boones Ferry Road sign. Allocated signage area to be determined by building owner and negotiated with lease.

Freestanding Sign – Boberg Road

- | | |
|-----------|---|
| Design: | The sign will feature the name of the development and building tenants. Company symbol/logo also permitted. Up lighting will be provided at base of the sign. Final tenant signage must be reviewed by owner. |
| Material: | The sign cabinet will be constructed of metal siding matching the profiles and colors of the building. The sign will be placed on a concrete base. Development name in font style and color of owner's choice. Must be applied on dark bronze background. |
| Location: | Located adjacent to the south entrance driveway off SW Boberg Road. |
| Area: | Sign to be 6 feet tall by 10 feet wide with a sign area of 60 square feet per face. Double sided sign. Total sign area = 60 sf. |

Freestanding Sign – Boones Ferry Road

- | | |
|---------|---|
| Design: | The sign will feature the name of the development and building tenants. Company symbol/logo also permitted. Up lighting will be provided at |
|---------|---|

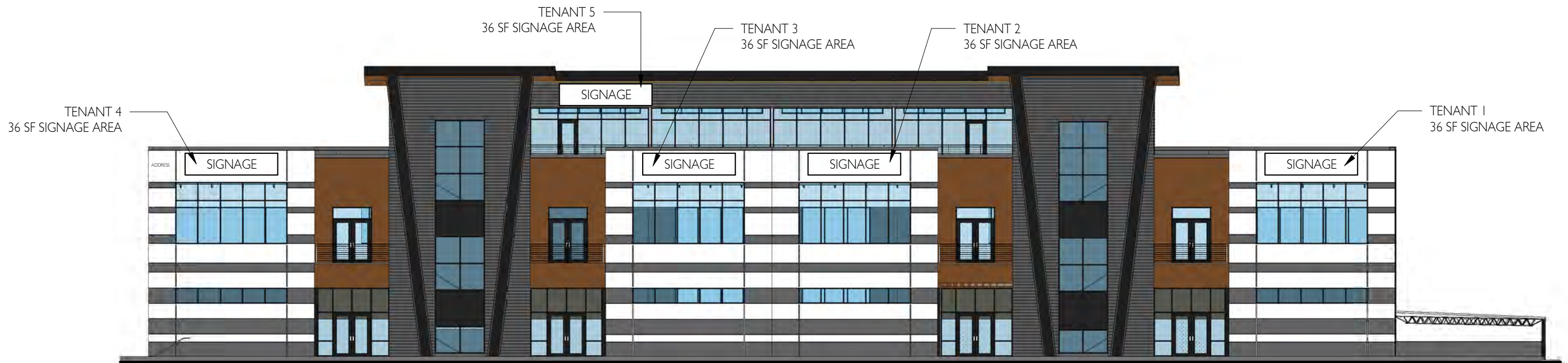
base of the sign. Final tenant signage must be reviewed by owner.

- Material:** The sign cabinet will be constructed of metal siding matching the profiles and colors of the building. The sign will be placed on a concrete base. Company name in font style and color of tenant's choice. Must be applied on dark bronze background.
- Location:** Located adjacent to the entrance driveway off SW Boones Ferry Road.
- Area:** Sign to be 32 feet tall by 8 feet wide with a sign area of 256 square feet per face. Double sided sign. Total sign area = 256 sf.

BUILDING MOUNTED SIGNS:

Building mounted signage is permitted on the east and west sides of the building. The approximate 6-foot-wide strip of panel immediately above the 2 story storefront is the preferred location with justification of the text 1' above the storefront system. Signage is limited to only the areas designated on the elevations. In the event than one of the tenant space is leased by a single occupant that occupant is allocated use of only one designated area.

- Design:** Company name in font style of tenant's choice — maximum three-foot-high lettering. Company symbol/logo also permitted — maximum (3) foot by (3) foot area. Back lighting is approved. Final tenant signage must be reviewed by building owner.
- Material:** Aluminum, steel or acrylic lettering. Paint color or finish selected by tenant.
- Location:** Located on building wall panel in designated signage area. See A2.1 & 2.2
- Area:** Length of lettering may not extend beyond prescribed boundaries. East and west faces are limited to 36 sf. North and South faces are limited to 60 sf.



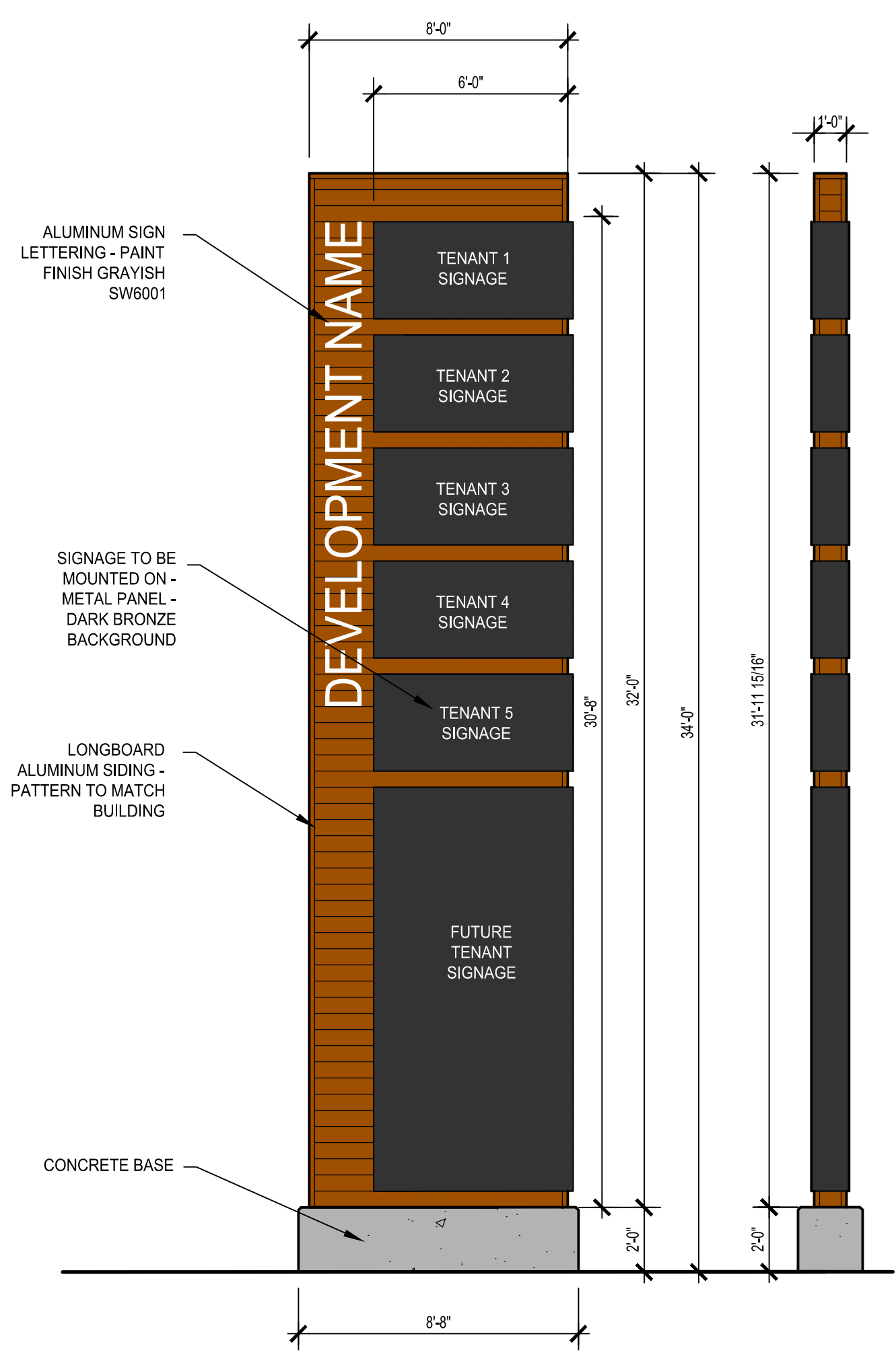
1
A0.X3

EAST ELEVATION



2
A0.X3

WEST ELEVATION



FREESTANDING SIGN - BOONES FERRY

1/4" = 1'-0"



**INDUSTRIAL FOCUS
WILSONVILLE OREGON**

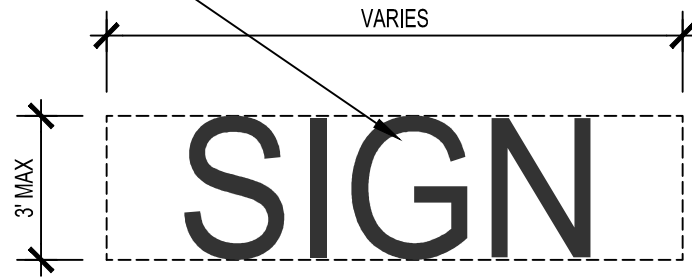
15895 SW 72ND AVE SUITE 200
 PORTLAND, OREGON 97224
 TEL: 503.226.1285
 FAX: 503.226.1670

COLOR SIGNAGE ELEVATIONS

180146.01

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ALUMINUM, STEEL
OR ACRYLIC
LETTERING - 3' HIGH
MAX LETTERING -
COLOR/FINISH MAY
VARY

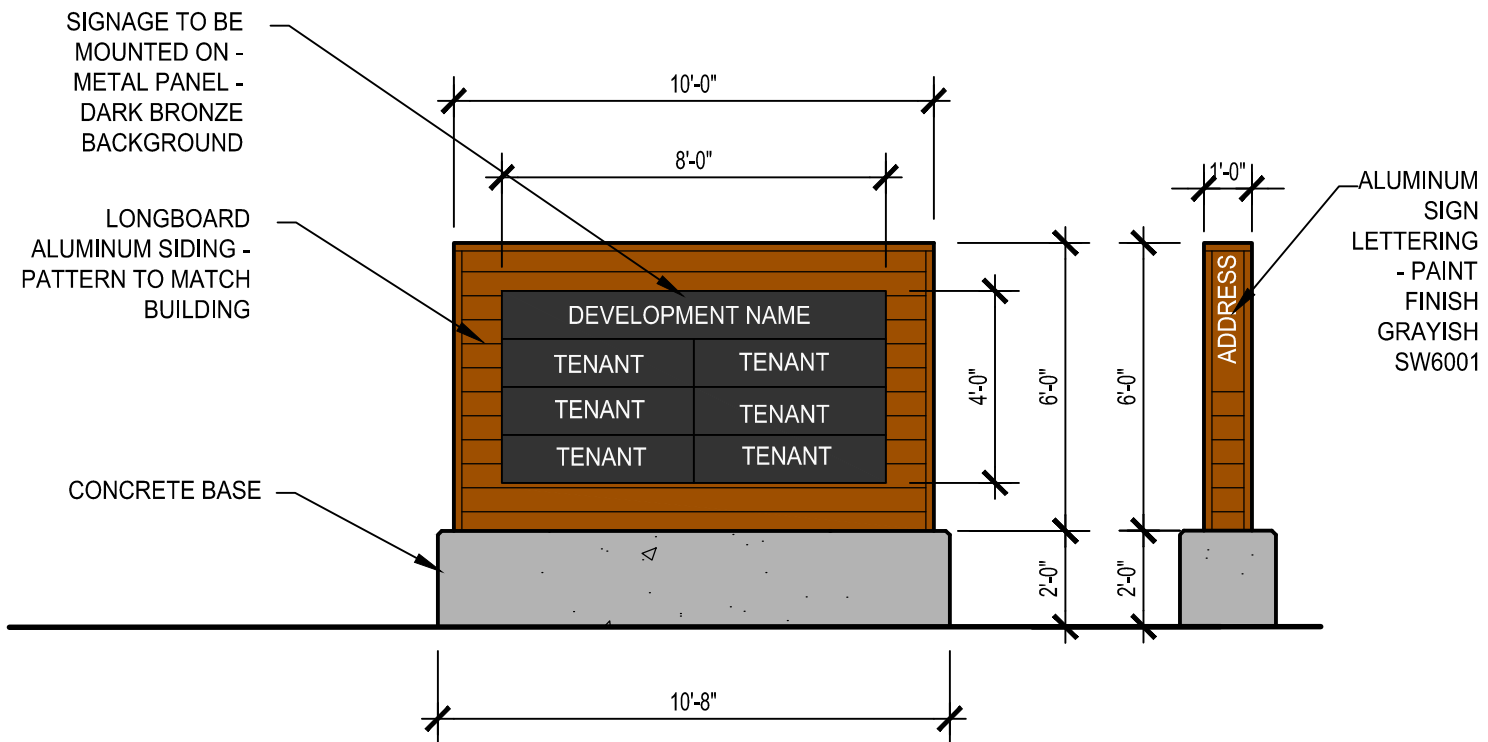


PAINTED
CONCRETE TILT
PANEL BEYOND

NOTE: PERIMETER AREA NOT TO
EXCEED MAXIMUM AREA ALLOWED

BUILDING MOUNTED SIGNAGE

1/4" = 1'-0"



FREESTANDING SIGN - BOBERG

1/4" = 1'-0"

INDUSTRIAL FOCUS SITE LIGHTING

The proposed phased development and all abutting lots are located in Lighting Zone 2 (LZ 2). The development will include building mounted and pole mounted LED fixtures. The fixtures cover entrances, parking area, storage area and walkways.

The exterior lighting design shall comply with the prescriptive option per the Oregon Energy Specialty Code Comcheck Compliance forms. All luminaires that face away from the property-lines to include a house side shield. All wall mounted luminaire wattages are below 60 lamp watts.

All lighting branch circuits to be routed through automatic lighting control. Luminaires to be 50% dimmed after dusk. Integral photocell on each luminaire to activate luminaire to 100% lumen output upon activation by motion.

Lighting Zone	Fully Shielded	Shielded	Partly Shielded	Unshielded
LZ 1	70	20	13	Low voltage landscape lighting 50 watts or less
LZ 2	100	35	39	Low voltage landscape lighting 50 watts or less
LZ 3	250	100	70	Landscape and facade lighting 100 watts or less; ornamental lighting on private drives of 39 watts and less
LZ 4	450	150	150	Landscape and facade lighting 250 watts or less; ornamental lights on private drives and lanterns 70 watts or less; marquee lighting not employing medium based lamps

[Table 7 amended by Ord. 682, 9/9/10; Ord. 688, 11/15/10]

Lighting Zone	Lighting for private drives, driveways, parking, bus stops and other transit facilities	Lighting for walkways, bikeways, plazas and other pedestrian areas	All other lighting
LZ 0	20	8	4
LZ 1	25	12	4
LZ 2	40	18	8
LZ 3	40	18	16
LZ 4	Height limit to be determined by Special Use Permit Only		

Lighting mounted onto buildings or other structures shall not exceed a mounting height greater than 4 feet higher than the tallest part of the building or structure at the place where the lighting is installed, nor higher than 33.33 percent of the horizontal distance of the light from the nearest property line, whichever is less.

[Table amended by Ord. 682, 9/9/10]

Table 9: Performance Method			
Lighting Zone	Maximum percentage of direct lumens of upright	Maximum Light Level at Property Line	
		Horizontal plane at grade (foot candles - fc)	Vertical plane facing the site in question, from grade to mounting height of highest mounted luminaire (foot candles – fc)
LZ 0	0	0.01 fc	0.02 fc
LZ 1	1%	0.05 fc	0.1 fc
LZ 2	5%	0.2 fc	0.4 fc
LZ 3	10%	0.4 fc	0.8 fc
LZ 4	20%	0.8 fc	1.6 fc

Table 10: Curfew	
Lighting Zone	Curfew Time
LZ 0	8:00 PM (2000 hours)
LZ 1	
LZ 2	10:00 PM (2200 hours)
LZ 3	Midnight (2400 hours)
LZ 4	

[Tables, above, renumbered by Ord. 688, 11/15/10

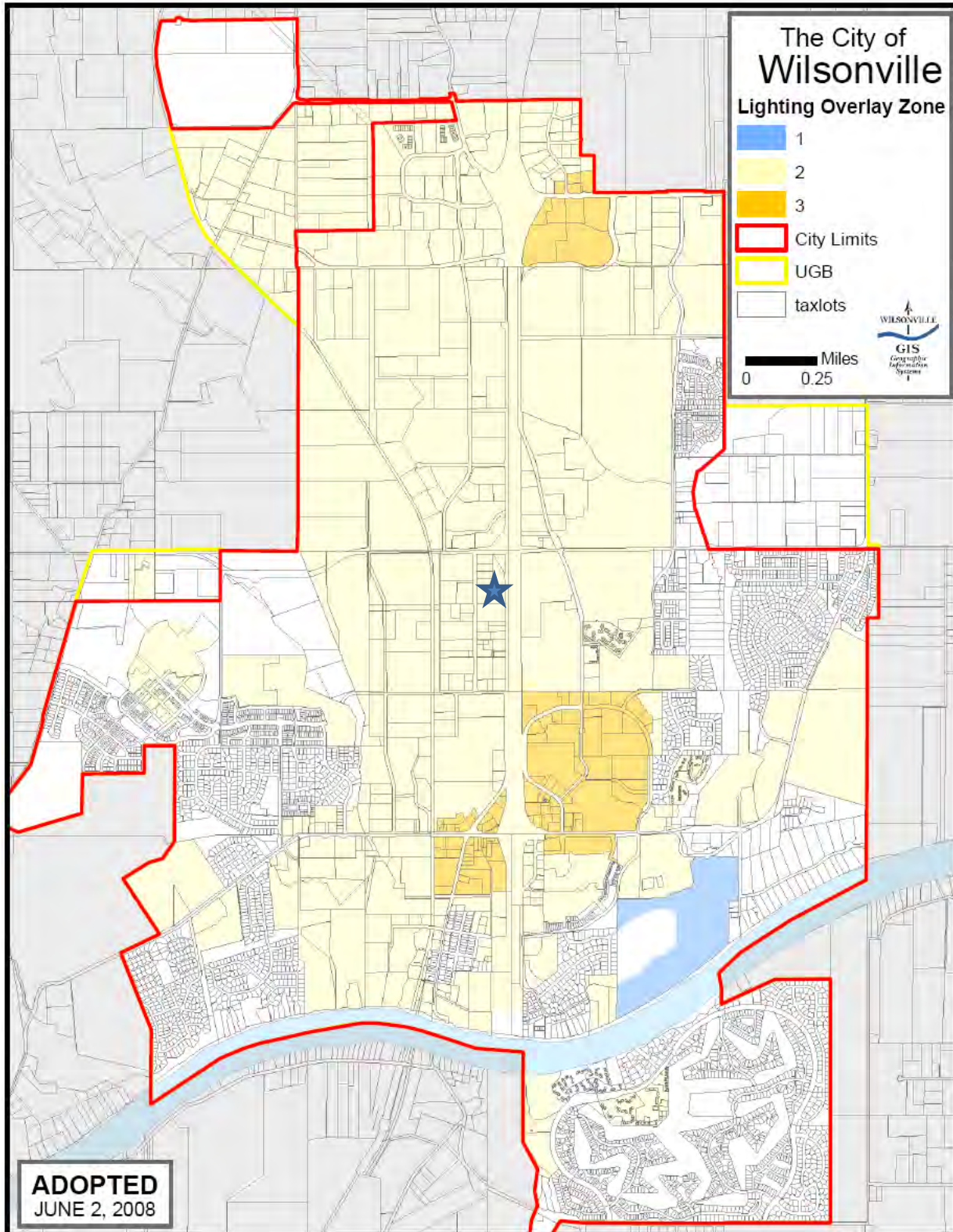


Figure 30: Lighting Overlay Zone Map

[Section 4.199 – 4.199.60 added by Ord. No. 649, adopted 6/2/08]



WST LED

Architectural Wall Sconce



Catalog
Number

Notes

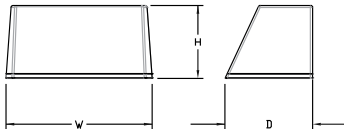
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

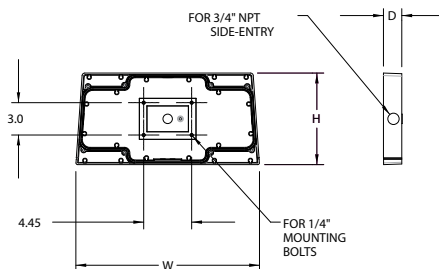
Luminaire

- Height:** 8-1/2"
(21.59 cm)
- Width:** 17"
(43.18 cm)
- Depth:** 10-3/16"
(25.9 cm)
- Weight:** 20 lbs
(9.1 kg)



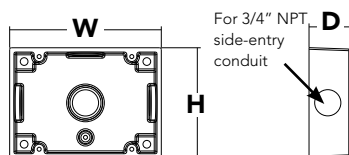
Optional Back Box (PBBW)

- Height:** 8.49"
(21.56 cm)
- Width:** 17.01"
(43.21 cm)
- Depth:** 1.70"
(4.32 cm)



Optional Back Box (BBW)

- Height:** 4"
(10.2 cm)
- Width:** 5-1/2"
(14.0 cm)
- Depth:** 1-1/2"
(3.8 cm)



A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is A+ Certified when ordered with DTL® controls marked by a shaded background. DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability¹
- This luminaire is part of an A+ Certified solution for ROAM® or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a shaded background¹

To learn more about A+, visit www.acuitybrands.com/aplus.

See ordering tree for details.

A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire. Sold Separately: [Link to Roam](#); [Link to DTL DLL](#)

Ordering Information

EXAMPLE: WST LED P1 40K VF MVOLT DDBTXD

WST LED						
Series	Performance Package	Color temperature	Distribution	Voltage		Mounting
WST LED	P1 1,500 Lumen package P2 3,000 Lumen package P3 6,000 Lumen package	27K 2700 K 30K 3000 K 40K 4000 K 50K 5000 K	VF Visual comfort forward throw VW Visual comfort wide	MVOLT ¹ 120 ² 208 ² 240 ²	277 ² 347 ² 480 ²	Shipped included (blank) Surface mounting bracket Shipped separately BBW Surface-mounted back box ³ PBBW Premium surface-mounted back box ^{3,4}

Options		Finish (required)
PE	Photoelectric cell, button type ⁵	DDBXD Dark bronze
PER	NEMA twist-lock receptacle only (controls ordered separate) ⁶	DBLXD Black
PER5	Five-wire receptacle only (controls ordered separate) ⁶	DNAXD Natural aluminum
PER7	Seven-wire receptacle only (controls ordered separate) ⁶	DWHXD White
PIR	Motion/Ambient Light Sensor, 8-15' mounting height ^{7,8}	DSSXD Sandstone
PIR1FC3V	Motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc ^{7,8}	DDBTXD Textured dark bronze
PIRH	180° motion/ambient light sensor, 15-30' mounting height ^{7,8}	DBLBXD Textured black
PIRH1FC3V	Motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc ^{7,8}	DNATXD Textured natural aluminum
SF	Single fuse (120, 277, 347V) ²	DWHGXD Textured white
DF	Double fuse (208, 240, 480V) ²	DSSTXD Textured sandstone
DS	Dual switching ⁹	
E7WH	Emergency battery backup, Non CEC compliant (7W) ¹⁰	
E7WC	Emergency battery backup, Non CEC compliant (cold, 7W) ^{10,11}	
E7WHR	Remote emergency battery backup, Non CEC compliant (remote 7W) ^{10,12}	
E20WH	Emergency battery pack 18W constant power, CEC compliant ¹⁰	
E20WC	Emergency battery pack -20°C 18W constant power, CEC compliant ^{10,11}	
E23WHR	Remote emergency battery backup, Non CEC compliant (remote 20W) ^{10,11,13}	
LCE	Left side conduit entry ¹⁴	
RCE	Right side conduit entry ¹⁴	
Shipped separately		
RBPW	Retrofit back plate ³	
VG	Vandal guard ¹⁵	
WG	Wire guard ¹⁵	

Accessories

Ordered and shipped separately.

WSTVCPBBW DDBXD U	Premium Surface - mounted back box
WSBBW DDBTX U	Surface - mounted back box
RBPW DDBXD U	Retrofit back plate

NOTES

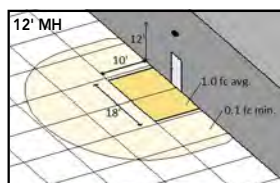
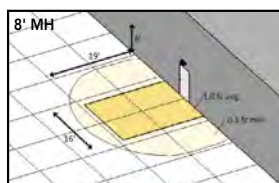
- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
- Also available as a separate accessory; see accessories information.
- Top conduit entry standard.
- Need to specify 120, 208, 240 or 277 voltage.
- Photocell ordered and shipped as a separate line item from Acuity Brands Controls. Shorting Cap included.
- Not available with VG or WG. See PER Table.

- Reference Motion Sensor table.
- Not available with Emergency options, PE or PER options.
- Not available with 347/480V.
- Battery pack rated for -20° to 40°C.
- Comes with PBBW.
- Warranty period is 3-years.
- Not available with BBW.
- Must order with fixture; not an accessory.

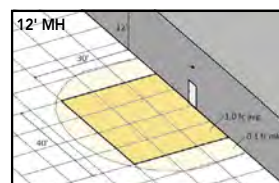
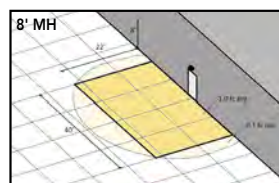
Emergency Battery Operation

The emergency battery backup is integral to the luminaire — no external housing required! This design provides reliable emergency operation while maintaining the aesthetics of the product. All emergency backup configurations include an independent secondary driver with an integral relay to immediately detect AC power loss, meeting interpretations of NFPA 70/NEC 2008 - 700.16. The emergency battery will power the luminaire for a minimum duration of 90 minutes (maximum duration of three hours) from the time supply power is lost, per International Building Code Section 1006 and NFPA 101 Life Safety Code Section 7.9, provided luminaires are mounted at an appropriate height and illuminate an open space with no major obstructions. The examples below show illuminance of 1 fc average and 0.1 fc minimum of the P1 power package and VF distribution product in emergency mode.

10' x 10' Gridlines
8' and 12' Mounting Height



WST LED P1 27K VF MVOLT E7WH



WST LED P2 40K VF MVOLT E20WH

Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.03
10°C	50°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
40°C	104°F	0.98

Electrical Load

Performance package	System Watts	Current (A)					
		120	208	240	277	347	480
P1	11	0.1	0.06	0.05	0.04	---	---
	14	---	---	---	---	0.04	0.03
P1 DS	14	0.12	0.07	0.06	0.06	---	---
	P2	25	0.21	0.13	0.11	0.1	---
30		---	---	---	---	0.09	0.06
P2 DS	25	0.21	0.13	0.11	0.1	---	---
	P3	50	0.42	0.24	0.21	0.19	---
56		---	---	---	---	0.16	0.12
P3 DS	52	0.43	0.26	0.23	0.21	---	---

Projected LED Lumen Maintenance

Values calculated according to IESNA TM-21-11 methodology and valid up to 40°C.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	>0.95	>0.92	>0.87

Motion Sensor Default Settings

Option	Dimmed State	High Level (when triggered)	Photocell Operation	Ramp-up Time	Dwell Time	Ramp-down Time
*PIR or PIRH	3V (37%) Output	10V (100%) Output	Enabled @ 5FC	3 sec	5 min	5 min
PIR1FC3V or PIRH1FC3V	3V (37%) Output	10V (100%) Output	Enabled @ 1FC	3 sec	5 min	5 min

*for use with centralize Dusk to Dawn

PER Table

Control	PER (3 wire)	PER5 (5 wire)			PER7 (7 wire)		
			Wire 4/Wire5		Wire 4/Wire5	Wire 6/Wire7	
Photocontrol Only (On/Off)	✓	⚠	Wired to dimming leads on driver	⚠	Wired to dimming leads on driver	Wires Capped inside fixture	
ROAM	⊘	✓	Wired to dimming leads on driver	⚠	Wired to dimming leads on driver	Wires Capped inside fixture	
ROAM with Motion	⊘	⚠	Wired to dimming leads on driver	⚠	Wired to dimming leads on driver	Wires Capped inside fixture	
Futureproof*	⊘	⚠	Wired to dimming leads on driver	✓	Wired to dimming leads on driver	Wires Capped inside fixture	
Futureproof* with Motion	⊘	⚠	Wired to dimming leads on driver	✓	Wired to dimming leads on driver	Wires Capped inside fixture	

✓ Recommended

⊘ Will not work

⚠ Alternate

*Futureproof means: Ability to change controls in the future.

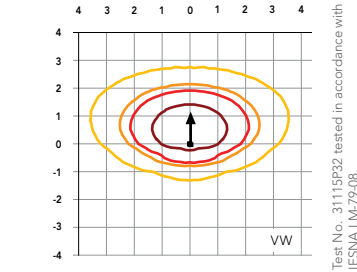
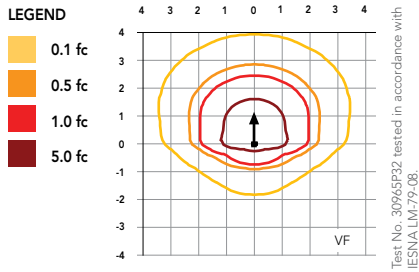
Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts.

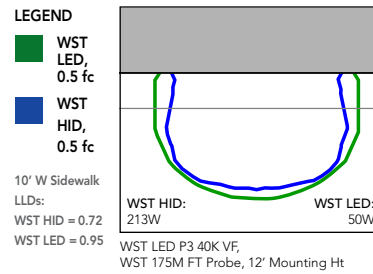
Performance Package	System Watts (MVOLT*)	Dist. Type	27K (2700K, 70 CRI)					30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW
P1	12W	VF	1,494	0	0	0	125	1,529	0	0	0	127	1,639	0	0	0	137	1,639	0	0	0	137
		VW	1,513	0	0	0	126	1,548	0	0	0	129	1,659	0	0	0	138	1,660	0	0	0	138
P2	25W	VF	3,163	1	0	1	127	3,237	1	0	1	129	3,469	1	0	1	139	3,468	1	0	1	139
		VW	3,201	1	0	0	128	3,276	1	0	0	131	3,512	1	0	0	140	3,512	1	0	0	140
P3	50W	VF	6,025	1	0	1	121	6,165	1	0	1	123	6,609	1	0	1	132	6,607	1	0	1	132
		VW	6,098	1	0	1	122	6,240	1	0	1	125	6,689	1	0	1	134	6,691	1	0	1	134



Isofootcandle plots for the WST LED P3 40K VF and VW. Distances are in units of mounting height (10').



Distribution overlay comparison to 175W metal halide.



FEATURES & SPECIFICATIONS

INTENDED USE

The classic architectural shape of the WST LED was designed for applications such as hospitals, schools, malls, restaurants, and commercial buildings. The long life LEDs and driver make this luminaire nearly maintenance-free.

CONSTRUCTION

The single-piece die-cast aluminum housing integrates secondary heat sinks to optimize thermal transfer from the internal light engine heat sinks and promote long life. The driver is mounted in direct contact with the casting for a low operating temperature and long life. The die-cast door frame is fully gasketed with a one-piece solid silicone gasket to keep out moisture and dust, providing an IP65 rating for the luminaire.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Standard Super Durable colors include dark bronze, black, natural aluminum, sandstone and white. Available in textured and non-textured finishes.

OPTICS

Well crafted reflector optics allow the light engine to be recessed within the luminaire, providing visual comfort, superior distribution, uniformity, and spacing in wall-mount applications. The WST LED has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL

Light engine(s) consist of 98 high-efficacy LEDs mounted to a metal core circuit board and integral aluminum heat sinks to maximize heat dissipation and promote long life (100,000 hrs at 40°C, L87). Class 2 electronic driver has a power factor >90%, THD <20%. Easily-serviceable surge protection device meets a minimum Category B (per ANSI/IEEE C62.41.2).

INSTALLATION

A universal mounting plate with integral mounting support arms allows the fixture to hinge down for easy access while making wiring connections.

LISTINGS

CSA certified to U.S. and Canadian standards. Luminaire is IP65 rated. PIR and back box options are rated for wet location. Rated for -30°C to 40°C ambient.

DesignLights Consortium® (DLC) Premium qualified product. Not all versions of this product may be DLC Premium qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

WARRANTY

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.



D-Series Size 1 LED Area Luminaire

d#series



Catalog Number
Notes
Type

Hit the Tab key or mouse over the page to see all interactive elements.

Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

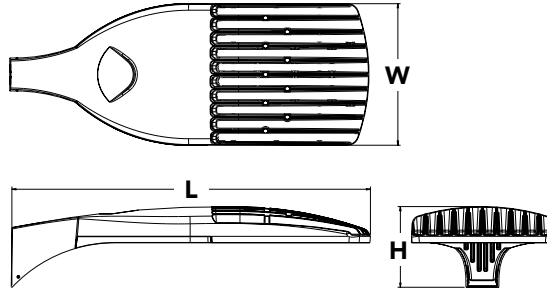
- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is A+ Certified when ordered with DTL® controls marked by a shaded background. DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability¹
- This luminaire is part of an A+ Certified solution for ROAM® or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a shaded background¹

To learn more about A+, visit www.acuitybrands.com/aplus.

1. See ordering tree for details.
2. A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire. Sold Separately: [Link to Roam](#); [Link to DTL DLL](#)

Specifications

EPA:	1.01 ft ² (0.09 m ²)
Length:	33" (83.8 cm)
Width:	13" (33.0 cm)
Height:	7-1/2" (19.0 cm)
Weight (max):	27 lbs (12.2 kg)



A+ Capable options indicated by this color background.

Ordering Information

EXAMPLE: DSX1 LED P7 40K T3M MVOLT SPA DDBXD

Series	LEDs	Color temperature	Distribution	Voltage	Mounting
DSX1 LED	Forward optics P1 P4 P7 P2 P5 P8 P3 P6 P9 Rotated optics P10 ¹ P12 ¹ P11 ¹ P13 ¹	30K 3000 K 40K 4000 K 50K 5000 K AMBPC Amber phosphor converted ²	T1S Type I short T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium TSVS Type V very short T5S Type V short T5M Type V medium T5W Type V wide BLC Backlight control ^{2,3} LCCO Left corner cutoff ^{2,3} RCCO Right corner cutoff ^{2,3}	MVOLT ^{4,5} 120 ⁶ 208 ^{5,6} 240 ^{5,6} 277 ⁶ 347 ^{5,6,7} 480 ^{5,6,7}	Shipped included SPA Square pole mounting RPA Round pole mounting WBA Wall bracket SPUMBA Square pole universal mounting adaptor ⁸ RPUMBA Round pole universal mounting adaptor ⁸ Shipped separately KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish) ⁹

Control options	Other options	Finish (required)
Shipped installed NLTAIR2 nLight AIR generation 2 enabled ¹⁰ PER NEMA twist-lock receptacle only (controls ordered separate) ¹¹ PER5 Five-wire receptacle only (controls ordered separate) ^{11,12} PER7 Seven-wire receptacle only (controls ordered separate) ^{11,12} DMG 0-10V dimming extend out back of housing for external control (leads exit fixture) DS Dual switching ^{13,14} PIR Bi-level, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc ^{5,15,16} PIRH Bi-level, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 5fc ^{5,15,16} PIRHN Network, Bi-Level motion/ambient sensor ¹⁷ PIR1FC3V Bi-level, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 1fc ^{5,15,16}	PIRH1FC3V Bi-level, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 1fc ^{5,15,16} BL30 Bi-level switched dimming, 30% ^{5,14,18} BL50 Bi-level switched dimming, 50% ^{5,14,18} PNMTDD3 Part night, dim till dawn ^{5,19} PNMT5D3 Part night, dim 5 hrs ^{5,19} PNMT6D3 Part night, dim 6 hrs ^{5,19} PNMT7D3 Part night, dim 7 hrs ^{5,19} FAO Field adjustable output ²⁰	Shipped installed HS House-side shield ²¹ SF Single fuse (120, 277, 347V) ⁶ DF Double fuse (208, 240, 480V) ⁶ L90 Left rotated optics ¹ R90 Right rotated optics ¹ Shipped separately BS Bird spikes ²² EGS External glare shield ²²
		DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLTXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white



Ordering Information

Accessories

Ordered and shipped separately.

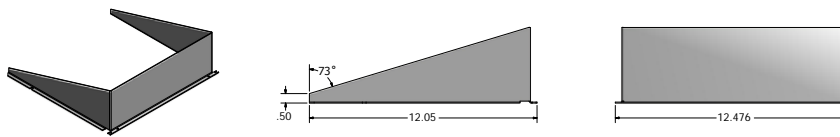
DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) ²³
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) ²³
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) ²³
DSHORT SBK U	Shorting cap ²³
DSX1HS 30C U	House-side shield for 30 LED unit ²¹
DSX1HS 40C U	House-side shield for 40 LED unit ²¹
DSX1HS 60C U	House-side shield for 60 LED unit ²¹
PUMBA DDBXD U*	Square and round pole universal mounting bracket (specify finish) ²⁴
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish) ⁴

For more control options, visit [DTL](#) and [ROAM](#) online.

NOTES

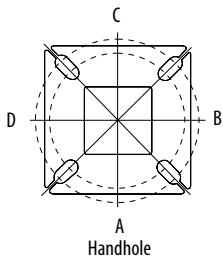
- P10, P11, P12 or P13 and rotated optics (L90, R90) only available together.
- AMBPC is not available with BLC, LCCO, RCCO or P4, P7, P8, P9 or P13.
- Not available with HS.
- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- Any PIRx with BL30, BL50 or PNMT, is not available with 208V, 240V, 347V, 480V or MVOLT. It is only available in 120V or 277V specified.
- Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V.
- Not available in P1 or P10. Not available with BL30, BL50 or PNMT options.
- Existing drilled pole only. Available as a separate combination accessory; for retrofit use only: PUMBA (finish) U; 1.5 G vibration load rating per ANCI C136.31.
- Must order fixture with SPA option. Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" mast arm (not included).
- Must be ordered with PIRHN.
- Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Not available with DS option. Shorting cap included.
- If ROAM[®] node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Not available with DCR. Node with integral dimming. Shorting cap included.
- Provides 50/50 fixture operation via (2) independent drivers. Not available with PER, PER5, PER7, PIR or PIRH. Not available P1, P2, P3, P4 or P5.
- Requires (2) separately switched circuits.
- Reference Motion Sensor table on page 3.
- Reference PER table on page 3 to see functionality.
- Must be ordered with NLTAIR2. For more information on nLight Air 2 visit [this link](#).
- Not available with 347V, 480V, PNMT, DS. For PER5 or PER7, see PER Table on page 3. Requires isolated neutral.
- Not available with 347V, 480V, DS, BL30, BL50. For PER5 or PER7, see PER Table on page 3. Separate Dusk to Dawn required.
- Not available with other dimming controls options
- Not available with BLC, LCCO and RCCO distribution. Also available as a separate accessory; see Accessories information.
- Must be ordered with fixture for factory pre-drilling.
- Requires luminaire to be specified with PER, PER5 or PER7 option. See PER Table on page 3.
- For retrofit use only.

External Glare Shield



Drilling

HANDHOLE ORIENTATION



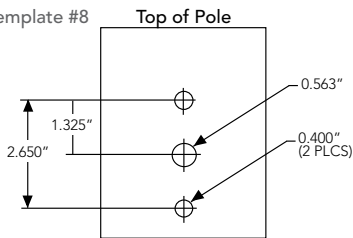
Tenon Mounting Slipfitter**

Tenon O.D.	Single Unit	2 at 180°	2 at 90°	3 at 120°	3 at 90°	4 at 90°
2-3/8"	AST20-190	AST20-280	AST20-290	AST20-320	AST20-390	AST20-490
2-7/8"	AST25-190	AST25-280	AST25-290	AST25-320	AST25-390	AST25-490
4"	AST35-190	AST35-280	AST35-290	AST35-320	AST35-390	AST35-490

Pole drilling nomenclature: # of heads at degree from handhole (default side A)					
DM19AS	DM28AS	DM29AS	DM32AS	DM39AS	DM49AS
1 @ 90°	2 @ 280°	2 @ 90°	3 @ 120°	3 @ 90°	4 @ 90°
Side B	Side B & D	Side B & C	Round pole only	Side B, C, & D	Sides A, B, C, D

Note: Review luminaire spec sheet for specific nomenclature

Template #8



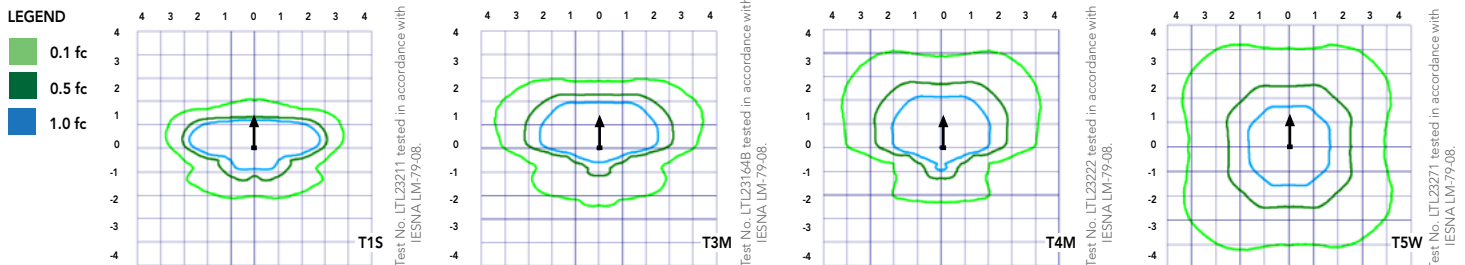
Pole top or tenon O.D.	4.5" @ 90°	4" @ 90°	3.5" @ 90°	3" @ 90°	4.5" @ 120°	4" @ 120°	3.5" @ 120°	3" @ 120°
DSX SPA	Y	Y	Y	N	-	-	-	-
DSX RPA	Y	Y	N	N	Y	Y	Y	Y
DSX SPUMBA	Y	N	N	N	-	-	-	-
DSX RPUMBA	N	N	N	N	Y	Y	Y	N

*3 fixtures @120 require round pole top/tenon.

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's [D-Series Area Size 1 homepage](#).

Isofootcandle plots for the DSX1 LED 60C 1000 40K. Distances are in units of mounting height (25').



Performance Data

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.04
5°C	41°F	1.04
10°C	50°F	1.03
15°C	59°F	1.02
20°C	68°F	1.01
25°C	77°F	1.00
30°C	86°F	0.99
35°C	95°F	0.98
40°C	104°F	0.97

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a **25°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25000	50000	100000
Lumen Maintenance Factor	1.00	0.96	0.92	0.85

Electrical Load

	Performance Package	LED Count	Drive Current	Wattage	Current (A)					
					120	208	240	277	347	480
Forward Optics (Non-Rotated)	P1	30	530	54	0.45	0.26	0.23	0.19	0.10	0.12
	P2	30	700	70	0.59	0.34	0.30	0.25	0.20	0.16
	P3	30	1050	102	0.86	0.50	0.44	0.38	0.30	0.22
	P4	30	1250	125	1.06	0.60	0.52	0.46	0.37	0.27
	P5	30	1400	138	1.16	0.67	0.58	0.51	0.40	0.29
	P6	40	1250	163	1.36	0.78	0.68	0.59	0.47	0.34
	P7	40	1400	183	1.53	0.88	0.76	0.66	0.53	0.38
	P8	60	1050	207	1.74	0.98	0.87	0.76	0.64	0.49
	P9	60	1250	241	2.01	1.16	1.01	0.89	0.70	0.51
Rotated Optics (Requires L90 or R90)	P10	60	530	106	0.90	0.52	0.47	0.43	0.33	0.27
	P11	60	700	137	1.15	0.67	0.60	0.53	0.42	0.32
	P12	60	1050	207	1.74	0.99	0.87	0.76	0.60	0.46
	P13	60	1250	231	1.93	1.12	0.97	0.86	0.67	0.49

Motion Sensor Default Settings

Option	Dimmed State	High Level (when triggered)	Photocell Operation	Dwell Time	Ramp-up Time	Ramp-down Time
PIR or PIRH	3V (37%) Output	10V (100%) Output	Enabled @ 5FC	5 min	3 sec	5 min
*PIR1FC3V or PIRH1FC3V	3V (37%) Output	10V (100%) Output	Enabled @ 1FC	5 min	3 sec	5 min

*for use with Inline Dusk to Dawn or timer.

PER Table

Control	PER (3 wire)	PER5 (5 wire)		PER7 (7 wire)		
		Wire 4/Wire5	Wire 4/Wire5	Wire 4/Wire5	Wire 6/Wire7	
Photocontrol Only (On/Off)	✓	▲	Wired to dimming leads on driver	▲	Wired to dimming leads on driver	Wires Capped inside fixture
ROAM	✗	✓	Wired to dimming leads on driver	▲	Wired to dimming leads on driver	Wires Capped inside fixture
ROAM with Motion (ROAM on/off only)	✗	▲	Wires Capped inside fixture	▲	Wires Capped inside fixture	Wires Capped inside fixture
Future-proof*	✗	▲	Wired to dimming leads on driver	✓	Wired to dimming leads on driver	Wires Capped inside fixture
Future-proof* with Motion	✗	▲	Wires Capped inside fixture	✓	Wires Capped inside fixture	Wires Capped inside fixture

✓ Recommended
✗ Will not work
▲ Alternate

*Future-proof means: Ability to change controls in the future.

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics																									
LED Count	Drive Current	Power Package	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)					
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	
					30	530	P1	54W	T1S	6,457	2	0	2	120	6,956	2	0	2	129	7,044	2	0	2	130	3,640
				T2S	6,450	2	0	2	119	6,949	2	0	2	129	7,037	2	0	2	130	3,813	1	0	1	73	
				T2M	6,483	1	0	1	120	6,984	2	0	2	129	7,073	2	0	2	131	3,689	1	0	1	71	
				T3S	6,279	2	0	2	116	6,764	2	0	2	125	6,850	2	0	2	127	3,770	1	0	1	73	
				T3M	6,468	1	0	2	120	6,967	1	0	2	129	7,056	1	0	2	131	3,752	1	0	1	72	
				T4M	6,327	1	0	2	117	6,816	1	0	2	126	6,902	1	0	2	128	3,758	1	0	1	72	
				TFTM	6,464	1	0	2	120	6,963	1	0	2	129	7,051	1	0	2	131	3,701	1	0	1	71	
				TSVS	6,722	2	0	0	124	7,242	3	0	0	134	7,334	3	0	0	136	3,928	2	0	0	76	
				TSS	6,728	2	0	1	125	7,248	2	0	1	134	7,340	2	0	1	136	3,881	2	0	0	75	
				T5M	6,711	3	0	1	124	7,229	3	0	1	134	7,321	3	0	2	136	3,930	2	0	1	76	
				TSW	6,667	3	0	2	123	7,182	3	0	2	133	7,273	3	0	2	135	3,820	3	0	1	73	
				BLC	5,299	1	0	1	98	5,709	1	0	2	106	5,781	1	0	2	107						
				LCCO	3,943	1	0	2	73	4,248	1	0	2	79	4,302	1	0	2	80						
				RCCO	3,943	1	0	2	73	4,248	1	0	2	79	4,302	1	0	2	80						
30	700	P2	70W	T1S	8,249	2	0	2	118	8,886	2	0	2	127	8,999	2	0	2	129	4,561	1	0	1	67	
				T2S	8,240	2	0	2	118	8,877	2	0	2	127	8,989	2	0	2	128	4,777	1	0	1	70	
				T2M	8,283	2	0	2	118	8,923	2	0	2	127	9,036	2	0	2	129	4,622	1	0	2	68	
				T3S	8,021	2	0	2	115	8,641	2	0	2	123	8,751	2	0	2	125	4,724	1	0	1	69	
				T3M	8,263	2	0	2	118	8,901	2	0	2	127	9,014	2	0	2	129	4,701	1	0	2	69	
				T4M	8,083	2	0	2	115	8,708	2	0	2	124	8,818	2	0	2	126	4,709	1	0	2	69	
				TFTM	8,257	2	0	2	118	8,896	2	0	2	127	9,008	2	0	2	129	4,638	1	0	2	68	
				TSVS	8,588	3	0	0	123	9,252	3	0	0	132	9,369	3	0	0	134	4,922	2	0	0	72	
				TSS	8,595	3	0	1	123	9,259	3	0	1	132	9,376	3	0	1	134	4,863	2	0	0	72	
				T5M	8,573	3	0	2	122	9,236	3	0	2	132	9,353	3	0	2	134	4,924	3	0	1	72	
				TSW	8,517	3	0	2	122	9,175	4	0	2	131	9,291	4	0	2	133	4,787	3	0	1	70	
				BLC	6,770	1	0	2	97	7,293	1	0	2	104	7,386	1	0	2	106						
				LCCO	5,038	1	0	2	72	5,427	1	0	2	78	5,496	1	0	2	79						
				RCCO	5,038	1	0	2	72	5,427	1	0	2	78	5,496	1	0	2	79						
30	1050	P3	102W	T1S	11,661	2	0	2	114	12,562	3	0	3	123	12,721	3	0	3	125						
				T2S	11,648	2	0	2	114	12,548	3	0	3	123	12,707	3	0	3	125						
				T2M	11,708	2	0	2	115	12,613	2	0	2	124	12,773	2	0	2	125						
				T3S	11,339	2	0	2	111	12,215	3	0	3	120	12,370	3	0	3	121						
				T3M	11,680	2	0	2	115	12,582	2	0	2	123	12,742	2	0	2	125						
				T4M	11,426	2	0	3	112	12,309	2	0	3	121	12,465	2	0	3	122						
				TFTM	11,673	2	0	2	114	12,575	2	0	3	123	12,734	2	0	3	125						
				TSVS	12,140	3	0	1	119	13,078	3	0	1	128	13,244	3	0	1	130						
				TSS	12,150	3	0	1	119	13,089	3	0	1	128	13,254	3	0	1	130						
				T5M	12,119	4	0	2	119	13,056	4	0	2	128	13,221	4	0	2	130						
				TSW	12,040	4	0	3	118	12,970	4	0	3	127	13,134	4	0	3	129						
				BLC	9,570	1	0	2	94	10,310	1	0	2	101	10,440	1	0	2	102						
				LCCO	7,121	1	0	3	70	7,671	1	0	3	75	7,768	1	0	3	76						
				RCCO	7,121	1	0	3	70	7,671	1	0	3	75	7,768	1	0	3	76						
30	1250	P4	125W	T1S	13,435	3	0	3	107	14,473	3	0	3	116	14,657	3	0	3	117						
				T2S	13,421	3	0	3	107	14,458	3	0	3	116	14,641	3	0	3	117						
				T2M	13,490	2	0	2	108	14,532	3	0	3	116	14,716	3	0	3	118						
				T3S	13,064	3	0	3	105	14,074	3	0	3	113	14,252	3	0	3	114						
				T3M	13,457	2	0	2	108	14,497	2	0	2	116	14,681	2	0	2	117						
				T4M	13,165	2	0	3	105	14,182	2	0	3	113	14,362	2	0	3	115						
				TFTM	13,449	2	0	3	108	14,488	2	0	3	116	14,672	2	0	3	117						
				TSVS	13,987	4	0	1	112	15,068	4	0	1	121	15,259	4	0	1	122						
				TSS	13,999	3	0	1	112	15,080	3	0	1	121	15,271	3	0	1	122						
				T5M	13,963	4	0	2	112	15,042	4	0	2	120	15,233	4	0	2	122						
				TSW	13,872	4	0	3	111	14,944	4	0	3	120	15,133	4	0	3	121						
				BLC	11,027	1	0	2	88	11,879	1	0	2	95	12,029	1	0	2	96						
				LCCO	8,205	1	0	3	66	8,839	1	0	3	71	8,951	1	0	3	72						
				RCCO	8,205	1	0	3	66	8,839	1	0	3	71	8,951	1	0	3	72						
30	1400	P5	138W	T1S	14,679	3	0	3	106	15,814	3	0	3	115	16,014	3	0	3	116						
				T2S	14,664	3	0	3	106	15,797	3	0	3	114	15,997	3	0	3	116						
				T2M	14,739	3	0	3	107	15,878	3	0	3	115	16,079	3	0	3	117						
				T3S	14,274	3	0	3	103	15,377	3	0	3	111	15,572	3	0	3	113						
				T3M	14,704	2	0	3	107	15,840	3	0	3	115	16,040	3	0	3	116						
				T4M	14,384	2	0	3	104	15,496	3	0	3	112	15,692	3	0	3	114						
				TFTM	14,695																				

Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Forward Optics																											
LED Count	Drive Current	Power Package	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)							
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lu-mens	B	U	G	LPW			
40	1250	P6	163W	T1S	17,654	3	0	3	108	19,018	3	0	3	117	19,259	3	0	3	118								
				T2S	17,635	3	0	3	108	18,998	3	0	3	117	19,238	3	0	3	118								
				T2M	17,726	3	0	3	109	19,096	3	0	3	117	19,337	3	0	3	119								
				T3S	17,167	3	0	3	105	18,493	3	0	3	113	18,727	3	0	3	115								
				T3M	17,683	3	0	3	108	19,049	3	0	3	117	19,290	3	0	3	118								
				T4M	17,299	3	0	3	106	18,635	3	0	4	114	18,871	3	0	4	116								
				TFTM	17,672	3	0	3	108	19,038	3	0	4	117	19,279	3	0	4	118								
				TSVS	18,379	4	0	1	113	19,800	4	0	1	121	20,050	4	0	1	123								
				T5S	18,394	4	0	2	113	19,816	4	0	2	122	20,066	4	0	2	123								
				T5M	18,348	4	0	2	113	19,766	4	0	2	121	20,016	4	0	2	123								
				T5W	18,228	5	0	3	112	19,636	5	0	3	120	19,885	5	0	3	122								
				BLC	14,489	2	0	2	89	15,609	2	0	3	96	15,806	2	0	3	97								
				LCCO	10,781	1	0	3	66	11,614	1	0	3	71	11,761	2	0	3	72								
				RCCO	10,781	1	0	3	66	11,614	1	0	3	71	11,761	2	0	3	72								
				40	1400	P7	183W	T1S	19,227	3	0	3	105	20,712	3	0	3	113	20,975	3	0	3	115				
T2S	19,206	3	0					3	105	20,690	3	0	3	113	20,952	3	0	3	114								
T2M	19,305	3	0					3	105	20,797	3	0	3	114	21,060	3	0	3	115								
T3S	18,696	3	0					3	102	20,141	3	0	3	110	20,396	3	0	4	111								
T3M	19,258	3	0					3	105	20,746	3	0	3	113	21,009	3	0	3	115								
T4M	18,840	3	0					4	103	20,296	3	0	4	111	20,553	3	0	4	112								
TFTM	19,246	3	0					4	105	20,734	3	0	4	113	20,996	3	0	4	115								
TSVS	20,017	4	0					1	109	21,564	4	0	1	118	21,837	4	0	1	119								
T5S	20,033	4	0					2	109	21,581	4	0	2	118	21,854	4	0	2	119								
T5M	19,983	4	0					2	109	21,527	5	0	3	118	21,799	5	0	3	119								
T5W	19,852	5	0					3	108	21,386	5	0	3	117	21,656	5	0	3	118								
BLC	15,780	2	0					3	86	16,999	2	0	3	93	17,214	2	0	3	94								
LCCO	11,742	2	0					3	64	12,649	2	0	3	69	12,809	2	0	3	70								
RCCO	11,742	2	0					3	64	12,649	2	0	3	69	12,809	2	0	3	70								
60	1050	P8	207W					T1S	22,490	3	0	3	109	24,228	3	0	3	117	24,535	3	0	3	119				
				T2S	22,466	3	0	4	109	24,202	3	0	4	117	24,509	3	0	4	118								
				T2M	22,582	3	0	3	109	24,327	3	0	3	118	24,635	3	0	3	119								
				T3S	21,870	3	0	4	106	23,560	3	0	4	114	23,858	3	0	4	115								
				T3M	22,527	3	0	4	109	24,268	3	0	4	117	24,575	3	0	4	119								
				T4M	22,038	3	0	4	106	23,741	3	0	4	115	24,041	3	0	4	116								
				TFTM	22,513	3	0	4	109	24,253	3	0	4	117	24,560	3	0	4	119								
				TSVS	23,415	5	0	1	113	25,224	5	0	1	122	25,543	5	0	1	123								
				T5S	23,434	4	0	2	113	25,244	4	0	2	122	25,564	4	0	2	123								
				T5M	23,374	5	0	3	113	25,181	5	0	3	122	25,499	5	0	3	123								
				T5W	23,221	5	0	4	112	25,016	5	0	4	121	25,332	5	0	4	122								
				BLC	18,458	2	0	3	89	19,885	2	0	3	96	20,136	2	0	3	97								
				LCCO	13,735	2	0	3	66	14,796	2	0	4	71	14,983	2	0	4	72								
				RCCO	13,735	2	0	3	66	14,796	2	0	4	71	14,983	2	0	4	72								
				60	1250	P9	241W	T1S	25,575	3	0	3	106	27,551	3	0	3	114	27,900	3	0	3	116				
T2S	25,548	3	0					4	106	27,522	3	0	4	114	27,871	3	0	4	116								
T2M	25,680	3	0					3	107	27,664	3	0	3	115	28,014	3	0	3	116								
T3S	24,870	3	0					4	103	26,791	3	0	4	111	27,130	3	0	4	113								
T3M	25,617	3	0					4	106	27,597	3	0	4	115	27,946	3	0	4	116								
T4M	25,061	3	0					4	104	26,997	3	0	4	112	27,339	3	0	4	113								
TFTM	25,602	3	0					4	106	27,580	3	0	4	114	27,929	3	0	4	116								
TSVS	26,626	5	0					1	110	28,684	5	0	1	119	29,047	5	0	1	121								
T5S	26,648	4	0					2	111	28,707	5	0	2	119	29,070	5	0	2	121								
T5M	26,581	5	0					3	110	28,635	5	0	3	119	28,997	5	0	3	120								
T5W	26,406	5	0					4	110	28,447	5	0	4	118	28,807	5	0	4	120								
BLC	20,990	2	0					3	87	22,612	2	0	3	94	22,898	2	0	3	95								
LCCO	15,619	2	0					4	65	16,825	2	0	4	70	17,038	2	0	4	71								
									15,619	2	0	4	65	16,825	2	0	4	70	17,038	2	0	4	71				

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Rotated Optics																											
LED Count	Drive Current	Power Package	System Watts	Dist. Type	30K (3000 K, 70 CRI)					40K (4000 K, 70 CRI)					50K (5000 K, 70 CRI)					AMBPC (Amber Phosphor Converted)							
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	B	U	G	LPW			
60	530	P10	106W	T1S	13,042	3	0	3	123	14,050	3	0	3	133	14,228	3	0	3	134	7,167	2	0	2	72			
				T2S	12,967	4	0	4	122	13,969	4	0	4	132	14,146	4	0	4	133	7,507	2	0	2	76			
				T2M	13,201	3	0	3	125	14,221	3	0	3	134	14,401	3	0	3	136	7,263	2	0	2	73			
				T3S	12,766	4	0	4	120	13,752	4	0	4	130	13,926	4	0	4	131	7,424	2	0	2	75			
				T3M	13,193	4	0	4	124	14,213	4	0	4	134	14,393	4	0	4	136	7,387	2	0	2	75			
				T4M	12,944	4	0	4	122	13,945	4	0	4	132	14,121	4	0	4	133	7,400	2	0	2	75			
				TFTM	13,279	4	0	4	125	14,305	4	0	4	135	14,486	4	0	4	137	7,288	1	0	2	74			
				TSVS	13,372	3	0	1	126	14,405	4	0	1	136	14,588	4	0	1	138	7,734	3	0	1	78			
				TSS	13,260	3	0	1	125	14,284	3	0	1	135	14,465	3	0	1	136	7,641	3	0	0	77			
				TSM	13,256	4	0	2	125	14,281	4	0	2	135	14,462	4	0	2	136	7,737	3	0	2	78			
				TSW	13,137	4	0	3	124	14,153	4	0	3	134	14,332	4	0	3	135	7,522	3	0	2	76			
				BLC	10,906	3	0	3	103	11,749	3	0	3	111	11,898	3	0	3	112								
				LCCO	7,789	1	0	3	73	8,391	1	0	3	79	8,497	1	0	3	80								
				RCCO	7,779	4	0	4	73	8,380	4	0	4	79	8,486	4	0	4	80								
				60	700	P11	137W	T1S	16,556	3	0	3	121	17,835	3	0	3	130	18,061	4	0	4	132	8,952	2	0	2
T2S	16,461	4	0					4	120	17,733	4	0	4	129	17,957	4	0	4	131	9,377	2	0	2	72			
T2M	16,758	4	0					4	122	18,053	4	0	4	132	18,281	4	0	4	133	9,072	2	0	2	69			
T3S	16,205	4	0					4	118	17,457	4	0	4	127	17,678	4	0	4	129	9,273	2	0	2	71			
T3M	16,748	4	0					4	122	18,042	4	0	4	132	18,271	4	0	4	133	9,227	2	0	2	70			
T4M	16,432	4	0					4	120	17,702	4	0	4	129	17,926	4	0	4	131	9,243	2	0	2	71			
TFTM	16,857	4	0					4	123	18,159	4	0	4	133	18,389	4	0	4	134	9,103	2	0	2	69			
TSVS	16,975	4	0					1	124	18,287	4	0	1	133	18,518	4	0	1	135	9,661	3	0	1	74			
TSS	16,832	4	0					1	123	18,133	4	0	2	132	18,362	4	0	2	134	9,544	3	0	1	73			
TSM	16,828	4	0					2	123	18,128	4	0	2	132	18,358	4	0	2	134	9,665	3	0	2	74			
TSW	16,677	4	0					3	122	17,966	5	0	3	131	18,193	5	0	3	133	9,395	4	0	2	72			
BLC	13,845	3	0					3	101	14,915	3	0	3	109	15,103	3	0	3	110								
LCCO	9,888	1	0					3	72	10,652	2	0	3	78	10,787	2	0	3	79								
RCCO	9,875	4	0					4	72	10,638	4	0	4	78	10,773	4	0	4	79								
60	1050	P12	207W					T1S	22,996	4	0	4	111	24,773	4	0	4	120	25,087	4	0	4	121				
				T2S	22,864	4	0	4	110	24,631	5	0	5	119	24,943	5	0	5	120								
				T2M	23,277	4	0	4	112	25,075	4	0	4	121	25,393	4	0	4	123								
				T3S	22,509	4	0	4	109	24,248	5	0	5	117	24,555	5	0	5	119								
				T3M	23,263	4	0	4	112	25,061	4	0	4	121	25,378	4	0	4	123								
				T4M	22,824	5	0	5	110	24,588	5	0	5	119	24,899	5	0	5	120								
				TFTM	23,414	5	0	5	113	25,223	5	0	5	122	25,543	5	0	5	123								
				TSVS	23,579	5	0	1	114	25,401	5	0	1	123	25,722	5	0	1	124								
				TSS	23,380	4	0	2	113	25,187	4	0	2	122	25,506	4	0	2	123								
				TSM	23,374	5	0	3	113	25,181	5	0	3	122	25,499	5	0	3	123								
				TSW	23,165	5	0	4	112	24,955	5	0	4	121	25,271	5	0	4	122								
				BLC	19,231	4	0	4	93	20,717	4	0	4	100	20,979	4	0	4	101								
				LCCO	13,734	2	0	3	66	14,796	2	0	4	71	14,983	2	0	4	72								
				RCCO	13,716	4	0	4	66	14,776	4	0	4	71	14,963	4	0	4	72								
				60	1250	P13	231W	T1S	25,400	4	0	4	110	27,363	4	0	4	118	27,709	4	0	4	120				
T2S	25,254	5	0					5	109	27,205	5	0	5	118	27,550	5	0	5	119								
T2M	25,710	4	0					4	111	27,696	4	0	4	120	28,047	4	0	4	121								
T3S	24,862	5	0					5	108	26,783	5	0	5	116	27,122	5	0	5	117								
T3M	25,695	5	0					5	111	27,680	5	0	5	120	28,031	5	0	5	121								
T4M	25,210	5	0					5	109	27,158	5	0	5	118	27,502	5	0	5	119								
TFTM	25,861	5	0					5	112	27,860	5	0	5	121	28,212	5	0	5	122								
TSVS	26,043	5	0					1	113	28,056	5	0	1	121	28,411	5	0	1	123								
TSS	25,824	4	0					2	112	27,819	5	0	2	120	28,172	5	0	2	122								
TSM	25,818	5	0					3	112	27,813	5	0	3	120	28,165	5	0	3	122								
TSW	25,586	5	0					4	111	27,563	5	0	4	119	27,912	5	0	4	121								
BLC	21,241	4	0					4	92	22,882	4	0	4	99	23,172	4	0	4	100								
LCCO	15,170	2	0					4	66	16,342	2	0	4	71	16,549	2	0	4	72								
									15,150	5	0	5	66	16,321	5	0	5	71	16,527	5	0	5	72				

FEATURES & SPECIFICATIONS

INTENDED USE

The sleek design of the D-Series Size 1 reflects the embedded high performance LED technology. It is ideal for many commercial and municipal applications, such as parking lots, plazas, campuses, and streetscapes.

CONSTRUCTION

Single-piece die-cast aluminum housing has integral heat sink fins to optimize thermal management through conductive and convective cooling. Modular design allows for ease of maintenance and future light engine upgrades. The LED drivers are mounted in direct contact with the casting to promote low operating temperature and long life. Housing is completely sealed against moisture and environmental contaminants (IP65). Low EPA (1.01 ft²) for optimized pole wind loading.

FINISH

Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling. Available in both textured and non-textured finishes.

OPTICS

Precision-molded proprietary acrylic lenses are engineered for superior area lighting distribution, uniformity, and pole spacing. Light engines are available in standard 3000 K, 4000 K and 5000 K (70 CRI) configurations. The D-Series Size 1 has zero uplight and qualifies as a Nighttime Friendly™ product, meaning it is consistent with the LEED® and Green Globes™ criteria for eliminating wasteful uplight.

ELECTRICAL

Light engine configurations consist of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L85/100,000 hours at 25°C). Class 1

electronic drivers are designed to have a power factor >90%, THD <20%, and an expected life of 100,000 hours with <1% failure rate. Easily serviceable 10kV surge protection device meets a minimum Category C Low operation (per ANSI/IEEE C62.41.2).

INSTALLATION

Included mounting block and integral arm facilitate quick and easy installation. Stainless steel bolts fasten the mounting block securely to poles and walls, enabling the D-Series Size 1 to withstand up to a 3.0 G vibration load rating per ANSI C136.31. The D-Series Size 1 utilizes the AERIS™ series pole drilling pattern (template #8). Optional terminal block and NEMA photocontrol receptacle are also available.

LISTINGS

UL Listed for wet locations. Light engines are IP66 rated; luminaire is IP65 rated. Rated for -40°C minimum ambient. U.S. Patent No. D672,492 S. International patent pending.

DesignLights Consortium® (DLC) Premium qualified product and DLC qualified product. Not all versions of this product may be DLC Premium qualified or DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

International Dark-Sky Association (IDA) Fixture Seal of Approval (FSA) is available for all products on this page utilizing 3000K color temperature only.

WARRANTY

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25 °C. Specifications subject to change without notice.



5/22/2019

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

PROJECT #: 180146.01

Dear Cindy:

Enclosed is a package of information that responds to the notice of incompleteness.

1. Inadequate narrative, written response to applicable review criteria, specifically:
 - a. Comprehensive Plan Area of Special Concern E (Area E), which addresses development in the area planned for industrial use between SW Boeckman Road and SW Barber Street, from SW Boones Ferry Road to the railroad tracks. (See page F-4 of the Comprehensive Plan, updated October 2018.) Primary concerns relate to continuity in design and protection of the Walnut Mobile Home Park. The Plan states: "While economics may ultimately force redevelopment of the park to industrial use, the life of the park can be prolonged through careful design considerations of surrounding development. Doing so will help to retain one of the City's affordable housing opportunities." Three design objectives apply:
 - i. Encourage consolidation of smaller lots to allow for master planning of large areas.
 - ii. Provide buffers adjacent to the mobile home park, e.g., increased landscaped setbacks, or complementary uses.
 - iii. Minimize traffic (truck) conflicts with residential activities, including pedestrians.

All applicable sections of the Comprehensive Plan Area of Special Concern E (Area E) have been addressed. See new narrative section titled Wilsonville Comprehensive Plan.

- b. Subsection 4.137.5 and Sections 4.176 and 4.400 related to screening and buffering of proposed storage yard to SW Boberg Road and to residential use south of subject property, landscaping and public improvements on SW Boberg and SW Boones Ferry Roads, and screening of accessory buildings and structures

Required sections and subsection for screening and buffering have been addressed. High wall standards have been applied to the southern property fully sight obscuring fence and high wall screening has been applied around the storage yard. See revised narrative, A0.1, A0.2, and L sheets.

- c. Section 4.156 related to inconsistencies in number of signs, how sign area was calculated, which tenant spaces correspond to which signs, etc., and miscalculation of allowed freestanding sign height on SW Boberg Road

See revised Master Sign Plan and narrative for revised calculations.

- d. Section 4.177 related to location of easements for required fire lanes

Fire access will be provided as noted in in narrative. We don't anticipate need for a fire lane easement. We have added a note on A0.1 for fire lane marking.

- e. Master Sign Plan – refer to b. Section 4.156, above

See revised Master Sign Plan and narrative.

- 2. Insufficient detail in submitted plans and drawings. While some information is provided, the following is specific information still missing:

- a. Existing Conditions (C0.2)

- i. Off-site features including distances from subject property to any structures on adjacent property to south, and building footprints of mobile homes and associated structures
- ii. Locations and uses of streets, private drives, or driveways on adjacent property to south
- iii. Major existing landscaping features including trees located immediately south of the subject property that will be protected during construction

An additional survey was preformed to collect the missing information. The adjacent buildings were surveyed to the extent possible without accessing private property. See revised C0.2.

- b. Site Plan (C1.0)

- i. Public street improvements on SW Boberg and SW Boones Ferry Roads
- ii. ADA ramps in sidewalk on SW Boberg and SW Boones Ferry Roads
- iii. Details of proposed stairs (Item 6)
- iv. Details (height, extent, etc.) of proposed walls (Item 10)
- v. Details of gate (Item 15) and fence (Item 17)
- vi. Direction and flow of vehicular traffic in/out of site and within site

C1.0 has been revised to include street improvements (sidewalks, and ADA ramps). New site details have been added to sheet A0.2 & A0.3. Sheet A0.5 has been provided to show traffic circulation.

- c. Grading Plan (C2.0)

- i. See b. Site Plan regarding details of proposed walls

Wall heights were labeled on the grading plan

- d. Storm Plan (C3.0)

- i. Design of storm water system is unacceptable. Manufactured/proprietary systems are the last resort. Design must use LIDA (Low Impact Development Approaches) techniques consistent with the City's policy to infiltrate, filter, store, evaporate, and detain runoff as close to its source as possible. Refer to

previous emails from Kerry Rappold and Steve Adams (March 26, 2019) on this topic.

- ii. Amount of impervious surface in parking and paved areas, buildings and accessory structures
- iii. Storm water calculations

Storm water facilities have been decentralized based on LIDA approach. See revised C3.0 and stormwater calculations.

e. Utility Plan (C4.0)

- i. Show water line and 15' easement in south drive aisle (not north)

Public water line and easement were added to the south drive aisle. See C4.0 & A0.1.

f. Tree Maintenance and Protection Plan (L1.1 and L1.2)

- i. Existing off-site trees to be preserved and protected on adjacent property to south and location of protective fencing

Landscape plans show tree protection for off-site trees that are close to the property boundaries.

- ii. Justification for removing trees #1 and #2 (red oaks *Quercus rubra*; 13.5 DBH; fair condition) and consideration to retaining them in a landscape island

The trees in question are in the middle of the proposed storage yard. Saving the trees is not possible.

- iii. Tree protection fencing must be outside dripline of protected trees

Tree protection fencing is shown outside of protected trees drip line.

- iv. Correct tree protection detail – Refer to Public Works Standards RD1230 – requiring 6' chain link with line posts set at least 2' deep in native soil

Landscape Plans have been updated with detail RD1230.

g. Planting Plan (L1.3 and L1.4)

- i. Key for pattern in landscape areas on north, south, and west property boundaries (as it is unclear what is shown)

Planting legend is included on landscape plans.

- ii. List proposed street trees in plant schedule and show their location in relation to street improvements

Landscape plans have been updated to include street trees and street improvements.

- iii. Landscape screening and buffering along entire length of south property boundary to High Wall Standard

Landscape plans have been updated to include a high wall screening standard.

- iv. Screening of proposed storage area from public view and screening and buffering of same area from adjacent residential area to south to High Screen Landscaping Standard or Fully Sight-Obscuring Fence Standard with appropriate level of landscape plantings

Landscape plans have been updated with high screening landscape at the storage yard.

- v. Landscaping along SW Boberg Road

Landscape plans have been updated to include landscaping along SW Boberg Road.

- vi. Detail of landscaping proposed as part of public street improvements on SW Boberg and SW Boones Ferry Roads

Landscape installation details are included with set.

- vii. Wheel stops in east parking area on SW Boones Ferry Road

Wheel stops are not needed along SW Boones Ferry as there is overhang. The sidewalk on the east side is placed 2' from the edge of curb allowing clearance for overhang.

- viii. See comment at d. Storm Plan regarding storm water system design

Storm water layout was updated to design based of the LIDA approach
Areas are included on the storm report
Stormwater calculations are included in the storm report

- ix. Screening of any ground-mounted utility equipment

- x. Irrigation system layout

To be provided at permit submittal

- h. Site Plan (A0.1)

- i. See e. Utility Plan related to water line easement

- ii. Call out retaining wall by stairs on east side of building

- iii. See comment at b. Site Plan regarding walls

- iv. Double check number of parking spaces provided

- v. Correct inconsistencies between Site Plan (A0.1) and Elevations (A2.1 and A2.2) to show wash bay, trash enclosure, dock ramp, loading berth with canopy, etc. on building elevations

- vi. Amount of impervious surface in parking and paved areas, buildings and accessory structures

Easements, call outs and inconsistencies on the elevation have been addressed. See revised A0.1.

- i. Site Details (A0.2)

- i. As indicated on Site Plan (C1.0) provide architectural plans for stairs, walls, gates (other than trash enclosure), and fence

- ii. Detail of long-term bicycle parking provided inside lobby areas
- iii. Details for lampposts, wall-mounted building lights, wall-mounted building signs
- iv. Color rendering or materials board for freestanding and wall-mounted signs would be helpful

Stairs, fence, gates, light post footing and long-term bike rack details have been added to the A0.2 & A0.3. Cutsheets of specified lighting fixtures were submitted with original submittal, which has been acceptable in past project submitted to City of Wilsonville. Color renderings of signage are compiled with the Master Sign Plan package.

- j. Site Lighting Plan (A0.3)
 - i. Keep location of site lighting in mind related to the adjacent residential area to the south

Site lighting has been revised to better address the adjacent lot and landscaping has been better integrated. See A0.3.

- k. Floor Plan (A1.1 and A1.3))
 - i. Clearly indicate which tenant spaces will be occupied by Industrial Focus and which by other future tenants
 - ii. Correct shading on shared lobby areas (on Split Level and Level 3 Floor Plans)
 - iii. Location of long-term bicycle parking spaces inside lobby areas

Tenant spaces have been clearly identified on floor plans. Due to the resized lobby the Long-term bicycle storage will be in tenant spaces, not in the lobbies. Locations will be specified on tenant improvement submittals. See A1.1 & A1.3

- l. Elevations (A2.1 and A2.2)
 - i. Show wash bay on north elevation
 - ii. Show dock ramp on south elevation
 - iii. Show trash enclosure on west elevation
 - iv. Wrap paint striping on west elevation wall to add visual and architectural relief to view from SW Boberg Road
 - v. Color renderings or perspectives of building elevations would be helpful
 - vi. Screening of roof-mounted mechanical equipment

Elevations have been revised to include the wash bay, trash enclosure and dock. Horizontal reveals continue to west side of building. Screening of roof-mounted mechanical equipment is not necessary due the height of building and parapet. See revised 2.1 & 2.2 and screening diagram.

- m. Sign Plan (not included in plan set)
 - i. To scale, showing location, size, design, materials, color and methods of illumination of all exterior signs
 - ii. Location of directional signage

A Master Sign Plan package has been assembled to include written guidelines, site sign plan, elevations and colored sign elevations, No directional signage is proposed, see revised narrative.

It shall be noted that some design elements have been altered from the original submittal. (3) sets of printed copies of the response package along with a digital copy have been included.

Sincerely,

A handwritten signature in blue ink that reads "Gavin Russell". The signature is written in a cursive style with a large initial 'G' and 'R'.

Gavin Russell
Project Manager



Meeting Minutes

Date: 05/21/19

Subject: Neighborhood Meeting – Walnut Mobile Home Park

Project Title: Industrial Focus

Project No: 180146.01

By: Gavin Russell

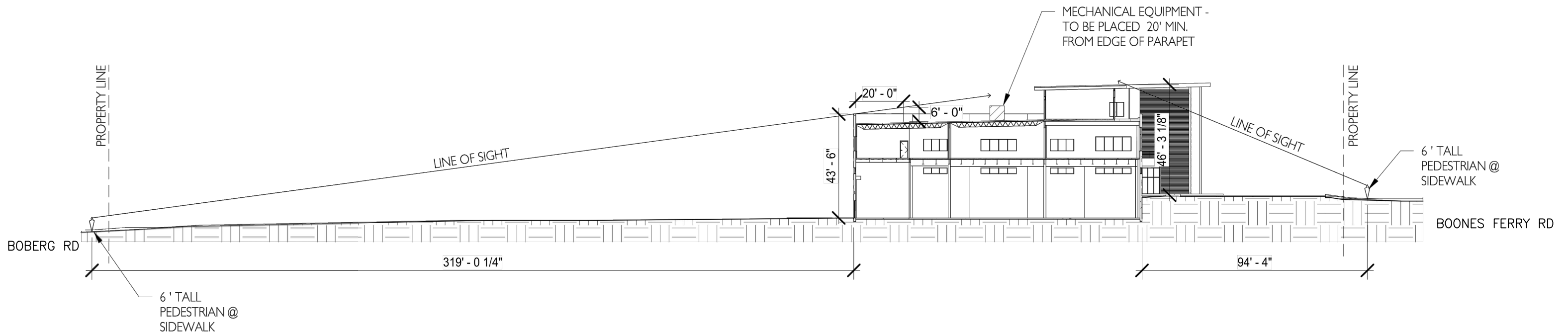
15895 SW 72ND AVE
SUITE 200
PORTLAND, OR 97224
PHONE: 503.226.1285
FAX: 503.226.1670
INFO@CIDAINC.COM
WWW.CIDAINC.COM

NOTES:

- Residents' concerns
 - Trucks turning into and out of property.
 - Should not impact current on street parking
 - New sidewalks should improve walkability
 - Hours of operation
 - Standard working hours 7 am to 6 pm.
 - No earlier than 6:30 am.
 - Nighttime occupancy would only be during emergencies
 - Will follow Wilsonville standards
 - Type of work
 - Industrial
 - Rental yard
 - Wall location and type
 - 10' landscape buffer with 6' masonry wall
 - Will extend full length of property line while maintaining vision triangles
 - Existing Landscaping
 - Tree to be protected on eastern edge of lot
 - Scrub brush and arborvitae to be removed
 - Construction schedule
 - Break ground in August
- Conclusion
 - Overall positive comments towards the new development. Residents were satisfied with proposed landscape buffer and wall.

ARCHITECTURE
ENGINEERING
PLANNING
INTERIORS

Every effort has been made to accurately record this meeting. If any errors or omissions are noted, recipients are asked to please provide written response within five days of receipt.



NOTE: MECHANICAL EQUIPMENT SCREENING OF ROOF UNITS IS NOT NECESSARY. PARAPET AND BUILDING ELEMENTS OBSCURE VIEWS FROM BOTH RIGHT OF WAYS.



**INDUSTRIAL FOCUS
WILSONVILLE, OREGON**

15895 SW 72ND AVE SUITE 200
 PORTLAND, OREGON 97224
 TEL: 503.226.1285
 FAX: 503.226.1670

MECHANICAL EQUIPMENT SCREENING

1" = 50'-0"

180146.01

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RTS SERIES

RIVEER TREATMENT SYSTEMS

RTS
5000

RTS
4000

RTS
3000

RTS
1000

RTS
500

RIVEER

RIVEERTM

Engineered Wash Water
Recovery Systems

The Solution is Clear with RiveerSM

RTS SERIES

Riveer Treatment Systems



WORLD CLASS WATER TREATMENT AND RECYCLING

The RTS Series of closed loop water treatment systems have been specifically designed to be used in wash rack applications. The systems recycle wash water from the above-ground wash racks, in-ground sumps, skid steer troughs, conveyors or trench drains. The zero discharge process allows environmentally safe cleaning by using simple filtration processes included in all models: built-in oil and water separation, ozone injection, oil coalescing, oil skimming, absolute filtration and more. Not only can RTS Series be used for equipment washing and corrosion control, but it can also save powder-coaters tens of thousands of dollars by recycling phosphate pretreatment chemicals. Whether you are degreasing or acid washing parts, or demucking equipment, the RTS Series can save you time and money while avoiding EPA fines.

FAST TO SET UP, EASY TO OPERATE AND SIMPLE TO MAINTAIN

- RTS Systems are assembled and ready to be hooked up to a concrete wash pad, spray booth or a modular Riveer Rack system. Professional technicians ensure the system is properly installed and that your operators and maintenance personnel are fully trained.
- A detailed manual and maintenance schedule accompanies every system in order to make operation and maintenance simple. Need help? We're just a phone call away.

Riveer RTS meets all US and CE electric standards: UL, TUV, IEC, NEC, NFPA.

Covered by patent numbers 6,021,792 and 6,164,298 with others pending



RTS 3000



RTS 3000 – MODERATE SOLIDS

For moderate to heavy mud and oil loads, the RTS 3000 filtration system features inclined plate separators to settle mud in a large initial settling chamber. The chamber is sloped to a valve that automatically purges settled solids. Oil coalescing in conjunction with ozone or bacteria injection completes the initial stage. Wash water is recovered with a run-dry diaphragm pump or a cast iron WSO sump pump where appropriate (this sump pump is capable of pumping large solids up to 3/4"). High-pressure industrial media filtration removes suspended solids, heavy metals and VOCs. This filter is automatically back-washed when needed. A final absolute polishing filter cleans the water down to 5 microns before sending it to a holding tank. Like all Riveer systems, it continuously circulates water and injects ozone to prevent odors.



EXCLUSIVE FEATURES

- Filter automatically back-washes when needed
- Settled mud is automatically purged with high-pressure water
- Oil coalescing with automatic oil skimmer
- Automatic 24/7 ozone injection and/or automatic 24/7 bacteria and air injection with pH adjust
- Continuous recirculation
- 475 gallons of mud settling

APPLICATIONS

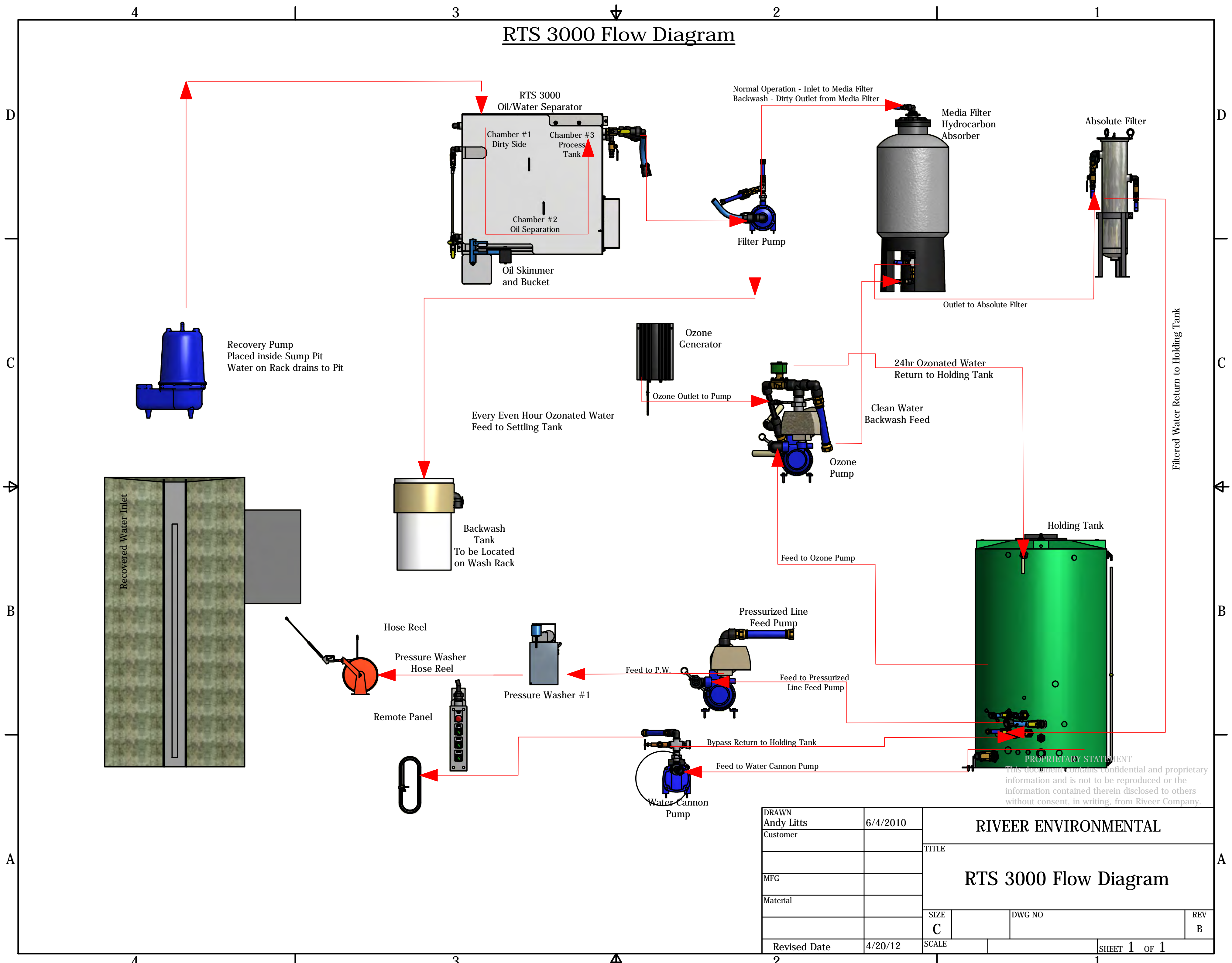
Designed for moderate mud loads found in washing:

- Equipment covered in mud, clay, debris and oils
- Industrial and commercial vehicles
- Municipal road vehicles, including salt trucks and street sweepers
- Rental equipment

MARKETS SERVED

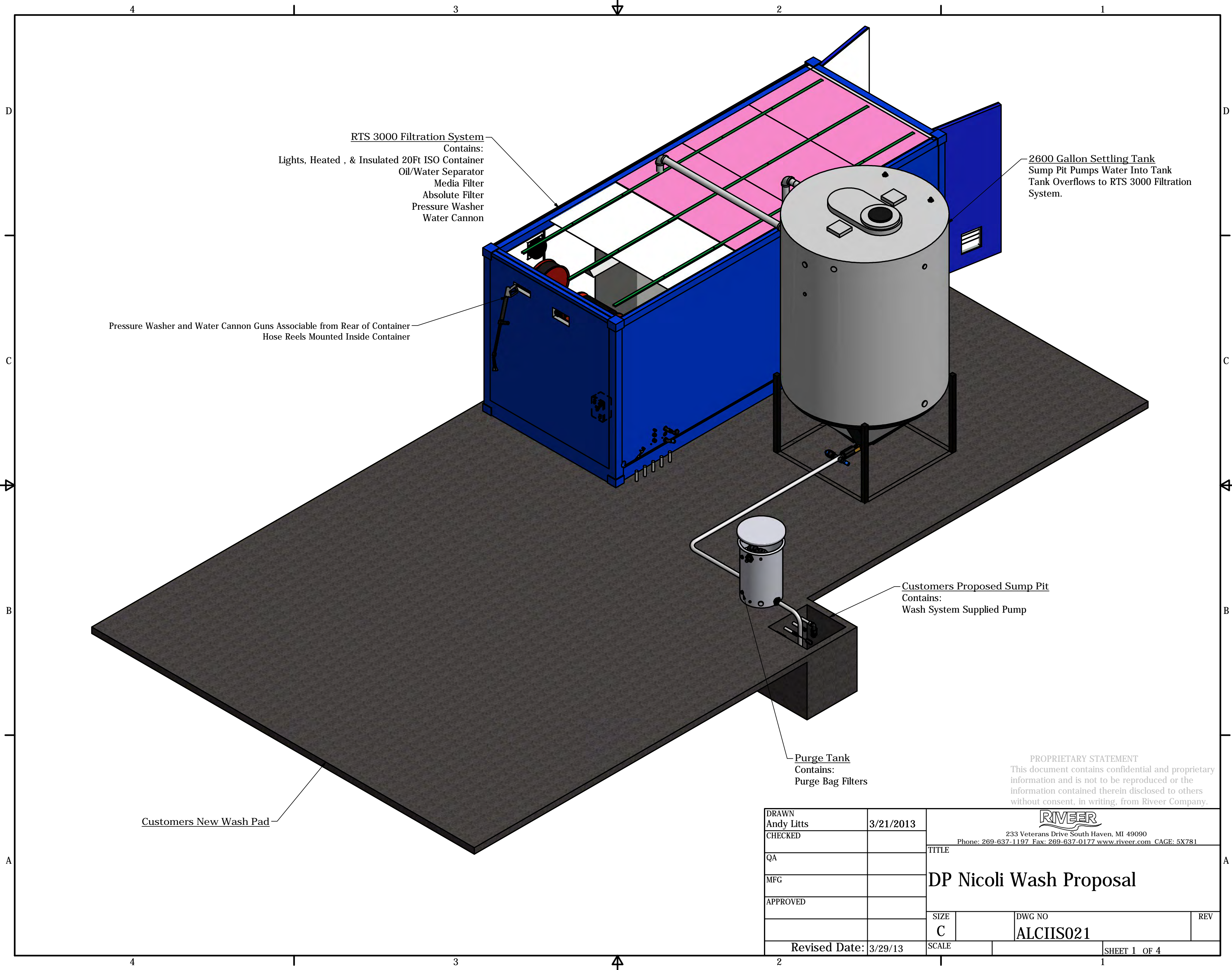
- Rental Industry
- Municipal
- Equipment Distributors
- Military
- Construction
- Mining
- Oil and Gas

RTS 3000 Flow Diagram



PROPRIETARY STATEMENT
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DRAWN Andy Litts	6/4/2010	RIVEER ENVIRONMENTAL		
Customer		TITLE		
MFG		RTS 3000 Flow Diagram		
Material		SIZE C	DWG NO	REV B
Revised Date	4/20/12	SCALE	SHEET 1 OF 1	



RTS 3000 Filtration System
 Contains:
 Lights, Heated, & Insulated 20Ft ISO Container
 Oil/Water Separator
 Media Filter
 Absolute Filter
 Pressure Washer
 Water Cannon

2600 Gallon Settling Tank
 Sump Pit Pumps Water Into Tank
 Tank Overflows to RTS 3000 Filtration System.


Pressure Washer and Water Cannon Guns Associate from Rear of Container
 Hose Reels Mounted Inside Container

Customers Proposed Sump Pit
 Contains:
 Wash System Supplied Pump

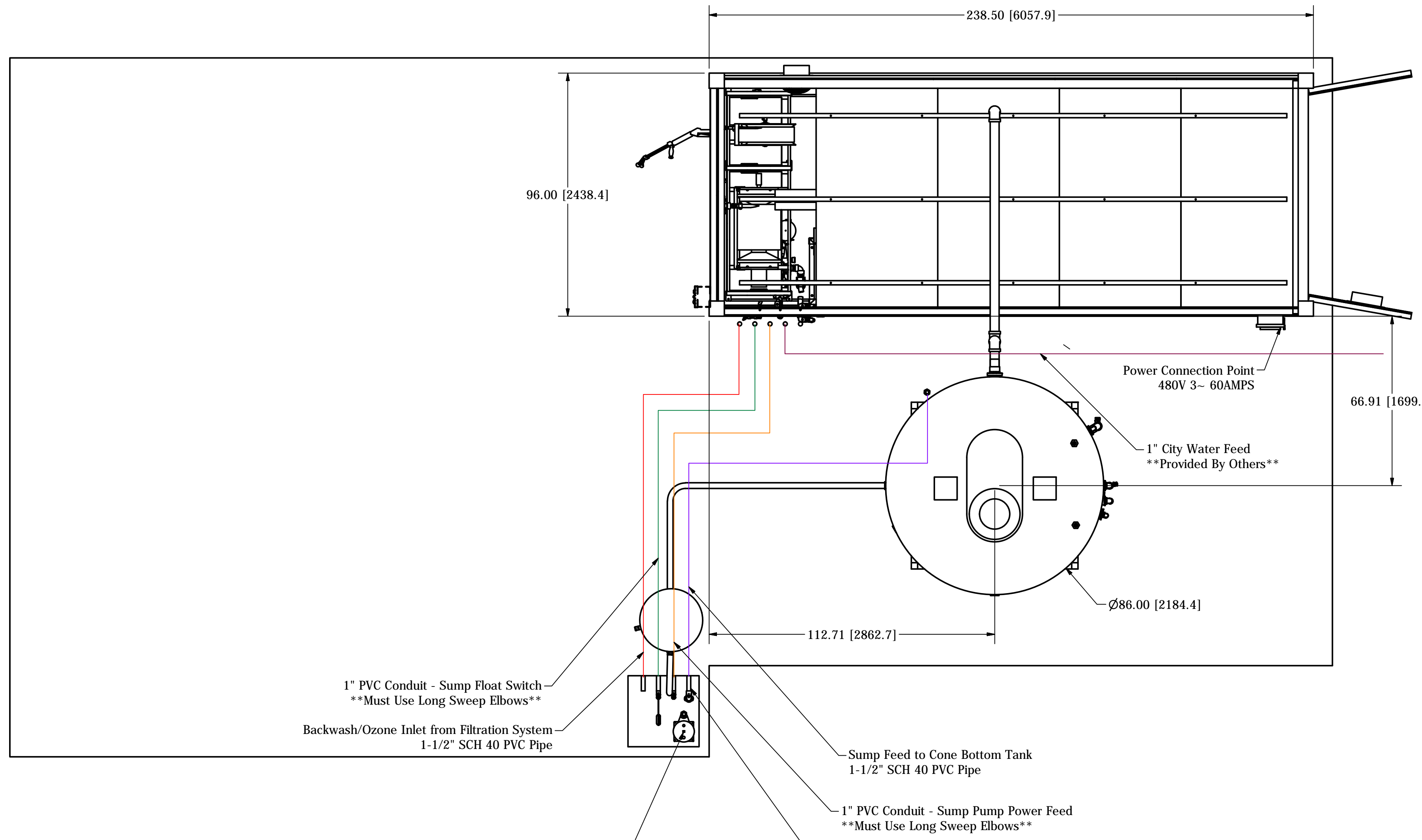
Purge Tank
 Contains:
 Purge Bag Filters

Customers New Wash Pad

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DRAWN Andy Litts	3/21/2013	 233 Veterans Drive South Haven, MI 49090 Phone: 269-637-1197 Fax: 269-637-0177 www.riveer.com CAGE: 5X781		
CHECKED				
QA		TITLE DP Nicoli Wash Proposal		
MFG		SIZE C	DWG NO ALCIIS021	REV
APPROVED		SCALE	SHEET 1 OF 4	
Revised Date: 3/29/13				

Wash System Piping Requirements



PROPRIETARY STATEMENT
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DRAWN Andy Litts	3/21/2013	233 Veterans Drive South Haven, MI 49090 Phone: 269-637-1197 Fax: 269-637-0177 www.riveer.com CAGE: 5X781		
CHECKED		TITLE		
QA		DP Nicoli Wash Proposal		
MFG		SIZE	DWG NO	REV
APPROVED		C	ALCIIS021	
Revised Date: 3/29/13		SCALE	SHEET 2 OF 4	

Questions and Clean Up Items for Industrial Focus 2nd Submittal Plan Set

Case File No. DB19-0013 et al

Sheet	Item	Detail	Action Needed	
CS1: Cover Sheet	Zoning code information – landscaping	Landscaping area provided does not match square footage on A0.1. Is it 26,335 sf or 29,621 sf?	Correct for consistency.	Cover sheet has been corrected.
	Zoning code information – parking spaces	Number of parking spaces is handwritten in.	Clean up.	Cover sheet has been corrected.
C1.0: Hardscape Plan	Wall along south property boundary	No breaks are shown in wall. Where will person doors be located in wall to provide access to landscape/buffer area for maintenance? What will the doors be made of?	Add person door(s) location(s) and provide details.	Door added on East side of biofiltration planters
	On-site pedestrian access and circulation	See note below under A0.1 Site Plan		Door locations updated and pedestrian striping was added on sheets C1.0, C2.0, C3.0, C4.0
C2.0: Grading Plan	Private sidewalk on east side of primary parking	What is the slope of the private sidewalk? Is it ADA compliant?	Verify compliance with ADA standards and provide slope details.	Slope is 3.78%. Elevation points have been added to the plan
	Grading of landscape area in southeast corner of site	It is difficult to read the elevation contours in this area. Is there a retaining wall in this area? Where/how does this transition from the 6-foot wall along the south property boundary? Does the landscape area slope down from the street to the parking area? Does the buffer area slope down/away from the wall along the south property boundary? What is the extent of other walls in the parking area (called out as #10 in the notes)?	Clarity and provide details.	Yes, there is a wall. Grading has been updated and labels have been added to provide clarity. A low point has been created to eliminate any run off from the site to adjacent properties with an area drain to collect the runoff.
	Grading of landscape area in northeast corner of site	It is difficult to read the elevation contours in this area, however, there appears to be steeper slope in this area. Is a retaining wall needed or provided?	Clarify and provide details.	Contour labels have been added to provide clarity. No retaining wall is needed, slopes are at 33.3%
L1.2: Tree Maintenance and Protection Plan	Tree protection notes	Note #5 indicates that fencing will be 4-foot high orange construction fence. This is incorrect and conflicts with detail drawing, which is correct.	Correct for consistency.	Removed note #5.
L1.3: Planting Plan (east)	Street tree species	Notes on plan indicate American hornbeam and Japanese snowbell will be planted as street trees along SW Boones Ferry Road, however, plant schedule and plan show red maple. Do “hornbeam” and “snowbell” notes need to be removed?	Correct for consistency.	
	Projected water consumption for irrigation	Plan should divide landscape areas into categories: high, moderate, low and interim/unique water usage areas, and these should be noted on plan and in plant schedule. [Subsection 4.176 (.09)]	Correct and provide details.	Added sheets L3.A Planting Legend with Water usage and L3.B, Landscape Water Usage Exhibit

	Buffer area along south property boundary	Is one of the proposed trees Hogan cedar or False cypress? The symbols appear identical. Are the proposed tree species fairly easy to maintain – e.g. do not create excessive leaf/flower litter and are not prone to limb failure?	Correct and provide clarification.	Changed the symbol for clarity. Trees are easy to maintain and approved for under power lines.
	Landscape islands on north side of building	No landscaping is shown in the islands adjacent to the north side of the building (except at the northeast corner). What is proposed in these islands?	Correct.	Landscaping is proposed and shown on plans as ground cover.
	10% Parking lot landscaping	3,604 sf (10%) of the 36,044 sf parking area must be landscaped. This requirement is shown on the plan, but the actual area provided is not. Landscaped area south of the wall along the south property boundary may not be counted toward this requirement.	Clarify and provide details.	Areas have been identified on the landscape plan.
L1.4: Planting Plan (west)	Fence and landscaping along SW Boberg Road and north property line	Plants are shown both outside and inside fence along SW Boberg Road and there are no plantings on the west side of the fence by the monument sign. Continuous landscaping is required (see below).	Correct.	Hedge plants have been moved to the west side of the fence and form a continuous high screen.
		Partially sight-obscuring fence is proposed (chain link with slats). Any outdoor storage visible at the property line must be concealed from view at the abutting property line (this includes along SW Boberg Road and neighboring properties to north and south) by a combination of fully sight-obscuring fence and plantings to high screen landscaping standard. [Subsections 4.135 (.05) M. 3., 4.176 (.02) E. and (.04) D.]	Correct.	Added Degroots Spire to the northern property line. The south is screened by the high screen and wall along the property line.
A0.1: Site Plan	Call out for dock ramp	Call out shows #10 but keynotes show dock ramp as #13.	Correct.	Corrected
	Parking spaces	Project Info shows 82 standard parking spaces and 31 compact spaces. A count of spaces shown on the plan totals 79 standards and 31 compact.	Correct for consistency.	Parking stall count has been corrected.
	Keynote #15	Spelling error in Keynote #15. “Pant” should be “Paint”.	Correct.	Corrected
	Long-term bicycle parking	Long-term bicycle parking is noted as “located in building”. Please be aware that the location of long-term parking must be shown on final plan set and will be inspected prior to issuance of Certificate of Occupancy.	Provide detail about location.	Final locations will be shown on tenant improvement submittals.
	Person doors on west side of building	Location of person doors on west side of building does not correspond to A1.1 Lower & First Floor Plan and A2.2 Elevations. There is similar inconsistency with C1.0 Hardscape Plan, C2.0 Grading Plan, C3.0 Storm Plan, C4.0 Utility Plan, and other plans.	Correct all plans for consistency.	Door locations have been corrected.
	Trash enclosure	See note below under A1.1.		

	On-site pedestrian access and circulation	Pedestrian pathway system doesn't extend throughout the site between primary building entrances and all adjacent parking areas, provide separation between pedestrians and vehicles, etc. Particularly problematic on north and west sides of building and to a lesser extent on south side of building. [Section 4.154]	Correct and provide details.	Pedestrian pathway striping has been added to the west side of building. High slope on the north side of the building is not conducive for sidewalks and would require extensive regrading.
	Monument signs	Verify that ground mounted signs are no further than 15 feet from the property line and no closer than 2 feet from a sidewalk or other hard surface in the public right-of-way. [Subsection 4.156.08 (.01) J.]	Verify compliance with standards.	Ground mounted signs meet standard. See revised site plan A0.1.
A0.5: Circulation	Note at bottom of sheet	Spelling error in Note. "Great" should be "Greater".	Correct.	Corrected
A1.1: Lower & First Floor Plan	Trash enclosure	Trash enclosure as shown on A0.1 Site Plan, A0.3 Site Details, and other plans is 20 feet wide. Wall area between roll-up doors on west side of building where enclosure is located is 8 feet wide. How is it possible to fit the trash enclosure in the area indicated?	Clarify and correct.	Door location have been revised to accommodate the location of the enclosure.
	Wash bay	Sides of the wash bay area are shown as tilt walls. Is this correct? It is unclear on A2.1 and 2.2 Elevations whether there is a solid wall or a canopy with half wall. Industrial Performance Standards require all uses and operations except storage, off-street parking, loading and unloading to be conducted wholly within completely enclosed buildings. [Subsection 4.135 (.05) A.]	Clarify, correct, and provide details.	Tilt walls to 12', with 4' of open air to roof. The north side is open. No activity will be visible from Boones Ferry or Boberg road. Material and color will be consistent with the building design.
A2.1: Elevations (north & east)	Shadows on elevations	Including shadows on the elevations is confusing and should be removed.	Correct.	Shadows have been removed.
	Signs	See note below under Master Sign Plan		
A2.2: Elevations (south and west)	Wash bay	See note above under A1.1		
	Trash enclosure	See note under A1.1		
	Signs	See note below under Master Sign Plan		
Master Sign Plan and Elevations	Sign placement on building	The east façade of the building is sign eligible. The north and south façades are not sign eligible and no signage should be placed on these sides of the building. The west façade may be sign eligible in Phase 1, however, construction of the Phase 2 building will make it ineligible and nonconforming; therefore, no signage should be placed on the west building façade. [Subsection 4.156.08 (.02) A.]	Correct all plans.	North, South and West signage has been removed.
		Signage for Tenant 5 is not included on the east façade of the building.	Correct all plans.	East side signage on tenant 5 has been added.