

City of Sandy

Agenda

Planning Commission Meeting
Meeting Location: Hybrid - 39250
Pioneer Blvd. and Zoom
Meeting Date: Monday, January
30, 2023
Meeting Time: 6:30 PM



Page

1. MEETING FORMAT NOTICE

This meeting will be conducted in a hybrid in-person / online format. The Commission or a portion of the Commission will be present in-person in the Council Chambers and members of the public are welcome to attend in-person as well. Members of the public also have the choice to view and participate in the meeting online via Zoom.

To attend the meeting in-person
Come to Sandy City Hall (lower parking lot entrance).
39250 Pioneer Blvd., Sandy, OR 97055

To attend the meeting online via Zoom
Please use this link: <https://us02web.zoom.us/j/89315193990>
If you would rather access the meeting via telephone, dial +1 346 248 7799. When prompted, enter the following meeting number: 893 1519 3990

2. ROLL CALL

3. PLANNING COMMISSION DISCUSSION

- 3.1. Planning Commission Chair Appointments for 2023 3
[Planning Commission Chair Appointments - Pdf](#)

4. APPROVAL OF MINUTES

- 4.1. Draft Minutes for November 28, 2022 4 - 8
[Planning Commission - 28 Nov 2022 - Minutes - Pdf](#)

5. REQUESTS FROM THE FLOOR - CITIZEN COMMUNICATION ON NON- AGENDA ITEMS

The Commission welcomes your comments at this time. Please see the instructions below:

- If you are participating online, click the "raise hand" button and wait to be recognized.

- If you are participating via telephone, dial *9 to "raise your hand" and wait to be recognized.

6. DIRECTOR'S REPORT

7. NEW BUSINESS

7.1. 22-037 DR/VAR - Johnson RV Canopy Cover

9 - 239

Staff recommends the Planning Commission approve this design review application and two variances with conditions as outlined in the staff report.

[22-037 DR/VAR - Johnson RV Canopy Cover - Pdf](#)

[Condition D.3 Modification Memo from Tracy Brown \(January 26, 2023\)](#)

8. ADJOURNMENT



Staff Report

Meeting Date: January 30, 2023

From Kelly O'Neill Jr., Development Services Director

SUBJECT: Planning Commission Chair Appointments

DECISION TO BE MADE:

- Appoint the Chair
- Appoint the Vice Chair

BACKGROUND / CONTEXT:

Each January, the Planning Commission appoints a Chair and Vice Chair. The 2022 appointments were Commissioner Crosby as the Chair and Commissioner Maclean-Wenzel as the Vice Chair.

The Chair assists with setting the Commission agenda, setting time limitations for applicants and the public at hearings, presides over meetings and work sessions, reviews final orders, and coordinates with fellow commissioners. The Vice Chair assumes the Chair responsibilities when the Chair is absent.

In accordance with Title 2, Section 2.16.070, the Chair and Vice Chair shall serve one-year terms. Commissioners shall not serve as the Chair or Vice Chair for more than two consecutive calendar years.

RECOMMENDATION:

At the January 30, 2023, Planning Commission meeting appoint a Chair and Vice Chair for the calendar year of 2023.

SUGGESTED MOTION LANGUAGE:

"I move to appoint Commissioner _____ as the Chair and Commissioner _____ as the Vice Chair of the Sandy Planning Commission for the calendar year of 2023."



MINUTES
Planning Commission Meeting
Monday, November 28, 2022 Hybrid -
39250 Pioneer Blvd. and Zoom 6:30 PM

COMMISSIONERS PRESENT: Hollis MacLean-Wenzel, Commissioner, Jerry Crosby, Commissioner, Chris Mayton, Commissioner, Jan Lee, Commissioner, Breezy Poulin, Commissioner, and Darren Wegener, Commissioner

COMMISSIONERS ABSENT: Steven Hook, Commissioner

STAFF PRESENT: Kelly O'Neill Jr., Development Services Director, Emily Meharg, Senior Planner, Shelley Denison, Associate Planner, and Josh Soper, City Attorney

COUNCIL LIAISON ABSENT: Rich Sheldon, Councilor

1. MEETING FORMAT NOTICE

Instructions for electronic meeting.

2. ROLL CALL

Chairman Crosby called the meeting to order at 6:30 p.m.

3. APPROVAL OF MINUTES

3.1. Draft Minutes for September 26, 2022

Chair Crosby asked for any edits. With no requested edits, Crosby declared the minutes approved.

4. REQUESTS FROM THE FLOOR - CITIZEN COMMUNICATION ON NON-AGENDA ITEMS

None

5. DIRECTOR'S REPORT

Development Services Director O'Neill congratulated Commissioner Mayton and provided a brief summary of the director's report. Commissioner Maclean-Wenzel and Commissioner Mayton asked some additional questions.

6. PLANNING COMMISSION DISCUSSION

Commissioner Maclean-Wenzel told the Commission that she is resigning from the Commission for personal reasons and that she will not be participating beyond the November 28, 2022, meeting. Commissioner Wegener congratulated Commissioner Mayton and thanked Commissioner Maclean-Wenzel for her time spent on the Commission.

Commissioner Crosby polled the Commission on their availability for January 23, 2023. Commissioners Crosby, Lee, and Poulin all stated they are available on January 23. City Attorney Soper said he would review the Planning Commission bylaws during the meeting to determine the quorum rules. Commissioner Mayton provided a brief summary of his time spent on the Commission and thanked everyone.

7. WORK SESSION

7.1. Cul-de-Sac Code Review

Staff Report:

Associate Planner Denison provided a brief presentation on cul-de-sacs and the need to make the code standards clear and objective. Development Services Director O'Neill provided some additional details on why cul-de-sacs were removed from the Sandy Development Code.

Discussion:

Chairman Crosby thanked staff for the work on the cul-de-sac research and talked about the articles in the Commission packet. He then added additional details on his experience with at one time living on a dead-end street on Dubarko Road. Commissioner Lee stated that her experience with dead-end streets has been advantageous where she lives. Chairman Crosby then asked if the City's intent is to encourage or allow cul-de-sacs. Associate Planner Denison stated that the answer would depend on what your priorities are, and then she provided additional details on her research. Commissioner Maclean-Wenzel stated that if we do allow cul-de-sacs, they need to have good bicycle and pedestrian connectivity. Commissioner Wegener stated that he grew up on cul-de-sacs and had a sense of community when living on cul-de-sacs. He then stated that modernizing cul-de-sacs to allow for pedestrian and bicycle access is important.

Chairman Crosby asked if there are other reasons for developers to desire cul-de-sacs. Associate Planner Denison stated that installing cul-de-sacs saves the developer money but is an inefficient use of land. Commissioner Maclean-Wenzel asked if any of the research talked about public transit. Associate Planner Denison said that her research didn't reveal anything about public transit.

Development Services Director O'Neill provided some examples of living on dead end streets, cul-de-sacs, and through streets. Associate Planner Denison said that research shows that both cul-de-sacs and through streets have some safety issues and vehicular/pedestrian conflicts. She went on to elaborate that we should think about how we want the City of Sandy to feel to determine how to write clear and objective code.

Commissioner Maclean-Wenzel stated that when she lived in Portland, she had lots of experience with her children playing in parks instead of streets. Associate Planner Denison stated that additional parkland might be a great idea. Commissioner Mayton stated that driveway design, parking, public transit access, and pedestrian and bicycle connectivity are very important design considerations. He went on to elaborate that the cul-de-sacs he has experiences with have parking issues. Development Services Director O'Neill stated the traditional reasons in Sandy for allowing cul-de-sacs.

Commissioner Wegener asked about the advantages and disadvantages with loop streets. Development Services Director O'Neill stated that loop streets sometimes cause issues for first responders, especially when the names do not change when the cardinal directions change. Commissioner Wegener said that having pocket development is great, but too many cul-de-sacs create pockets and do not allow for a larger development feel. Commissioner Maclean-Wenzel said that the cul-de-sac considerations should take into account evacuation routes. Associate Planner Denison and Development Services Director O'Neill stated that fire evacuation routes should be prioritized. Commissioner Lee stated that a poor example of cul-de-sac use is Sunriver.

Associate Planner Denison stated that if Commissioners have additional thoughts on cul-de-sacs to please send their thoughts to staff in the next few weeks. She also stated that she will send an article from the Washington State Department of Transportation regarding street network connectivity.

8. NEW BUSINESS

8.1. Self-Service Storage Code Modifications (22-043 DCA)

Chair Crosby opened the public hearing on File No. 22-043 DCA at 7:42 p.m. Crosby called for any abstentions, conflicts of interest, ex-parte contact, challenges to the jurisdiction of the Planning Commission, or any challenges to any individual member of the Planning Commission. No challenges were made, and no declarations were made by the Planning Commission.

Staff Report:

Senior Planner Meharg provided a brief presentation on modifying the Sandy Municipal Code regarding self-service storage. City Attorney Soper explained why and when Measure 56 notices are sent.

Public Testimony:

Ara Nenninger
Spartan Investment Group
17301 W Colfax Ave, Ste. 120
Golden, CO 80401

Ms. Nenninger stated that she understands that self-service storage facilities produce less living wage jobs, but that the property manager is paid a living wage. She also stated that self-service storage is an amenity for residents.

Staff Recap:

Senior Planner Meharg explained that the proposed code modifications would not outright ban self-service storage in the city limits, would allow for the existing self-service storage structures to be reconstructed, and would allow an expansion of up to 20 percent. Development Services Director O'Neill provided additional input on the importance of having storage facilities in Sandy, but also stated that prime employment lands such as those adjacent to the new extension of 362nd Drive and Bell Street should be preserved for uses with more employment opportunities.

Motion: Motion to close the public hearing at 7:56 p.m.

Moved By: Commissioner Wegener

Seconded By: Commissioner Mayton

Yes votes: All Ayes

No votes: None

Abstentions: None

Discussion:

Commissioner Mayton stated that he wants some self-service storage in Sandy but is supportive of the proposed code modifications to limit self-service storage in the C-1 and C-2 zones. Commissioner Lee stated that she supports the staff recommendation and that she doesn't want the land by 362nd Drive and Bell Street to be all self-service storage. Commissioner Maclean-Wenzel and Chairman Crosby both supported the staff recommendation. Chairman Crosby stated that the code provisions regarding 'visible from public view' should be clarified. There was additional discussion around visible from public view.

Motion: Motion to forward a recommendation of approval to the City Council to adopt the regulations for self-service storage with notes as identified by the Commission.

Moved By: Commissioner Wegener

Seconded By: Commissioner Mayton

Yes votes: All Ayes

No votes: None

Abstentions: None

The motion passed at 8:07 p.m.

9. **ADJOURNMENT**

Based on discussion earlier in the meeting, City Attorney Soper said that the Commission needs four members present to be considered a quorum. Development Services Director O'Neill stated that he would reach out to Commissioner Hook to determine his availability for January 23, 2023. Chair Crosby adjourned the meeting at 8:10 p.m.



Chair, Jerry Crosby



Planning Director, Kelly O'Neill Jr



Staff Report

Meeting Date: January 30, 2023
From Shelley Denison, Associate Planner
SUBJECT: 22-037 DR/VAR - Johnson RV Canopy Cover

DECISION TO BE MADE:

Deny, approve, or approve with conditions a Type III design review with two variances.

BACKGROUND / CONTEXT:

The applicant is requesting approval to redevelop the site as a recreational vehicle repair and service center. Site improvements include construction of a 7,375 square foot awning on the east side of the existing building, a new access, paving, landscaping, lighting, and stormwater facilities. The applicant is also requesting a Type II Variance to the roof pitch design standard and a Type III Special Variance regarding Industrial Way frontage improvements.

RECOMMENDATION:

Staff recommends the Planning Commission approve this design review application and two variances with conditions as outlined in the staff report.

LIST OF ATTACHMENTS/EXHIBITS:

Attachment 1: Staff Report
Attachment 2: Exhibits A - C
Attachment 3: Exhibits D - H
Attachment 4: Exhibit I
Attachment 5: Exhibit J
Attachment 6: Exhibit K
Attachment 7: Exhibits L - Q

**PLANNING COMMISSION STAFF REPORT
TYPE III LAND USE PROPOSAL**

This proposal was reviewed concurrently as a Type III Design Review with one (1) Type II Variance and one (1) Type III Special Variance. The following exhibits, findings of fact, and conditions explain the proposal and support the staff recommendation.

DATE: January 24, 2023

FILE NO.: 22-037 DR/VAR

PROJECT NAME: Johnson RV Canopy Cover

APPLICANT/OWNER: Robert Murray, Johnson RV

PHYSICAL ADDRESS: 16800 362nd Drive

LEGAL DESCRIPTION: T2S R4E Section 14 Tax Lot 1111

OVERVIEW: The applicant is requesting approval to redevelop the site as a recreational vehicle repair and service center. Site improvements include construction of a 7,375 square foot awning on the east side of the existing building, a new access, paving, landscaping, lighting, and stormwater facilities. The applicant is also requesting a Type II Variance to the roof pitch design standard and a Type III Special Variance regarding Industrial Way frontage improvements.

TABLE OF CONTENTS:

EXHIBITS..... 3

FINDINGS OF FACT..... 4

GENERAL FINDINGS.....4

ZONING – Chapter 17.505

DESIGN REVIEW – Chapter 17.906

 Site Access – Section 17.90.130(A)6

 Pedestrian Accessibility – Section 17.90.130(B).....6

 Building Facades, Materials, and Colors – Section 17.90.130(C)6

 Roof Pitch, Materials, and Parapets – Section 17.90.130(D)7

 External Storage – Section 17.90.130(J).....7

 Trash Collection/Recycling Areas – Section 17.90.130(K)7

FENCES – Chapter 17.748

VARIANCES – Chapter 17.669

 Type II Variance: Roof Pitch9

 Type III Special Variance: Sidewalk Waiver10

TRANSPORTATION, UTILITIES, AND IMPROVEMENTS – Chapters 17.84 and 15.3012

 Sidewalk Requirements – Section 17.84.3012

 Street Requirements – Section 17.84.5012

 Utilities – Sections 17.84.60 and 17.84.8013

 Lighting – Chapter 15.3014

PARKING, LOADING, AND ACCESS REQUIREMENTS – Chapter 17.9815

 Off-Street Parking – Sections 17.98.10 – 17.98.80 and 17.98.16015

 Driveways and Access to Arterial and Collector Streets – Sections 17.98.80 and 17.98.10016

 Landscaping and Screening – Section 17.98.12016

 Drainage – Section 17.98.14017

URBAN FORESTRY – CHAPTER 17.10218

LANDSCAPING AND SCREENING – Chapter 17.92.....19

RECOMMENDATION 21

RECOMMENDED CONDITIONS OF APPROVAL..... 21

EXHIBITS

Applicant's Submittals:

- A. Land Use Applications
- B. Project Narrative
- C. Owner Authorization Letter (dated September 15, 2022)
- D. Civil Plans
 - Sheet C1 – Cover sheet and notes
 - Sheet C2 – Existing conditions
 - Sheet C3 – Site plan
 - Sheet C4 – Utility plan
 - Sheet C5 – Grading/erosion control plan
- E. Architectural Plans
 - Sheet A1.01 – Existing building elevations
 - Sheet A3.01 – Proposed building elevations
- F. Landscape Plans
 - Sheet L101 – Planting plan
 - Sheet L102 – Planting details and notes
- G. Tree Retention Plan
- H. Applicant email regarding tree retention (dated September 14, 2022)
- I. Photometric Analysis and Lighting Cut Sheets
- J. Preliminary Stormwater Report
- K. Traffic Impact Study

Agency Comments:

- L. Fire Marshal (dated June 24, 2022)
- M. City Engineer (dated December 5, 2022)
- N. City Engineer follow up (Dated January 20, 2023)
- O. City Traffic Engineer (dated December 7, 2022)
- P. City Traffic Engineer follow up (dated January 4, 2023)
- Q. City of Sandy Public Works (dated January 9, 2023)

FINDINGS OF FACT

GENERAL FINDINGS

1. These findings are based on the applicant's submittal items received on August 31, 2022, with additional items received on November 14, 2022. The application was deemed complete on November 21, 2022. The 120-day deadline is March 21, 2023.
2. This report is based upon the exhibits listed in this document, including the applicant's submittals and agency comments.
3. This application is not subject to the moratorium on development adopted by City Council through Resolution 2022-24 because it was submitted prior to the effective date of the moratorium and because there is not a new sanitary sewer connection proposed.
4. The subject site at 16800 362nd Drive is approximately 3.4 acres in size. There is an existing structure on the site. This application does not propose removal of the existing structure, but rather an addition to it.
5. The subject site has a Comprehensive Plan Map designation of Light Industrial and a Zoning Map designation of Light Industrial (I-2).
6. The applicant, Johnson RV, submitted an application to construct a 7,375 square foot awning on the east side of the existing building with associated site improvements. This awning is intended to accommodate an RV wash area. The applicant is also requesting the following variances:
 - A. Type II Variance to Section 17.90.130(D.1) to change the roof pitch from the required 3:12 to the requested 2:12.
 - B. Type III Special Variance to Section 17.84.30 to waive sidewalk improvement requirements on the south side of Industrial Way.
7. The City of Sandy completed the following notices:
 - A. A transmittal was sent to agencies asking for comment on November 21, 2022.
 - B. Notification of the proposed application was mailed to affected property owners within 500 feet of the subject property on December 19, 2022.
 - C. A legal notice was published in the Sandy Post on January 18, 2023.
8. At publication of this staff report, no written public comments were received.

ZONING – Chapter 17.50

9. Chapter 17.50 contains the development standards specific to the Light Industrial (I-2) zoning district. The proposed use of the development as RV repair and service is considered a primary use permitted outright per Section 17.50.10(A.2.a).
10. Section 17.50.30 contains development requirements for this zone, including setbacks, landscaping, and structure height.
11. The awning is proposed for the eastern or “rear” yard of the property, and the Code does not specify a rear yard setback.
12. Per the Code, at least 15 percent of the subject site shall be landscaped. Per the landscaping plan (Exhibit F), 15.71 percent of the site will be landscaped.
13. The maximum allowable structure height in the I-2 zone is 45 feet. According to the architectural elevation plans (Exhibit E), the awning is proposed to be 22 feet and eight (8) inches in height.
14. Section 17.50.30(C) requires that all buildings that are visible from an arterial street shall be screened from view by a vegetative buffer of at least 20 feet in depth as measured from the property line and running the entire length of the property. According to Sandy’s current Transportation System Plan, 362nd Drive is a minor arterial street and is visible from the southern, western, and northern property lines. There is an existing vegetative buffer along these edges of the property, but it is currently less than 20 feet in depth in many places. According to the landscaping plan (Exhibit F) and the project narrative (Exhibit B), this buffer will be increased to 20 feet and additional planting provided. Along the northern property line, the Landscape Plan details additional shrubs and trees located within an approximately 10-foot-wide area on the development side of the existing fence; however, no additional landscaping is proposed to be planted in the remaining 10 feet of the landscape buffer on the public right-of-way side of the existing fence. There are many existing conifers along the western property line and the applicant is proposing to plant an additional layer of shrubs behind the existing conifers. In addition, the Landscape Plan details two groupings of proposed evergreen trees located at the northwest corner of the property and where the existing driveway will be removed. However, there are still gaps in the existing and proposed landscaping, particularly just north of the existing conifers on the western property line. Staff conducted a site visit and determined that the existing landscape buffer does not fully screen either the existing building or the RV storage areas and it is likely that some of the proposed shrubs on the submitted Landscape Plan will need to be replaced with evergreen trees capable of growing at least 30 feet in height to accomplish the required screening. **The applicant shall update the landscape plan to detail additional evergreen trees at least eight feet in height and capable of growing to at least 30 feet in height at a density that will create a visual screen within five (5) years.**

DESIGN REVIEW – Chapter 17.90

15. The proposal is subject to all the requirements for Design Review as stated in Section 17.90.00.
16. Section 17.90.70 specifies that **design review approval shall be void after two (2) years from the date of the Final Order unless the applicant has submitted plans for building permit approval.**
17. Section 17.90.130 contains design standards for the Light Industrial (I-2) zone.

Site Access – Section 17.90.130(A)

18. Section 17.90.130(A) requires that all lots shall abut or have access to a dedicated public street. Additionally, each lot shall be permitted one access point, but lots with street frontage of 150 feet or more may be permitted additional access points as approved by the City Engineer.
19. The subject site abuts 362nd Drive and Industrial Way, which are both public streets. There is currently one access point to the site on 362nd Drive approximately 279 feet from the intersection of 362nd Drive and Industrial Way. The applicant is requesting to relocate the existing access southward by approximately 53 feet. The purpose for this is to align the subject site's access point with the access point of the site to the west. See Sheet C3 of Exhibit D for an illustration of this.
20. The applicant is also requesting to construct an additional access point to the site on Industrial Way. This access, which will be gated, is intended to allow movement of large RVs onto and off of the site. The subject lot has over 800 feet of street frontage, and the addition of the Industrial Way access point has been permitted by the City Engineer (Exhibit N).

Pedestrian Accessibility – Section 17.90.130(B)

21. Section 17.90.130(B) requires that the primary entrance to a building must be both attractive and functional, and that building entries must comply with the accessibility requirements of the Oregon State Structural Specialty Code. As no changes are being proposed to the primary entrance of the existing primary structure, this section is not necessary for design review.

Building Facades, Materials, and Colors – Section 17.90.130(C)

22. Section 17.90.130(C.1) outlines facade requirements. Because the proposed development is a canopy cover and does not include facades, this standard is not applicable.
23. Sections 17.90.130(C.2) and 17.90.130(C.3) detail building material and siding requirements. The proposed awning will contain a metal standing seam roof and will be sided with vertical

ribbed metal siding as shown in Exhibit E. Use of metal in this manner is permitted in the subject zoning district.

24. Section 17.90.130(C.4) includes standards related to masonry finishes. No masonry finishes are being proposed as part of this project.
25. Section 17.90.130(C.5) states that buildings must include changes in relief on ten (10) percent of the facades facing public streets. While the architectural plans show changes in relief, it is not clear if they meet the ten (10) percent standard. **The applicant shall submit documentation showing compliance with this standard.**
26. Section 17.90.130(C.6) details color requirements. Earth tones, creams, and pastels of earth tones are preferred for exterior building finishes. The applicant is proposing the paint colors “Sterling Gray” and “Charcoal Gray” for the awning. **The applicant shall submit swatches of these colors for review and approval.**
27. Sections 17.90.130(C.7) through 17.90.130(C.10) do not apply to the design review of this project.

Roof Pitch, Materials, and Parapets – Section 17.90.130(D)

28. Section 17.90.130(D) requires that roofs in the I-2 zoning district have a pitch of 3:12. The existing structure has a roof pitch of 2:12. The applicant is proposing that the awning have a roof pitch of 2:12 to match the existing structure, and they have applied for a Type II Variance to this requirement. Analysis of this variance can be found in analysis of Chapter 17.66 of this staff report.

External Storage – Section 17.90.130(J)

29. Per Section 17.90.130(J), the exterior storage of merchandise and/or materials, except as specifically authorized as a permitted accessory use, is prohibited. The applicant is requesting approval to redevelop the site as a recreational vehicle repair and service center, not as a sales lot for recreational vehicles. **The applicant shall not use the outdoor portion of the property as storage for merchandise and/or related materials unless authorized.**

Trash Collection/Recycling Areas – Section 17.90.130(K)

30. The applicant is proposing a new garbage facility on the south side of the building as shown on Sheet C3 of Exhibit D. This facility will be screened by a chain link fence enclosure with vinyl slats. This complies with the requirements of Section 17.90.130(K).

FENCES – Chapter 17.74

31. Section 17.74.30 contains requirements related to vision clearance. Per Section 17.74.30(A), a vision clearance area shall be maintained on each corner of property at the intersection of two streets. No visual obstruction (e.g., sign, structure, solid fence, or vegetation) shall be placed or located in the "vision clearance area" between the height of 36 inches (three feet) and eight and one-half feet measured from the street grade at the curb line, or where curbs are absent from the edge of asphalt as specified in the table below. Based on the submitted Landscape Plan (Exhibit F), it appears that the applicant is proposing to locate the vegetative buffer at the northwest corner of the subject property within the required vision clearance area. **The applicant shall update the Landscape Plan to detail the minimum 20-foot-deep vegetative buffer as required by Section 17.50.30(C) such that it is located outside of the required vision clearance area.**
32. Section 17.74.40 specifies, among other things, fence height in front, side, and rear yards. According to Section 17.74.40, fences in industrial zones shall not exceed six (6) feet in height in the front yard and eight (8) feet in height in rear and side yards. Section 17.74.40(E.1) states that barbed wire fencing may be permitted for industrial uses when the wire is employed on the top of any other type of fencing, and when the barbed wire is a minimum of six feet above the finished ground surface and does not extend over a public right-of-way. The maximum height shall not exceed eight feet.
33. Sheet C3 of Exhibit D shows a proposed fenced garbage enclosure in what would be considered the side yard of the property. This fence is proposed to be six (6) feet in height, complying with this standard.
34. Sheet C2 of Exhibit D shows an existing six (6) foot tall chain link fence with barbed wire surrounding the property. A portion of this fence will be relocated to accommodate the new entrances on 362nd Drive and Industrial Way. Per Section 17.74.40(E), **the relocated fences shall be six (6) feet in height with the barbed wire extending no more than two (2) feet above the top of the fence.**

VARIANCES – Chapter 17.66

35. The applicant requested the following two (2) variances:

- A. Type II Variance to Section 17.90.130(D.1) to change the roof pitch from the required 3:12 to the requested 2:12.
- B. Type III Special Variance to Section 17.84.30 to waive sidewalk improvement requirements on the south side of Industrial Way.

Type II Variance: Roof Pitch

36. The applicant has requested a variance to the required roof pitch standard found in Section 17.90.130(D). While the Code standard is 3:12, the applicant proposes a 2:12 roof pitch. The applicant's reasoning for this request is that the existing structure has a 2:12 roof pitch and allowing the awning to match would provide architectural consistency.

37. Variances are a means of requesting a major adjustment to development standards, and the Type II Variance process is generally reserved for major adjustments on individual lots.

38. Section 17.66.70 details the review criteria for a Type II Variance:

- A. The circumstances necessitating the variance are not of the applicant's making. The existing structure has been on the site since before the current Code standard requiring a 3:12 roof pitch. Also, the existing building existed on the subject site prior to the property being purchased by the applicant. This criterion is satisfied.
- B. The hardship does not arise from a violation of this Code, and approval will not allow otherwise prohibited uses in the district in which the property is located. Staff finds no reason to believe that allowing a 2:12 roof pitch would open the door to prohibited uses being allowed in the I-2 zone. This criterion is satisfied.
- C. Granting of the variance will not adversely affect implementation of the Comprehensive Plan. According to the Comprehensive Plan, the I-2 zoning district is intended to provide locations for industrial uses which have minimal impact on their surroundings and do not produce undue noise, light, smoke, odor, or other pollutants. There is no evidence to suggest that allowing a 2:12 roof pitch on the proposed project would violate the intent of the I-2 zone. This criterion is satisfied.
- D. The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity. Neighboring property owners were given notice of this project, and no comments from them were received. Additionally, staff finds no reason to believe that an alternative roof pitch would be materially detrimental to the public welfare or injurious to surrounding properties. This criterion is satisfied.

- E. The development will be the same as development permitted under this Code and City standards to the greatest extent that is reasonably possible while permitting some economic use of the land. Save this Variance and the Type III Special Variance (both of which having been applied for appropriately according to the Code), this project complies with the Code. This criterion is satisfied.
- F. Special circumstances or conditions apply to the property which do not apply generally to other properties in the same zone or vicinity, and result from lot size or shape (legally existing prior to the effective date of this Code), topography, or other circumstances over which the applicant has no control. The primary structure on the subject site was constructed prior to the current Code standards. This criterion is satisfied.

Type III Special Variance: Sidewalk Waiver

- 39. The Planning Commission may grant a special variance waiving a specified provision for under the Type III procedure if it finds that the provision is unreasonable and unwarranted due to the specific nature of the proposed development.
- 40. The applicant has requested a Type III Special Variance to the sidewalk improvement requirements found in Section 17.84.30. Specifically, the applicant is requesting a waiver for the requirement to construct a sidewalk along the Industrial Way frontage. The City's adopted Transportation System Plan from 2011 shows that the eastern leg of the 362nd Drive and Industrial Way intersection is planned to be realigned at some point in the future. Therefore, as a sidewalk will be constructed along the Industrial Way frontage during this realignment, staff is supportive of the applicant's request to waive sidewalk improvement requirements along the south side of the current section of Industrial Way. As recommended by the City's Transportation Engineer (Exhibit O) and in accordance with Section 17.84.20(A.2), **the applicant shall pay a fee-in-lieu of sidewalk improvements along the Industrial Way frontage of the subject property in an amount determined by an approved engineer estimate. Prior to submitting the payment, the applicant shall submit an itemized engineer estimate for sidewalk and street tree installation along the entire frontage of Industrial Way for staff review and approval.**
- 41. Section 17.66.80 details the review criteria for a Type III Special Variance. While three criteria are listed, only one must be met.
- 42. The review criterion found in Section 17.66.80(A) requires that the unique nature of the proposed development is such that the intent and purpose of the regulations and of the provisions to be waived will not be violated; and authorization of the special variance will not be materially detrimental to the public welfare and will not be injurious to other property in the area when compared with the effects of development otherwise permitted. Because there are clear plans for sidewalks to be constructed along Industrial Way in the future, staff believes that approving this variance request does not violate the intent of the site improvement standards, nor will it be injurious to the public welfare or nearby properties. In fact, by waiving the sidewalk requirement now and not requiring sidewalk improvements on

Industrial Way with this project but instead with the future realignment, the nuisance inherent to construction activity will be lessened.

TRANSPORTATION, UTILITIES, AND IMPROVEMENTS – Chapters 17.84 and 15.30

43. Chapter 17.84 contains standards for improvements required with development. **All improvements required by the standards in this Chapter shall be installed concurrently with development.**

Sidewalk Requirements – Section 17.84.30

44. Sidewalks are required along both sides of all arterial, collector, and local streets. Industrial Way is a collector street and 362nd Drive is an arterial street as defined by Sandy’s adopted Transportation System Plan. However, as the applicant has requested a waiver to the sidewalk requirements along Industrial Way, this section will only address the sidewalk improvements required along 362nd Drive.
45. According to Section 17.84.30(A.2), sidewalks along arterial streets shall be a minimum of six (6) feet wide. Typically, a planter strip is also required to be sited between the sidewalk and the curb. However, exceptions are made as necessary to continue an existing curb-tight sidewalk. The applicant is proposing a curb tight sidewalk to align with the existing sidewalk. As stated in the narrative (Exhibit B), “the applicant proposes constructing a curb tight sidewalk along the unimproved portion of 362nd Drive. The reason for this is due to the curb tight condition of the existing sidewalk abutting the unimproved section and steep slopes along this portion of the unimproved frontage. Construction of a setback sidewalk with planter strip would require extensive grading, construction of a wall, and the dedication of additional frontage. For these reasons the applicant proposes eliminating the landscape strip as allowed by Section 17.84.30(3)(c) and build a curb tight sidewalk in this location.” The City Engineer (Exhibit M) reviewed the proposal and concluded that the new curb-tight sidewalk shown on 362nd Drive is acceptable. The Proposed Site Plan (Exhibit D, sheet 3) details an approximately 48 square foot proposed public sidewalk easement or dedication to accommodate the 362nd Drive sidewalk extension at the northwest corner of the subject site. **The applicant shall record a right-of-way dedication to accommodate the 362nd Drive sidewalk extension at the northwest corner of the subject site.**
46. Per the City Engineer (Exhibit M), **an ADA compliant ramp with a truncated dome shall be installed at the corner of 362nd Drive and Industrial Way.**
47. **The required sidewalk along the 362nd Drive frontage shall be installed prior to occupancy of the awning area.**

Street Requirements – Section 17.84.50

48. Section 17.84.50(A) explains that a Transportation Impact Study (TIS) is required in order to evaluate the impact of a proposed development on the transportation system. The applicant provided a TIS prepared by a qualified Professional Engineer licensed in the State of Oregon (Exhibit K). The TIS was reviewed by a third-party traffic engineer contracted by the City (Exhibits N and O).

49. According to the submitted TIS, the site is projected to accommodate 18 site trips during the morning peak hour, 22 trips during the evening peak hour, and 108 daily site trips.
50. Based on a review of the TIS submitted by the applicant, the City-contracted traffic engineer has recommended the following conditions of approval:
- A. **Page 10 states that HCM 6th edition was used. The volume – capacity ratio at the intersection of US 26 and 362nd Drive is based on HCM 2000 results. This is not expected to change the findings but the report shall be updated to reflect the appropriate HCM methodology used.**
 - B. **Page 11 states that the 10th edition of the Trip Generation Manual was used to estimate trip generation while the report in the appendix shows the 11th edition was used. The report shall be updated to reflect the appropriate Trip Generation edition used.**
 - C. **The development shall contribute System Development Charges toward citywide impacts.**
 - D. **The development shall clear vegetation as appropriate to maintain the intersection site distance from the site access along Industrial Way.**
 - E. **Minimum sight distance requirements shall be met at all site driveways. Sight distances should be re-verified in the final engineering/construction stages of development.**

Utilities – Sections 17.84.60 and 17.84.80

51. Per Section 17.84.60, all development sites shall be provided with public water, sanitary sewer, broadband (fiber), and storm drainage. **The development shall be connected to these utilities as appropriate.**
52. Section 17.84.60(D) requires that public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies). As shown on Sheet C4 of Exhibit D, an existing public sanitary sewer line currently runs across the front of the subject property. No recorded easement was found to accommodate this facility. As part of the approval for this development, **the applicant shall provide a 15-foot-wide easement for the sanitary sewer facility in compliance with Section 17.84.60(D) and Section 17.84.90(A).**
53. **All public facility installations required with development shall conform to the City's facilities master plans.**

54. **The applicant shall be responsible for making necessary arrangements with franchise utility providers for provision of plans, timing of installation, and payment for services installed.**
55. **All franchise utility distribution facilities installed to serve new development shall be placed underground.**
56. **All site runoff shall be detained such that post-development runoff does not exceed the predevelopment runoff rate for the 2, 5, 10 and 25 year storm events. Stormwater quality treatment shall be provided for all site drainage per the standards in the City of Portland Stormwater Management Manual (COP SWMM).** The City Engineer (Exhibit M) finds that the submitted stormwater report (Exhibit J) is acceptable.
57. The applicant has proposed installing a septage receiving station on the property. Per the city engineer, (Exhibit M), **a sampling manhole shall be required downstream of the grease separator.**

Lighting – Chapter 15.30

58. Chapter 15.30 contains the City of Sandy's Dark Sky Ordinance. Downward facing, full cut-off lighting shall be required. Lights shall not exceed 4,125 Kelvins or 591 nanometers to minimize negative impacts on wildlife and human health. The applicant submitted lighting plans and lighting fixture cut sheets (Exhibit I). All proposed lighting fixtures are shown to be downward facing and full cut-off at 4,000 Kelvins.
59. Section 15.30.060(D) states that all outdoor lighting systems shall be designed and operated so that the area ten feet beyond the property line of the premises receives no more than one-quarter of a foot-candle of light from the premises lighting system. The submitted Lighting and Photometric Plan (Exhibit I) details a maximum foot candle of 0.25 extending ten (10) feet from the property.

PARKING, LOADING, AND ACCESS REQUIREMENTS – Chapter 17.98

60. The intent of Chapter 17.98 is to outline regulations to provide adequate capacity and appropriate location and design of parking and loading areas as well as adequate access to such areas.

Off-Street Parking – Sections 17.98.10 – 17.98.80 and 17.98.160

61. Section 17.98.10(L) states that **required vehicle and bicycle parking spaces shall be unobstructed, available for parking of vehicles and bicycles of residents, customers, patrons, and employees only, and shall not be used for storage of vehicles or materials or for parking of vehicles and bicycles used in conducting the business or use and shall not be used for sale, repair, or servicing of any vehicle or bicycle.**

62. Section 17.98.20 outlines standards regarding off-street parking. According to Section 17.98.20(A.11), the proposed use of the property requires one (1) parking space per 1,000 square feet of total floor area as well as one (1) parking space per two (2) employees. Additionally, two (2) bicycle parking spaces are required.

63. The combined total floor area of the existing and proposed structures is 22,219 square feet. Additionally, 20 employees work at the site. Using the rounding procedure found in Section 17.98.10(P), 32 off-street parking spaces are required.

64. There are 11 existing parking spaces and two (2) existing bicycle parking spaces. The applicant is proposing adding an additional 19 standard parking spaces.

65. Section 17.98.60 details design, size, and access requirements for off-street parking facilities.

66. **The applicant shall pave all areas for required parking and maneuvering of vehicles with a durable, hard surface such as concrete or asphalt.**

67. Per Section 17.98.60(B.1), a standard parking space shall be nine (9) feet by 18 feet. Sheet C3 of Exhibit D shows that all existing and proposed parking spaces meet this requirement.

68. Because the applicant is proposing a double sided two-way 90 degree parking aisle, the minimum aisle width must be 25 feet. According to the site plan (Exhibit D), the proposed aisle width is approximately 35 feet 9 inches.

69. Per Section 17.98.70, **groups of more than three (3) parking spaces shall be permanently striped and shall be provided with adequate aisles or turnaround areas so that all vehicles enter the right-of-way in a forward manner.**

70. As required by Section 17.98.160, bicycle spaces must be 2.5 feet wide and six (6) feet deep. It is unclear from the submitted site plan if the existing bicycle parking spaces meet this requirement. Additionally, as explained in the analysis for Section 17.98.120 of this staff report, a planter will be required in the current location of the site's bicycle parking. **The**

applicant shall submit an updated site plan showing a new location for bicycle parking in compliance with the requirements found in Section 17.98.160.

Driveways and Access to Arterial and Collector Streets – Sections 17.98.80 and 17.98.100

71. According to the adopted Transportation System Plan, Industrial Way is a collector street and 362nd Drive is an arterial street.
72. According to Section 17.98.80(A), accesses to arterials or collectors shall be located a minimum of 150 feet from any other access or street intersection. Exceptions may be granted by the City Engineer. The proposed location for the driveway realignment on 362nd Drive is approximately 105 feet from the intersection of 362nd Drive and Industrial Way. Staff and the City's traffic engineer agree that aligning the driveway on 362nd Drive with the driveway on the abutting property to the west justifies waiving the distance requirement (Exhibit O).
73. According to Section 17.98.100(A), a driveway to an off-street parking area shall be improved from the public right-of-way to the parking area a minimum width of 20 feet for a two-way drive. The proposed site plan (Exhibit D) shows a width of 30 feet for both the driveway on Industrial Way and the driveway on 362nd Drive.

Landscaping and Screening – Section 17.98.120

74. Section 17.98.120(A) requires screening of all parking areas containing four (4) or more spaces according to the underlying zoning district requirements along a public right-of-way.
75. Section 17.98.120(D) states that parking areas shall be divided into bays of not more than 20 parking spaces in parking areas with 20 or more parking spaces. Between, and at the end of each parking bay, there shall be planters that have a minimum width of five (5) feet and a minimum length of 17 feet for a single depth bay. Each planter shall contain one major structural tree and ground cover. According to the proposed site plan (Exhibit D), no proposed parking bay contains more than 20 parking spaces. While planters of appropriate sizes are shown on the site plan on both sides of the proposed parking bay on the west end of the property, the parking bay next to the building does not show a planter on its north end. According to the landscape plan (Exhibit F), each bay is proposed to have a large Village Green Zelkova tree with Creeping Raspberry ground cover. **The applicant shall update the Landscape Plan to detail a tree in a minimum five (5) foot by 17-foot (inside dimension) landscape planter north of the parking bay in front of the building.**
76. Parking area setbacks shall be landscaped with major trees, shrubs, and ground cover as required by Section 17.98.120(E) and Chapter 17.92. The submitted landscape plan (Exhibit F) shows trees, shrubs, and groundcover in the parking area setback.
77. Section 17.98.120(F) requires that wheel stops, bumper guards, or other methods to protect landscaped areas and pedestrian walkways shall be provided. As shown on the proposed site plan (Exhibit D), wheel stops are proposed in front of parking spaces adjacent to the building

to prevent vehicles from encroaching on sidewalks. The proposed parking spaces along the west buffer planting do not require wheel stops due to the depth of this planter.

Drainage – Section 17.98.140

78. Section 17.98.140 states that parking areas, aisles, and turnarounds shall have adequate provisions made for the on-site collection of drainage waters to eliminate sheet flow of such waters onto sidewalks, public rights-of-way, and abutting private property. The applicant submitted a preliminary stormwater management plan (Exhibit J) which shows compliance with the City of Sandy stormwater management requirements. Additionally, as shown on the utility plan (Sheet C4, Exhibit D), all roof and parking lot storm water will be routed to a proposed underground stormwater detention tank.

URBAN FORESTRY – CHAPTER 17.102

79. In addition to the landscaping requirements of Chapter 17.92, Chapter 17.102 contains Urban Forestry regulations. Per Section 17.102.20, this Chapter applies to properties within the Sandy Urban Growth Boundary that are greater than one acre. Because the subject property is approximately 3.4 acres, the standards of this Chapter are applicable.
80. Based on review of an existing site plan (Exhibit D, Sheet 3), a submitted tree retention plan (Exhibit G), and a site visit (Exhibit H), it was determined that there are only two (2) trees at least eight (8) inches DBH on the property. One (1) of these trees will need to be removed in order to accommodate construction of the driveway on Industrial Way.
81. Typically, a Type I permit would be required in order to remove a tree. However, because the requirement found in Section 17.102.50(A.1) that prescribes retention of at least three (3) trees 11 inches DBH or greater would be impossible to meet as there are no such trees on the property, staff determined that it would be appropriate to waive this permit requirement on this land use application.

LANDSCAPING AND SCREENING – Chapter 17.92

82. Section 17.92.10 contains general provisions for landscaping. **All required landscaping and related improvements shall be completed or financially guaranteed prior to the issuance of a Certificate of Occupancy and/or final of the building permit.**
83. **Appropriate care and maintenance of landscaping on-site and landscaping in the adjacent public right-of-way shall be the right and responsibility of the property owner.**
84. Per Section 17.92.10(C), significant plant and tree specimens (8-inch or greater DBH) should be preserved to the greatest extent practicable and integrated into the design of a development. Based on the Existing Conditions Plan (Exhibit D, Sheet 2), a majority of the trees on the subject property are less than 8-inches DBH; however, they are required as part of the landscaping buffer requirement outlined in Section 17.50.30(C). There are three (3) trees on the subject property detailed at 8-inches DBH or greater along the north property line and some additional 8-inch or greater trees located in the Industrial Way right-of-way north of the north property line. Based on the Grading and Erosion Control Plan (Exhibit D, Sheet 5), the applicant is proposing to remove four (4) trees from the subject property, one (1) of which is 8-inches DBH or greater, to accommodate the proposed driveway access to Industrial Way. In addition, the applicant is proposing to remove two (2) trees 8-inches or greater DBH from the Industrial Way right-of-way to accommodate the driveway as well and one (1) additional tree 8-inches DBH or greater at the northwest corner of the site to accommodate the sidewalk extension along 362nd Drive.
85. Section 17.92.20 contains minimum landscaping area requirements. The subject property is zoned Light Industrial, I-2. Section 17.92.20 requires that a minimum of 15 percent of the site be landscaped in the I-2 zoning district. The submitted landscaping plan (Exhibit F) shows a 15.71 percent landscaping area on the property.
86. Section 17.92.30 states that planting of trees is required for all parking lots with four (4) or more parking spaces and along public street frontages. Parking lot trees are required at one (1) medium tree per eight (8) spaces or one (1) large tree per 12 spaces. The applicant is proposing three (3) large canopy trees in the parking area for 32 spaces. Street trees are required at one (1) medium tree every 30 feet or one (1) large tree every 50 feet. According to the landscaping plan (Exhibit F), a number of existing conifer and deciduous trees meeting these spacing requirements and proposed for retention. The 362nd Drive frontage of the site has existing street trees spaced approximately 30 feet on center. The Landscape Plan does not detail a street tree north of the proposed driveway in the space created through the relocation of the existing driveway. **The applicant shall update the Landscape Plan to detail an additional street tree north of the proposed driveway on 362nd Drive spaced approximately 30 feet on center south of the existing street tree at the west Industrial Way intersection.** The applicant is requesting a waiver to frontage improvements along the Industrial Way frontage of the site, including both the sidewalk and the street trees, which is discussed in more detail in Chapter 17.66 of this document.

87. Section 17.92.40 requires that all landscaping shall be irrigated, either with a manual or automatic system. **The applicant shall submit details on the proposed automatic irrigation system with building plans. As required by Section 17.92.140, the applicant shall be required to maintain all vegetation planted in the development for two (2) years from the date of completion, and shall replace any dead or dying plants during that period. Per Section 17.92.10(L), all landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing.**
88. Section 17.92.50 specifies the types and sizes of plant materials that are required when planting new landscaping. Trees are typically required to be a minimum caliper of 1.5-inches measured six (6) inches from grade if deciduous, or five (5) feet in height if coniferous. Shrubs are required to be a minimum of one (1) gallon in size or two (2) feet in height when measured immediately after planting. **All trees planted on the site shall be a minimum of 1.5-inches in caliper measured six (6) inches above the ground (if deciduous) or five (5) feet in height (if coniferous) and shall be planted per the City of Sandy standard planting detail. Evergreen trees needed to meet the requirements of Section 17.50.30(C) shall be a minimum of eight (8) feet in height and capable of growing to at least 30 feet in height. Trees shall be planted, staked, and bark mulch, vegetation, or other approved material installed prior to occupancy and/or the final of the building permit. Tree ties shall be loosely tied twine or other soft material and shall be removed after one (1) growing season (or a maximum of one (1) year). All shrubs shall be a minimum of one (1) gallon in size or two (2) feet in height when measured immediately after planting. Use of native plant materials or plants acclimatized to the Pacific Northwest is encouraged where possible.**
89. Section 17.92.60 requires revegetation in all areas that are not landscaped or remain as natural areas. The applicant did not submit any plans for re-vegetation of areas damaged through construction. **Exposed soils shall be covered by mulch, sheeting, temporary seeding, or other suitable material following construction to maintain erosion control.**
90. Section 17.92.80 requires boundary plantings in parking, loading, and vehicle maneuvering areas to buffer these uses from adjacent properties and the public right-of-way. Parking lot buffer landscaping is discussed in further detail in Section 17.98.120 of this document.
91. Section 17.92.130 contains standards for a performance bond. The applicant has the option to defer the installation of trees and other landscaping for weather-related reasons. Staff recommends the applicant utilize this option rather than planting trees and landscaping during the dry summer months. Consistent with the warranty period in Section 17.92.140, staff recommends a two (2) year maintenance and warranty period for trees and landscaping. **If the applicant chooses to postpone tree and/or landscaping installation, the applicant shall post a performance bond equal to 120 percent of the cost of the trees/landscaping, assuring planting within six (6) months. The cost of the trees shall be based on the average of three (3) estimates from three landscaping contractors; the estimates shall include as separate items all materials, labor, and other costs of the required action, including a two (2) year maintenance and warranty period.**

RECOMMENDATION

Staff recommends the Planning Commission **approve** this design review application and two variances **with conditions as outlined below**.

RECOMMENDED CONDITIONS OF APPROVAL

- A. Prior to submittal of trade permits and/or grading or other construction permits, the applicant shall update the plans submitted with the land use application to include the following items as specified below:**
1. Update the architectural elevation plans to show compliance with the change in relief standard found in Section 17.90.130(C.5).
 2. Submit paint swatches of proposed colors to show compliance with Section 17.90.130(C.6).
 3. Update the Transportation Impact Study with the following:
 - a. Page 10 states that HCM 6th edition was used. The volume – capacity ratio at the intersection of US 26 and 362nd Drive is based on HCM 2000 results. the report shall be updated to reflect the appropriate HCM methodology used.
 - b. Page 11 states that the 10th edition of the Trip Generation Manual was used to estimate trip generation while the report in the appendix shows the 11th edition was used. The report shall be updated to reflect the appropriate Trip Generation edition used.
 4. Update the landscaping plan with the following:
 - a. Detail additional evergreen trees at least eight (8) feet in height and capable of growing to at least 30 feet in height at a density that will create a visual screen within five (5) years.
 - b. Detail the minimum 20-foot-deep vegetative buffer as required by Section 17.50.30(C) such that it is located outside of the required vision clearance area.
 - c. Detail a tree in a minimum five (5) foot by 17-foot (inside dimension) landscape planter north of the parking bay in front of the building.
 - d. Detail an additional street tree north of the proposed driveway on 362nd Drive spaced approximately 30 feet on center south of the existing street tree at the west Industrial Way intersection.
 5. Update the site plan to show a new location for bicycle parking in compliance with the

requirements found in Section 17.98.160.

B. Submit the following information with the Building Permit:

1. Submit details on the proposed automatic irrigation system for staff review and approval. As required by Section 17.92.140, the installer and/or developer shall be required to maintain all vegetation planted with the development for two (2) years from the date of completion, and shall replace any dead or dying plants during that period.
2. Submit a detailed final stormwater report stamped by a licensed professional engineer for staff review and approval. The calculations shall meet the water quality/quantity criteria as stated in the City of Sandy Development Code (SDC) Chapter 13.18 Standards and the City of Portland Stormwater Management Manual (SWMM) Standards that were adopted by reference into the Sandy Development Code.
3. Submit an itemized engineer estimate for sidewalk and street tree installation along the entire frontage of Industrial Way for staff review and approval.
4. Submit draft documents for the 15-foot-wide utility easement and right-of-way dedication for staff review and approval.

C. Prior to receiving a certificate of occupancy and/or final of the building permit, the applicant shall complete all of the following improvements or provide financial assurance for their future completion:

1. Install all required landscaping.
 - a. Appropriate care and maintenance of landscaping on-site and landscaping in the adjacent public right-of-way shall be the right and responsibility of the property owner.
 - b. Per Section 17.92.10(L), all landscaping shall be continually maintained, including necessary watering, weeding, pruning and replacing.
 - c. All trees planted on the site shall be a minimum of 1.5-inches in caliper measured six (6) inches above the ground if deciduous) or five (5) feet in height (if coniferous) and shall be planted per the City of Sandy standard planting detail. Trees shall be planted, staked, and bark mulch, vegetation, or other approved material installed prior to occupancy. Tree ties shall be loosely tied twine or other soft material and shall be removed after one (1) growing season (or a maximum of one (1) year). All shrubs shall be a minimum of one (1) gallon in size or two (2) feet in height when measured immediately after planting. Use of native plant materials or plants acclimatized to the Pacific Northwest is encouraged where possible.
 - d. Exposed soils shall be covered by mulch, sheeting, temporary seeding, or other suitable material following construction to maintain erosion control.

- e. If the applicant chooses to postpone tree and/or landscaping installation, the applicant shall post a performance bond equal to 120 percent of the cost of the trees/landscaping, assuring planting within six (6) months. The cost of the trees shall be based on the average of three (3) estimates from three landscaping contractors; the estimates shall include as separate items all materials, labor, and other costs of the required action, including a two (2) year maintenance and warranty period.
2. Install all required improvements concurrently with development.
 - a. An ADA compliant ramp with a truncated dome shall be installed at the corner of 362nd Drive and Industrial Way.
 - b. The required sidewalk along the 362nd Drive frontage shall be installed with street improvements or with development of the site if street improvements are deferred.
 - c. Pave all areas for required parking and maneuvering of vehicles with a durable, hard surface such as concrete or asphalt.
 - d. The development shall be connected to public utilities as appropriate.
 - e. All public facility installations required with development shall conform to the City's facilities master plans.
 - f. The applicant shall be responsible for making necessary arrangements with franchise utility providers for provision of plans, timing of installation, and payment for services installed.
 - g. All franchise utility distribution facilities installed to serve new development shall be placed underground.
 3. Record a 15-foot-wide public utility easement along 362nd Drive and submit a copy of the recorded easement to the Development Services Department.
 4. Record a right-of-way dedication to accommodate the 362nd Drive sidewalk extension at the northwest corner of the subject site and submit a copy to the Development Services Department.
 5. Pay a fee in-lieu of sidewalk improvements and street tree installation along the Industrial Way frontage of the subject property in an amount determined by an approved engineer estimate.
 6. Submit verification from the project engineer detailing that sight distances are met for both driveways.
 7. Install a sampling manhole downstream of the grease separator.

D. General Conditions

1. Design review approval shall be void after two (2) years from the date of the Final Order unless the applicant has submitted plans for building permit approval.
2. Per Section 17.74.40(E), the relocated perimeter fences shall not be greater than six (6) feet in height with the barbed wire extending no more than two (2) feet above the top of the fence.
3. The applicant shall not use the outdoor portion of the property as storage for merchandise and/or related materials unless authorized.
4. The development shall clear vegetation as appropriate to maintain the intersection site distance from the site access along Industrial Way.
5. All site runoff shall be detained such that post-development runoff does not exceed the predevelopment runoff rate for the 2, 5, 10 and 25 year storm events. Stormwater quality treatment shall be provided for all site drainage per the standards in the City of Portland Stormwater Management Manual (COP SWMM).
6. Required vehicle and bicycle parking spaces shall be unobstructed, available for parking of vehicles and bicycles of residents, customers, patrons, and employees only, and shall not be used for storage of vehicles or materials or for parking of vehicles and bicycles used in conducting the business or use and shall not be used for sale, repair, or servicing of any vehicle or bicycle.
7. Groups of more than three (3) parking spaces shall be permanently striped and shall be provided with adequate aisles or turnaround areas so that all vehicles enter the right-of-way in a forward manner.
8. As required by Section 17.92.10(L), all landscaping shall be continually maintained, including necessary watering, weeding, pruning, and replacing. As required by Section 17.92.140, the developer shall maintain all vegetation planted in the development for two (2) years from the date of completion and shall replace any dead or dying plants during that period.
9. Exposed soils shall be covered by mulch, sheeting, temporary seeding, or other suitable material following grading or construction to maintain erosion control for a period of two (2) years following the date of recording of the final plat associated with those improvements.
10. Successors-in-interest of the applicant shall comply with site development requirements prior to the issuance of building permits.
11. Comply with all standards required by Section 17.84 of the Sandy Development Code. Public and franchise improvements shall be installed or financially guaranteed in accordance with Chapter 17 of the Sandy Municipal Code prior to temporary or final

occupancy of structures. Water lines and fire hydrants shall be installed in accordance with City standards. All sanitary sewer lines shall be installed in accordance with City standards.

12. Comply with all other conditions or regulations imposed by the Sandy Fire District or state and federal agencies.

EXHIBIT A



General Land Use Application

1 page

Name of Project:	Johnson RV Repair and Service Center
Location or Address:	16800 362nd Drive

Map & Tax Lot #	T: 2S	R: 4E	Section: 14	Tax Lot (s): 1111
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Request: Type II design review approval to redevelop the site as a recreational vehicle repair and service center. Site improvements include construction of a 7,375 square foot awning on the east side of the existing building, a new access, paving, landscaping, lighting, and stormwater facilities. The applicant is also requesting a Type II Variance to the roof pitch standard and a Type III Special Variance to Section 17.84.30 regarding Industrial Way frontage improvements.

I am the (check one) owner lessee of the property listed above, and the statements and information contained herein are in all respects true, complete and correct to the best of my knowledge and belief.

Applicant (if different than owner)	Owner Johnson RV (Robert Murray)
Address	Address 41777 Highway 26
City/State/Zip	City/State/Zip Sandy, OR 97055
Email	Email rmurray@johnsonrv.com
Phone	Phone 503-702-6580
Signature	Signature

Staff Use Only

File #:	Date:	Fee\$:	Planner:
Type of review: Type I <input type="checkbox"/> Type II <input type="checkbox"/> Type III <input type="checkbox"/> Type IV <input type="checkbox"/>			
Has applicant attended a pre-app? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, date of pre-app meeting:			

Development Services Department, 39250 Pioneer Blvd, Sandy, OR 97055, 503.489.2160

EXHIBIT B

Project Narrative
for
Johnson RV Repair and Service Center

16800 362nd Drive, Sandy, Oregon
(24E 14 tax lot 1111)



Prepared by
Tracy Brown Planning Consultants, LLC
September, 2022

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I. General Project Description

Johnson RV requests land use approval to redevelop the subject property to provide repair and service for recreational vehicles. The proposal includes construction of a new 7,375 square foot awning on the east side of the existing building to cover a proposed RV wash area, in addition to other site improvements including paving, adding 19 employee parking spaces, constructing a recreational vehicle sanitary sewer dump station, installing an oil-grease separator, and providing stormwater detention/water quality treatment system and landscaping. In addition to these site improvements, the applicant also proposes relocating the existing access on 362nd Drive that will be used primarily by employees and constructing a new access on Industrial Way to allow recreational vehicles to be safely moved on and off the site. The site is expected to employ approximately 20 employees.

The property is located on the east side of 362nd Drive at the corner of 362nd Drive and Industrial Way (16800 362nd Drive) and includes a single tax lot (24E14 tax lot 1111). The property is currently accessed from 362nd Drive.

The subject property contains approximately 3.43 acres and has a Light Industrial (I-2) zoning designation. The property abuts other I-2 designated properties along its southern, northern, and eastern boundaries, and a majority of its western boundary. Fred Meyer, zoned C-2, General Commercial is located across 362nd Drive to the northwest of the site.

The applicant attended pre-application conferences with the City on February 17, 2022.

II. Application Approval Requests

The applicant is requesting the following approvals with this application:

- Type II Design Review;
- Type II Variance to Section 17.90.130(D) regarding roof pitch; and,
- Type III Special Variance to Section 17.84.30 to waive sidewalk improvements along Industrial Way.

III. Items Submitted With This Application

- General Land Use Application
- Notification List and Mailing Labels
- Exhibit A - Project Narrative
- Exhibit B - Civil Plans
 - Sheet C1 - Cover Sheet and Notes
 - Sheet C2 - Existing Conditions Plan
 - Sheet C3 - Site Plan
 - Sheet C4 - Utility Plan
 - Sheet C5 - Grading/Erosion Control Plan

- Exhibit C - Architectural Plans
 - Sheet A1.01 - Existing Elevations
 - Sheet A3.01 - Proposed Building Elevations
- Exhibit D - Landscape Plan
 - Sheet L101 - Planting Plan
 - Sheet L102 - Planting Details and Notes
- Exhibit E - Photometric Analysis and Lighting Cut Sheets
- Exhibit F - Preliminary Stormwater Report
- Exhibit G - Traffic Impact Study

IV. Review of Applicable Approval Criteria

Development applications are required to meet standards set forth in the Sandy Development Code, codified as Title 17 of the Municipal Code. The following section addresses all applicable review criteria. Pertinent code provisions are cited below in plain text followed by a response identifying how the proposal complies with this standard in *italics*.

Chapter	Title
17.50	Light Industrial (I-2)
17.66	Adjustments & Variances
17.74	Accessory Development - Additional Provisions and Procedures
17.80	Additional Setbacks on Collector and Arterial Streets
17.84	Improvements Required with Development
17.90	Design Standards
17.92	Landscaping and Screening
17.98	Parking, Loading, and Access Requirements
17.102	Urban Forestry
15.30	Dark Sky Ordinance

CHAPTER 17.50 - LIGHT INDUSTRIAL (I-2)

It is the intent of this district to provide locations in suitable areas for manufacturing and warehousing business, or other commercial uses that do not depend on high visibility. Commercial or retail uses must be compatible with an environment that includes heavy truck traffic and outdoor storage of industrial materials. Because building design standards are less restrictive in this zone than in other zones, buildings (regardless of use) shall be screened from view from arterial streets and highways.

17.50.10 - PERMITTED USES

A. *Primary Uses Permitted Outright:*

2. Service and professional businesses and organizations, including but not limited to:
 - a. Automotive repair and service;

Response: The proposed use is to provide recreational vehicle repair and service which is similar in nature to an automobile repair and service facility (Section 17.50.10(A)(2)(a)), an outright permitted use in the I-2 zone.

17.50.30 DEVELOPMENT STANDARDS

Standard	Requirement	Proposed
Lot Area	No Minimum	The total site area contains 150,091 sf (3.45 acres)
Lot Dimension	No Minimum	complies
Setbacks Front	30 ft. minimum; 70 ft. maximum	SE 362nd Drive is considered the front lot line. All buildings are existing. Complies
Side or Rear.....	None, unless abutting a more restrictive zone	The site does not abut a more restrictive zone. Complies
Corner	15 ft.	All buildings are existing. Complies
Outside Display/Sale Lot Area	40%	No outside display is proposed.
Lot Coverage - Impervious	80%	Complies
Landscaping	15%	15.71% (23,585 sf) of the site will contain landscaping. Complies
Structure Height	45 ft.	The proposed canopy has an eave height of 19 ft 9 inches Complies
Transit Street Setback	See Chapter 17.82	N/A
Off-street Parking	See Section 17.98	See Chapter 17.98

Response: As shown on the table above, the proposed development complies with all applicable development standards.

- A. Special Setbacks—Side or Rear Yard Abutting a More Restrictive District.
 1. An additional ten feet shall be added for each 10-foot increment in building height over 35 feet;
 2. Measurement of the height transition area shall be made between the foundation of the proposed building and the property line of the abutting district;

3. When the proposed structure has different sections that have different heights, the height transition area shall be measured for each vertical surface as if it were to be freestanding. The building then must be located on the site so that no section is closer to the abutting property line than it would be if the section was free-standing;
4. The required buffering and screening and utilities may be located within the height transition area. Off-street parking, accessory structures and incidental development may be located within the height transition area but not any areas designated as buffering and screening area.

Response: *The proposed development does not abut a more restrictive zoning district and this section is not applicable.*

- B. Off-Street Parking. Parking shall not be located in a required standard 30 foot setback area. Where feasible, ingress and egress to parking shall be provided from side streets or alleys. When access must be provided directly from a public right-of-way, driveways for ingress or egress shall be limited to one per 150 feet. For lots with frontage of less than 150 feet or less, a shared driveway may be required.

Response: *The site is currently accessed by a driveway on 362nd Drive. To increase the safety functioning of this driveway, the applicant proposes moving this driveway to the south to align with a driveway on the west side of 362nd Drive. In addition, to shifting the access on 362nd Drive, a new access is proposed on Industrial Way to be used to move recreational vehicles on and off the site. This driveway will be located about 204 feet from the Industrial Way/362nd. The proposal complies with this section.*

- C. Screening. All buildings (regardless of use) that are visible from an arterial street or highway shall be screened from view by a vegetative buffer as specified below:

1. Minimum depth of the buffer shall be 20 feet measured from the property line and run the entire length of the property.
2. Existing trees shall be preserved to the greatest extent possible.
3. Evergreen trees at least eight feet in height and capable of growing to at least 30 feet in height shall be planted at a density that will create a visual screen within five years.
4. If the property does not abut a highway or arterial street, the screening requirement can be met by an offsite screen that has the effect of screening the property from view from arterial streets and highways.

Response: *The site is located along 362nd Drive, classified in the adopted Transportation Plan as a Minor Arterial. Per this section, the southern, western, and northern property lines are required to contain a vegetative screen as the existing building is visible from 362nd Avenue in these directions. The site currently contains a vegetative buffer planted by the previous occupants of the site. As shown on the submitted Site Plan, the depth of the existing landscaping buffer is less than 20 feet deep as required. For this reason, as shown on the Site Plan, the buffer will be increased to 20 feet and additional planting provided. The proposal complies with this section.*

CHAPTER 17.66 - ADJUSTMENTS AND VARIANCES

As reviewed in this narrative, the proposal complies with all relevant code criteria with the exception of the following:

- Section 17.84.30 regarding completing unimproved frontage improvements on Industrial Way; and,
- Section 17.90.130(D) regarding the minimum roof pitch.

For this reason, the following variances are requested with this application:

- Type II Variance to Section 17.90.130 (D) to allow the new canopy to contain a 2:12 pitch roof rather than 3:12 as required by this section.
- Type III Special Variance requesting a waiver of Section 17.84.30 requiring construction of frontage improvements along Industrial Way.

The narrative below first reviews the Type II Variance followed by the Type III Special Variance.

17.66.70 TYPE II VARIANCE CRITERIA

The authority to grant a variance does not include authority to approve a development that is designed, arranged or intended for a use not otherwise approvable in the location. The criteria are as follows:

Request: *As reviewed in this narrative, the applicant requests a Type II variance to Sections 17.90.130(D) regarding the minimum roof pitch required in the I-2 zone.*

Variance Section 17.90.130(D). *This section requires buildings in the I-2 zone to contain a minimum 3:12 roof pitch. As shown on submitted Building Elevations, the roof pitch of the proposed awning will be 2:12, slightly shallower than what is required. The proposed building addition is more similar to an awning as most of the structure will be open, rather than the roof of an enclosed building. Regardless, staff has advised the applicant to apply for a Type II Variance to this section.*

As reviewed below, the reasons for this request is because of the 2:12 roof pitch of the existing building which the proposed awning will be attached to. The proposed awning structure will attach to the existing building and will continue the 2:12 roof pitch of this structure to the eave of the awning.

A. The circumstances necessitating the variance are not of the applicant's making.

Response: *The circumstances necessitating this variance are due to the roof pitch of the existing building roof which the proposed awning will be attached to. As shown on the submitted Building Elevations, the roof line of the existing building will be extended with the proposed awning. The proposal complies with this criteria.*

B. The hardship does not arise from a violation of this Code, and approval will not allow otherwise prohibited uses in the district in which the property is located.

Response: *Approval of this variance will allow construction of the proposed awning to create a seamless transition between the existing roof and the*

proposed awning. The proposed awning will be located behind the existing building and will be marginally visible due to this location, site conditions, and surrounding site landscaping. The proposal complies with this criteria.

- C. Granting of the variance will not adversely affect implementation of the Comprehensive Plan.

***Response:** Approval of the requested variance will not adversely affect implementation of the Comprehensive Plan. On the contrary, approval of this variance will help to facilitate development of the subject property in accordance with the goals and policies of the Plan. The proposal complies with this criteria.*

- D. The variance authorized will not be materially detrimental to the public welfare or materially injurious to other property in the vicinity.

***Response:** Approval of the requested variance will have no affect on the public welfare or will it be injurious to other property in the vicinity. The proposed roof pitch reduction is intended to blend seamlessly with the roofline of the existing structure. In addition, redevelopment and active use of the subject property will provide overall benefits to properties in the vicinity and the city at large. The proposal complies with this criteria.*

- E. The development will be the same as development permitted under this Code and City standards to the greatest extent that is reasonably possible while permitting some economic use of the land.

***Response:** The requested variance and construction of a 2:12 pitch awning is designed to match the roof pitch of the existing structure and will also contain a similar pitch to other structures in the vicinity. In 2018, the city approved a variance allowing a 1:12 pitch roof to a new structure on the U.S. Metals property located directly south of the subject property. The proposal complies with this criteria.*

- F. Special circumstances or conditions apply to the property which do not apply generally to other properties in the same zone or vicinity, and result from lot size or shape (legally existing prior to the effective date of this Code), topography, or other circumstances over which the applicant has no control.

***Response:** The circumstances necessitating this variance are due to the roof pitch of the existing building and the site specific conditions of this site. These conditions are unique to the subject property and the proposal complies with this criteria.*

Section 17.66.80 - TYPE III SPECIAL VARIANCES

The Planning Commission may grant a special variance waiving a specified provision for under the Type III procedure if it finds that the provision is unreasonable and unwarranted due to the specific nature of the proposed development. In submitting an application for a Type III Special Variance, the proposed development explanation shall provide facts and evidence sufficient to enable the Planning Commission to make

findings in compliance with the criteria set forth in this section while avoiding conflict with the Comprehensive Plan.

Response: *The applicant requests a Special Variance to waive construction of frontage improvements along the Industrial Way frontage on the property as required by Section 17.84.30. The City's 2011 Transportation System Plan, Figure 15 shows the eastern leg of the 362nd Drive and Industrial Way intersection (Project M1) is planned to be realigned at some point in the future. For this reason, it doesn't make sense for the applicant to construct these improvements only to have them removed with construction of the realignment project. At the advice of Planning staff the applicant has requested a Special Variance to this section.*

One of the following sets of criteria shall be applied as appropriate.

A. The unique nature of the proposed development is such that:

1. The intent and purpose of the regulations and of the provisions to be waived will not be violated; and

Response: *The applicant requests approval to waive construction of Industrial Way frontage improvements given the future realignment of this street. Approval of this request make sense given the cost of installing these improvements and the cost to remove them when the realignment project occurs. The proposal complies with this criteria.*

2. Authorization of the special variance will not be materially detrimental to the public welfare and will not be injurious to other property in the area when compared with the effects of development otherwise permitted.

Response: *Elimination of improvements along the Industrial Way frontage will not be materially detrimental to the public welfare as a sidewalk currently exists along 362nd Drive and on the north side of Industrial Way directly across from the subject property. The proposal complies with this criteria.*

- B. The variance approved is the minimum variance needed to permit practical compliance with a requirement of another law or regulation.

Response: *The request to waive construction of these improvements is a temporary condition and will be completed at a later date when Industrial Way is realigned. This request is the minimum variance needed to accommodate the proposed development. The proposal complies with this criteria.*

- C. When restoration or replacement of a nonconforming development is necessary due to damage by fire, flood, or other casual or natural disaster, the restoration or replacement will decrease the degree of the previous noncompliance to the greatest extent possible.

Response: *The proposed use is a new use/redevelopment of the subject property and this criteria is not applicable.*

CHAPTER 17.74 - ACCESSORY DEVELOPMENT—ADDITIONAL PROVISIONS AND PROCEDURES

17.74.40 FENCES AND WINDSCREENS

B. Fences—Commercial/Industrial.

1. Fences on corner lots. Any fence or retaining wall, constructed upon or adjacent to any property line that abuts two or more intersecting streets, shall not exceed three feet in height within the clear vision area.
2. Fences in a front yard (Commercial). The height of a fence or retaining wall in a front yard shall not exceed four feet.
3. Fences in a front yard (Industrial). The height of a fence or retaining wall in a front yard shall not exceed six ft.
4. Fences—Side and Rear Yards. The height of a fence or retaining wall adjacent to a side or rear yard or a side or rear property line shall not exceed eight feet.
5. Sight Obscuring Hedges. Trees or shrubs that form a sight-obscuring hedge shall comply with the same height requirement as a fence within the clear vision area. Deciduous trees separated by at least 15 feet may grow to any height.

Response: As shown on the Existing Conditions Plan, the site is currently surrounded by a six foot tall chain link fence with barbed wire as permitted in the industrial zone. As shown on the Site Plan, a portion of this fence will be relocated to accommodate the entrance on 362nd Drive and the new access on Industrial Way. The proposal complies with this standard.

E. Wire Fences.

1. Barbed wire fencing may be permitted for agricultural, community service, commercial or industrial uses when the wire is employed on the top of any other type of fencing, and when the barbed wire is a minimum of six feet above the finished ground surface, and does not extend over a public way. The maximum height shall not exceed eight feet.
2. No electrically charged or sharp pointed fencing such as razor wire (other than barbed wire fencing) shall be constructed or maintained within the city limits.

Response: The existing chain link fence includes three strands of barbed wire as permitted. All new fencing will also include barbed wire as allowed. All barbed wire is a minimum of six feet above the ground surface and does not extend over a public right-of-way. No electrically charged or razor wire are proposed. The proposal complies with this standard.

F. Fences in excess of six feet in height require a building permit.

Response: No new fencing over six feet is proposed.

CHAPTER 17.80 - ADDITIONAL SETBACKS ON COLLECTOR & ARTERIAL STREETS

17.80.20 SPECIFIC SETBACKS

Any structure located on streets listed above or identified in the Transportation System Plan as arterials or collectors shall have a minimum setback of 20 feet measured from the property line. This applies to applicable front, rear and side yards.

Response: 362nd Drive is identified in the City's Transportation System Plan as a minor arterial and Industrial Way a collector street, both requiring a 20 foot setback.

As shown on the Site Plan, no structures are proposed within 20 feet of these rights-of-way as required. The proposal complies with this standard.

CHAPTER 17.84 - IMPROVEMENTS REQUIRED WITH DEVELOPMENT

17.84.20 TIMING OF IMPROVEMENTS

- A. All improvements required by the standards in this chapter shall be installed concurrently with development as follows:

Response: All improvements will be completed prior to occupancy

2. Where a land division is not proposed, the site shall have required public and franchise utility improvements installed or financially guaranteed in accordance with the provisions of Chapter 17 prior to temporary or final occupancy of structures.

Response: A land division is not proposed.

17.84.30 PEDESTRIAN AND BICYCLIST REQUIREMENTS

- A. Sidewalks shall be required along both sides of all arterial, collector, and local streets, as follows:

1. Sidewalks shall be a minimum of 5 ft. wide on local streets. The sidewalks shall be separated from curbs by a tree planting area that provides separation between sidewalk and curb, unless modified in accordance with Subsection 3 below.

Response: The subject property does not abut a local street.

2. Sidewalks along arterial and collector streets shall be separated from curbs with a planting area, except as necessary to continue an existing curb-tight sidewalk. The planting area shall be landscaped with trees and plant materials approved by the City. The sidewalks shall be a minimum of 6 ft. wide.

Response: As noted above, the subject property abuts Industrial Way identified in the TSP as a collector street and 362nd Drive a minor arterial. As shown on submitted plans, sidewalk improvements on 362nd Drive are proposed as curb tight to match this improvement directly south of the proposed improvement. In addition, the applicant has requested a Special Variance to waive improving the unimproved Industrial Way site frontage.

3. Sidewalk improvements shall be made according to City standards, unless the City determines that the public benefit in the particular case does not warrant imposing a severe adverse impact to a natural or other significant feature such as requiring removal of a mature tree, requiring undue grading, or requiring modification to an existing building. Any exceptions to the standards shall generally be in the following order.

- a. Narrow landscape strips.
- b. Narrow sidewalk or portion of sidewalk to no less than four feet in width.
- c. Eliminate landscape strips.
- d. Narrow on-street improvements by eliminating on-street parking.
- e. Eliminate sidewalks.

Response: As shown on submitted plans, the applicant proposes constructing a curb tight sidewalk along the unimproved portion of 362nd Drive. The reason for this is due to the curb tight condition of the existing sidewalk abutting the unimproved section and steep slopes along this portion of the unimproved frontage. Construction of a setback sidewalk with planter strip would require extensive grading, construction of a wall, and the dedication of additional frontage. For these reasons the applicant proposes eliminating the landscape strip as allowed by Section 17.84.30(3)(c) and build a curb tight sidewalk in this location.

4. The timing of the installation of sidewalks shall be as follows:

Response: All required improvements will be completed prior to occupancy or the applicant will bond these improvements as allowed.

17.84.50 STREET REQUIREMENTS

A. Traffic evaluations may be required of all development proposals in accordance with the following:

1. A proposal establishing the scope of the traffic evaluation shall be submitted for review to the City Engineer. The evaluation requirements shall reflect the magnitude of the project in accordance with accepted traffic engineering practices. Large projects should assess all nearby key intersections. Once the scope of the traffic evaluation has been approved, the applicant shall present the results with and an overall site development proposal. If required by the City Engineer, such evaluations shall be signed by a Licensed Professional Civil Engineer or Licensed Professional Traffic Engineer licensed in the State of Oregon.
2. If the traffic evaluation identifies level-of-service conditions less than the minimum standard established in the Transportation System Plan, improvements and funding strategies mitigating the problem shall be considered concurrent with a development proposal.

Response: The City of Sandy has required the applicant to provide a traffic impact study with this application. The applicant contracted with a Traffic Engineer to complete this study which will be included with the application package.

17.84.60 PUBLIC FACILITY EXTENSIONS

A. All development sites shall be provided with public water, sanitary sewer, broadband (fiber), and storm drainage.

Response: The site will be connected to all utilities as appropriate.

B. Where necessary to serve property as specified in "A" above, required public facility installations shall be constructed concurrent with development.

Response: This section is not applicable.

C. Off-site public facility extensions necessary to fully serve a development site and adjacent properties shall be constructed concurrent with development.

Response: *This section is not applicable.*

- D. As necessary to provide for orderly development of adjacent properties, public facilities installed concurrent with development of a site shall be extended through the site to the edge of adjacent property(ies).

Response: *As shown on the Utility Plan, an existing public sanitary sewer line currently runs across the front of the subject property. No recorded easement was found to accommodate this facility. As part of the approval, the applicant will provide a 15 foot wide easement for this facility. All other onsite facilities will be private.*

- E. All public facility installations required with development shall conform to the City's facilities master plans.

Response: *This section is not applicable.*

- F. Private on-site sanitary sewer and storm drainage facilities may be considered provided all the following conditions exist:

1. Extension of a public facility through the site is not necessary for the future orderly development of adjacent properties;
2. The development site remains in one ownership and land division does not occur (with the exception of land divisions that may occur under the provisions of 17.84.50 F above);
3. The facilities are designed and constructed in accordance with the Uniform Plumbing Code and other applicable codes, and permits and/or authorization to proceed with construction is issued prior to commencement of work.

Response: *All utilities will be private.*

17.84.70 PUBLIC IMPROVEMENT PROCEDURES

Response: *No public improvements are proposed.*

17.84.80 FRANCHISE UTILITY EXTENSIONS

These standards are intended to supplement, not replace or supersede, requirements contained within individual franchise agreements the City has with providers of electrical power, telephone, cable television, and natural gas services (hereinafter referred to as "franchise utilities").

Response: *Franchise utilities will be installed as needed according to the requirements of this section.*

17.84.90 LAND FOR PUBLIC PURPOSES

- A. Easements for public sanitary sewer, water, storm drain, pedestrian and bicycle facilities shall be provided whenever these facilities are located outside a public right-of-way in accordance with the following:

Response: *As noted above, an existing public sanitary sewer lines traverses the site but is not contained within an easement. The applicant intends to provide a 15-foot wide easement to accommodate this facility as required.*

CHAPTER 17.90 DESIGN STANDARDS

17.90.10 APPLICABILITY

The provisions of this chapter apply to all zones and uses as follows except as specified in Sections 17.90.10(B), (C), (D), (E), and (F) below:

- A. All construction within a Commercial or Industrial Zoning District or a non-residential use in a Residential Zoning District including the following:
1. New construction;
 2. Replacement of a building that is destroyed as specified in Section 17.08.30;
 3. Addition to an existing building;
 4. Exterior alterations other than general maintenance on an existing building;
 5. Site improvements including changes to landscaping, parking, civic spaces, etc.
- Response: The proposal includes constructing a new awning/wash facility on the east side of the existing building and additional site improvements. As such, the requirements of this chapter are applicable.*

17.90.130 LIGHT INDUSTRIAL (I-2) DESIGN STANDARDS

A. Access.

1. All lots shall abut or have access to a dedicated public street.
2. All lots which have access to a public alley shall provide for all personal and service access for vehicles from that alley.
3. Parking lots may include public alley accessed garages at the rear property line.
4. Joint use of access points and interconnections shall be required, where deemed needed by the Director and City Engineer.
5. Each lot shall be permitted one access point, except lots with street frontage of 150 feet or more may be permitted one or more additional access point, if approved by the City Engineer.
6. Connection to Adjacent Properties: The location of any real improvements to the property must provide for a future street and pedestrian network to adjacent properties.

Response: The subject property is currently accessed from 362nd Drive. Due to access spacing issues, the applicant proposes relocating this access slightly to the south to align with the existing access across 362nd Drive from the property. In addition, to better accommodate the movement of large RV's on and off the site, the applicant also proposes constructing a new access onto Industrial Way . No joint use access points have been identified or are necessary The proposal complies with this standard.

B. Pedestrian Accessibility.

1. Special attention shall be given to designing a primary building entrance, which is both attractive and functional.
2. Building entries must comply with the accessibility requirements of the Oregon State Structural Specialty Code.
3. Buildings located at the intersection of two streets shall consider the use of a corner entrance to the building.

4. Pedestrian environment may be enhanced by street furniture, landscaping, awnings, and movable planters of seasonal flowers.

Response: *The subject building is existing and no improvements to the building entrance or facade visible from a street are proposed. The proposal complies with this standard.*

C. Building Facades, Materials and Colors.

1. **Facades.** Facades shall be varied and articulated to provide visual interest to pedestrians. Within larger projects, variations in facades, floor levels, architectural features, and exterior finishes shall create the appearance of several smaller buildings.

Response: *No changes to the facade of either building, except the eastern facade of the repair building are proposed.*

2. **Building Materials.** Exterior building materials shall convey an impression of durability. Materials such as masonry, stone, stucco, and wood are encouraged. Metal is not allowed as the primary exterior building material except in the I-2 and I-3 districts, but it may be used for accents including awnings.

Response: *The proposed awning will contain a metal standing seam roof and will be sided with vertical ribbed metal siding as permitted by this section.*

3. **Siding.** Lap or horizontal siding or walls of brick, masonry or stone shall be required. Vertical grooved (i.e., T1-11) sheet siding is prohibited.

Response: *Metal siding is proposed as allowed in the section above. The proposal complies with this standard.*

4. **Masonry Finishes.** Where masonry is used for exterior finish, decorative patterns must be incorporated. Examples of these decorative patterns include multicolored masonry units, such as brick, stone, or cast stone, in layered or geometric patterns or split-faced concrete block to simulate a rusticated stone-type construction.
5. **Change in Relief.** Buildings must include changes in relief on ten percent of the facades facing public streets or residential development. Relief changes include cornices, bases, fenestration, fluted masonry or other treatments for pedestrian interest and scale.

Response: *No masonry is proposed. The proposed awning will be open to the east and north and contain a 20 foot deep section and a 35 foot deep section to provide a degree of relief change. The proposal complies with this section.*

6. **Colors.** Preferred colors for exterior building finishes are earth tones, creams, and pastels of earth tones. High-intensity primary colors, metallic colors, and black may be utilized as trim and detail colors but shall not be used as primary wall colors.

Response: *As noted on the submitted Architectural Plans, the new structure will contain integrated color noted as Sterling Grey with Charcoal Grey trim. The proposed colors comply with this section. Because these colors are different then*

the color of the existing building, the applicant intends to repaint the entire existing building to match the new awning at a later date.

7. **Ornamental Devices.** Ornamental devices, such as molding, entablature and friezes, are encouraged at the roofline. Where such ornamentation is present in the form of a linear molding or board, the band must be at least eight inches wide.
8. **Alcoves, Porches, Arcades, etc.** Building must incorporate features such as arcades, awnings, roofs, porches, alcoves, and porticoes to protect pedestrians from the rain and sun. Awnings and entrances may be designed to be shared between two structures.
9. **Continuous Outdoor Arcades.** Continuous outdoor arcades are strongly encouraged.
10. **Traditional Storefront Elements.** For buildings designed to house retail, service, or office businesses, traditional storefront elements are required. These elements include:
 - a. Clearly delineated upper and lower facades;
 - b. A lower facade dominated by large display windows and a recessed entry or entries;
 - c. Smaller, regularly spaced windows in the upper floor;
 - d. Decorative trim, such as window hoods, surrounding upper floor windows;
 - e. A decorative cornice near the top of the facade.

Response: *The proposed awning does not require any of the design features in these sections.*

D. Roof Pitch, Materials, and Parapets.

1.

Zoning District	Pitch
I-2	3:12

2. Flat roofs (with minimum pitch for drainage) are permitted with detailed stepped parapets or detailed brick coursing.
3. Parapet corners must be stepped or the parapet must be designed to emphasize the center or primary entrance(s), unless the primary entrance is at the corner of the building.
4. Visible roof materials must be wood or architectural grade composition shingle, slate, tile or sheet metal with standing or batten seam.
5. All roof and wall-mounted mechanical, electrical, communications, and service equipment, including satellite dishes and vent pipes, must be screened from public view by parapets, walls or by other approved means.

Response: *No changes to the primary roof structure of either building on the site are proposed. The proposed awning contains a 2:12 pitch roof to match the pitch of the existing building which it is attached to. A Type II Variance to the 3:12 pitch roof standard in this section has been requested as reviewed in Chapter 17.66.*

E. Building Orientation and Entrance Standards.

1. Primary entries shall face a public street or designated pedestrian way.
2. Primary entrances must be architecturally emphasized and visible from the public right-of-way.
3. Buildings must have an entrance connecting directly between the right-of-way and the building interior.
4. Secondary entries may face parking lots or loading areas. Buildings must have an entrance connecting directly between the street and the building interior.
5. Entries shall be sheltered with an overhang or portico with a depth of at least four feet.
6. *Multiple units:* Ground floor units shall face a public street or designated pedestrian way and be visible from the street whenever feasible and shall avoid out-of-direction travel.

Response: *No changes to the facades of either building are proposed.*

F. Windows.

1. Windows, which allow views to the interior activity or display areas, are encouraged. Windows shall include sills at bottom and pediments at the top. Glass curtain walls, reflective glass, and painted or darkly tinted glass shall not be used.
2. Ground Floor Windows. All new buildings must provide ground floor windows along street frontages.
 - a. Required window areas must be either windows that allow views into working areas or lobbies, pedestrian entrances, or display windows.
 - b. Required windows must have a sill no more than four feet above grade. Where interior floor levels prohibit such placement, the sill must be raised to allow it to be no more than two feet above the finished floor level, up to a maximum sill height of six feet above grade.
 - c. Darkly tinted windows and mirrored windows that block two way visibility are prohibited for ground floor windows along street façades.
 - d. Any wall that faces a public right-of-way must contain at least ten percent of the ground floor wall area in display areas, windows, and doorways. Blank walls facing a public right-of-way are prohibited.
 - e. Glass curtain windows are not permitted fronting public rights-of-way.
3. *Upper Floor Window Standards.*
 - a. Glass area dimensions shall not exceed five feet by seven feet. (The longest dimension may be taken either horizontally or vertically.)
 - b. Windows must have trim or molding at least two inches wide around their perimeters.
 - c. At least half of all the window area in upper floors must be made up of glass panes with dimensions no greater than two feet by three feet. Windows that have one foot by one foot grid inside double pane glass are appropriate and are encouraged.

Response: *No new windows or changes to existing windows are proposed.*

G. Landscaping/Streetscape.

1. Benches, outdoor seating, and trash receptacles must complement the existing ornamental street lighting and be in keeping with the overall architectural character of the area.
2. Benches and other streetscape items may be placed within the public right-of-way but must not block free movement of pedestrians. A minimum pedestrian walkway width of five feet must be maintained at all times.

Response: *None of these amenities are proposed.*

H. Lighting.

1. All building entrances and exits must be well lighted.
2. Exterior lighting must be an integral part of the architectural design and must complement any ornamental street lighting and remain in context with the overall architectural character of the district.
3. Lighting must be adequate for safety purposes.
4. Lighting must be of a pedestrian scale and the source light must be shielded to reduce glare.

Response: *A Photometric Analysis is included with the application package.*

I. Safety and Security.

1. Locate windows in a manner, which enables tenants, employees and police to watch over pedestrian, parking and loading areas.
2. In commercial, public and semipublic development and where possible in industrial development, locate windows in a manner which enables surveillance of interior activity from the public right-of-way.
3. Provide an identification system, which clearly locates buildings and their entries for patrons and emergency services.
4. Locate, orient and select on-site lighting to facilitate surveillance of on-site activities from the public right-of-way or other public areas.

Response: *No new windows are proposed to the existing buildings. The applicant intends to install surveillance cameras to monitor on-site activities as necessary.*

J. External Storage.

1. The exterior storage of merchandise and/or materials, except as specifically authorized as a permitted accessory use, is prohibited.

Response: *The majority of the site will be used to stage recreational vehicles for servicing.*

K. Trash Collection/Recycling Areas.

1. All trash collection areas must be located within the structure or behind the building in an enclosure in accordance with the provisions of the City of Sandy Design Standards, Appendix A.

Response: *As shown on the Site Plan, a new garbage enclosure will be located on the south side of the building. This facility will be screened by a chain link fence enclosure with vinyl slats installed.*

CHAPTER 17.92 LANDSCAPING AND SCREENING GENERAL STANDARDS - ALL ZONES

***Response:** As noted above, because of site constraints with the proposed stormwater detention facility and the nature of the proposed use, no onsite landscaping is proposed with this application. The proposal includes landscaping within the public right-of-way in the location of the removed approach on Proctor Blvd.*

17.92.10 GENERAL PROVISIONS

- A. Where landscaping is required by this Code, detailed planting plans shall be submitted for review with development applications. No development may commence until the Director or Planning Commission has determined the plans comply with the purposes clause and specific standards in this chapter. All required landscaping and related improvements shall be completed or financially guaranteed prior to the issuance of a Certificate of Occupancy.

***Response:** A Landscape Plan containing the details of the proposed landscape planting is included with the application package. The applicant understands all required landscaping shall be completed or financially guaranteed prior to the issuance of a final Certificate of Occupancy.*

- B. Appropriate care and maintenance of landscaping on-site and landscaping in the adjacent public right-of-way is the right and responsibility of the property owner, unless City ordinances specify otherwise for general public and safety reasons. If street trees or other plant materials do not survive or are removed, materials shall be replaced in kind within 6 months.

***Response:** All required landscape materials will be cared for as specified in this section.*

- C. Significant plant and tree specimens should be preserved to the greatest extent practicable and integrated into the design of a development. Trees of 25-inches or greater circumference measured at a height of 4-1/2 ft. above grade are considered significant. Plants to be saved and methods of protection shall be indicated on the detailed planting plan submitted for approval. Existing trees may be considered preserved if no cutting, filling, or compaction of the soil takes place between the trunk of the tree and the area 5-ft. outside the tree's drip line. Trees to be retained shall be protected from damage during construction by a construction fence located 5 ft. outside the dripline.

***Response:** The applicant intends to retain all existing landscaping and supplement this by planting additional materials. No significant trees are located on the site.*

- D. Planter and boundary areas used for required plantings shall have a minimum diameter of 5-ft. (2-1/2 ft. radius, inside dimensions). Where the curb or the edge of these areas are used as a tire stop for parking, the planter or boundary plantings shall be a minimum width of 7-1/2 ft.

***Response:** The landscape planters along the north, south, and west property lines are proposed to be formalized with additional plant materials added. In addition, new landscape planters will be added on the south side of the parking bay along*

the west side of the existing building and on the north side of the parking bay along the western property line landscape buffer.

- E. In no case shall shrubs, conifer trees, or other screening be permitted within vision clearance areas of street, alley, or driveway intersections, or where the City Engineer otherwise deems such plantings would endanger pedestrians and vehicles.

Response: *No landscape materials will be located with a vision clearance area.*

- F. Landscaped planters and other landscaping features shall be used to define, soften or screen the appearance of off-street parking areas and other activity from the public street. Up to 35 percent of the total required landscaped area may be developed into pedestrian amenities, including, but not limited to sidewalk cafes, seating, water features, and plazas, as approved by the Director or Planning Commission.

Response: *A landscape planter is proposed at the end of the parking bay on the west side of the existing building and on the north side of the parking bay along the western property line landscape buffer.*

- G. Required landscaping/open space shall be designed and arranged to offer the maximum benefits to the occupants of the development as well as provide visual appeal and building separation.

Response: *As noted above and shown on the plans, 15.71 percent of the site will be landscaped. All landscaped areas are designed to screen the site and to enhance the appearance of the site to provide visual appeal and interest.*

- H. Balconies required for entrances and exits shall not be considered as open space except where such exits and entrances are for the sole use of the unit.

- I. Roofed structures shall not be included as open space except for open unenclosed public patios, balconies, gazebos, or other similar structures or spaces.

Response: *These sections are not applicable.*

- J. Driveways and parking areas shall not be included as open space.

Response: *None of these areas are included in site landscaping calculations.*

- K. All areas not occupied by paved roadways, walkways, patios, or buildings shall be landscaped.

Response: *As shown on submitted plans all areas not occupied by buildings and paved surfaces will be landscaped.*

- L. All landscaping shall be continually maintained, including necessary watering, weeding, pruning and replacing.

Response: *All landscaping is intended to be maintained as required.*

17.92.20 MINIMUM IMPROVEMENTS - LANDSCAPING AND SCREENING

The minimum landscaping area of a site to be retained in landscaping shall be as follows: I-2, Light Industrial - 15%

Response: *As shown on the Landscape Plan and Site Plan, all areas not containing building or hard surfaces will be landscaped. About 23,585 square feet (15.71 percent) of the 3.45 acre total site is proposed to be landscaped. The area of landscaping exceeds the 15 percent minimum landscaping (22,514 square feet) required in the I-2 zone. The proposal complies with this standard.*

17.92.30 REQUIRED TREE PLANTINGS

Planting of trees is required for all parking lots with 4 or more parking spaces, public street frontages, and along private drives more than 150 feet long. Trees shall be planted outside the street right-of-way except where there is a designated planting strip or City adopted street tree plan.

The City maintains a list of appropriate trees for street tree and parking lot planting situations. Selection of species should be made from the city-approved list. Alternate selections may be approved by the Director following written request. The type of tree used shall determine frequency of trees in planting areas. Trees in parking areas shall be dispersed throughout the lot to provide a canopy for shade and visual relief.

Response: *The proposed development contains 19 new parking spaces for a total of 32 spaces. A Landscape Plan is included with the submitted plan set. This plan identifies all proposed landscaping. All existing landscaping will be retained and supplemented with new plant materials.*

17.92.40 IRRIGATION

Landscaping shall be irrigated, either with a manual or automatic system, to sustain viable plant life.

Response: *All formal landscape areas will be irrigated using either a manual or automatic system. The details of this system will be determined with building plans.*

17.92.50 TYPES AND SIZES OF PLANT MATERIALS

- A. At least 75% of the required landscaping area shall be planted with a suitable combination of trees, shrubs, or evergreen ground cover except as otherwise authorized by Chapter 17.92.10 F.
- B. Plant Materials. Use of native plant materials or plants acclimatized to the Pacific Northwest is encouraged where possible.
- C. Trees shall be species having an average mature spread of crown greater than 15 feet and having trunks which can be maintained in a clear condition with over 5 feet of clear wood (without branches). Trees having a mature spread of crown less than 15 feet may be substituted by grouping the same so as to create the equivalent of a 15-foot crown spread.
- D. Deciduous trees shall be balled and burlapped, be a minimum of 7 feet in overall height or 1 1/2 inches in caliper measured 6 inches above the ground, immediately after planting. Bare root trees will be acceptable to plant during their dormant season.
- E. Coniferous trees shall be a minimum five feet in height above ground at time of planting.

- F. Shrubs shall be a minimum of 1 gallon in size or 2 feet in height when measured immediately after planting.
- G. Hedges, where required to screen and buffer off-street parking from adjoining properties shall be planted with an evergreen species maintained so as to form a continuous, solid visual screen within 2 years after planting.
- H. Vines for screening purposes shall be a minimum of 1 gallon in size or 30 inches in height immediate after planting and may be used in conjunction with fences, screens, or walls to meet physical barrier requirements as specified.
- I. Groundcovers shall be fully rooted and shall be well branched or leafed. If used in lieu of turf in whole or in part, ground covers shall be planted in such a manner as to provide complete coverage in one year.
- J. Turf areas shall be planted in species normally grown as permanent lawns in western Oregon. Either sod or seed are acceptable. Acceptable varieties include improved perennial ryegrasses and fescues used within the local landscape industry.
- K. Landscaped areas may include architectural features or artificial ground covers such as sculptures, benches, masonry or stone walls, fences, rock groupings, bark dust, decorative hard paving and gravel areas, interspersed with planted areas. The exposed area developed with such features shall not exceed 25% of the required landscaped area. Artificial plants are prohibited in any required landscape area.

***Response:** The submitted Landscape Plan has been designed in accordance with the standards of this section. All deciduous trees will be at least 1.5-inch caliper, coniferous trees at five feet in height, shrubs will be two to five gallons, groundcover will be four inch pots and spaced 30-inches on-center as appropriate. The submitted Landscape Plan complies with these standards.*

17.92.70 LANDSCAPING BETWEEN PUBLIC RIGHT-OF-WAY AND PROPERTY LINES

Except for portions allowed for parking, loading, or traffic maneuvering, a required setback area abutting a public street and open area between the property line and the roadway in the public street shall be landscaped. That portion of the landscaping within the street right-of-way shall not count as part of the lot area percentage to be landscaped.

***Response:** Offsite landscaping is not counted toward required landscaping. No offsite areas are proposed to contain landscaping.*

17.92.80 BUFFER PLANTING - PARKING, LOADING AND MANEUVERING AREAS

Buffer plantings are used to reduce building scale, provide transition between contrasting architectural styles, and generally mitigate incompatible or undesirable views. They are used to soften rather than block viewing. Where required, a mix of plant materials shall be used to achieve the desired buffering effect. Buffering is required in conjunction with issuance of construction permits for parking areas containing 4 or more spaces, loading areas, and vehicle maneuvering areas.

Boundary plantings shall be used to buffer these uses from adjacent properties and the public right-of-way. On-site plantings shall be used between parking bays, as well as between parking bays and vehicle maneuvering areas. A balance of low-lying

ground cover and shrubs, and vertical shrubs and trees shall be used to buffer the view of these facilities. Decorative walls and fences may be used in conjunction with plantings, but may not be used by themselves to comply with buffering requirements. Exception: truck parking lots are exempt from parking bay buffer planting requirements.

Response: As shown on submitted plans, all parking spaces will be buffered by a landscape planter.

17.92.90 SCREENING (HEDGES, FENCES, WALLS, BERMS)

Screening is used where unsightly views or visual conflicts must be obscured or blocked and where privacy and security are desired. Fences and walls used for screening may be constructed of wood, concrete, stone, brick, and wrought iron, or other commonly used fencing/wall materials. Acoustically designed fences and walls are also used where noise pollution requires mitigation.

- A. Height and Opacity. Where landscaping is used for required screening, it shall be at least 6 ft. in height and at least 80 percent opaque, as seen from a perpendicular line of sight, within 2 years following establishment of the primary use of the site.
- B. Chain Link Fencing. A chain link fence with slats shall qualify for screening only if a landscape buffer is also provided in compliance with Section 17.92.00 above.
- C. Height Measurement. The height of hedges, fences, walls, and berm shall be measured from the lowest adjoining finished grade, except where used to comply with screening requirements for parking, loading, storage, and similar areas. In these cases, height shall be measured from the finished grade of such improvements. Screening is not permitted within vision clearance areas.
- D. Berms. Earthen berms up to 6 ft. in height may be used to comply with screening requirements. Slope of berms may not exceed 2:1 and both faces of the slope shall be planted with ground cover, shrubs, and trees.

Response: All existing and proposed plant materials comply with the requirements of this section.

17.92.100 SCREENING OF SERVICE FACILITIES

Site-obscuring shrubbery or a berm, wall or fence shall be placed along a property line between residential and commercial and industrial zones and around unsightly areas such as trash and recycling areas, gas meters, ground level air conditioning units, disc antennas exceeding 36 inches in diameter and equipment storage or an industrial or commercial use with outside storage of equipment or materials.

Response: The entire site perimeter will be screened by landscape materials as shown on the Landscape Plan.

17.92.110 OUTDOOR STORAGE

All outdoor storage areas for commercial, industrial, public and semi-public uses are to be entirely screened by a sight obscuring fence, vegetative materials, or other alternative deemed appropriate by the Director. Exceptions to the preceding requirements include: new or used cars, cycles and trucks (but not including car parts

or damaged vehicles); new or used boat sales; recreational vehicle sales; new or used large equipment sales or rentals; manufactured home

Response: Recreational vehicles waiting to be repaired will be parked on the site as an ancillary use. No outdoor storage is proposed.

CHAPTER 17.98 PARKING, LOADING, AND ACCESS REQUIREMENTS

17.98.10 GENERAL PROVISIONS

- A. Provision and Maintenance. The provision of required off-street parking for motor vehicles and bicycles, and loading facilities for motor vehicles is a continuing obligation of the property owners. Building permits or other permits will only be issued after review and approval of site plans showing location of permanent access, parking and loading facilities.
- B. Unspecified Requirements. Vehicle and bicycle parking requirements for uses not specified in this chapter shall be determined by the Director based upon the requirements of similar specified uses.
- C. New Structure or Use. When a structure is constructed or a new use of land is commenced, on-site vehicle and bicycle parking and loading spaces shall be provided in accordance with Section 17.98.20 below or as otherwise modified through a planned development or specific area plan.

Response: All of these sections have been reviewed and the proposal addresses these requirements.

- D. Alteration of Existing Structures. When an existing structure is altered to the extent that the existing use is intensified, on-site vehicle and bicycle parking shall be provided in the amount required for such intensification.
- E. Increased Intensity. When increased intensity requires no more than 2 vehicle spaces, no additional parking facilities shall be required. However, the effects of changes, additions, or enlargements shall be cumulative. When the net effect of one or more changes generates a need for more than two spaces, the additional required spaces shall be provided. Additional spaces shall be required for the intensification but not for the original use.
- F. Change in Use. When an existing structure or use of land is changed in use from one use to another use as listed in Section 17.98.20 below and the vehicle and bicycle parking requirements for each use type are the same; no additional parking shall be required. However, where a change in use results in an intensification of use in terms of number of vehicle and bicycle parking spaces required, additional parking space shall be provided in an amount equal to the difference between the number of spaces required for the existing use and number of spaces required for the more intensive use.

Response: The proposed use constitutes a change in use.

- G. Time of Completion. Required parking spaces and loading areas shall be improved and available for use prior to issuance of a temporary occupancy and/or final building inspection.

Response: All required parking will be constructed prior to temporary or final occupancy.

- H. Inoperative Motor Vehicles. In any residential district, all motor vehicles incapable of movement under their own power or lacking legal registration shall be completely screened from public view.
- I. Truck Parking. In residential zoning districts, no overnight parking of trucks or other equipment on wheels or tracks exceeding a 1-ton capacity used in the conduct of a business activity shall be permitted except vehicles and equipment necessary for farming and truck gardening on the premises where such use is conducted.
- J. Mixed Uses. In the case of mixed uses, the total required vehicle and bicycle parking shall be the sum of requirements of individual uses computed separately.
- K. Conflicting Parking Requirements. When a building or use is planned or constructed in such a manner that more than one standard is applicable, the use that requires the greater number of parking spaces shall govern.

Response: *These sections are not applicable.*

- L. Availability of Parking Spaces. Required vehicle and bicycle parking spaces shall be unobstructed, available for parking of vehicles and bicycles of residents, customers, patrons, and employees only, and shall not be used for storage of vehicles or materials or for parking of vehicles and bicycles used in conducting the business or use and shall not be used for sale, repair, or servicing of any vehicle or bicycle.

Response: *All proposed vehicle and bicycle parking spaces will be available as required.*

- N. Location of Required Parking.

1. Off-street vehicle parking required for residential uses, except for residential uses in the Central Business District, shall be provided on the development site of the primary structure. Except where permitted by 17.98.40 below, required parking for all other uses in other districts shall be provided on the same site as the use or upon abutting property.
2. May be utilized in the C-1 Zoning District to meet the minimum parking requirements as specified in Section 17.98.30 (B).
3. Bicycle parking required for all uses in all districts shall be provided on the development site in accordance with Section 17.98.160 below.

Response: *All vehicle and bicycle parking will be located on the same lot as the proposed use.*

- P. Fractions. When the sum of the required vehicle and bicycle parking spaces is a fraction of a space (0.5 or more of a space) a full space shall be required.

Response: *The calculation of required vehicle and bicycle parking has been rounded according to the requirements in this section.*

- Q. Maximum Parking Allowed. Commercial or Industrial zoned properties shall not be permitted to exceed the minimum off-street vehicle parking required by Section 17.98.20 by more than 30 percent.

Response: Section 17.98.20 as reviewed below requires 32 parking spaces and this is the number of spaces proposed with this application.

17.98.20 OFF-STREET PARKING REQUIREMENTS

- A. Off Street Parking Requirements. Off street parking shall conform to the following standards:
1. All square footage measurements are gross square feet of total floor area.
 2. 18 lineal inches of bench shall be considered 1 seat.
 3. Except as otherwise specified, parking for employees shall be provided based on 1 space per 2 employees for the largest shift in addition to required parking specified in Sections A6-A9 below.
 4. Where less than 5 parking spaces are required, then only one bicycle space shall be required except as otherwise modified in Sections 5-9 below.
 5. In addition to requirements for residential off street parking, new dwellings shall meet the on-street parking requirements in Section 17.98.200.

Response: The proposal complies with these requirements as applicable.

11.

Industrial Uses	Number of Parking Spaces	Number of Bicycle Spaces
Sales, Storage, Rental, Services and Repairs of: recreation vehicles	1 per 1000 sf., plus 1 per 2 employees	2
Required Parking	22,219 sf building = 22 parking spaces	
	Number of employees = 20 20/2 = 10 parking spaces required	
	22 + 10 spaces = 32 spaces required	
Proposed Parking	32 spaces total (30 standard and 2 ADA spaces). 11 existing spaces and 19 new spaces	2 existing spaces

Response: As shown on the table above, the 22,219 square feet of indoor work area require a minimum of 22 vehicle parking spaces and two bicycle parking spaces. In addition, the applicant has indicated the site will employ 20 employees requiring an additional 10 parking spaces (1 space/2 employees). As shown on the submitted Site Plan, 32 vehicle parking spaces (30 standard and two ADA spaces) and two existing bicycle parking spaces in compliance with this standard.

17.98.50 SETBACKS

- A. Parking areas, which abut a residential zoning district, shall meet the setback of the most restrictive adjoining residential zoning district.
- B. Required parking shall not be located in a required front or side yard setback area abutting a public street except in industrial districts. For single family and two-family dwellings, required off-street parking may be located in a driveway.

- C. Parking areas shall be setback from a lot line adjoining a street the same distance as the required building setbacks. Regardless of other provisions, a minimum setback of 5 feet shall be provided along the property fronting on a public street. The setback area shall be landscaped as provided in this code.

Response: No parking is proposed to abut a residential zone and no parking is proposed within a required front or side yard setback area.

17.98.60 DESIGN, SIZE AND ACCESS

All off-street parking facilities, vehicular maneuvering areas, driveways, loading facilities, accessways, and private streets shall conform to the standards set forth in this section.

- A. **Parking Lot Design.** All areas for required parking and maneuvering of vehicles shall have a durable hard surface such as concrete or asphalt.

Response: All parking and maneuvering areas will be surfaced with asphalt.

B. **Size of Space.**

1. A standard parking space shall be 9 feet by 18 feet.
2. A compact parking space shall be 8 feet by 16 feet.
3. Handicapped parking spaces shall be 13 feet by 18 feet. Accessible parking shall be provided for all uses in compliance with the requirements of the State of Oregon (ORS 447.233) and the Americans with Disabilities Act.
4. Parallel parking spaces shall be a length of 22 feet.
5. No more than 35 percent of the parking stalls shall be compact spaces.

Response: All proposed parking spaces are designed in compliance with these standards. All parking spaces will be standard spaces or ADA spaces in compliance with this standard.

C. **Aisle Width.**

Response: All proposed parking spaces comply with these standards.

17.98.70 ON-SITE CIRCULATION

- A. Groups of more than three (3) parking spaces shall be permanently striped.
- B. **Backing and Maneuvering.** Except for a single family dwelling or two family dwelling, groups of more than 3 parking spaces shall be provided with adequate aisles or turnaround areas so that all vehicles enter the right-of-way (except for alleys) in a forward manner. Parking spaces shall not have backing or maneuvering movements for any of the parking spaces occurring across public sidewalks or within any public street, except as approved by the City Engineer. Evaluations of requests for exceptions shall consider constraints due to lot patterns and impacts to the safety and capacity of the adjacent public street, bicycle and pedestrian facilities.

Response: All proposed parking will be permanently striped and the site has sufficient space to allow for all vehicles to turn-around to exit the site in a forward manner.

17.98.80 ACCESS TO ARTERIAL AND COLLECTOR STREETS

- A. Location and design of all accesses to and/or from arterials and collectors (as designated in the Transportation System Plan) are subject to review and approval by the City Engineer. Where practical, access from a lower functional order street may be required. Accesses to arterials or collectors shall be located a minimum of 150 ft. from any other access or street intersection. Exceptions may be granted by the City Engineer. Evaluations of exceptions shall consider posted speed of the street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.
- B. No development site shall be allowed more than one access point to any arterial or collector street (as designated in the Transportation System Plan) except as approved by the City Engineer. Evaluations of exceptions shall consider posted speed of street on which access is proposed, constraints due to lot patterns, and effects on safety and capacity of the adjacent public street, bicycle and pedestrian facilities.
- C. When developed property is to be expanded or altered in a manner that significantly affects on-site parking or circulation, both existing and proposed accesses shall be reviewed under the standards in A and B above. As a part of an expansion or alteration approval, the City may require relocation and/or reconstruction of existing accesses not meeting those standards.

Response: 362nd Drive is classified as a Minor Arterial and Industrial Way, a Collector. The existing access on 362nd Drive is proposed to be relocated to the south and a new access is proposed on Industrial Way. The 362nd Drive access is intended to be used primarily by employees and the Industrial Way access will be used to move recreational vehicles on and off the site. A Traffic Engineer was contracted to prepare a traffic impact study as requested.

17.98.100 DRIVEWAYS

- A. A driveway to an off-street parking area shall be improved from the public roadway to the parking area a minimum width of 20 feet for a two-way drive or 12 feet for a one-way drive but in either case not less than the full width of the standard approach for the first 20 feet of the driveway.
- B. A driveway for a single-family dwelling shall have a minimum width of 10 feet.
- C. A driveway for a two-family dwelling shall have a minimum width of 20 feet. A driveway approach must be constructed in accordance with applicable city standards and the entire driveway must be paved with asphalt or concrete.
- D. Driveways, aisles, turnaround areas and ramps shall have a minimum vertical clearance of twelve feet for their entire length and width but such clearance may be reduced in parking structures.
- E. No driveway shall traverse a slope in excess of 15 percent at any point along the driveway length.
- F. The location and design of the driveway shall provide for unobstructed sight per the vision clearance requirements. Requests for exceptions to these requirements will be evaluated by the City Engineer considering the physical limitations of the lot and safety impacts to vehicular, bicycle, and pedestrian traffic.

Response: The proposal complies with the minimum standards in this section.

17.98.110 VISION CLEARANCE

- A. Except within the Central Business District, vision clearance areas shall be provided at intersections of all streets and at intersections of driveways and alleys with streets to promote pedestrian, bicycle, and vehicular safety. The extent of vision clearance to be provided shall be determined from standards in Chapter 17.74 and taking into account functional classification of the streets involved, type of traffic control present at the intersection, and designated speed for the streets.
- B. Traffic control devices, streetlights, and utility installations meeting approval by the City Engineer are permitted within vision clearance areas.

Response: None of these items are located within vision clearance areas.

17.98.120 LANDSCAPING AND SCREENING

- A. Screening of all parking areas containing 4 or more spaces and all parking areas in conjunction with an off-street loading facility shall be required in accordance with zoning district requirements and Chapter 17.98. Where not otherwise specified by district requirement, screening along a public right-of-way shall include a minimum 5-ft. depth of buffer plantings adjacent to the right-of-way.

Response: The proposal includes 32 parking spaces. All parking spaces will be screened by a 20 foot deep landscaped buffer along 362nd Drive and Industrial Way. The proposal complies with this standard.

- B. When parking in a commercial or industrial district adjoins a residential zoning district, a sight-obscuring screen that is at least 80% opaque when viewed horizontally from between 2 and 8 feet above the average ground level shall be required. The screening shall be composed of materials that are an adequate size so as to achieve the required degree of screening within 3 years after installation.

Response: As shown on the City's Zoning Map, the subject property does not abut a residential zone. For this reason, compliance with this section is not required.

- C. Except for a residential development which has landscaped yards, parking facilities shall include landscaping to cover not less than 10% of the area devoted to parking facilities. The landscaping shall be uniformly distributed throughout the parking area and may consist of trees, shrubs, and ground covers.

Response: The Landscape Plan shows landscaping within and along the edge of all paved areas.

- D. Parking areas shall be divided into bays of not more than 20 spaces in parking areas with 20 or more spaces. Between, and at the end of each parking bay, there shall be planters that have a minimum width of 5 feet and a minimum length of 17 feet for a single depth bay and 34 feet for a double bay. Each planter shall contain one major structural tree and ground cover. Truck parking and loading areas are exempt from this requirement.

Response: All parking areas are divided into bays containing no more than 20 parking spaces. A planter in compliance with this section is proposed at each end of the proposed parking bays.

- E. Parking area setbacks shall be landscaped with major trees, shrubs, and ground cover as specified in Chapter 17.92.

Response: As shown on the submitted Landscape Plan, all parking area setbacks will be landscaped in compliance with Chapter 17.92.

- F. Wheel stops, bumper guards, or other methods to protect landscaped areas shall be provided. No vehicle may project over a property line or a public right-of-way. Parking may project over an internal sidewalk, but a minimum clearance of 5 feet for safe pedestrian circulation is required.

Response: As shown on the Site Plan, wheel stops are proposed in front of parking spaces adjacent to the building to prevent vehicles from encroaching on sidewalks. The proposed parking spaces along the west buffer planting do not require wheel stops due to the depth of this planter.

17.98.130 PAVING

- A. Parking areas, driveways, aisles and turnarounds shall be paved with concrete, asphalt or comparable surfacing, constructed to city standards for off-street vehicle areas.
- B. Gravel surfacing shall be permitted only for areas designated for non-motorized trailer or equipment storage, propane or electrically powered vehicles, or storage of tracked vehicles.

Response: As shown on submitted plans all driving surfaces will be paved with asphalt.

17.98.140 DRAINAGE

Parking areas, aisles and turnarounds shall have adequate provisions made for the on-site collection of drainage waters to eliminate sheet flow of such waters onto sidewalks, public rights-of-way and abutting private property.

Response: A preliminary stormwater management plan is provided as part of the application package. This plan has been designed in accordance with the City of Sandy Stormwater Management requirements. As shown on the submitted Utility Plan all roof and parking lot stormwater water will be routed to the proposed underground stormwater detention tank.

17.98.150 LIGHTING

Artificial lighting shall be provided in all required off-street parking areas. Lighting shall be directed into the site and shall be arranged to not produce direct glare on adjacent properties. Light elements shall be shielded and shall not be visible from abutting residential properties. Lighting shall be provided in all bicycle parking areas so that all facilities are thoroughly illuminated and visible from adjacent sidewalks or vehicle parking lots during all hours of use.

Response: As noted above, the applicant proposes installing new lighting to illuminate the site. All site lighting will be designed and installed in accordance with Chapter 15.30, Dark Sky Ordinance standards.

17.98.160 BICYCLE PARKING FACILITIES

Multi-family developments, industrial, commercial and community service uses, transit transfer stations, and park and ride lots shall meet the following standards for bicycle parking facilities. The intent of this section is to provide secure bicycle parking that is visible from a building's primary entrance and convenient to bicyclists.

A. Location.

1. Bicycle parking shall be located on-site, convenient to primary building entrances, and have direct access to both the public right-of-way and to the main entrance of the principal structure.
2. Bicycle parking areas shall be visible from building interiors where possible.
3. For facilities with multiple buildings or parking lots, bicycle parking shall be located in areas of greatest use and convenience to bicyclists.
4. If the bicycle parking area is located within the vehicle parking area, the bicycle facilities shall be separated from vehicular maneuvering areas by curbing or other barrier to prevent damage to parked bicycles.
5. Curb cuts shall be installed to provide safe, convenient access to bicycle parking areas.

Response: A rack to accommodate two bicycle parking spaces currently exists on the site. The proposal complies with this standard.

B. Bicycle Parking Space Dimensions.

1. Each required bicycle parking space shall be at least 2 1/2 feet by 6 feet. If covered, vertical clearance of 7 feet must be provided.
2. An access aisle of at least 5 feet wide shall be provided and maintained beside or between each row of bicycle parking. Vertical or upright bicycle storage structures are exempted from the parking space length.

Response: The two bicycle parking spaces comply with the space dimension requirements of this section.

C. Security.

1. Bicycle parking facilities shall offer security in the form of either a lockable enclosure in which the bicycle can be stored or a stationary object (i.e., a "rack") upon which the bicycle can be located.
2. Racks requiring user-supplied locks shall accommodate both cable and U-shaped locks. Racks shall be designed and installed to permit the frame and both wheels to be secured, with removal of the front wheel, or the frame and one wheel to be secured, if both wheels remain on the bicycle.
3. Bicycle racks shall be securely anchored to the ground or a structure and shall be designed to hold bicycles securely by means of the bicycle frame.
4. All outdoor bicycle parking facilities shall provide adequate shelter from precipitation where possible.

Response: The existing bicycle rack is secured to allow bicycles to be securely locked.

17.98.190 OFF-STREET LOADING FACILITIES

- A. The minimum area required for commercial and industrial loading spaces is as follows:
 - 1. 250 square feet for buildings of 5,000 to 19,999 square feet of gross floor area.
 - 2. 500 square feet for buildings of 20,000 to 49,999 square feet of gross floor area
 - 3. 750 square feet for buildings in excess of 50,000 square feet of gross floor area.
- B. The required loading berth shall be not less than 10 feet in width by 35 feet in length and shall have an unobstructed height clearance of 14 feet.
- C. Loading areas shall be screened from public view from public streets and adjacent properties except in industrial districts and shall require the same screening as parking lots.
- D. Sufficient space for turning and maneuvering of vehicles shall be provided on the site in accordance with the standard specifications established by the City Engineer.
- E. Entrances and exits shall be provided at locations approved in accordance with applicable ordinances and statutes.
- F. No off-street loading facilities shall be required where buildings abut a public alley in such a manner that loading operations can be conducted from said alley in accordance with applicable traffic and parking ordinances.

Response: The proposed use does not warrant a separate designated loading area.

CHAPTER 17.102 - URBAN FORESTRY

17.102.20 - APPLICABILITY

This chapter applies only to properties within the Sandy Urban Growth Boundary that are greater than one acre including contiguous parcels under the same ownership.

- A. General: No person shall cut, harvest, or remove trees 11 inches DBH or greater without first obtaining a permit and demonstrating compliance with this chapter.
 - 1. As a condition of permit issuance, the applicant shall agree to implement required provisions of this chapter and to allow all inspections to be conducted.
 - 2. Tree removal is subject to the provisions of Chapter 15.44, Erosion Control, Chapter 17.56, Hillside Development, and Chapter 17.60 Flood and Slope Hazard.

Response: The site contains greater than one acre and the standards of this chapter are applicable.

17.102.50 - TREE RETENTION AND PROTECTION REQUIREMENTS

- A. Tree Retention: The landowner is responsible for retention and protection of trees required to be retained as specified below:
 - 1. At least three trees 11 inches DBH or greater are to be retained for every one-acre of contiguous ownership.

2. Retained trees can be located anywhere on the site at the landowner's discretion before the harvest begins. Clusters of trees are encouraged.
3. Trees proposed for retention shall be healthy and likely to grow to maturity, and be located to minimize the potential for blow-down following the harvest.
4. If possible, at least two of the required trees per acre must be of conifer species.
5. Trees within the required protected setback areas may be counted towards the tree retention standard if they meet these requirements.

Response: As shown on the Existing Conditions Plan, the site does not contain any trees 11-inches and greater.

CHAPTER 15.30 - DARK SKY ORDINANCE

15.30.000 Purpose.

The purpose of the Sandy Dark Sky Ordinance is to regulate outdoor lighting in order to reduce or prevent light pollution. This means to the extent reasonably possible the reduction or prevention of glare and light trespass, the conservation of energy, and promotion of safety and security. (Ord. 2002-11)

Response: All new light fixtures will be designed and installed in accordance with these regulations. A photometric analysis and lighting fixture cut-sheets are included with the application package.

V. Conclusion

Johnson RV requests land use approval to redevelop the subject property to provide repair and service for recreational vehicles. The proposal includes construction of a new 7,375 square foot awning on the east side of the existing building to cover a proposed RV wash area, in addition to other site improvements including paving, adding 19 employee parking spaces, constructing a recreational vehicle sanitary sewer dump station, installing an oil-grease separator, and providing stormwater detention/water quality treatment system and landscaping. In addition to these site improvements, the applicant also proposes relocating the existing access on 362nd Drive that will be used primarily by employees and constructing a new access on Industrial Way to allow recreational vehicles to be safely moved on and off the site. The site is expected to employ approximately 20 employees.

In addition to design review approval, the applicant is also requesting a Type II Variance and a Type III Special Variance as described above. As shown on submitted plans and demonstrated in this narrative, the proposal complies with all applicable code sections except as reviewed above and the applicant requests the application be approved.

EXHIBIT C



September 15, 2022

City of Sandy
39250 Pioneer Blvd
Sandy, OR 97055
503-668-5533

RE: NOTICE REGARDING INCOMPLETION OF SUBMISSION
FILE NUMBER: 22-037 DR/VAR
PROJECT NAME: Johnson RV Canopy Cover

Please accept this letter as authorization for Robert Murray to be an authorized agent for RV Direct/Brandon Johnson. Please email me if you have any concerns or questions at bjohnson@johnsonrv.com.

Sincerely,

A handwritten signature in black ink, appearing to read "Brandon Johnson", with a horizontal line extending to the right.

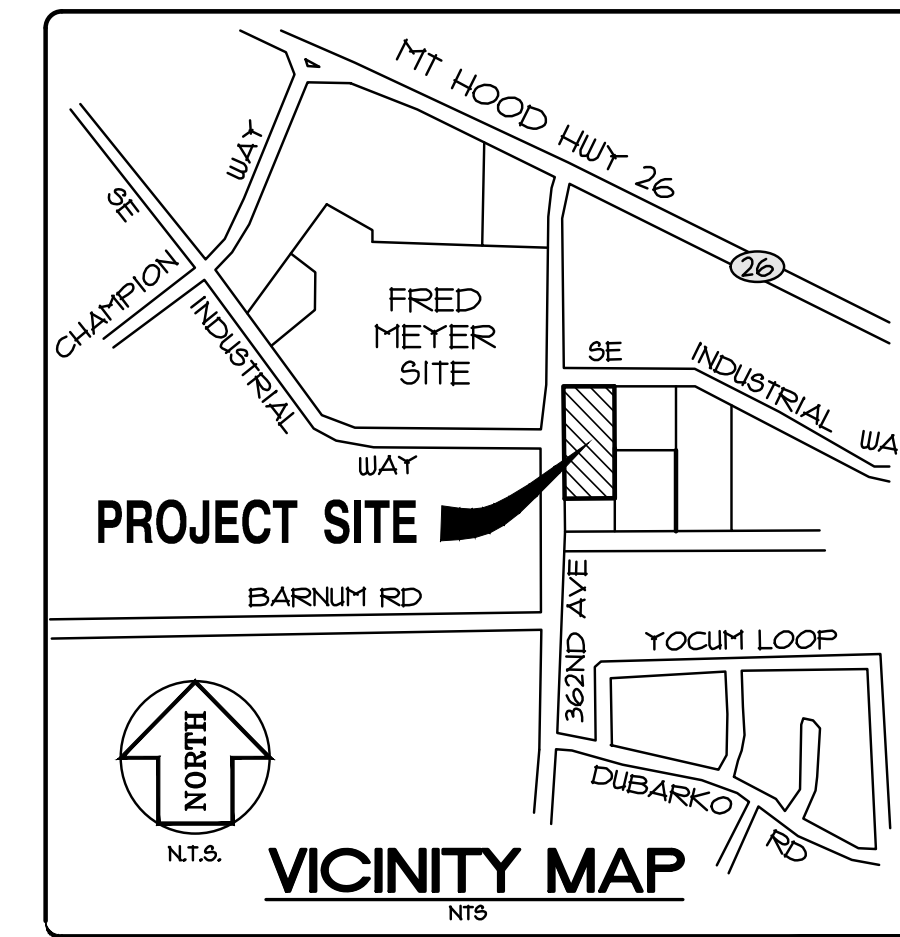
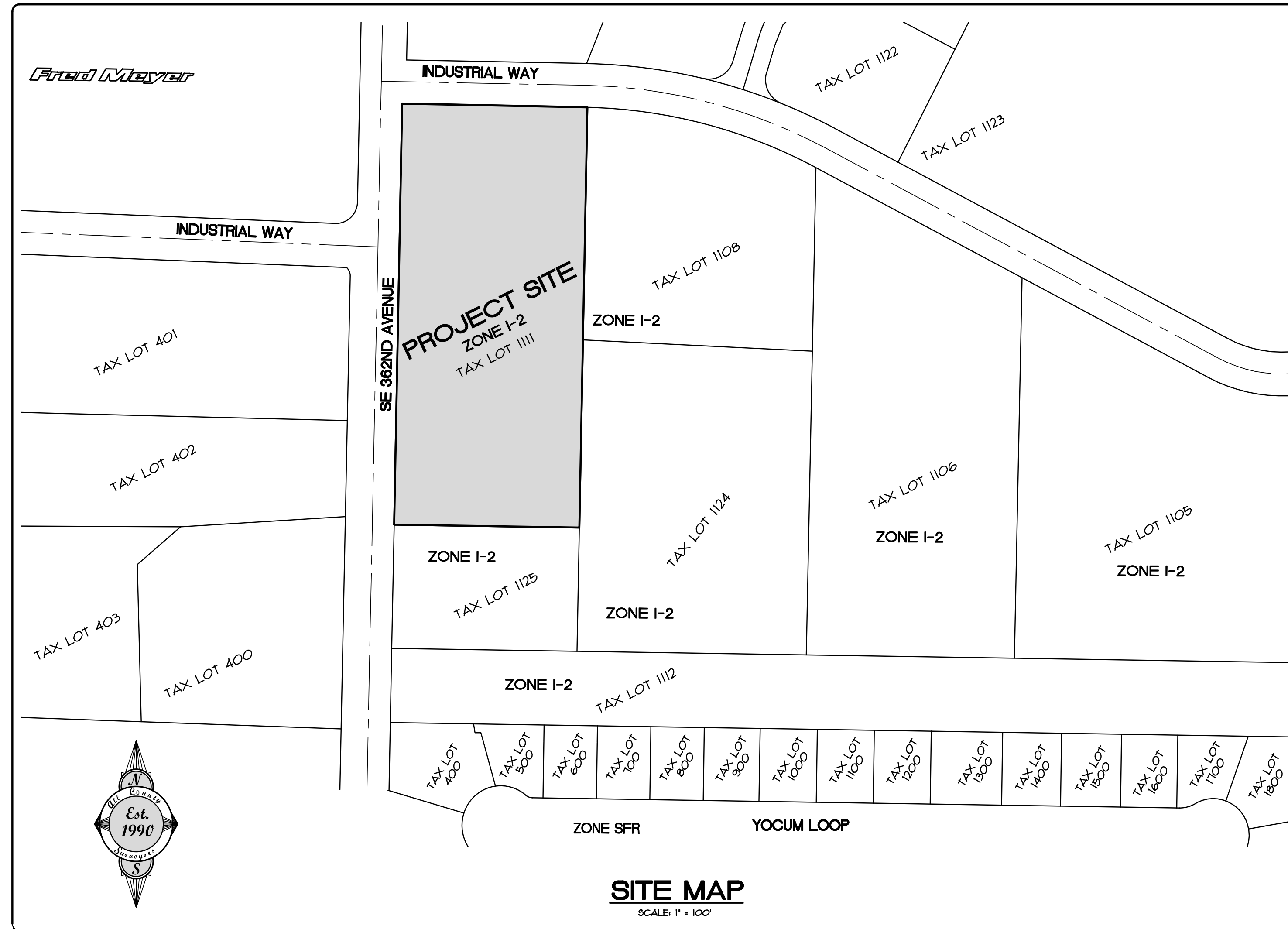
Brandon Johnson
CEO

EXHIBIT D

JOHNSON RV RV STAGING, BUILDING AND UTILITY PLANNING

JULY, 2022

LEGEND	
	EXISTING CONCRETE
	EXISTING PAVEMENT
	EXISTING CURB
	EXISTING FENCE
	EXISTING WATER LINE
	EXISTING STORM LINE
	EXISTING SANITARY LINE
	EXISTING GAS LINE
	EXISTING TELEPHONE LINE
	EXISTING POWER LINE
	EXISTING GROUND CONTOUR
	PROPERTY LINE
	EXISTING STORM MANHOLE
	EXISTING CATCH BASIN
	EXISTING SANITARY MANHOLE
	EXISTING WATER VALVE
	EXISTING FIRE HYDRANT
	EXISTING WATER METER
	EXISTING SIGN
	EXISTING POWER/PHONE RISER
	EXISTING GAS VALVE
	EXISTING MAILBOX
	SURVEY CONTROL POINT
	EXISTING DECIDUOUS TREE
	EXISTING EVERGREEN TREE
	EXISTING LIGHT
	PROPOSED STORM LINE
	PROPOSED CATCH BASIN
	PROPOSED SEDIMENT FENCE
	PROPOSED CURB
	PROPOSED GROUND CONTOUR
	PROPOSED AC PAVING
	PROPOSED WATER LINE
	PROPOSED SANITARY LINE
	PROPOSED POWER LINE
	PROPOSED LIGHT POLE



UTILITY CONTACTS

POTENTIAL UNDERGROUND FACILITY OWNERS
"ONE CALL" UTILITIES NOTIFICATION CENTER 800-332-2344

PG&E, ELECTRICITY, CARL WATERS	503-669-8271
NGL, NATURAL GAS, GAS, SCOTT PALMER	503-226-4211
QUEST, TELEPHONE, RICK JANSEN	503-242-6064
PARAGON CABLE TV	503-667-9390
CITY OF SANDY	503-668-5533
FIRE DISTRICT	503-663-4638

SHEET INDEX

- COVER SHEET AND NOTES
- EXISTING CONDITIONS PLAN
- SITE PLAN
- UTILITY PLAN
- GRADING/EROSION CONTROL PLAN

LANDSCAPE AREA TABLE

TOTAL SITE AREA = 150,091 SF (3.45 AC)
15% LANDSCAPING = 22,514 SF
LANDSCAPING PROPOSED = 23,585 SF (15.71%)

PARKING TABLE

EXISTING PARKING SPACES	11 - STANDARD SPACES	2 - ADA SPACES
PROPOSED PARKING UNDER THIS APPLICATION	19 - STANDARD SPACES	
TOTAL PARKING PROPOSED FOR THE SITE	32 SPACES	

SITE INFORMATION:
BUILDING SITE:
OWNER: JOHNSON RV
ADDRESS: 16800 362ND DRIVE, SANDY, OR
TAX LOT 1111, MAP 26 4E 14
AREA: 150,091 SF (3.45 AC)
ZONING: I-2 (LIGHT INDUSTRIAL)

PROJECT TEAM:
CLIENT
JOHNSON RV
ATTN: ROBERT MURRAY
16800 SE 362ND AVE.,
SANDY, OR 97055
503-102-6580

ENGINEER/SURVEYOR
ALL COUNTY SURVEYORS & PLANNERS, INC.
ATTN: RAY MOORE, PE, PLS
PO BOX 955
SANDY, OR 97055
PHONE: (503) 668-3151

PLANNER
TRACY BROWN PLANNING CONSULTANTS, LLC
ATTN: TRACY BROWN
11075 FIR DRIVE
SANDY, OR 97055
PHONE: (503) 781-0453

ARCHITECT
KEYSTONE ARCHITECTURE
ATTN: BLAINE SKOWHED
12020 SE IDLEMAN RD.
PORTLAND, OR 97266-6854
PHONE: (503) 761-1362

TRAFFIC ENGINEER
ARD ENGINEERING
ATTN: MICHAEL ARD, PE
PORTLAND, OR 97204
EMAIL: mike.ard@gmail.com

LANDSCAPE ARCHITECT
MEARS DESIGN GROUP, LLC
ATTN: TROY MEARS
PO BOX 23338
PORTLAND, OR 97281
PHONE: (503) 601-4516

BY	DATE	REVISION	SHEET
			1
			OF 6
DESIGNED:	LFK		
DRAWN:	LFK		
CHECKED:	DLH		
APPROVED:	RLM		

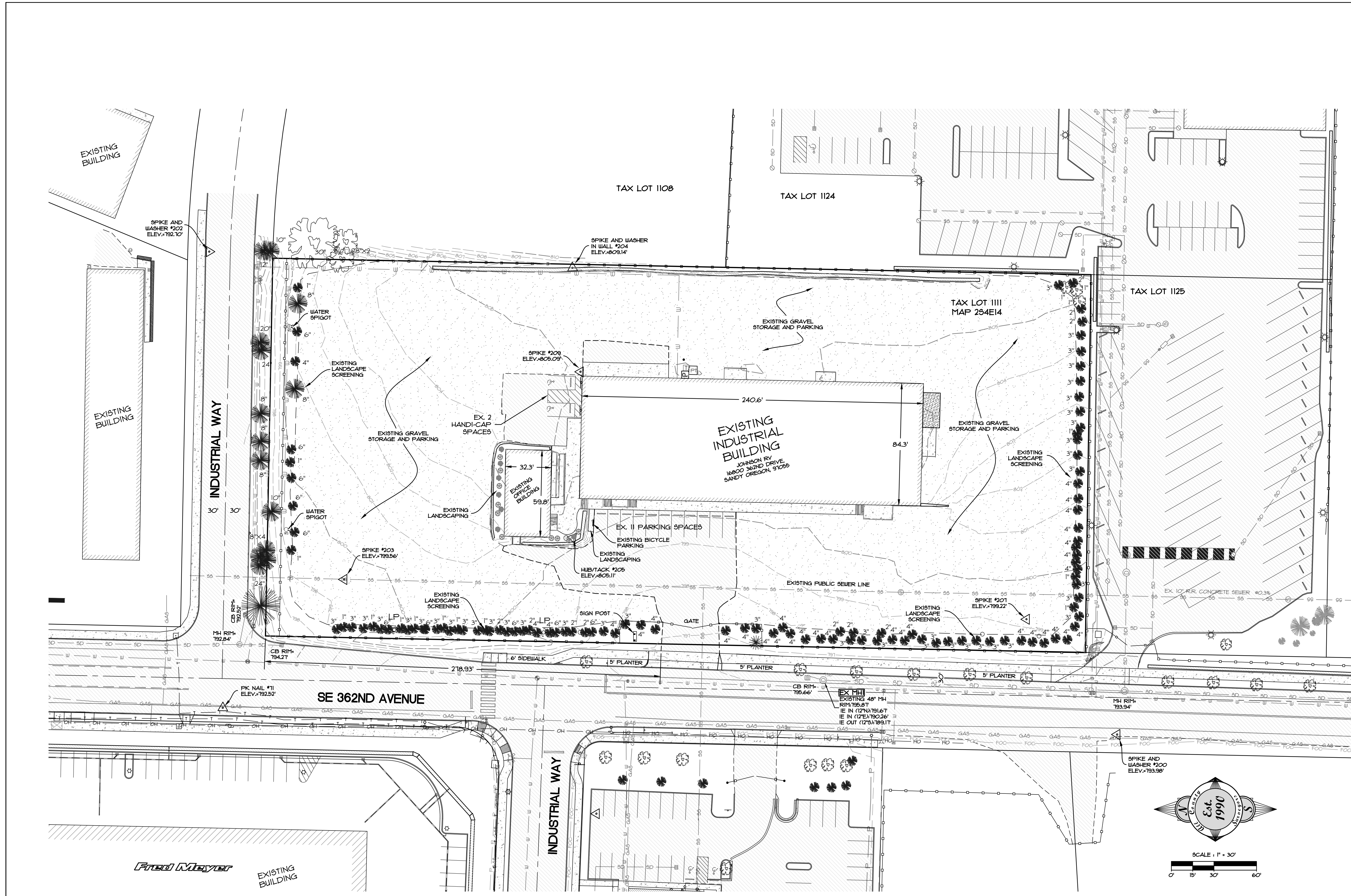
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JOHNSON RV
RV STAGING, BUILDING AND UTILITY PLANS
COVER SHEET AND NOTES
SE INDUSTRIAL WAY AND SE 362ND, SANDY, OR 97055

Surveyors & Planners, Inc.
Surveying, Planning and
Civil Engineering and
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-4730
Fax: (503) 668-4730
DATE OF PLOT: 08-30-22

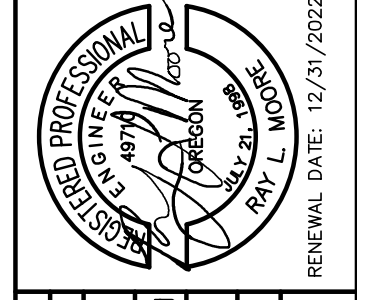
JOHNSON RV
ROBERT MURRAY
16800 SE 362ND AVE.,
SANDY, OR 97055
503-102-6580





EXISTING CONDITIONS PLAN
SCALE: 1" = 30'

BY	REVISION	SHEET
		2
DATE	NO.	OF
		5
DESIGNED: LKF	DRAWN: LKF	CHECKED: DLH
APPROVED: RLMT		

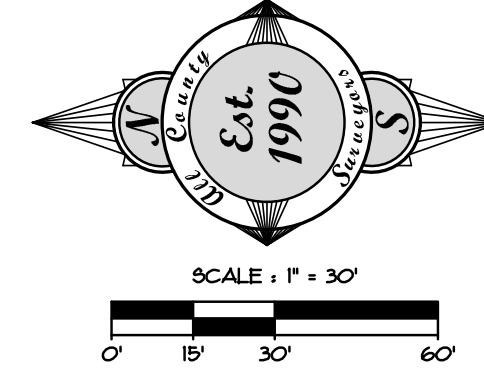
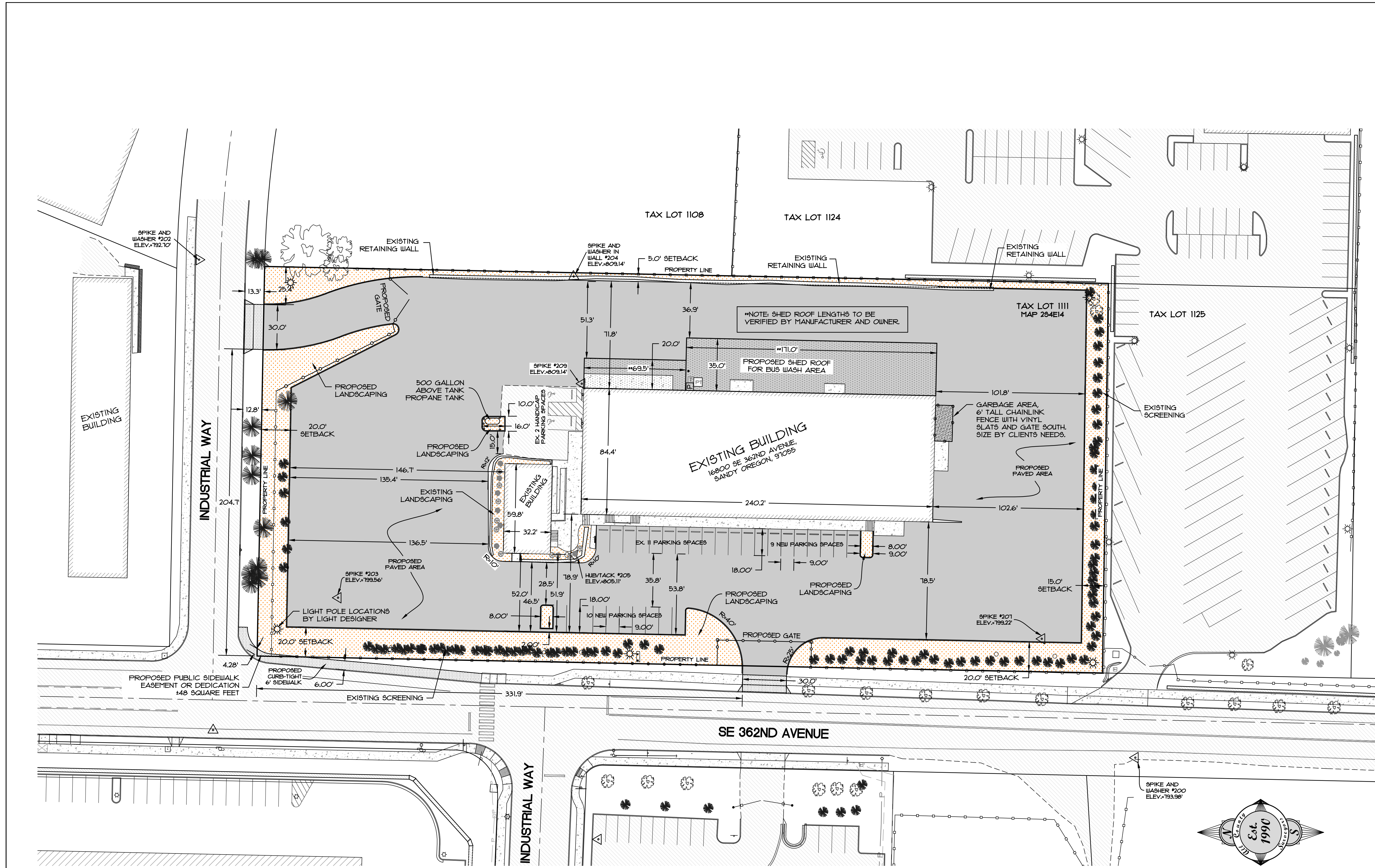


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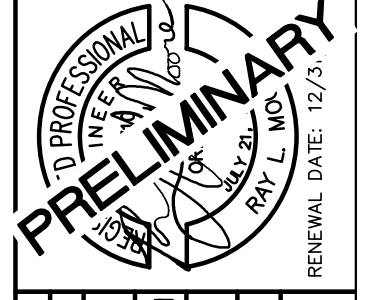
JOHNSON RV
RV STAGING, BUILDING AND UTILITY PLANS
EXISTING CONDITIONS PLAN
SE INDUSTRIAL WAY AND SE 362ND, SANDY, OR 97055

Surveyors & Planners, Inc.
Surveying, Planning and
Civil Engineering
P.O. Box 955 Sandy, OR 97055
Phone: (503) 668-4730
Fax: (503) 668-4730
DATE OF PLOT: 08-30-22

JOHNSON RV
ROBERT MURRAY
16800 SE 362ND AVE.,
SANDY, OR 97055
503-102-6580



NO.	REVISION	DATE	BY
1			
2			
3			



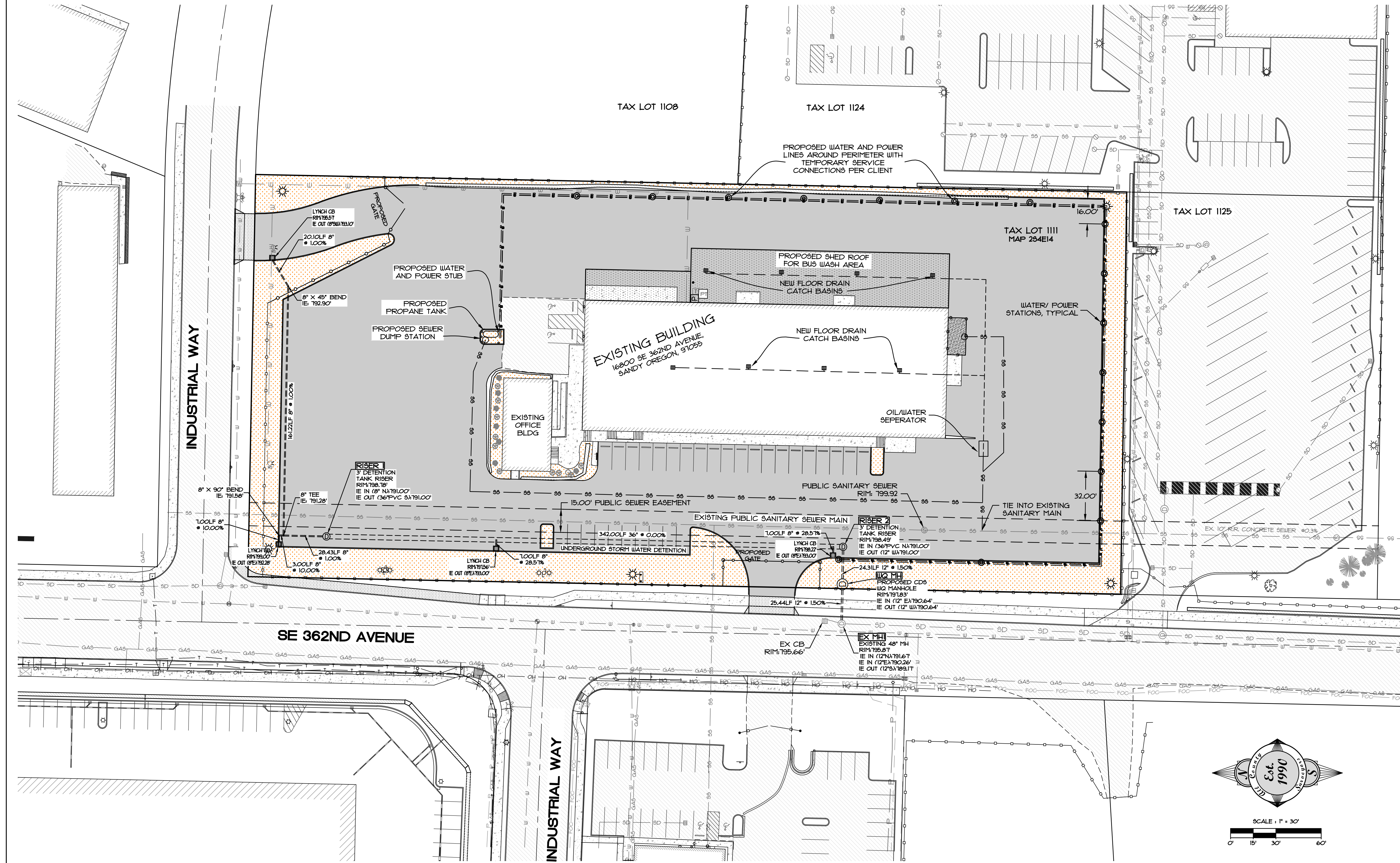
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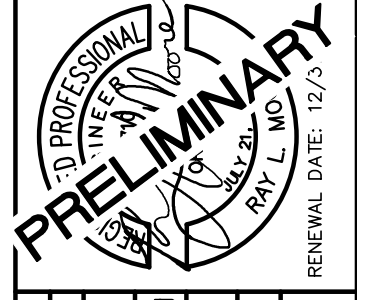
JOHNSON RV
 RV STAGING, BUILDING AND UTILITY PLANS
 PROPOSED SITE PLAN
 SE INDUSTRIAL WAY AND SE 362ND, SANDY, OR 97055

Surveyors & Planners, Inc.
 Surveying, Planning and
 Civil Engineering
 P.O. Box 955 Sandy, OR 97055
 Phone: (503) 668-4730
 Fax: (503) 668-4730
 DATE OF PLOT: 08-30-22

JOHNSON RV
 ROBERT MURRAY
 16800 SE 362ND AVE.
 SANDY, OR 97055
 503-102-6260



REVISION	DATE	NO.	BY



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LEGAL	14	SECTION	4E

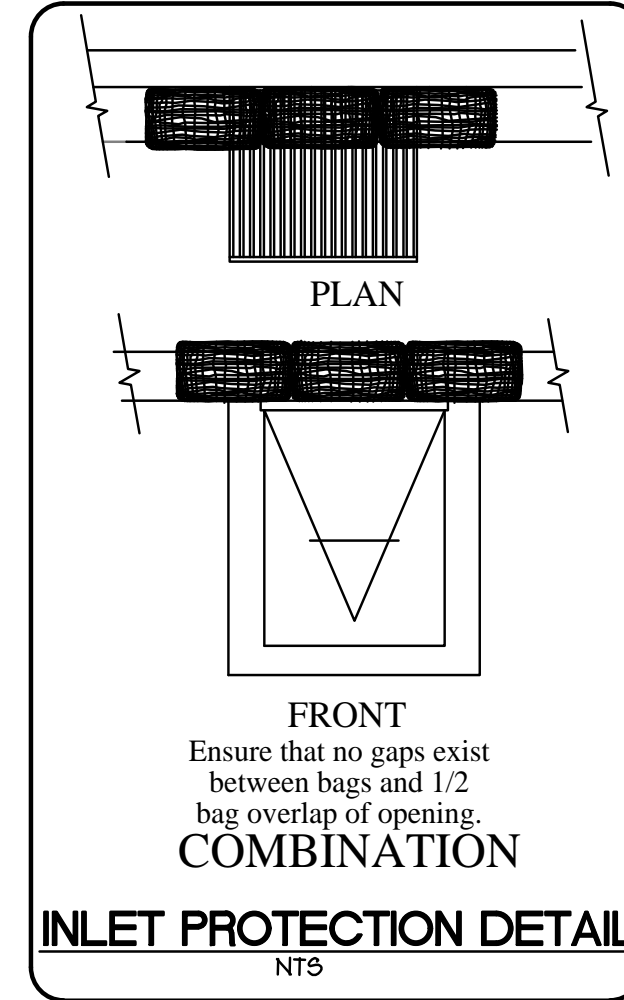
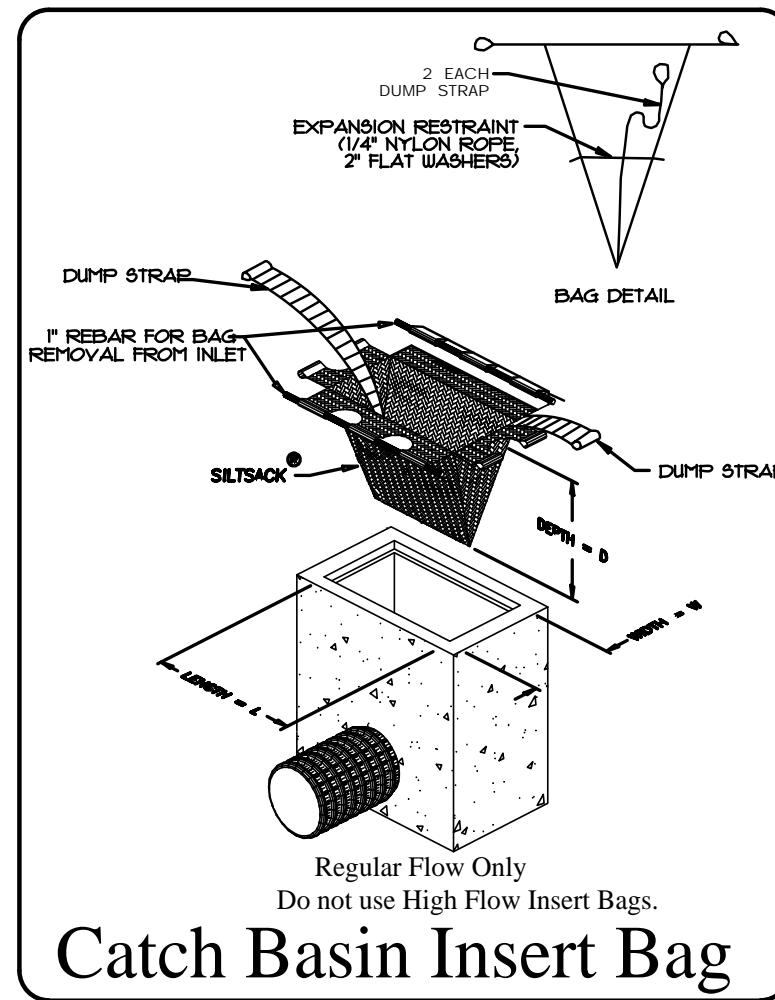
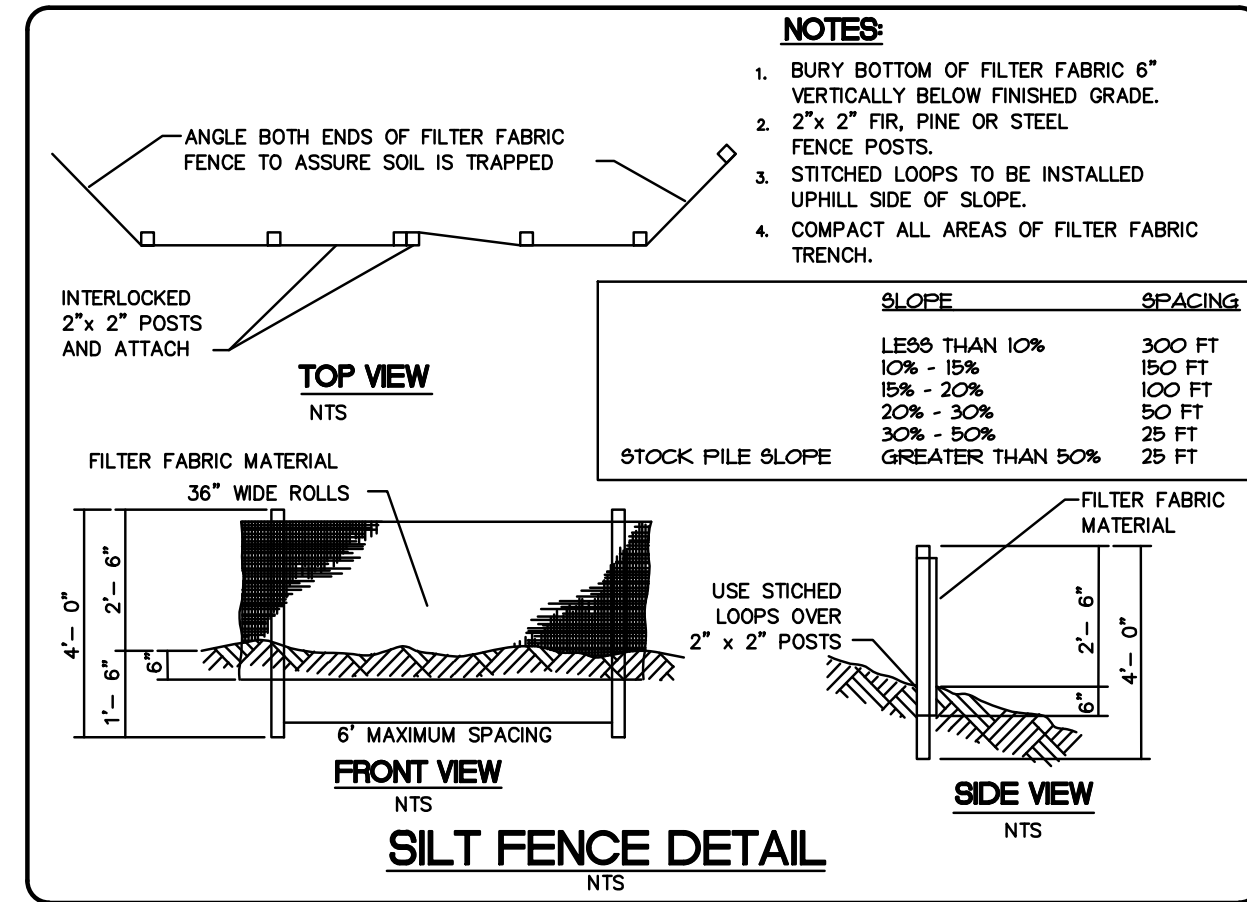
JOHNSON RV
 RV STAGING, BUILDING AND UTILITY PLANS
 UTILITY PLAN

PROJECT: JOHNSON RV
 CLIENT: ROBERT MURRAY
 16800 SE 362ND AVE.,
 SANDY, OR 97055
 503-102-6580

DATE OF PLOT: 08-30-22

DESIGNED	LKF
DRAWN	LKF
CHECKED	DLH
APPROVED	RLT

CLIENT: JOHNSON RV
 ROBERT MURRAY
 16800 SE 362ND AVE.,
 SANDY, OR 97055
 503-102-6580



SEDIMENT FENCE NOTES

THE FILTER FABRIC FENCE SHALL BE INSTALLED TO FOLLOW THE CONTOURS. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 24 INCHES.

SEDIMENT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.

SEDIMENT FENCES SHALL BE INSPECTED BY CONTRACTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

BY		SHEET	5
REVISION		OF	5
DATE		DESIGNED	LFK
		DRAWN	LFK
		CHECKED	DLH
		APPROVED	RLM



SCALE	N/A	VERT. SCALE	1"=50'
DATE	08-30-22	LEGAL	
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		RANGE	4E
		TWP.	2S

JOHNSON RV
 RV STAGING, BUILDING AND UTILITY PLANS
 GRADING AND EROSION CONTROL PLAN
 SE INDUSTRIAL WAY AND SE 362ND, SANDY, OR 97055

Surveyors & Planners, Inc.
 Surveying, Planning and
 Civil Engineering and
 P.L.L.C.
 P.O. Box 955 Sandy, OR 97055
 Phone: (503) 668-4730
 Fax: (503) 668-4730
 DATE OF PLOT: 08-30-22

JOHNSON RV
 ROBERT MURRAY
 16800 SE 362ND AVE.
 SANDY, OR 97055
 503-102-6280

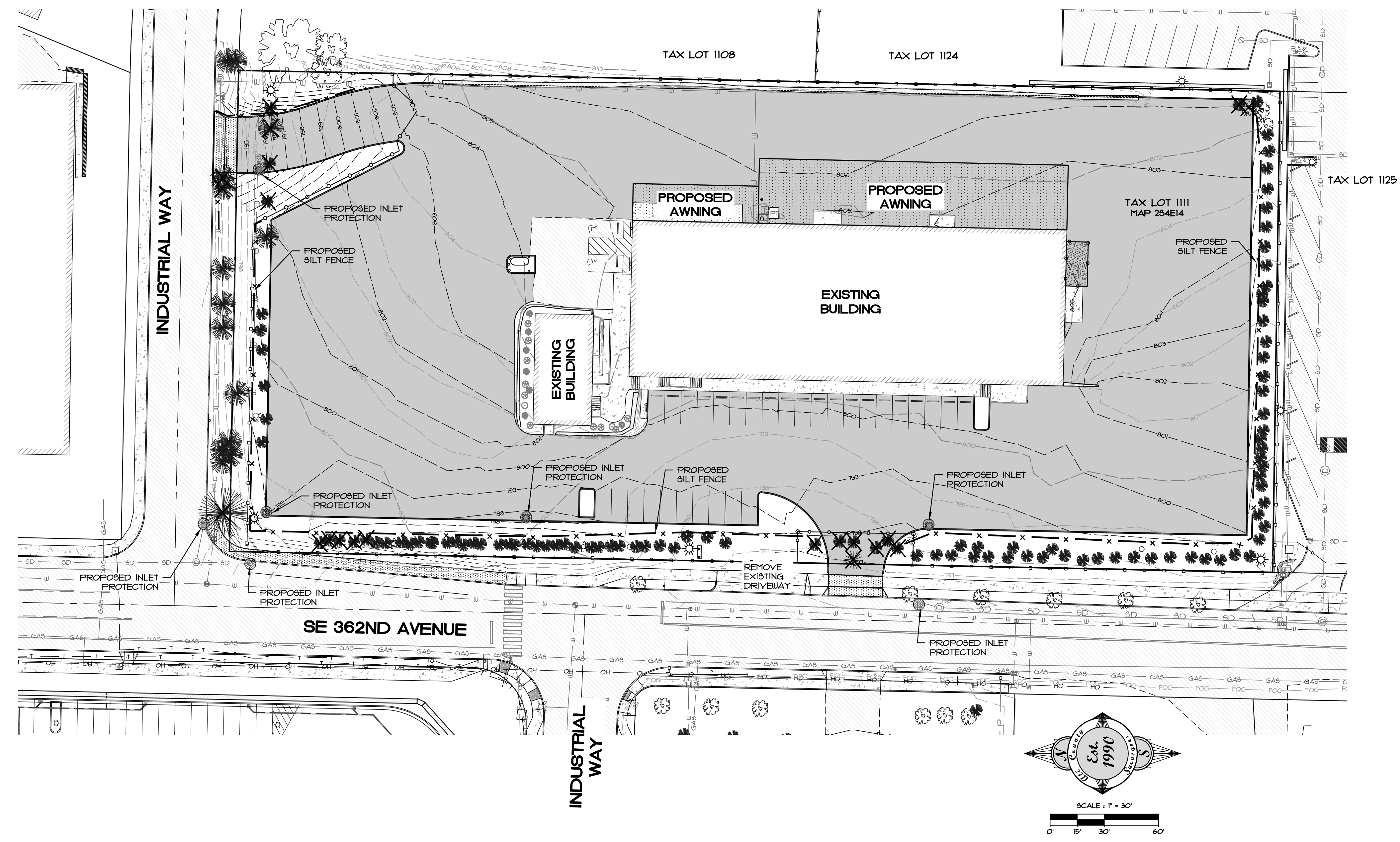
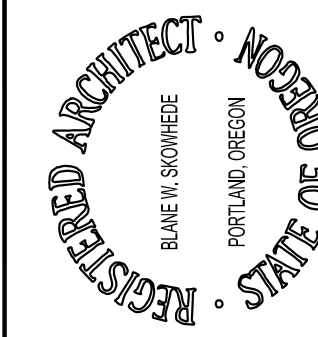
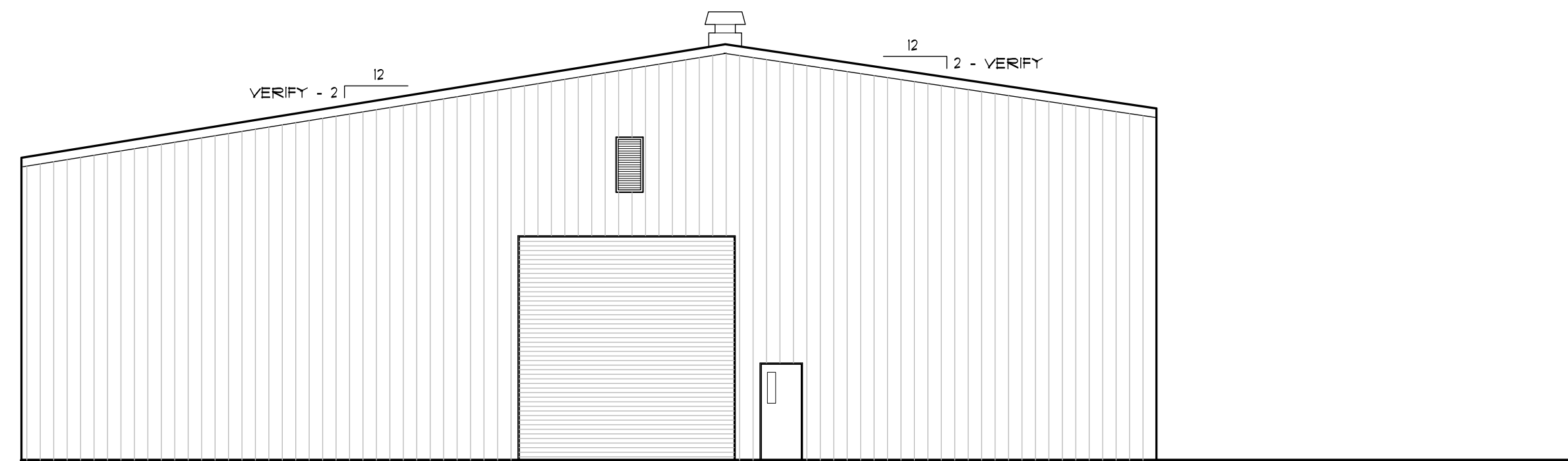


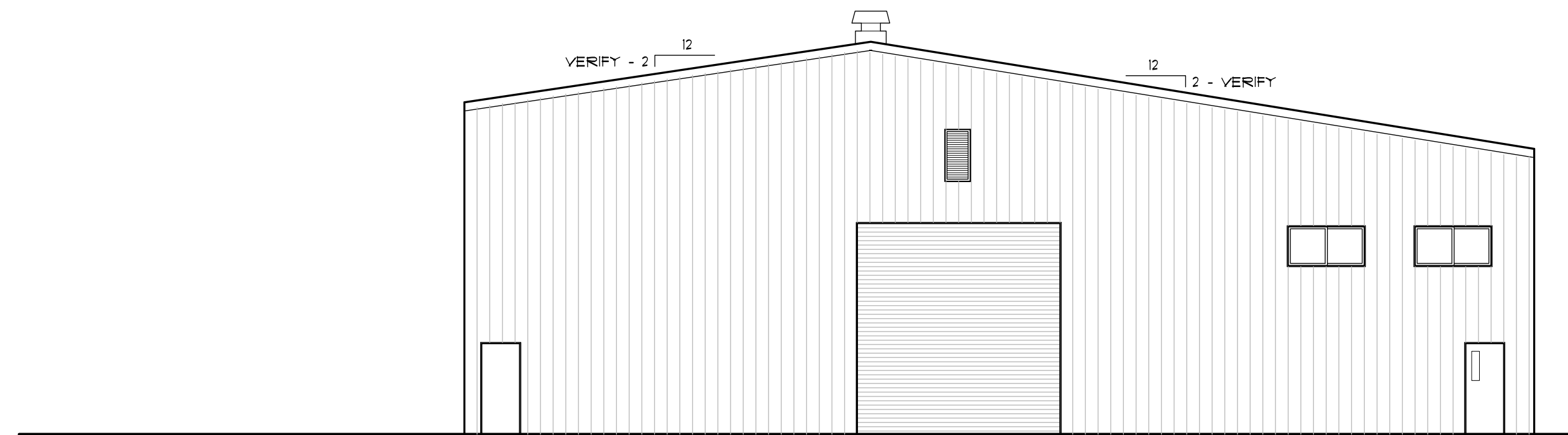
EXHIBIT E



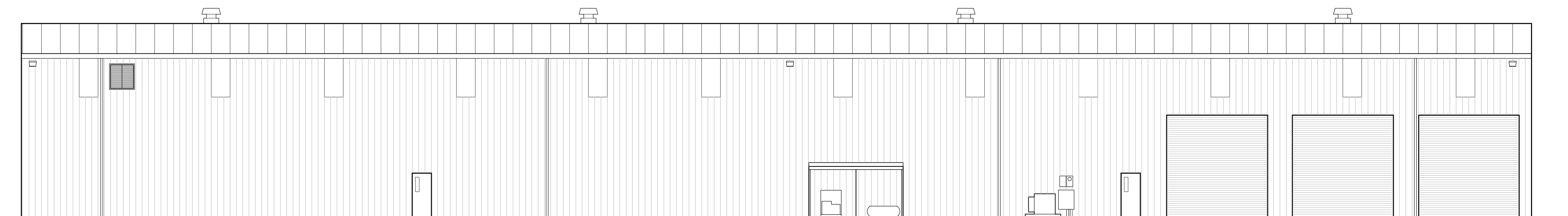
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③ EXISTING SOUTH ELEVATION
1/8" = 1'-0"



② EXISTING NORTH ELEVATION
1/8" = 1'-0"



① EXISTING EAST ELEVATION
1/8" = 1'-0"

JOHNSON RV
RV STAGING, BUILDING AND UTILITY PLANS
PROPOSED BUILDING ELEVATIONS
SE INDUSTRIAL WAY AND SE 362ND, SANDY, OR 97055

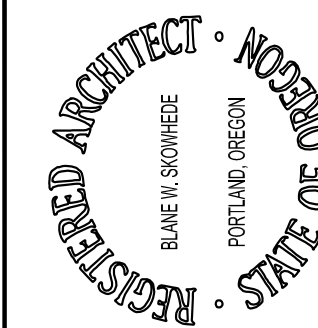
KEYSTONE
ARCHITECTURE PLANNING
AND PROJECT MANAGEMENT
PO BOX 161362 PORTLAND, OR 97216
PHONE: (503) 761-1362 FAX: (503) 760-0534

REVISION	DATE

APPROVED: BWS
DRAWN BY:
SCALE: AS SHOWN
DATE: 8/8/22
JOB: 22-114
FILE:

A1.01

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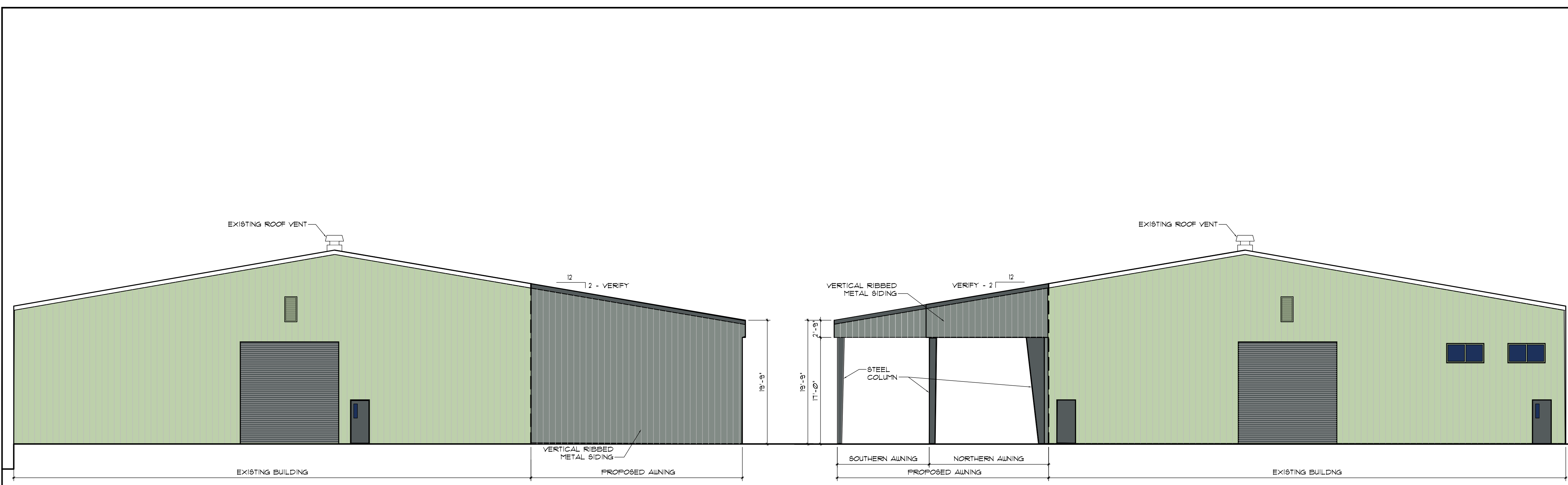
JOHNSON RV
 RV STAGING, BUILDING AND UTILITY PLANS
 PROPOSED BUILDING ELEVATIONS
 SE INDUSTRIAL WAY AND SE 362ND, SANDY, OR 97055

KEYSTONE
 ARCHITECTURE PLANNING
 AND PROJECT MANAGEMENT
 1000 SE INDUSTRIAL WAY, SUITE 100
 SANDY, OREGON 97055
 PHONE: (503) 761-1362 FAX: (503) 760-0534

REVISION	DATE

A3.01

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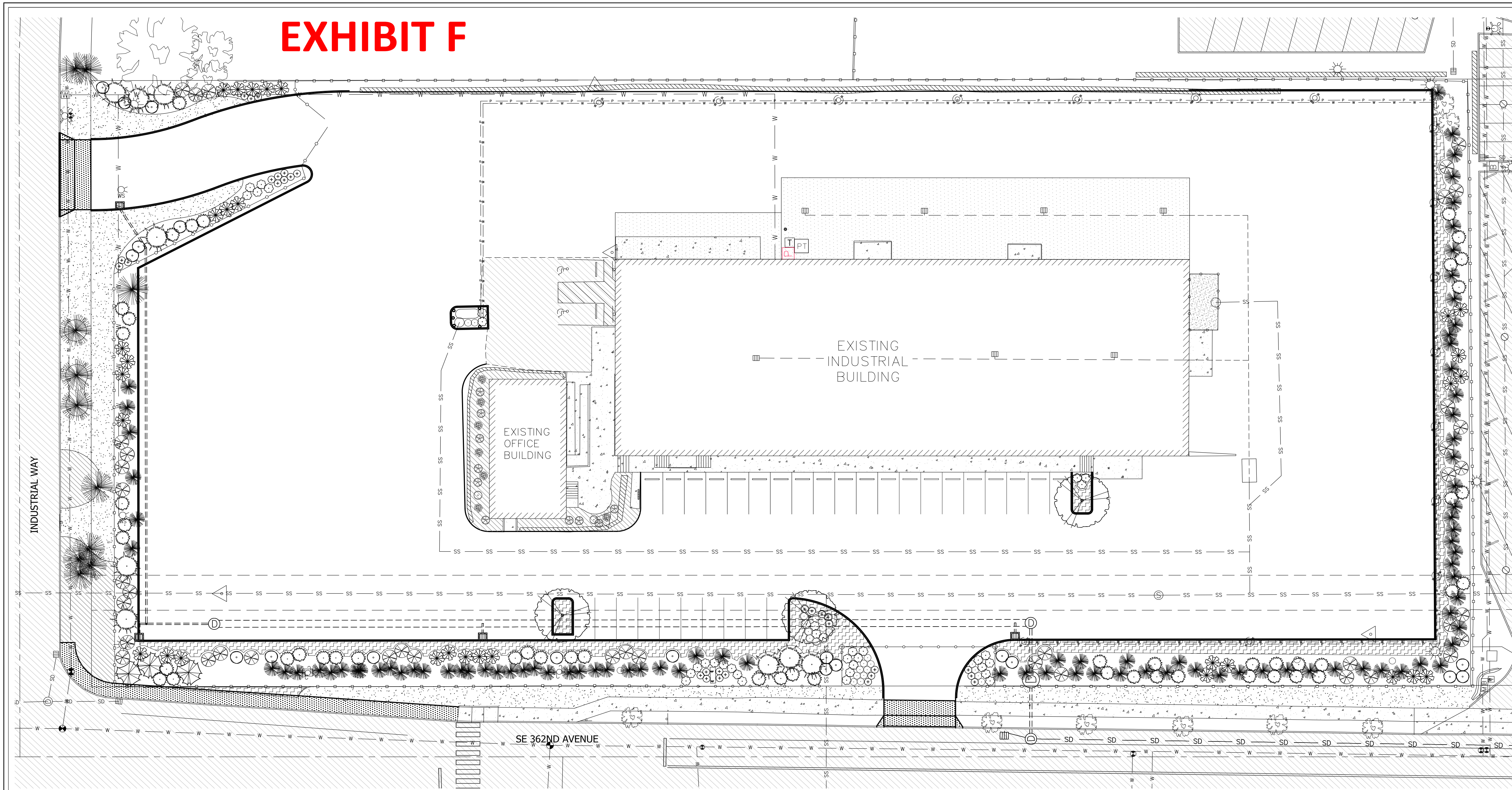
3 PROPOSED SOUTH ELEV.
 1/8" = 1'-0"

2 PROPOSED NORTH ELEV.
 1/8" = 1'-0"



1 PROPOSED EAST ELEVATION
 1/8" = 1'-0"

EXHIBIT F



MEARS
DESIGN GROUP
LANDSCAPE ARCHITECTURE & PLANNING
PO Box 23338 | Portland, Oregon | 97281
PHONE: 503.901.4516 | FAX: 503.924.4688

REGISTERED
PROFESSIONAL
LANDSCAPE ARCHITECT
CONSULTANT

JOHNSON RV LANDSCAPE PLAN

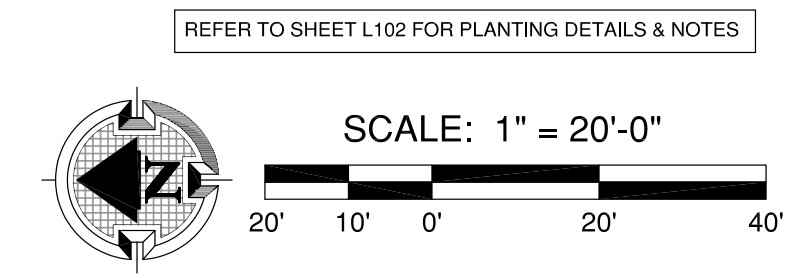
SE INDUSTRIAL WAY & SE 362ND, SANDY, OR 97055

SUGGESTED PLANT SCHEDULE				
TREES				
SYM	Scientific name Common Name	Minimum Species Quantity	Minimum Size	Condition Remarks
	x Cupressocyparis leylandii 'Moncal' Emerald Isle Leyland Cypress	9	5'-6"	B&B
	Picea omorika 'Bruns' Bruns Serbian Spruce	3	5'-6"	B&B
	Zelkova serrata 'Village Green' Village Green Zelkova	3	1.5" Cal.	B&B

SHRUB LISTING				
SYM	Scientific name Common Name	Minimum Species Quantity	Minimum Size	Condition Remarks
	Azalea x 'Hino-Crimson' Hino-Crimson Azalea	30	2 Gal.	Can As Shown
	Berberis thunbergii 'Rose Glow' Rose Glow Barberry	36	5 Gal.	Can As Shown
	Cornus 'Elegantissima' Variegated Redtwig Dogwood	40	5 Gal.	Can As Shown
	Euonymus alata 'Compacta' Compact Winged Euonymus	50	5 Gal.	Can As Shown
	Euonymus japonica 'Aureovariegatus' Gold Spot Euonymus	31	5 Gal.	Can As Shown
	Nandina domestica 'Gulf Stream' Gulf Stream Heavenly Bamboo	23	2 Gal.	Can As Shown
	Rhododendron 'PJM Elite' PJM Elite Rhododendron	19	5 Gal.	Can As Shown

GROUND COVER LISTING				
SYM	Scientific name Common Name	Minimum Species Quantity	Minimum Size	Condition Spacing
	Rubus calycinoides 'Emerald Carpet' Creeping Raspberry	620	4"	Pot 30" o/c.
	Seed Mix as Specified (Hydroseed) Sunmark Seeds (DOT Multipurpose)	7,455 sq. ft.		

LEGEND	
	Existing landscape to remain
	Existing deciduous tree to remain
	Existing conifer tree to remain

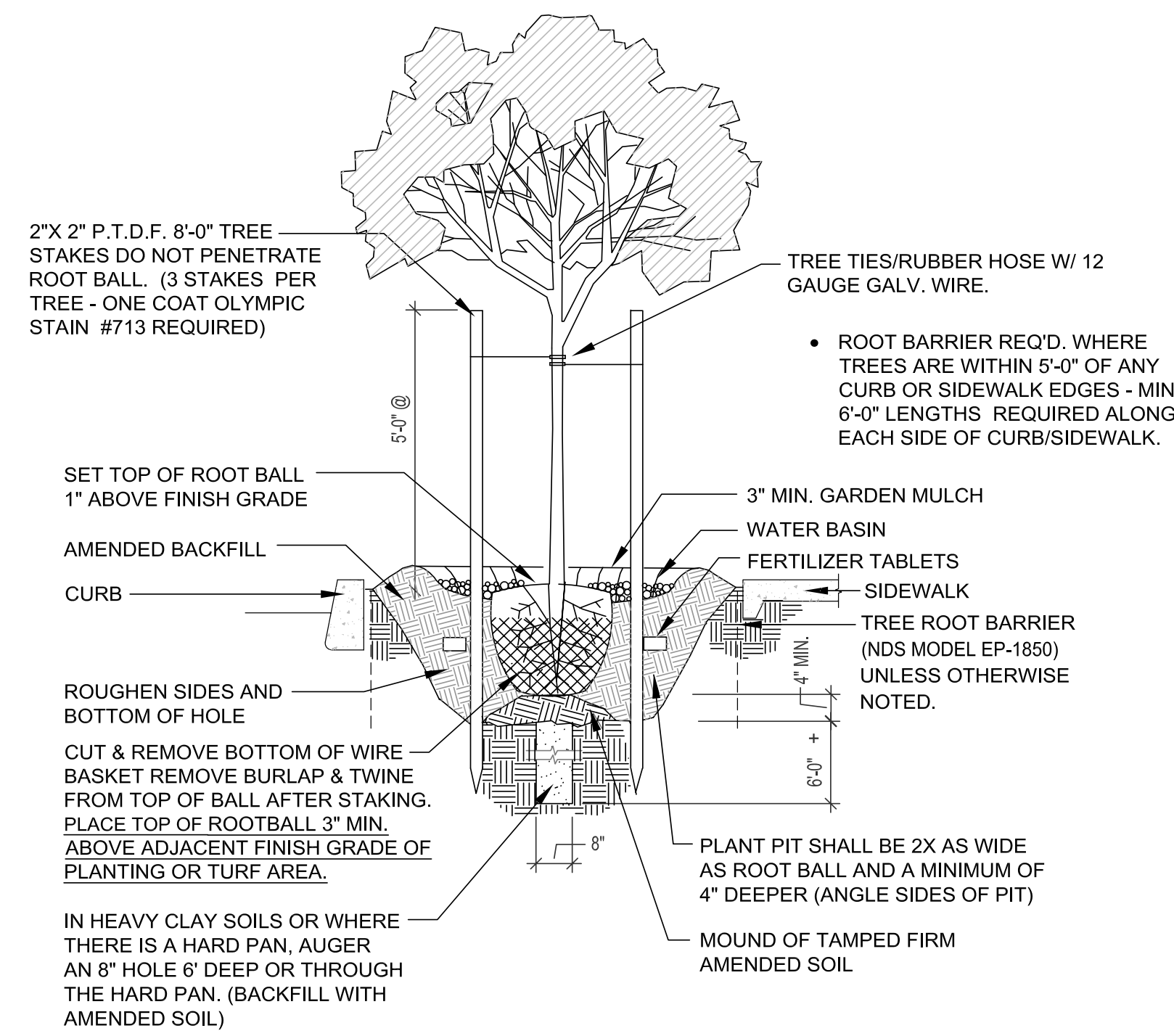


REVISIONS		
REV.	DATE	DESCRIPTION

SHEET NAME:
PLANTING PLAN

DRAWN BY: _____ TM
CHECKED BY: _____ TM
ISSUE DATE: 8/26/2022
JOB NO.: 2222

SHEET:
L101
OF 2

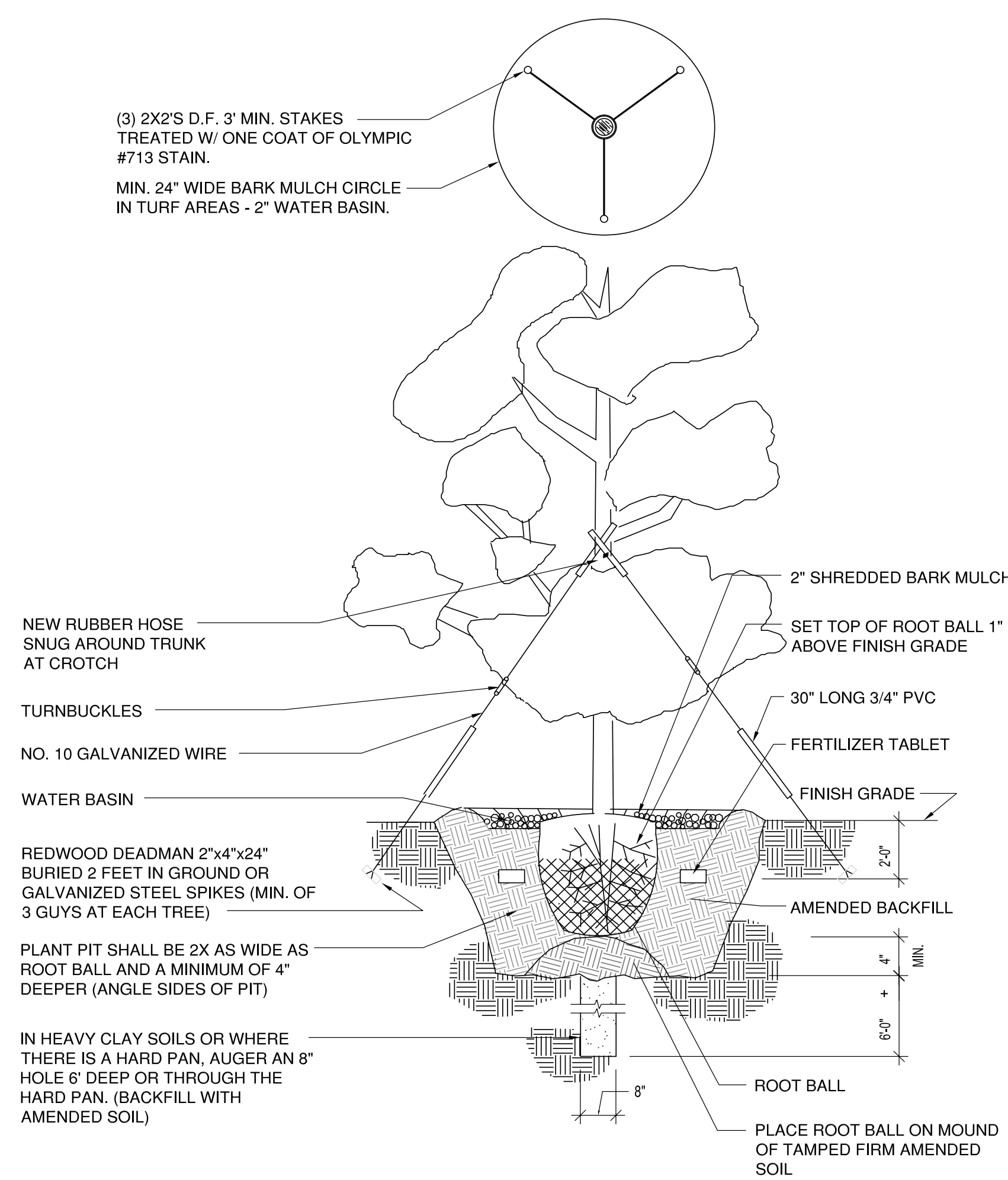


TREE PLANTING DETAIL

N.T.S.

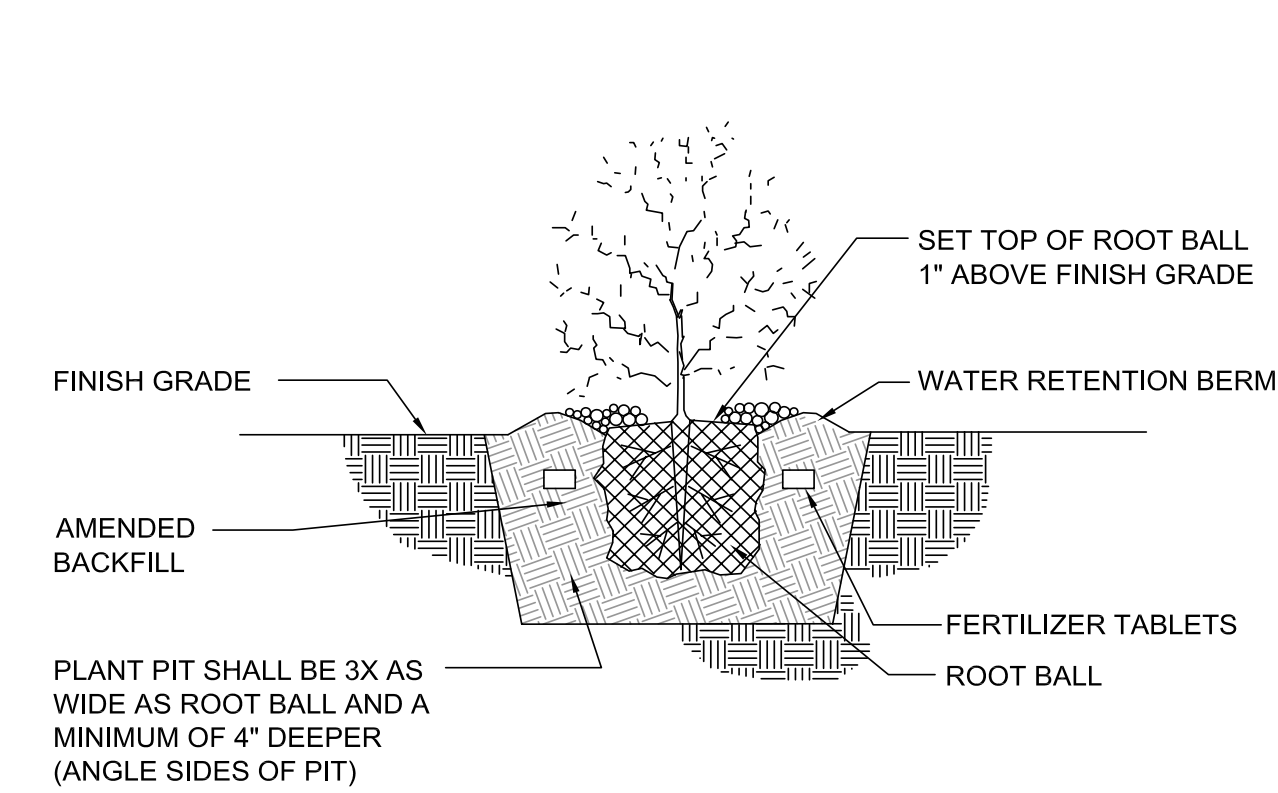
GENERAL PLANTING NOTES:

1. B&B stock may be substituted with container stock of equal grade.
2. Container stock may be substituted with B&B stock of equal grade.
3. Plant material shall conform with American Standard for Nursery Stock, ANSI Z60.1, 2014 edition.
4. All trees shall be branched.
5. Stormwater Facility shall have a minimum of 18 inches amended soil as defined by the City of Portland Stormwater Management Manual. Re-use of existing topsoil is recommended, but must meet specifications.
6. Landscape Contractor to provide soil analysis of existing soil and/or imported soil prior to placement. Recommended amendments to be reviewed and approved by Landscape Architect.
7. Garden mulch all planting beds with 2" min. Layer of specified garden mulch.
8. In the event of a discrepancy between this material listing and the drawings, the drawings shall govern the plant species and quantities required.
9. In the event of question or lack of clarity on drawings, Landscape Contractor is to call Landscape Architect before proceeding.
10. Landscape contractor is to notify Landscape Architect prior to installation of plant material to approve final placement.
11. Landscape Contractor to verify plant material quantities.
12. Contractor will provide a one year warranty on all provided & installed plant material from date of final approval by owner's representative.
13. All plantings shall be watered with a automatic irrigation system or manual irrigation system (hand watering). Irrigation shall be provided for the first two years minimum after planting.
14. If automatic irrigation is not provided, all trees are to have a treegrator for supplemental watering until established.



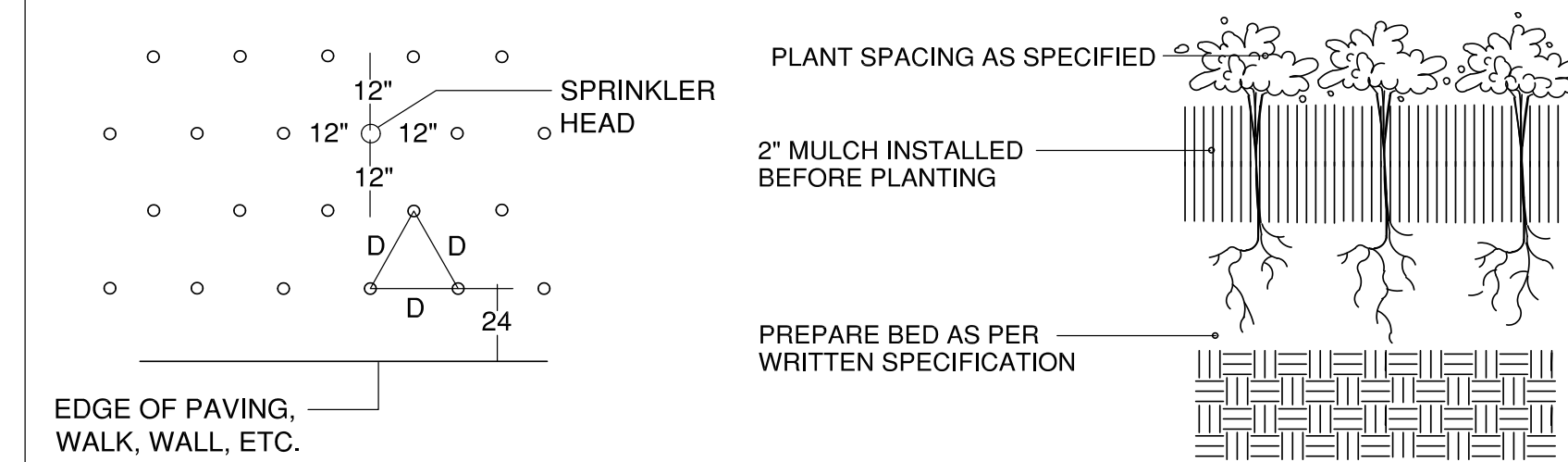
EVERGREEN TREE PLANTING DETAIL

N.T.S.



SHRUB PLANTING DETAIL

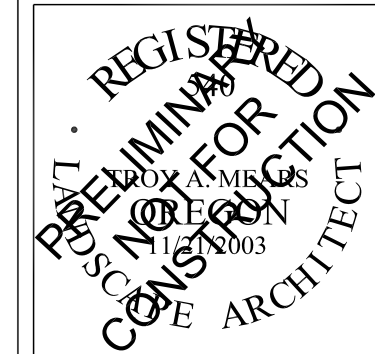
N.T.S.



HERBACEOUS/GROUNDCOVER PLANTING DETAIL

N.T.S.

NOTE:
LOCATE PLANTS SPACED EQUAL DISTANT (D) FROM EACH OTHER AS SPECIFIED AND MINIMUM OF 12" FROM SPRINKLER HEAD



JOHNSON RV
LANDSCAPE PLAN

SE INDUSTRIAL WAY & SE 362ND, SANDY, OR 97055

REVISIONS		
REV.	DATE	DESCRIPTION

SHEET NAME:
**PLANTING
DETAILS & NOTES**

DRAWN BY: _____ TM
CHECKED BY: _____ TM
ISSUE DATE: 8/28/2022
JOB NO.: 2222

SHEET:
L102
OF 2

EXHIBIT G

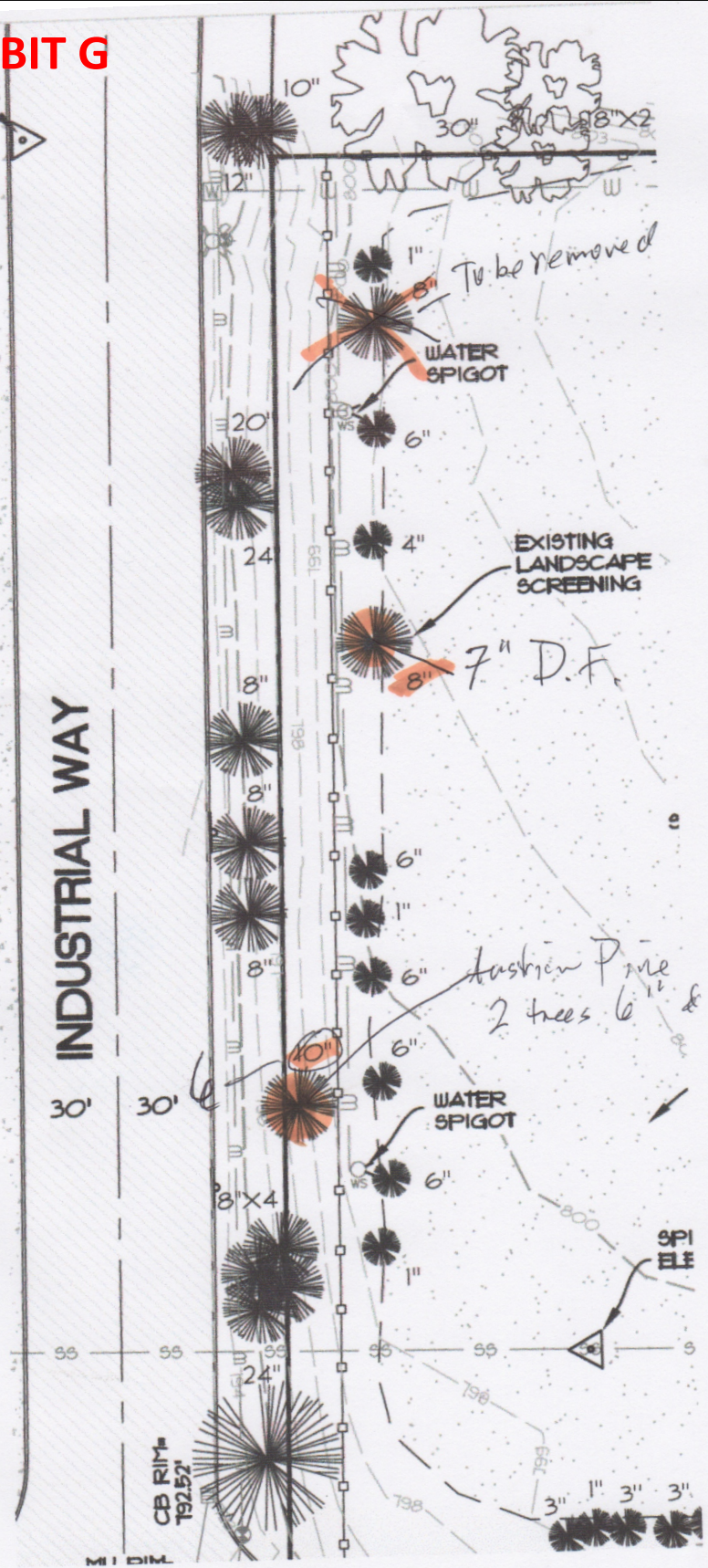




EXHIBIT H

Emily Meharg <emeharg@ci.sandy.or.us>

Letter of Incompleteness (Johnson RV Canopy Cover) File No. 22-037 DR

Tracy Brown <tbrownplan@gmail.com>

Wed, Sep 14, 2022 at 2:22 PM

To: Sandy Planning <planning@cityofsandy.com>, Robert Murray <rmurray@johnsonrv.com>, Lance Forney <lance@allcountysurveyors.com>, Ray Moore <raym@allcountysurveyors.com>

Hi Emily, I wanted to let you know Mike Ard is working on the TIS and Robert will be getting confirmation of his ability to submit the application. Both of these items will be completed soon. Regarding the requested Arborist Report for trees 8-inches DBH and greater: I just conducted a site visit to review the three onsite trees identified as 8-inches or greater. There are only two trees inside the fence and one on the outside of this size.

The most easterly tree (identified as Tree #1 on the attached plan and photo, is close to 8-inches but this tree will need to be removed to construct the new entrance driveway.

Tree #2 (Douglas fir) to the west of Tree #1 is located inside the fence and is listed as 8-inches. Based on my measurement, this tree is only 7-inches at most and will be retained in a landscape planter.

Tree #3 listed as 10-inches on the plan is located outside the fence. This tree is really two trees, a 6-inch and a 4-inch Austrian Pine and will also be retained.

My conclusion after this site visit, is there are at most two trees 8-inches and greater on the site and one of these will be removed. Also, there would seem to be little value requiring the expense of an Arborist Report given these circumstances.

Please let us know if you agree or how you would like us to proceed.

Thank, Tracy

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4 attachments

photo 1.jpeg
478K



photo 2.jpeg
5740K

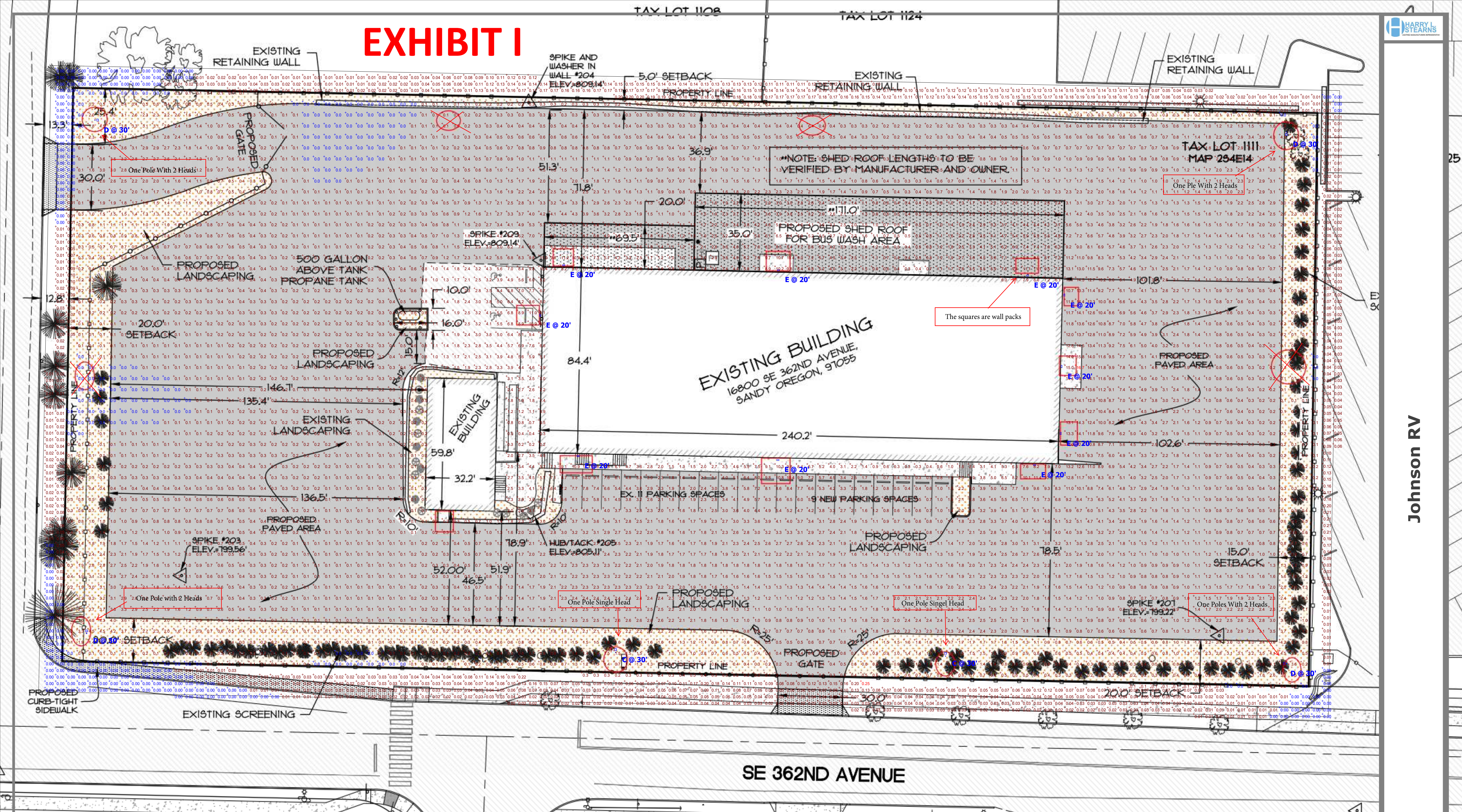


photo 3.jpeg
5465K



 **Johnson RV tree plan.pdf**
1496K

EXHIBIT I



Johnson RV

Schedule						
Symbol	Label	QTY	Manufacturer	Catalog Number	Description	
	C	2	Lithonia Lighting	DSX1 LED P4 40K BLC MVOLT	DSX1 LED P4 40K BLC MVOLT	Lumens per Lamp
	D	4	Lithonia Lighting	DSX1 LED P6 40K LCCO MVOLT	DSX1 LED P6 40K LCCO MVOLT	Wattage
	E	10	Lithonia Lighting	WDGE4 LED P5 70CRI RFT 40K	WDGE4 LED WITH P5 - PERFORMANCE PACKAGE, 4000K, 70CRI, FORWARD THROW OPTIC	Wattage

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
10' Boundry Site	+	0.05 fc	0.25 fc	0.00 fc	N/A	N/A
	+	1.7 fc	16.7 fc	0.0 fc	N/A	N/A



D-Series Size 1 LED Area Luminaire

d#series



Buy American

Catalog Number _____

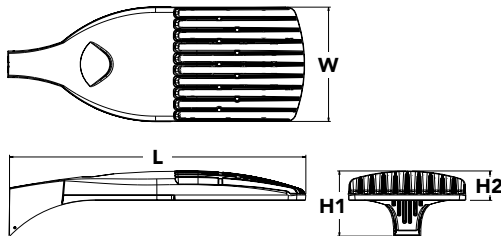
Notes _____

Type _____

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

- EPA:** 1.01 ft²
(0.09 m²)
- Length:** 33"
(83.8 cm)
- Width:** 13"
(33.0 cm)
- Height H1:** 7-1/2"
(19.0 cm)
- Height H2:** 3-1/2"
- Weight:** 27 lbs
(12.2 kg)



Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment. The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire.

The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 750W metal halide in pedestrian and area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information

EXAMPLE: DSX1 LED P7 40K T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX1 LED						
Series	LEDs	Color temperature	Distribution	Voltage	Mounting	
DSX1 LED	Forward optics P1 P4 ¹ P7 ¹ P2 P5 ¹ P8 P3 P6 ¹ P9 ¹ Rotated optics P10 ² P12 ² P11 ² P13 ^{1,2}	30K 3000 K 40K 4000 K 50K 5000 K	T1S Type I short (Automotive) T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium	T5VS Type V very short ³ T5S Type V short ³ T5M Type V medium ³ T5W Type V wide ³ BLC Backlight control⁴ LCCO Left corner cutoff ⁴ RCCO Right corner cutoff ⁴	MVOLT⁵ XVOLT (277V-480V) ^{6,7,8} 120 ⁹ 208 ⁹ 240 ⁹ 277 ⁹ 347 ⁹ 480 ⁹	Shipped included SPA Square pole mounting RPA Round pole mounting ¹⁰ WBA Wall bracket ³ SPUMBA Square pole universal mounting adaptor ¹¹ RPUMBA Round pole universal mounting adaptor ⁹ Shipped separately KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish) ¹²

Control options	Other options	Finish (required)
Shipped installed NLTAIR2 nLight AIR generation 2 enabled ¹³ PIRHN Network, high/low motion/ambient sensor ¹⁴ PER NEMA twist-lock receptacle only (controls ordered separate) ¹⁵ PER5 Five-pin receptacle only (controls ordered separate) ^{15,16} PER7 Seven-pin receptacle only (controls ordered separate) ^{15,16} DMG 0-10v dimming wires pulled outside fixture (for use with an external control, ordered separately) ¹⁷ DS Dual switching ^{18,19,20}	Shipped installed HS House-side shield ²³ SF Single fuse (120, 277, 347V) ⁹ DF Double fuse (208, 240, 480V) ⁹ L90 Left rotated optics ² R90 Right rotated optics ² HA 50°C ambient operations ¹ BAA Buy America(n) Act Compliant Shipped separately BS Bird spikes ²⁴ EGS External glare shield	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLTXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white



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DSX1-LED
 Rev. 07/19/21
 Page 1 of 8

Ordering Information

Accessories

Ordered and shipped separately.

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) ²⁵
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) ²⁵
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) ²⁵
DSHORT SBK U	Shorting cap ²⁵
DSX1HS 30C U	House-side shield for P1, P2, P3, P4 and P5 ²¹
DSX1HS 40C U	House-side shield for P6 and P7 ²¹
DSX1HS 60C U	House-side shield for P8, P9, P10, P11 and P12 ²¹
PUMBA DDBXD U*	Square and round pole universal mounting bracket (specify finish) ²⁸
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish) ¹²
DSX1EGS (FINISH) U	External glare shield

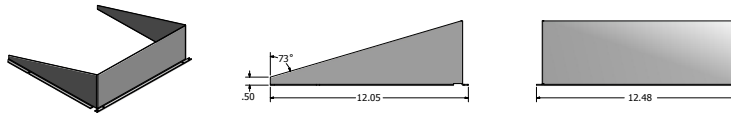
For more control options, visit [DTL](#) and [ROAM](#) online.

NOTES

- HA not available with P4, P5, P6, P7, P9 and P13.
- P10, P11, P12 or P13 and rotated optics (L90, R90) only available together.
- Any Type 5 distribution with photocell, is not available with WBA.
- Not available with HS.
- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- XVOLT only suitable for use with P3, P5, P6, P7, P9 and P13.
- XVOLT works with any voltage between 277V and 480V.
- XVOLT not available with fusing (SF or DF) and not available with PIR, PIRH, PIR1FC3V, PIR1FC3V.
- Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V. XVOLT not available with fusing (SF or DF).
- Suitable for mounting to round poles between 3.5" and 12" diameter.
- Universal mounting brackets intended for retrofit on existing, pre-drilled poles only. 1.5 G vibration load rating per ANCI C136.31. Only usable when pole's drill pattern is NOT Lithonia template #8
- Must order fixture with SPA option. Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" diameter mast arm (not included).
- Must be ordered with NLTAIR2. Sensor cover available only in dark bronze, black, white and natural aluminum colors.
- Must be ordered with NLTAIR2. For more information on nLight Air 2 visit [this link](#).
- Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Shorting cap included.
- If ROAM® node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Node with integral dimming.
- DMG not available with PIRHN, PER5, PER7, PIR, PIRH, PIR1FC3V or PIR1FC3V, FAO.
- 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 with isolated neutral.
- Reference Controls Option Default settings table on page 4.
- Reference Motion Sensor table on page 4 to see functionality.
- 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 Control Option Table on page 4.
- For retrofit use only. Only usable when pole's drill pattern is NOT Lithonia template #8.

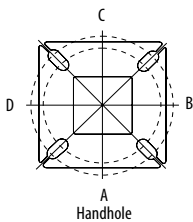
Options

EGS - External Glare Shield

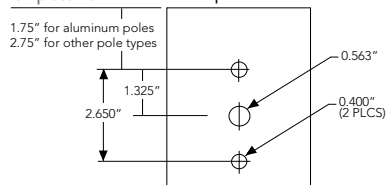


Drilling

HANDHOLE ORIENTATION



Template #8



Tenon Mounting Slipfitter

Tenon O.D.	Mounting	Single Unit	2 @ 180	2 @ 90	3 @ 90	3 @ 120	4 @ 90
2-3/8"	RPA	AS3-5 190	AS3-5 280	AS3-5 290	AS3-5 390	AS3-5 320	AS3-5 490
2-7/8"	RPA	AST25-190	AST25-280	AST25-290	AST25-390	AST25-320	AST25-490
4"	RPA	AST35-190	AST35-280	AST35-290	AST35-390	AST35-320	AST35-490

Mounting Option	Drilling Template	Single	2 @ 180	2 @ 90	3 @ 90	3 @ 120	4 @ 90
Head Location		Side B	Side B & D	Side B & C	Side B, C & D	Round Pole Only	Side A, B, C & D
Drill Nomenclature	#8	DM19AS	DM28AS	DM29AS	DM39AS	DM32AS	DM49AS

DSX1 Area Luminaire - EPA

*Includes luminaire and integral mounting arm. Other tenons, arms, brackets or other accessories are not included in this EPA data.

Fixture Quantity & Mounting Configuration	Single DM19	2 @ 180 DM28	2 @ 90 DM29	3 @ 90 DM39	3 @ 120 DM32	4 @ 90 DM49
Mounting Type						
DSX1 LED	1.013	2.025	1.945	3.038	2.850	3.749

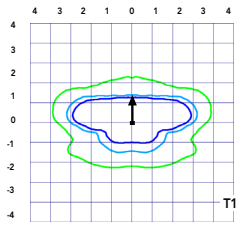
	Drilling Template	Minimum Acceptable Outside Pole Dimension					
SPA	#8	2-7/8"	2-7/8"	3.5"	3.5"	3"	3.5"
RPA	#8	2-7/8"	2-7/8"	3.5"	3.5"	3"	3.5"
SPUMBA	#5	2-7/8"	3"	4"	4"	3.5"	4"
RPUMBA	#5	2-7/8"	3.5"	5"	5"	3.5"	5"

Photometric Diagrams

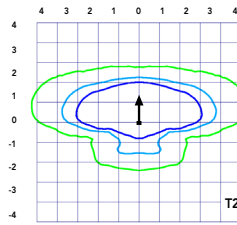
To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's [D-Series Area Size 1 homepage](#).

Isofootcandle plots for the DSX1 LED 60C 1000 40K. Distances are in units of mounting height (25').

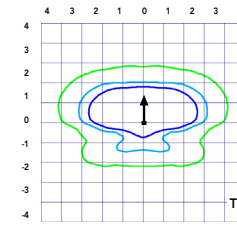
- LEGEND**
- 0.1 fc
 - 0.5 fc
 - 1.0 fc



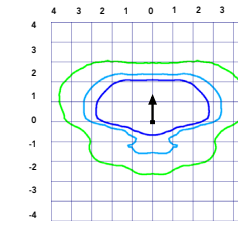
Test No. LT123211 tested in accordance with IESNA LM-79-08.



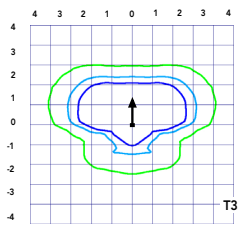
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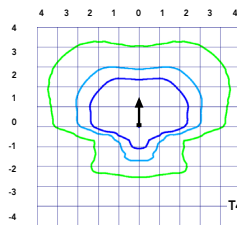
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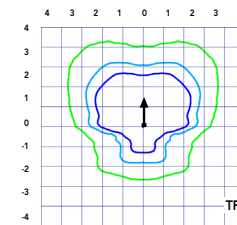
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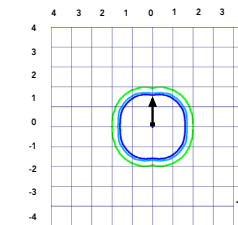
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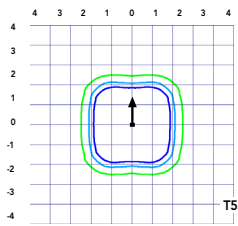
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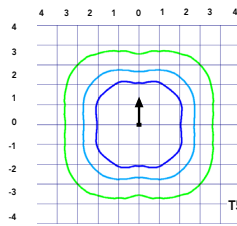
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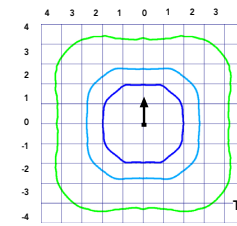
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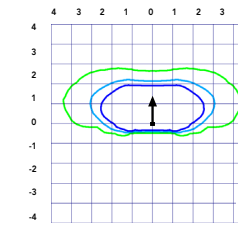
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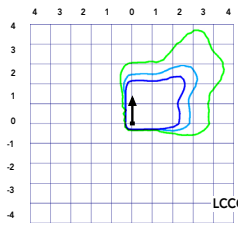
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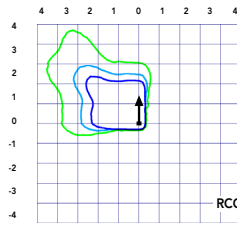
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Test No. LT123271 tested in accordance with IESNA LM-79-08.



Test No. LT123211 tested in accordance with IESNA LM-79-08.



Test No. LT123164B tested in accordance with IESNA LM-79-08.

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	Lumen Maintenance Factor
0	1.00
25,000	0.96
50,000	0.92
100,000	0.85

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 when motion sensor is used as dusk to dawn control.

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

Controls Options

Nomenclature	Description	Functionality	Primary control device	Notes
FAO	Field adjustable output device installed inside the luminaire; wired to the driver dimming leads.	Allows the luminaire to be manually dimmed, effectively trimming the light output.	FAO device	Cannot be used with other controls options that need the 0-10V leads
DS	Drivers wired independently for 50/50 luminaire operation	The luminaire is wired to two separate circuits, allowing for 50/50 operation.	Independently wired drivers	Requires two separately switched circuits. Consider nLight AIR as a more cost effective alternative.
PERS or PER7	Twist-lock photocell receptacle	Compatible with standard twist-lock photocells for dusk to dawn operation, or advanced control nodes that provide 0-10V dimming signals.	Twist-lock photocells such as DLL Elite or advanced control nodes such as ROAM.	Pins 4 & 5 to dimming leads on driver, Pins 6 & 7 are capped inside luminaire
PIR or PIRH	Motion sensors with integral photocell. PIR for 8-15' mounting; PIRH for 15-30' mounting	Luminaires dim when no occupancy is detected.	Acuity Controls SBGR	Also available with PIRH1FC3V when the sensor photocell is used for dusk-to-dawn operation.
NLTAIR2 PIRHN	nLight AIR enabled luminaire for motion sensing, photocell and wireless communication.	Motion and ambient light sensing with group response. Scheduled dimming with motion sensor over-ride when wirelessly connected to the nLight Eclipse.	nLight Air rSDGR	nLight AIR sensors can be programmed and commissioned from the ground using the CIAIRity Pro app.

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)				
					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
				T2S	6,450	2	0	2	119	6,949	2	0	2	129	7,037	2	0	2	130
				T2M	6,483	1	0	1	120	6,984	2	0	2	129	7,073	2	0	2	131
				T3S	6,279	2	0	2	116	6,764	2	0	2	125	6,850	2	0	2	127
				T3M	6,468	1	0	2	120	6,967	1	0	2	129	7,056	1	0	2	131
				T4M	6,327	1	0	2	117	6,816	1	0	2	126	6,902	1	0	2	128
				TFTM	6,464	1	0	2	120	6,963	1	0	2	129	7,051	1	0	2	131
				TSVS	6,722	2	0	0	124	7,242	3	0	0	134	7,334	3	0	0	136
				T5S	6,728	2	0	1	125	7,248	2	0	1	134	7,340	2	0	1	136
				T5M	6,711	3	0	1	124	7,229	3	0	1	134	7,321	3	0	2	136
				TSW	6,667	3	0	2	123	7,182	3	0	2	133	7,273	3	0	2	135
				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
T2S	8,240	2	0					2	118	8,877	2	0	2	127	8,989	2	0	2	128
T2M	8,283	2	0					2	118	8,923	2	0	2	127	9,036	2	0	2	129
T3S	8,021	2	0					2	115	8,641	2	0	2	123	8,751	2	0	2	125
T3M	8,263	2	0					2	118	8,901	2	0	2	127	9,014	2	0	2	129
T4M	8,083	2	0					2	115	8,708	2	0	2	124	8,818	2	0	2	126
TFTM	8,257	2	0					2	118	8,896	2	0	2	127	9,008	2	0	2	129
TSVS	8,588	3	0					0	123	9,252	3	0	0	132	9,369	3	0	0	134
T5S	8,595	3	0					1	123	9,259	3	0	1	132	9,376	3	0	1	134
T5M	8,573	3	0					2	122	9,236	3	0	2	132	9,353	3	0	2	134
TSW	8,517	3	0					2	122	9,175	4	0	2	131	9,291	4	0	2	133
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
				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
				T5S	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
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
T5S	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
				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	2	0	3	106	15,830	3	0	3	115	16,030	3	0	3	116
				TSVS	15,283	4	0	1	111	16,464	4	0	1	119	16,672	4	0	1	121
				T5S	15,295	3	0	1	111	16,477	4	0	1	119	16,686	4	0	1	121
				T5M	15,257	4	0	2	111	16,435	4	0	2	119	16,644	4	0	2	121
				TSW	15,157	4	0	3	110	16,328	4	0	3	118	16,534	4	0	3	120
				BLC	12,048	1	0	2	87	12,979	1	0	2	94	13,143	1	0	2	95
				LCCO	8,965	1	0	3	65	9,657	1	0	3	70	9,780	1	0	3	71
				RCCO	8,965	1	0	3	65	9,657	1	0	3	70	9,780	1	0	3	71

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)								
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	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				
				TSW	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				
TSW	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				
				TSW	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				
TSW	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				
RCCO	15,619	2	0					4	65	16,825	2	0	4	70	17,038	2	0	4	71				

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.

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)								
					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				
				T2S	12,967	4	0	4	122	13,969	4	0	4	132	14,146	4	0	4	133				
				T2M	13,201	3	0	3	125	14,221	3	0	3	134	14,401	3	0	3	136				
				T3S	12,766	4	0	4	120	13,752	4	0	4	130	13,926	4	0	4	131				
				T3M	13,193	4	0	4	124	14,213	4	0	4	134	14,393	4	0	4	136				
				T4M	12,944	4	0	4	122	13,945	4	0	4	132	14,121	4	0	4	133				
				TFTM	13,279	4	0	4	125	14,305	4	0	4	135	14,486	4	0	4	137				
				TSVS	13,372	3	0	1	126	14,405	4	0	1	136	14,588	4	0	1	138				
				T5S	13,260	3	0	1	125	14,284	3	0	1	135	14,465	3	0	1	136				
				T5M	13,256	4	0	2	125	14,281	4	0	2	135	14,462	4	0	2	136				
				TSW	13,137	4	0	3	124	14,153	4	0	3	134	14,332	4	0	3	135				
				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
								T2S	16,461	4	0	4	120	17,733	4	0	4	129	17,957	4	0	4	131
T2M	16,758	4	0					4	122	18,053	4	0	4	132	18,281	4	0	4	133				
T3S	16,205	4	0					4	118	17,457	4	0	4	127	17,678	4	0	4	129				
T3M	16,748	4	0					4	122	18,042	4	0	4	132	18,271	4	0	4	133				
T4M	16,432	4	0					4	120	17,702	4	0	4	129	17,926	4	0	4	131				
TFTM	16,857	4	0					4	123	18,159	4	0	4	133	18,389	4	0	4	134				
TSVS	16,975	4	0					1	124	18,287	4	0	1	133	18,518	4	0	1	135				
T5S	16,832	4	0					1	123	18,133	4	0	2	132	18,362	4	0	2	134				
T5M	16,828	4	0					2	123	18,128	4	0	2	132	18,358	4	0	2	134				
TSW	16,677	4	0					3	122	17,966	5	0	3	131	18,193	5	0	3	133				
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				
				T5S	23,380	4	0	2	113	25,187	4	0	2	122	25,506	4	0	2	123				
				T5M	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				
T5S	25,824	4	0					2	112	27,819	5	0	2	120	28,172	5	0	2	122				
T5M	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				
RCCO	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).

STANDARD CONTROLS

The DSX1 LED area luminaire has a number of control options. DSX Size 1, comes standard with 0-10V dimming drivers. Dusk to dawn controls can be utilized via optional NEMA twist-lock photocell receptacles. Integrated motion sensors with on-board photocells feature field-adjustable programming and are suitable for mounting heights up to 30 feet.

nLIGHT AIR CONTROLS

The DSX1 LED area luminaire is also available with nLight® AIR for the ultimate in wireless control. This powerful controls platform provides out-of-the-box basic motion sensing and photocontrol functionality and is suitable for mounting heights up to 40 feet. Once commissioned using a smartphone and the easy-to-use CLAIRITY app, nLight AIR equipped luminaires can be grouped, resulting in motion sensor and photocell group response without the need for additional equipment. Scheduled dimming with motion sensor over-ride can be achieved when used with the nLight Eclipse. Additional information about nLight Air can be found here.

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). NEMA photocontrol receptacle are also available.

LISTINGS

UL listed to meet U.S. and Canadian standards. 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.

BUY AMERICAN

Product with the BAA option is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT. Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/support/customer-support/terms-and-conditions

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.



COMMERCIAL OUTDOOR

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DSX1-LED

Rev. 07/19/21

Page 8 of 8



D-Series Size 1 LED Area Luminaire

d#series



Buy American

Catalog Number _____

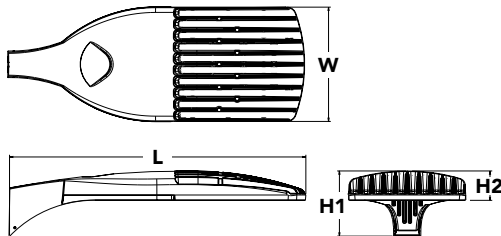
Notes _____

Type _____

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

- EPA:** 1.01 ft²
(0.09 m²)
- Length:** 33"
(83.8 cm)
- Width:** 13"
(33.0 cm)
- Height H1:** 7-1/2"
(19.0 cm)
- Height H2:** 3-1/2"
- Weight:** 27 lbs
(12.2 kg)



Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment. The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire.

The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 750W metal halide in pedestrian and area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Ordering Information

EXAMPLE: DSX1 LED P7 40K T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX1 LED						
Series	LEDs	Color temperature	Distribution	Voltage	Mounting	
DSX1 LED	Forward optics P1 P4 ¹ P7 ¹ P2 P5 ¹ P8 P3 P6 ¹ P9 ¹ Rotated optics P10 ² P12 ² P11 ² P13 ^{1,2}	30K 3000 K 40K 4000 K 50K 5000 K	T1S Type I short (Automotive) T2S Type II short T2M Type II medium T3S Type III short T3M Type III medium T4M Type IV medium TFTM Forward throw medium	T5VS Type V very short ³ T5S Type V short ³ T5M Type V medium ³ T5W Type V wide ³ BLC Backlight control⁴ LCCO Left corner cutoff⁴ RCCO Right corner cutoff⁴	MVOLT⁵ XVOLT (277V-480V) ^{6,7,8} 120 ⁹ 208 ⁹ 240 ⁹ 277 ⁹ 347 ⁹ 480 ⁹	Shipped included SPA Square pole mounting RPA Round pole mounting ¹⁰ WBA Wall bracket ³ SPUMBA Square pole universal mounting adaptor ¹¹ RPUMBA Round pole universal mounting adaptor ⁹ Shipped separately KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish) ¹²

Control options	Other options	Finish (required)
Shipped installed NLTAIR2 nLight AIR generation 2 enabled ¹³ PIRHN Network, high/low motion/ambient sensor ¹⁴ PER NEMA twist-lock receptacle only (controls ordered separate) ¹⁵ PER5 Five-pin receptacle only (controls ordered separate) ^{15,16} PER7 Seven-pin receptacle only (controls ordered separate) ^{15,16} DMG 0-10v dimming wires pulled outside fixture (for use with an external control, ordered separately) ¹⁷ DS Dual switching ^{18,19,20}	Shipped installed HS House-side shield ²³ SF Single fuse (120, 277, 347V) ⁹ DF Double fuse (208, 240, 480V) ⁹ L90 Left rotated optics ² R90 Right rotated optics ² HA 50°C ambient operations ¹ BAA Buy America(n) Act Compliant Shipped separately BS Bird spikes ²⁴ EGS External glare shield	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLTXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white



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DSX1-LED
 Rev. 07/19/21
 Page 1 of 8

Ordering Information

Accessories

Ordered and shipped separately.

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) ²⁵
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) ²⁵
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) ²⁵
DSHORT SBK U	Shorting cap ²⁵
DSX1HS 30C U	House-side shield for P1, P2, P3, P4 and P5 ²¹
DSX1HS 40C U	House-side shield for P6 and P7 ²¹
DSX1HS 60C U	House-side shield for P8, P9, P10, P11 and P12 ²¹
PUMBA DDBXD U*	Square and round pole universal mounting bracket (specify finish) ²⁸
KMA8 DDBXD U	Mast arm mounting bracket adaptor (specify finish) ¹²
DSX1EGS (FINISH) U	External glare shield

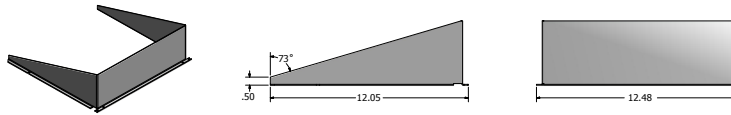
For more control options, visit [DTL](#) and [ROAM](#) online.

NOTES

- HA not available with P4, P5, P6, P7, P9 and P13.
- P10, P11, P12 or P13 and rotated optics (L90, R90) only available together.
- Any Type 5 distribution with photocell, is not available with WBA.
- Not available with HS.
- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
- XVOLT only suitable for use with P3, P5, P6, P7, P9 and P13.
- XVOLT works with any voltage between 277V and 480V.
- XVOLT not available with fusing (SF or DF) and not available with PIR, PIRH, PIR1FC3V, PIR1FC3V.
- Single fuse (SF) requires 120V, 277V or 347V. Double fuse (DF) requires 208V, 240V or 480V. XVOLT not available with fusing (SF or DF).
- Suitable for mounting to round poles between 3.5" and 12" diameter.
- Universal mounting brackets intended for retrofit on existing, pre-drilled poles only. 1.5 G vibration load rating per ANCI C136.31. Only usable when pole's drill pattern is NOT Lithonia template #8
- Must order fixture with SPA option. Must be ordered as a separate accessory; see Accessories information. For use with 2-3/8" diameter mast arm (not included).
- Must be ordered with NLTAIR2. Sensor cover available only in dark bronze, black, white and natural aluminum colors.
- Must be ordered with NLTAIR2. For more information on nLight Air 2 visit [this link](#).
- Photocell ordered and shipped as a separate line item from Acuity Brands Controls. See accessories. Shorting cap included.
- If ROAM[®] node required, it must be ordered and shipped as a separate line item from Acuity Brands Controls. Node with integral dimming.
- DMG not available with PIRHN, PER5, PER7, PIR, PIRH, PIR1FC3V or PIR1FC3V, FAO.
- 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 with isolated neutral.
- Reference Controls Option Default settings table on page 4.
- Reference Motion Sensor table on page 4 to see functionality.
- 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 Control Option Table on page 4.
- For retrofit use only. Only usable when pole's drill pattern is NOT Lithonia template #8.

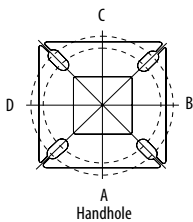
Options

EGS - External Glare Shield

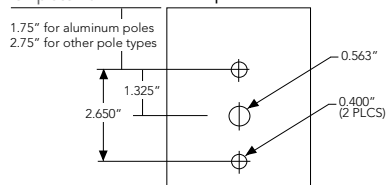


Drilling

HANDHOLE ORIENTATION



Template #8



Tenon Mounting Slipfitter

Tenon O.D.	Mounting	Single Unit	2 @ 180	2 @ 90	3 @ 90	3 @ 120	4 @ 90
2-3/8"	RPA	AS3-5 190	AS3-5 280	AS3-5 290	AS3-5 390	AS3-5 320	AS3-5 490
2-7/8"	RPA	AST25-190	AST25-280	AST25-290	AST25-390	AST25-320	AST25-490
4"	RPA	AST35-190	AST35-280	AST35-290	AST35-390	AST35-320	AST35-490

Mounting Option	Drilling Template	Single	2 @ 180	2 @ 90	3 @ 90	3 @ 120	4 @ 90
Head Location		Side B	Side B & D	Side B & C	Side B, C & D	Round Pole Only	Side A, B, C & D
Drill Nomenclature	#8	DM19AS	DM28AS	DM29AS	DM39AS	DM32AS	DM49AS

DSX1 Area Luminaire - EPA

*Includes luminaire and integral mounting arm. Other tenons, arms, brackets or other accessories are not included in this EPA data.

Fixture Quantity & Mounting Configuration	Single DM19	2 @ 180 DM28	2 @ 90 DM29	3 @ 90 DM39	3 @ 120 DM32	4 @ 90 DM49
Mounting Type						
DSX1 LED	1.013	2.025	1.945	3.038	2.850	3.749

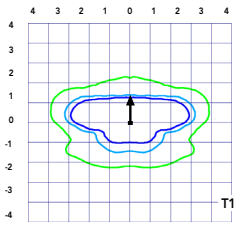
	Drilling Template	Minimum Acceptable Outside Pole Dimension					
SPA	#8	2-7/8"	2-7/8"	3.5"	3.5"	3"	3.5"
RPA	#8	2-7/8"	2-7/8"	3.5"	3.5"	3"	3.5"
SPUMBA	#5	2-7/8"	3"	4"	4"	3.5"	4"
RPUMBA	#5	2-7/8"	3.5"	5"	5"	3.5"	5"

Photometric Diagrams

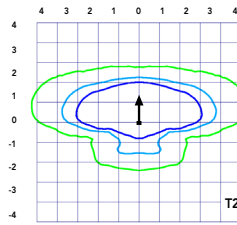
To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's [D-Series Area Size 1 homepage](#).

Isofootcandle plots for the DSX1 LED 60C 1000 40K. Distances are in units of mounting height (25').

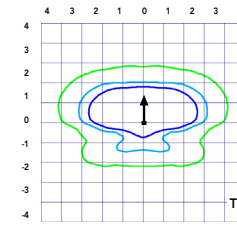
- LEGEND**
- 0.1 fc
 - 0.5 fc
 - 1.0 fc



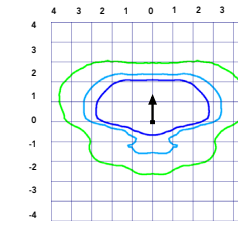
T1S
Test No. LT123211 tested in accordance with IESNA LM-79-08.



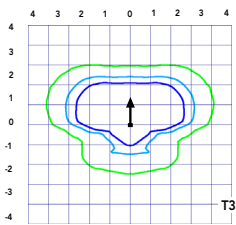
T2M
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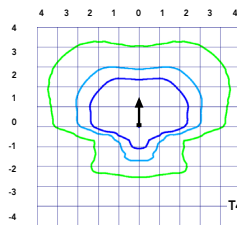
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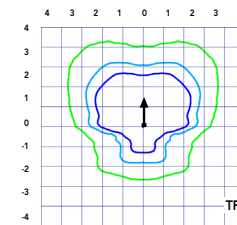
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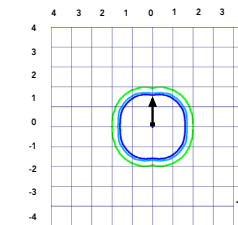
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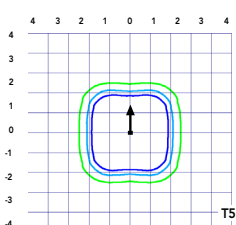
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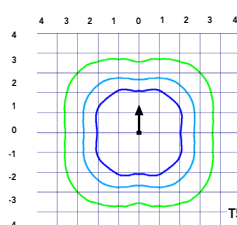
T4T
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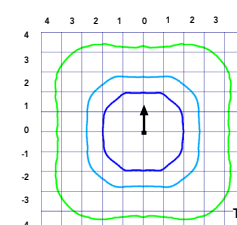
T5VS
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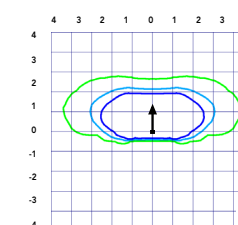
T5S
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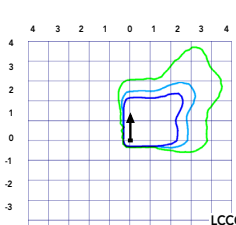
T5M
Test No. LT123164B tested in accordance with IESNA LM-79-08.



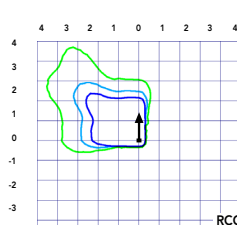
T5W
Test No. LT123222 tested in accordance with IESNA LM-79-08.



BLC
Test No. LT123271 tested in accordance with IESNA LM-79-08.



LCCO
Test No. LT123211 tested in accordance with IESNA LM-79-08.



RCCO
Test No. LT123164B tested in accordance with IESNA LM-79-08.

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	Lumen Maintenance Factor
0	1.00
25,000	0.96
50,000	0.92
100,000	0.85

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 when motion sensor is used as dusk to dawn control.

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

Controls Options

Nomenclature	Description	Functionality	Primary control device	Notes
FAO	Field adjustable output device installed inside the luminaire; wired to the driver dimming leads.	Allows the luminaire to be manually dimmed, effectively trimming the light output.	FAO device	Cannot be used with other controls options that need the 0-10V leads
DS	Drivers wired independently for 50/50 luminaire operation	The luminaire is wired to two separate circuits, allowing for 50/50 operation.	Independently wired drivers	Requires two separately switched circuits. Consider nLight AIR as a more cost effective alternative.
PERS or PER7	Twist-lock photocell receptacle	Compatible with standard twist-lock photocells for dusk to dawn operation, or advanced control nodes that provide 0-10V dimming signals.	Twist-lock photocells such as DLL Elite or advanced control nodes such as ROAM.	Pins 4 & 5 to dimming leads on driver, Pins 6 & 7 are capped inside luminaire
PIR or PIRH	Motion sensors with integral photocell. PIR for 8-15' mounting; PIRH for 15-30' mounting	Luminaires dim when no occupancy is detected.	Acuity Controls SBGR	Also available with PIRH1FC3V when the sensor photocell is used for dusk-to-dawn operation.
NLTAIR2 PIRHN	nLight AIR enabled luminaire for motion sensing, photocell and wireless communication.	Motion and ambient light sensing with group response. Scheduled dimming with motion sensor over-ride when wirelessly connected to the nLight Eclipse.	nLight Air rSDGR	nLight AIR sensors can be programmed and commissioned from the ground using the CIAIRity Pro app.

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)				
					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
				T2S	6,450	2	0	2	119	6,949	2	0	2	129	7,037	2	0	2	130
				T2M	6,483	1	0	1	120	6,984	2	0	2	129	7,073	2	0	2	131
				T3S	6,279	2	0	2	116	6,764	2	0	2	125	6,850	2	0	2	127
				T3M	6,468	1	0	2	120	6,967	1	0	2	129	7,056	1	0	2	131
				T4M	6,327	1	0	2	117	6,816	1	0	2	126	6,902	1	0	2	128
				TFTM	6,464	1	0	2	120	6,963	1	0	2	129	7,051	1	0	2	131
				TSVS	6,722	2	0	0	124	7,242	3	0	0	134	7,334	3	0	0	136
				T5S	6,728	2	0	1	125	7,248	2	0	1	134	7,340	2	0	1	136
				T5M	6,711	3	0	1	124	7,229	3	0	1	134	7,321	3	0	2	136
				TSW	6,667	3	0	2	123	7,182	3	0	2	133	7,273	3	0	2	135
				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
				T1S	8,249	2	0	2	118	8,886	2	0	2	127	8,999	2	0	2	129
				T2S	8,240	2	0	2	118	8,877	2	0	2	127	8,989	2	0	2	128
T2M	8,283	2	0	2	118	8,923	2	0	2	127	9,036	2	0	2	129				
T3S	8,021	2	0	2	115	8,641	2	0	2	123	8,751	2	0	2	125				
T3M	8,263	2	0	2	118	8,901	2	0	2	127	9,014	2	0	2	129				
T4M	8,083	2	0	2	115	8,708	2	0	2	124	8,818	2	0	2	126				
TFTM	8,257	2	0	2	118	8,896	2	0	2	127	9,008	2	0	2	129				
TSVS	8,588	3	0	0	123	9,252	3	0	0	132	9,369	3	0	0	134				
T5S	8,595	3	0	1	123	9,259	3	0	1	132	9,376	3	0	1	134				
T5M	8,573	3	0	2	122	9,236	3	0	2	132	9,353	3	0	2	134				
TSW	8,517	3	0	2	122	9,175	4	0	2	131	9,291	4	0	2	133				
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				
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				
T5S	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				
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				
T5S	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				
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	2	0	3	106	15,830	3	0	3	115	16,030	3	0	3	116				
TSVS	15,283	4	0	1	111	16,464	4	0	1	119	16,672	4	0	1	121				
T5S	15,295	3	0	1	111	16,477	4	0	1	119	16,686	4	0	1	121				
T5M	15,257	4	0	2	111	16,435	4	0	2	119	16,644	4	0	2	121				
TSW	15,157	4	0	3	110	16,328	4	0	3	118	16,534	4	0	3	120				
BLC	12,048	1	0	2	87	12,979	1	0	2	94	13,143	1	0	2	95				
LCCO	8,965	1	0	3	65	9,657	1	0	3	70	9,780	1	0	3	71				
RCCO	8,965	1	0	3	65	9,657	1	0	3	70	9,780	1	0	3	71				



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DSX1-LED
 Rev. 07/19/21
 Page 5 of 8

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)								
					Lumens	B	U	G	LPW	Lumens	B	U	G	LPW	Lumens	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				
				TSW	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				
TSW	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				
				TSW	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				
TSW	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				
RCCO	15,619	2	0					4	65	16,825	2	0	4	70	17,038	2	0	4	71				

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.

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)								
					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				
				T2S	12,967	4	0	4	122	13,969	4	0	4	132	14,146	4	0	4	133				
				T2M	13,201	3	0	3	125	14,221	3	0	3	134	14,401	3	0	3	136				
				T3S	12,766	4	0	4	120	13,752	4	0	4	130	13,926	4	0	4	131				
				T3M	13,193	4	0	4	124	14,213	4	0	4	134	14,393	4	0	4	136				
				T4M	12,944	4	0	4	122	13,945	4	0	4	132	14,121	4	0	4	133				
				TFTM	13,279	4	0	4	125	14,305	4	0	4	135	14,486	4	0	4	137				
				TSVS	13,372	3	0	1	126	14,405	4	0	1	136	14,588	4	0	1	138				
				T5S	13,260	3	0	1	125	14,284	3	0	1	135	14,465	3	0	1	136				
				T5M	13,256	4	0	2	125	14,281	4	0	2	135	14,462	4	0	2	136				
				TSW	13,137	4	0	3	124	14,153	4	0	3	134	14,332	4	0	3	135				
				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
								T2S	16,461	4	0	4	120	17,733	4	0	4	129	17,957	4	0	4	131
T2M	16,758	4	0					4	122	18,053	4	0	4	132	18,281	4	0	4	133				
T3S	16,205	4	0					4	118	17,457	4	0	4	127	17,678	4	0	4	129				
T3M	16,748	4	0					4	122	18,042	4	0	4	132	18,271	4	0	4	133				
T4M	16,432	4	0					4	120	17,702	4	0	4	129	17,926	4	0	4	131				
TFTM	16,857	4	0					4	123	18,159	4	0	4	133	18,389	4	0	4	134				
TSVS	16,975	4	0					1	124	18,287	4	0	1	133	18,518	4	0	1	135				
T5S	16,832	4	0					1	123	18,133	4	0	2	132	18,362	4	0	2	134				
T5M	16,828	4	0					2	123	18,128	4	0	2	132	18,358	4	0	2	134				
TSW	16,677	4	0					3	122	17,966	5	0	3	131	18,193	5	0	3	133				
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				
				T5S	23,380	4	0	2	113	25,187	4	0	2	122	25,506	4	0	2	123				
				T5M	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				
T5S	25,824	4	0					2	112	27,819	5	0	2	120	28,172	5	0	2	122				
T5M	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				
RCCO	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).

STANDARD CONTROLS

The DSX1 LED area luminaire has a number of control options. DSX Size 1, comes standard with 0-10V dimming drivers. Dusk to dawn controls can be utilized via optional NEMA twist-lock photocell receptacles. Integrated motion sensors with on-board photocells feature field-adjustable programming and are suitable for mounting heights up to 30 feet.

nLIGHT AIR CONTROLS

The DSX1 LED area luminaire is also available with nLight® AIR for the ultimate in wireless control. This powerful controls platform provides out-of-the-box basic motion sensing and photocontrol functionality and is suitable for mounting heights up to 40 feet. Once commissioned using a smartphone and the easy-to-use CLAIRITY app, nLight AIR equipped luminaires can be grouped, resulting in motion sensor and photocell group response without the need for additional equipment. Scheduled dimming with motion sensor over-ride can be achieved when used with the nLight Eclipse. Additional information about nLight Air can be found here.

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). NEMA photocontrol receptacle are also available.

LISTINGS

UL listed to meet U.S. and Canadian standards. 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.

BUY AMERICAN

Product with the BAA option is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT. Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/support/customer-support/terms-and-conditions

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.



COMMERCIAL OUTDOOR

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DSX1-LED

Rev. 07/19/21

Page 8 of 8



WDGE4 LED

Architectural Wall Sconce



Catalog Number

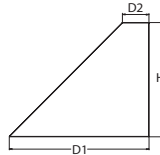
Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements.

Specifications

- Depth (D1):** 10"
- Depth (D2):** 2"
- Height:** 9"
- Width:** 25"
- Weight:** 30.5 lbs
(without options)



Introduction

The WDG4 LED family is designed to meet specifier's every wall-mounted lighting need in a widely accepted shape that blends with any architecture. The clean rectilinear design comes in four sizes with lumen packages ranging from 1,200 to 25,000 lumens, providing a true site-wide solution. Embedded with nLight® AIR wireless controls, the WDG4 family provides additional energy savings and code compliance.

WDGE4 has been designed to deliver up to 25,000 lumens through a precision refractive lens with wide distribution, perfect for augmenting the lighting from pole mounted luminaires.

WDGE LED Family Overview

Luminaire	Standard EM, 0°C	Cold EM, -20°C	Sensor	Lumens (4000K)					
				P1	P2	P3	P4	P5	P6
WDGE1 LED	4W	--	--	1,200	2,000	--	--	--	--
WDGE2 LED	10W	18W	Standalone / nLight	1,200	2,000	3,000	4,500	6,000	--
WDGE3 LED	15W	18W	Standalone / nLight	7,500	8,500	10,000	12,000	--	--
WDGE4 LED	--	--	Standalone / nLight	12,000	16,000	18,000	20,000	22,000	25,000

Ordering Information

EXAMPLE: WDG4 LED P3 40K 70CRI R3 MVOLT SRM DDBXD

Series	Package	Color Temperature	CRI	Distribution	Voltage	Mounting
WDGE4 LED	P1 P4 P2 P5 P3 P6	30K 3000K 40K 4000K 50K 5000K	70CRI 80CRI	R2 Type 2 R3 Type 3 R4 Type 4 RFT Forward Throw	MVOLT 347 ¹ 480 ¹	Shipped included SRM Surface mounting bracket ICW Indirect Canopy/Ceiling Washer bracket (dry/damp locations only) ⁴
						Shipped separately AWS 3/8inch Architectural wall spacer PBBW Surface-mounted back box (top, left, right conduit entry). Use when there is no junction box available.

Options	Finish
PE ² Photocell, Button Type DS ³ Dual switching (comes with 2 drivers and 2 light engines) DMG ³ 0-10V dimming wires pulled outside fixture (for use with an external control, ordered separately) BCE Bottom conduit entry for back box (PBBW). Total of 4 entry points. SPD10KV 10kV Surge pack BAA Buy America(n) Act Compliant	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DSSXD Sandstone DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white DSSTXD Textured sandstone
Standalone Sensors/Controls PIR Bi-level (100/35%) motion sensor for 8-15' mounting heights. Intended for use on switched circuits with external dusk to dawn switching. PIRH Bi-level (100/35%) motion sensor for 15-30' mounting heights. Intended for use on switched circuits with external dusk to dawn switching PIR1FC3V Bi-level (100/35%) motion sensor for 8-15' mounting heights with photocell pre-programmed for dusk to dawn operation. PIRH1FC3V Bi-level (100/35%) motion sensor for 15-30' mounting heights with photocell pre-programmed for dusk to dawn operation.	
Networked Sensors/Controls NLTAIR2 PIR nLightAIR Wireless enabled bi-level motion/ambient sensor for 8-15' mounting heights. NLTAIR2 PIRH nLightAIR Wireless enabled bi-level motion/ambient sensor for 15-30' mounting heights. See page 3 for out of box functionality	

Accessories

Ordered and shipped separately.

- WDGEAWS DDBXD WDG4 3/8inch Architectural Wall Spacer (specify finish)
- WDGE4PBBW DDBXD U WDG4 surface-mounted back box (specify finish)

NOTES

- 1 347V and 480V not available with DS.
- 2 PE not available in 480V and with sensors/controls.
- 3 DS and DMG not available with sensors/controls.
- 4 Not qualified for DLC. Not available with emergency battery backup.



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 Rev. 03/01/22

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.

Performance Package	System Watts	Dist. Type	30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)				
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G
P1	77W	R2	11,173	146	2	0	1	12,125	158	2	0	1	12,125	158	2	0	1
		R3	10,951	143	2	0	2	11,884	155	2	0	2	11,884	155	2	0	2
		R4	11,224	147	2	0	2	12,180	159	2	0	2	12,180	159	2	0	2
		RFT	11,104	145	2	0	2	12,050	157	2	0	2	12,050	157	2	0	2
P2	106W	R2	14,960	141	3	0	2	16,235	153	3	0	2	16,235	153	3	0	2
		R3	14,663	138	2	0	2	15,912	150	2	0	3	15,912	150	2	0	3
		R4	15,028	141	2	0	2	16,308	153	2	0	3	16,308	153	2	0	3
		RFT	14,868	140	2	0	2	16,134	152	2	0	2	16,134	152	2	0	2
P3	123W	R2	16,993	138	3	0	2	18,441	150	3	0	2	18,441	150	3	0	2
		R3	16,655	136	2	0	3	18,074	147	3	0	3	18,074	147	3	0	3
		R4	17,070	139	2	0	3	18,524	151	3	0	3	18,524	151	3	0	3
		RFT	16,888	138	2	0	3	18,327	149	2	0	3	18,327	149	2	0	3
P4	140W	R2	18,958	136	3	0	2	20,573	147	3	0	2	20,573	147	3	0	2
		R3	18,581	133	3	0	3	20,164	144	3	0	3	20,164	144	3	0	3
		R4	19,044	136	3	0	3	20,667	148	3	0	3	20,667	148	3	0	3
		RFT	18,841	135	2	0	3	20,446	146	3	0	3	20,446	146	3	0	3
P5	156W	R2	20,919	134	3	0	2	22,702	146	3	0	2	22,702	146	3	0	2
		R3	20,503	132	3	0	3	22,250	143	3	0	3	22,250	143	3	0	3
		R4	21,014	135	3	0	3	22,804	147	3	0	4	22,804	147	3	0	4
		RFT	20,790	134	3	0	3	22,561	145	3	0	3	22,561	145	3	0	3
P6	185W	R2	23,725	128	3	0	2	25,746	139	3	0	2	25,746	139	3	0	2
		R3	23,253	126	3	0	4	25,234	136	3	0	4	25,234	136	3	0	4
		R4	23,832	129	3	0	4	25,863	140	3	0	4	25,863	140	3	0	4
		RFT	23,578	127	3	0	3	25,587	138	3	0	4	25,587	138	3	0	4

Electrical Load

Performance Package	System Watts	Current (A)					
		120V	208V	240V	277V	347V	480V
P1	77W	0.635	0.366	0.319	0.280	0.223	0.161
P2	106W	0.889	0.514	0.449	0.395	0.309	0.228
P3	123W	1.014	0.585	0.510	0.447	0.356	0.258
P4	140W	1.159	0.668	0.582	0.509	0.403	0.294
P5	156W	1.296	0.743	0.647	0.564	0.451	0.326
P6	185W	1.512	0.864	0.751	0.655	0.526	0.378

Lumen Multiplier for 80CRI

CCT	Multiplier
30K	0.891
40K	0.906
50K	0.906

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	1.05
10°C / 50°F	1.03
20°C / 68°F	1.01
25°C / 77°F	1.00
30°C / 86°F	0.99
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	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	>0.98	>0.96	>0.92



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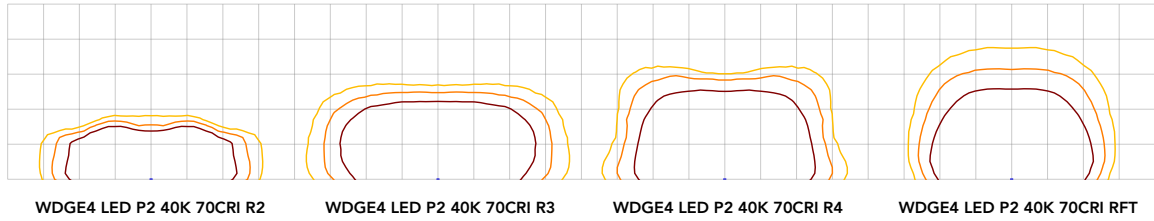
Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit the Lithonia Lighting WDGE LED homepage. Tested in accordance with IESNA LM-79 and LM-80 standards.

LEGEND

- 0.25 fc
- 0.5 fc
- 1.0 fc

MH = 18ft
Grid = 18ft x 18ft



Control / Sensor Options

Motion/Ambient Sensor (PIR, PIRH)

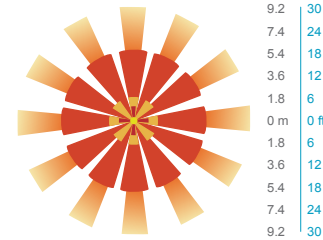
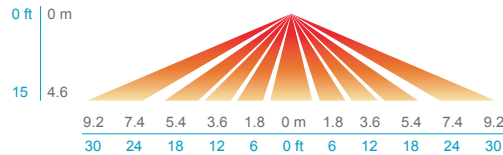
Motion/Ambient sensor (Sensor Switch MSOD) is integrated into the the luminaire. The sensor provides both Motion and Daylight based dimming of the luminaire. For motion detection, the sensor utilizes 100% Digital Passive Infrared (PIR) technology that is tuned for walking size motion while preventing false tripping from the environment. The integrated photocell enables additional energy savings during daytime periods when there is sufficient daylight. Optimize sensor coverage by either selecting PIR or PIRH option. PIR option comes with a sensor lens that is optimized to provide maximum coverage for mounting heights between 8-15ft, while PIRH is optimized for 15-40ft mounting height.

Networked Control (NLTAIR2)

nLight® AIR is a wireless lighting controls platform that allows for seamless integration of both indoor and outdoor luminaires. Five-tier security architecture, 900 MHz wireless communication and app (CLAIRITY™ Pro) based configurability combined together make nLight® AIR a secure, reliable and easy to use platform.

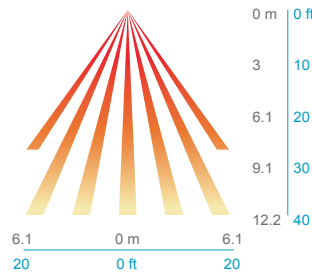
PIR

HIGH VIEW



PIRH

SIDE VIEW



TOP VIEW



Option	Dim Level	High Level (when triggered)	Photocell Operation	Motion Time Delay	Ramp-down Time	Ramp-up Time
PIR or PIRH	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
PIR1FC3V, PIRH1FC3V	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 1fc	5 min	5 min	Motion - 3 sec Photocell - 45 sec
NLTAIR2 PIR, NLTAIR2 PIRH (out of box)	Motion - 3V (37% of full output) Photocell - 0V (turned off)	10V (100% output)	Enabled @ 5fc	7.5 min	5 min	Motion - 3 sec Photocell - 45 sec



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Mounting, Options & Accessories

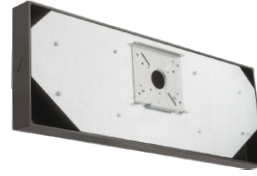


**NLTAIR2 PIR – nLight AIR
Motion/Ambient Sensor**

D = 10"

H = 11"

W = 25"



PBBW – Surface-Mounted Back Box
Use when there is no junction box available.

D = 1.75"

H = 9"

W = 25"



AWS – 3/8inch Architectural Wall Spacer

D = 0.38"

H = 4.4"

W = 7.5"

FEATURES & SPECIFICATIONS

INTENDED USE

Common architectural look, with clean rectilinear shape, of the WDGE LED was designed to blend with any type of construction, whether it be tilt-up, frame or brick. Applications include commercial offices, warehouses, hospitals, schools, malls, restaurants, and other commercial buildings.

CONSTRUCTION

The single-piece die-cast aluminum housing to optimize thermal transfer from the light engine 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 IP66 rating for the luminaire.

FINISH

Exterior painted 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 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

Individually formed acrylic lenses are engineered for superior application efficiency which maximizes the light in the areas where it is most needed. Light engines are available in 3000 K, 4000 K or 5000 K configurations. The WDGE 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 consists of high-efficacy LEDs mounted to metal-core circuit boards to maximize heat dissipation and promote long life (up to L92/100,000 hours at 25°C). The electronic driver has a power factor of >90%, THD <20%. Luminaire comes with built in 6kV surge protection, which meets a minimum Category C low exposure (per ANSI/IEEE C62.41.2). Fixture ships standard with 0-10v dimmable driver.

INSTALLATION

A universal mounting plate with integral mounting support arms allows the fixture to hinge down for easy access while making wiring connections. The 3/8" Architectural Wall Spacer (AWS) can be used to create a floating appearance or to accommodate small imperfections in the wall surface. The ICW option can be used to mount the luminaire inverted for indirect lighting in dry and damp locations. Design can withstand up to a 1.5 G vibration load rating per ANSI C136.31.

LISTINGS

CSA certified to U.S. and Canadian standards. Light engines are IP66 rated; luminaire is IP65 rated. PIR options are rated for wet location. Rated for -40°C minimum ambient. 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 and SRM mounting only.

BUY AMERICAN

Product with the BAA option is assembled in the USA and meets the Buy America(n) government procurement requirements under FAR, DFARS and DOT. Please refer to www.acuitybrands.com/buy-american for additional information.

WARRANTY

5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: www.acuitybrands.com/support/warranty/terms-and-conditions

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.



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EXHIBIT J

**Johnson RV Staging Site
Storm Report**

**Storm Drainage Design and
Hydrology Report**

August 02, 2022

Prepared By:

All County Surveyors and Planners, Inc.
Lance K. Forney
Ray L. Moore, PE, PLS
P.O. Box 955 Sandy, Oregon 97055
Phone: 668-3151 Fax: 668-4730
Job #21-375

Prepared For:

Johnson RV
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41777 US-26
Sandy, OR 97055

<u>Description</u>	<u>Page(s)</u>
Summary	1
King County Surface Water Calculations	2-3
Water Quality Design / Conclusion	4
Appendix A	
-Standard Formulas Used for the Time of Concentration Calculations	
-SCS Runoff Curve Numbers (CN)	
-Pre-developed Time of Concentration Calculations	
-Hydrograph Analysis Summary	
-Detention System Summary	
-Stage Storage Summary	
-Option Weir calculations	
-Water Quality Manhole CDS2015-4-C Detail	
-Existing Conditions Plan	
-Existing Conditions Plan with Proposed Storm Improvements	



RENEWAL DATE: 12/31/2022

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SUMMARY

The purpose of this storm drainage design is to calculate the amount of stormwater detention and water quality requirements that will be needed to fully develop Tax Lot 1111, Map 2S 4E S14. The tax lot is owned by Johnson RV.

The current site contains two buildings, an office building and a metal industrial building. The site is also being used as an outright industrial use. These calculations will satisfy the condition of approval and also will provide a detention and water quality system for the entire site based on the current master plan.

The pervious landscape area proposed on the plan is 23,889 sf (15.9%) of the site. For this analysis the minimum pervious area used is 22,514 sf (15%). This is a conservative number as the minimum landscape area requirement is 15%. The total site area is 150,091 sf (3.45 acres).

The purpose of this summary is to overview the components of the system detailed in the following calculations. The detention system proposed is designed in accordance with the City of Sandy standards and the City of Portland Stormwater Management Manual. The following detention calculations demonstrate the total volume requirements needed to detain the new impervious area and release at the pre-developed rates for all of the design storms: 2, 5, 10, and 25 year event, in accordance with the City of Sandy Code. A new on-site water quality manhole can be used to provide water quality treatment for the project. A detention tank has been chosen for stormwater detention. The attached calculations demonstrate how the design meets the requirements of the City of Sandy.

KING COUNTY SURFACE WATER DETENTION CALCULATIONS

- RAINFALL (From the City of Sandy Storm Drainage Master Plan dated November 1999)
 - 25 yr., 24 hr. rainfall = 5.5"
 - 10 yr., 24 hr. rainfall = 4.8"
 - 5 yr., 24 hr. rainfall = 4.5"
 - 2 yr., 24 hr. rainfall = 3.5"
- SOILS
 - From the "Soil Survey of Clackamas County" the soil is a type 15B which is a Cazadero Silty Clay Loam which belongs to the hydrologic group "C".
- AREAS AND CURVE NUMBERS (Curve numbers are from the King County Surface Water Design Manual – Areas were found using AutoCad). The total site area is 3.45 ac

EXISTING CONDITIONS:

Pre-Developed Impervious areas:

Gravel = 94,679 sf (2.17 acres) (CN = 89, gravel) (63.08%) 56.1412
Pavement, roof, and concrete = 37,291 sf (0.856 acres)(CN = 98, pavement) (36.92%)
Total Impervious = 132,420 sf (3.04 ac, weighted CN=92.32)

Pre-Developed Pervious areas:

Total Pervious = 18,121 sf (0.42 ac, weighted CN=86)

PROPOSED CONDITIONS Fully Developed:

Developed Impervious areas:

Total Impervious = 127,577 sf (2.93 ac, CN=98 pavement and roofs)

Developed Pervious areas:

Total Pervious = 22,514 sf (0.52 ac, CN=86, landscaping)

TIME OF CONCENTRATION (See the Time of Concentration Calculator Printouts)

Detention Basin

Pre-Developed Tc = 5.5 minutes (See the Time of Concentration Calculator Printouts)

Developed Tc = 5 minutes (assumed)

- HYDROGRAPH MODELING RESULTS
(See hydrograph program printouts from the King County Hydrograph Program)

- DETENTION SIZING RESULTS (From hydrograph program printout)

A 3' diameter tank size was used in this analysis.

3' Detention Tank

A 3-foot diameter pipe was used to calculate the orifices.
Required Storage: 2,417 cubic feet.

Minimum 3-foot diameter pipe length required is 342 feet

Orifice Table:

Orifice	Diameter (inches)	Height
Bottom	5.93"	0.00'
Middle	7.18"	0.83'
Top	99.32 degree weir	2.56'

WATER QUALITY DESIGN

The water quality system designed for this site is a Contech Solutions water quality manhole, or approved equal. As required by the City Code, the rational method was used to calculate the water quality treatment flow. The system is designed as a flow-rate based treatment facility.

- AREAS (Areas were found using AutoCAD)

Water Quality Basin

Total Developed Impervious area = 127,577 sf (2.93 acres)

- RATIONAL METHOD RATE BASED CALCULATIONS

Q = CIA

C = 0.90 (impervious area, including pavement, sidewalks, roof area)

I = 0.2 in/hr

A = 2.93 acres

Q = 0.90 X 0.2 in/hr X 2.93 acres = 0.53 cfs

The water quality system will need to be designed for the peak flow of 0.53 cfs.

Water Quality Manhole

The recommended water quality manhole is a CDS2015-4-C by Contech Solution or approved equal. This unit can treat up to 0.7 cfs. It has an internal bypass capable of handling 10.0 cfs.

CONCLUSION:

The total detention volume needed for the 3' diameter detention tank is 2,417 cubic feet. We recommend using a CDS2015-4-C unit by Contech Solution for water quality. The above calculations demonstrate how the proposed storm water improvements meet City Code requirements for this site.

Appendix A

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Project Name: Johnson RV
PRE-DEVELOPED - TIME OF CONCENTRATION CALCULATIONS

Job # 21-375
 Date: 6/14/2022

5.5 = Total Tc (min)

Overland Flow (max 300' total)			total
Tc =	3.6	1.9	5.5 = travel time for less than 300' (min)
Ns =	0.02	0.24	= Manning's coefficient (<u>sheet flow</u>)
L =	255	10	= flow length (ft)
P2 =	3.5	3.5	= 2-year, 24 hour rainfall (in)
So =	2.60%	2.60%	= slope of the land (%)

Shallow Concentrated Flow (after initial 300')			total
T =	0.0	0.0	= travel time for sheet flow (min)
L =	0	0	= flow length (ft)
So =	1.00%	3.00%	= slope of the land (%)
k =	11	11	= time of concentration velocity factor (ft/s)

Flow in Swales			total
Tc =	0.00		= travel time in swale (min)
A =	6.00		= area of flow (sf)
R =	0.59		= hydraulic radius (ft)
Ls =	4.12		= side slope wet (ft)
Q =	3.12		= quantity of flow (ft ³ /sec)
V =	0.52		= velocity
L =	0		= flow length (ft)
Ve =	1		= vertical distance of side
Ho =	4		= horizontal distance of side
Bw =	24		= base width of swale (in)
D =	12		= depth of flow ESTIMATE (in)
S =	1.00%		= slope of the swale (%)
n =	0.2		= Manning's coefficient (<u>channel</u>)

Flow in Gutters			total
Tc =	0.0		= travel time in gutter (min)
fps =	0.02		= average velocity of flow (ft/sec)
T =	0.0		= calculated width of flow in the gutter (ft)
Qc =	0.00		= quantity of flow (as calculated Q=CIA) (ft ³ /sec)
C =	0.90		= runoff coefficient for rational method (paved=0.9)
I =	2.75		= rainfall intensity (assume 5 min tc)
W =	18.00		= width of pavement draining to CB
S =	8.00%		= street longitudinal slope (%)
Sx =	2.50%		= street cross slope (%)
n =	0.016		= Manning's coefficient (<u>pavement</u> = 0.016)
L =	0.0		= length of flow and drainage basin (ft)

Flow in Pipes			total
Tc =	0.0		= travel time in pipe (min)
V =	10.15		= calculated velocity pipe full (ft/sec)
Q =	7.96		= quantity of flow (ft ³ /sec)
n =	0.013		= Manning's coefficient (<u>pipe</u>)
D =	12		= pipe diameter (in)
S =	5.00%		= slope of pipe (%)
L =	0.0		= length of pipe (ft)

Standard formulas used for the Time of Concentration Calculations

Overland Flow (max 300' total)

$$\frac{(0.42)[(Ns)(L)]^{0.8}}{(P_2)^{0.5}(S_0)^{0.4}}$$

Tc	= time of concentration for less than 300' of travel (minute)
Ns	= sheet flow Manning's effective roughness coefficient
L	= flow length (ft)
P2	= 2-year, 24 hour rainfall (in)
So	= slope of hydraulic grade line (land slope, ft/ft)

Shallow Concentrated Flow (after initial 300')

$$T = \frac{L}{(60)(k\sqrt{S_0})}$$

T	= travel time for sheet flow (min)
L	= flow length (ft)
So	= slope of hydraulic grade line (land slope, ft/ft)
k	= time of concentration velocity factor (ft/s)

Flow in Swales

Q = (1.486/n) x A x R^{2/3} x S^{1/2} (Manning's Equation)

Tc	= time of concentration for gutter flow (minutes)
A	= area of flow (sf)
R	= hydraulic radius (ft)
Ls	= side slope
Q	= quantity of flow (ft ³ /sec)
V	= average velocity of flow (ft/sec)
L	= length of flow
Ve	= vertical length of side slope
Ho	= horizontal length of side slope
Bw	= base width (in)
D	= depth (in)
S	= slope (ft/ft)
n	= Manning's n

Flow in gutters

$$V = \frac{1.12}{n} (S)^{0.5} (Sx)^{.67} (T)^{0.67}$$

Tc	= time of concentration for gutter flow (minutes)
V	= average velocity of flow (ft/sec)
Q	= quantity of flow (ft ³ /sec)
S	= street longitudinal slope (ft/ft)
Sx	= street cross slope (ft/ft)
T	= total width of flow in the gutter (ft)
n	= sheet flow Manning's (pavement = 0.018)
L	= Length of flow (ft)

Flow in pipes

Mannings Equation

Tc	= time of concentration in pipe (minutes)
V	= calculated velocity pipe full (ft/sec)
Q	= quantity of flow (ft ³ /sec)
n	= Manning's n
D	= pipe Diameter (in)
S	= slope (ft/ft)
L	= length of pipe

COEFFICIENTS

Ns = = Manning's coefficient (sheet flow)
n values are for sheet flow only

Design Value

- 0.011 Concrete or asphalt
- 0.010 Bare soil
- 0.020 Graveled surface
- 0.020 Bare clay - loam (eroded)
- 0.150 Grass (short prairie)
- 0.240 Grass (dense lawn)
- 0.410 Grass (bermuda)
- 0.400 Woods (light underbrush)
- 0.800 Woods (dense underbrush)

k = = time of concentration velocity factor (ft/s)

Design Value

- 3 Forest with heavy ground cover and meadows (n=0.10)
- 5 Brushy ground with some trees (n=0.060)
- 8 Fallow or cultivation (n=0.040)
- 9 High grass (n=0.035)
- 11 Short grass, pasture or lawns (n=0.030)
- 13 Nearly bare ground (n=0.025)
- 27 Paved and gravel areas (n=0.012)

n = = Manning's coefficient (channel)

Design Value

CONSTRUCTED CHANNELS

A. Earth, straight and uniform

- 0.018 Earth (straight and uniform)
- 0.025 Gravel (straight and uniform)
- 0.027 Grass (with weeds)

B. Earth, winding and sluggish

- 0.025 Earth (no vegetation)
- 0.030 Grass (some weeds)
- 0.035 Dense weeds (deep channel)
- 0.030 Earth (rubble bottom and sides)
- 0.035 Stony bottom and weedy banks
- 0.040 Cobble bottom with clean sides

C. Rock lined

- 0.035 Smooth and uniform
- 0.040 Jagged and irregular

D. Channels not maintained (weeds and brush uncut)

- 0.050 Dense weeds (high as flow depth)
- 0.050 Clean bottom (brush on sides)
- 0.100 Dense brush (high stage)
- 0.200 Water quality swales (mowed regularly)

NATURAL STREAMS

- 0.029 Clean (straight no pools)
- 0.035 Clean (straight no pools with weeds and stones)
- 0.039 Clean (winding pools)
- 0.042 Clean (winding pools weeds and stones)
- 0.052 Clean (winding pools weeds and large stones)
- 0.065 Weedy (sluggish with deep pools)
- 0.112 Very weedy (sluggish with deep pools)

SCS RUNOFF CURVE NUMBERS (CN)

For Selected Land Uses

LAND USE DESCRIPTION		RUNOFF CURVE NUMBERS (CN) BY HYDROLOGIC SOIL GROUP			
		A	B	C	D
Cultivated land (1):	winter condition	86	91	94	95
Mountain open areas:	low growing brush and grasslands	74	82	89	92
Meadow or pasture:		65	78	85	89
Wood or forest land:	undisturbed or older second growth	42	64	76	81
Wood or forest land:	young second growth or brush	55	72	81	86
Orchard:	with cover crop	81	88	92	94
Open spaces, lawns, parks, golf courses, cemeteries, landscaping					
Good condition:	grass cover on 75% or more of the area	68	80	86	90
Fair condition:	grass cover on 50% to 75% of the area	77	85	90	92
Gravel roads and parking lots		76	85	89	91
Dirt Roads and parking lots		72	82	87	89
Impervious surfaces:	pavement, roof, etc.	98	98	98	98
Open water bodies:	lakes, wetlands, ponds, etc.	100	100	100	100
Single Family Residential (2)		Select separate curve numbers for the pervious and impervious portion of the site or basin.			
Dwelling Unit/Gross Acre (DU/GA)	% Impervious (3)				
1.0	15				
2.0	25				
3.0	34				
4.0	42				
5.0	48				
6.0	52				
7.0	56				
Planned unit developments, condominiums, apartments, commercial businesses and industrial areas.	Use actual impervious area.				
(1) Detailed information relating to specific agricultural land uses is available in the National Engineering Engineering Handbook, Section 4, Hydrology, chapter 9, August 1972.					
(2) Assume site drains to storm system.					
(3) For this land use, the remaining pervious areas are assumed to be lawn in good condition.					

Project Name: Johnson RV
Hydrograph Analysis Summary

Job # 21-375
 Date: 6/14/2022

Rainfall (year)	Rainfall (inches)
2	3.50
5	4.50
10	4.80
25	5.50
100	0.00

Pre-Developed	
Pervious	
Area =	0.42 acres
CN =	86 na
Impervious	
Area =	3.03 acres
CN =	92.32 na
Tc =	5.5 min
Total A =	3.45 acres

Developed	
Pervious	
Area =	0.52 acres
CN =	86 na
Impervious	
Area =	2.93 acres
CN =	98 na
Tc =	5 min
Total A =	3.45 acres

Note: The hydrographs shown are based on the S.C.S. Type - 1A, 24 hour storm using the SBUH method based on the King County Model.

Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	2.50	3.45	3.74	4.40	0.00
Volume	cf =>	32,530	44,551	48,192	56,729	-
Tpeak	min =>	470	470	470	470	10
Tpeak	hr =>	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.17	0.00	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00	0.00
30	0.50	0.00	0.00	0.00	0.00	0.00
40	0.67	0.00	0.00	0.00	0.00	0.00
50	0.83	0.00	0.00	0.00	0.00	0.00
60	1.00	0.00	0.00	0.00	0.00	0.00
70	1.17	0.00	0.00	0.00	0.00	0.00
80	1.33	0.00	0.00	0.00	0.00	0.00
90	1.50	0.00	0.00	0.00	0.01	0.00
100	1.67	0.00	0.00	0.01	0.03	0.00
110	1.83	0.00	0.01	0.02	0.05	0.00
120	2.00	0.00	0.03	0.05	0.08	0.00
130	2.17	0.01	0.05	0.07	0.11	0.00
140	2.33	0.02	0.07	0.09	0.13	0.00
150	2.50	0.03	0.09	0.10	0.15	0.00
160	2.67	0.04	0.10	0.12	0.17	0.00
170	2.83	0.06	0.13	0.15	0.21	0.00
180	3.00	0.08	0.16	0.19	0.25	0.00
190	3.17	0.09	0.18	0.21	0.28	0.00
200	3.33	0.10	0.20	0.23	0.30	0.00
210	3.50	0.12	0.21	0.24	0.32	0.00
220	3.67	0.13	0.23	0.26	0.34	0.00
230	3.83	0.15	0.26	0.30	0.39	0.00
240	4.00	0.18	0.30	0.34	0.44	0.00
250	4.17	0.19	0.32	0.36	0.46	0.00
260	4.33	0.20	0.33	0.38	0.48	0.00
270	4.50	0.22	0.35	0.39	0.49	0.00
280	4.67	0.23	0.36	0.41	0.51	0.00
290	4.83	0.26	0.41	0.45	0.57	0.00
300	5.00	0.29	0.46	0.51	0.63	0.00
310	5.17	0.31	0.47	0.52	0.65	0.00
320	5.33	0.32	0.49	0.54	0.66	0.00
330	5.50	0.33	0.50	0.55	0.68	0.00
340	5.67	0.34	0.51	0.56	0.69	0.00
350	5.83	0.38	0.56	0.62	0.75	0.00
360	6.00	0.42	0.62	0.68	0.82	0.00
370	6.17	0.43	0.63	0.70	0.84	0.00
380	6.33	0.44	0.65	0.71	0.85	0.00
390	6.50	0.45	0.66	0.72	0.86	0.00
400	6.67	0.46	0.67	0.73	0.88	0.00
410	6.83	0.56	0.81	0.88	1.06	0.00
420	7.00	0.67	0.96	1.05	1.25	0.00
430	7.17	0.69	0.98	1.07	1.27	0.00
440	7.33	0.83	1.17	1.27	1.51	0.00
450	7.50	0.97	1.37	1.48	1.76	0.00
460	7.67	1.44	2.00	2.17	2.56	0.00
470	7.83	2.50	3.45	3.74	4.40	0.00
480	8.00	2.42	3.31	3.58	4.20	0.00
490	8.17	1.42	1.94	2.09	2.45	0.00
500	8.33	0.99	1.34	1.45	1.69	0.00
510	8.50	0.84	1.14	1.23	1.43	0.00
520	8.67	0.84	1.13	1.22	1.42	0.00

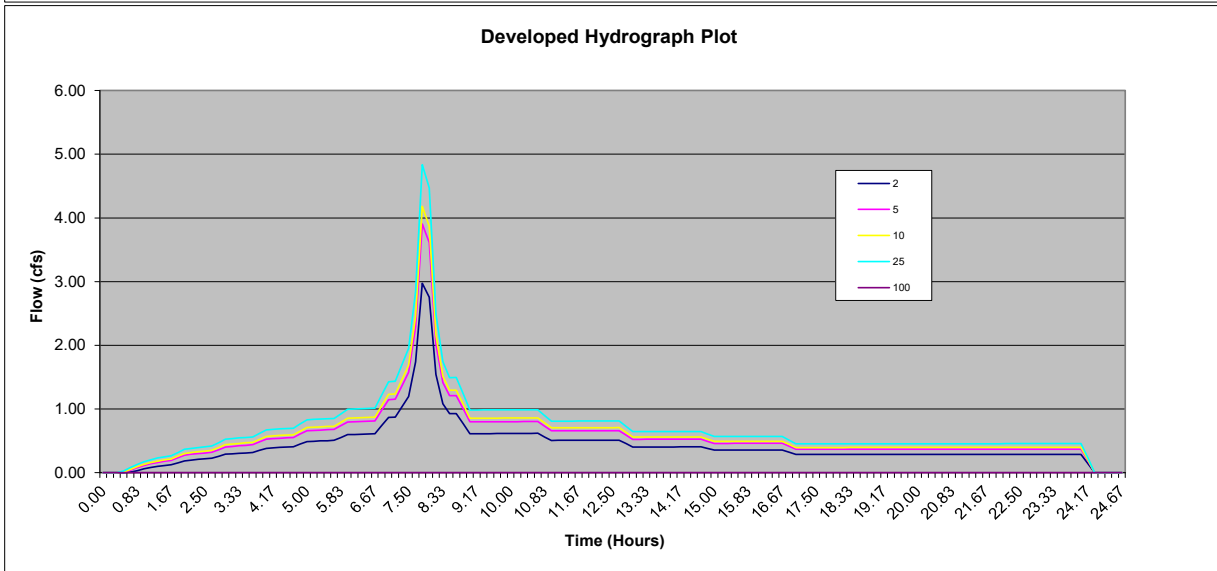
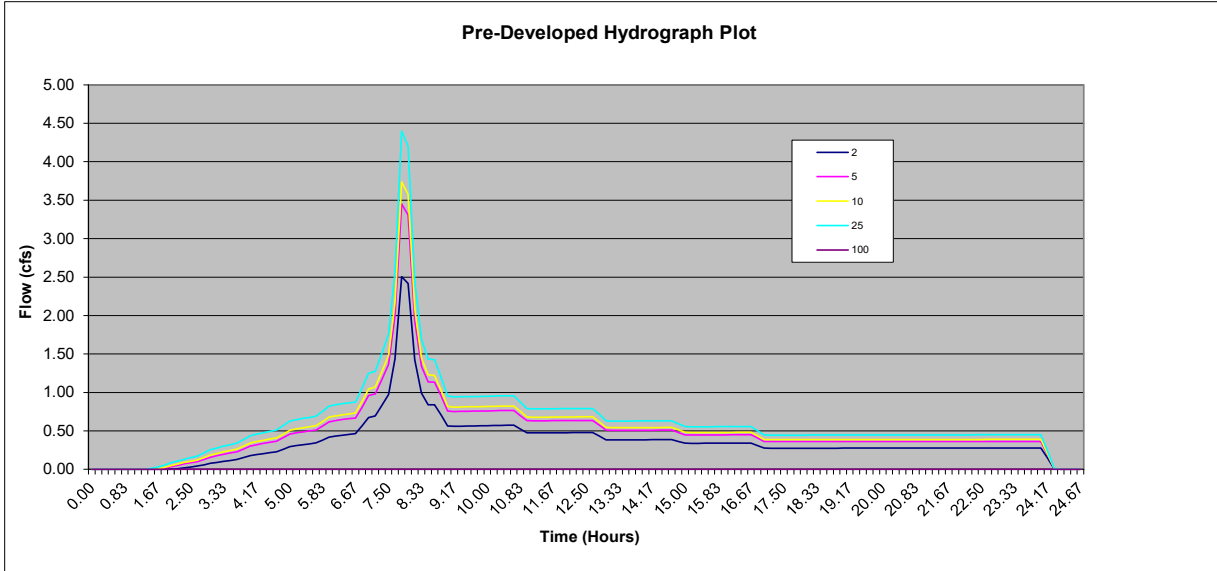
Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	2.97	3.90	4.18	4.83	0.00
Volume	cf =>	38,690	51,004	54,712	63,380	-
Tpeak	min =>	470	470	470	470	10
Tpeak	hr =>	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100
Time (min)	Time (hr)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)	Hyd (cfs)
0	0.00	0.00	0.00	0.00	0.00	0.00
10	0.17	0.00	0.00	0.00	0.00	0.00
20	0.33	0.00	0.00	0.00	0.00	0.00
30	0.50	0.00	0.01	0.01	0.02	0.00
40	0.67	0.01	0.04	0.05	0.08	0.00
50	0.83	0.03	0.08	0.09	0.13	0.00
60	1.00	0.06	0.11	0.13	0.17	0.00
70	1.17	0.08	0.14	0.16	0.20	0.00
80	1.33	0.10	0.16	0.18	0.23	0.00
90	1.50	0.11	0.18	0.20	0.25	0.00
100	1.67	0.12	0.19	0.21	0.27	0.00
110	1.83	0.15	0.23	0.26	0.32	0.00
120	2.00	0.18	0.27	0.30	0.37	0.00
130	2.17	0.20	0.29	0.32	0.38	0.00
140	2.33	0.21	0.30	0.33	0.39	0.00
150	2.50	0.22	0.31	0.34	0.40	0.00
160	2.67	0.23	0.32	0.35	0.42	0.00
170	2.83	0.26	0.36	0.39	0.47	0.00
180	3.00	0.29	0.40	0.44	0.52	0.00
190	3.17	0.30	0.41	0.45	0.53	0.00
200	3.33	0.30	0.42	0.46	0.54	0.00
210	3.50	0.31	0.43	0.47	0.55	0.00
220	3.67	0.32	0.44	0.47	0.56	0.00
230	3.83	0.35	0.48	0.52	0.62	0.00
240	4.00	0.38	0.53	0.57	0.67	0.00
250	4.17	0.39	0.53	0.58	0.68	0.00
260	4.33	0.40	0.54	0.58	0.69	0.00
270	4.50	0.40	0.55	0.59	0.69	0.00
280	4.67	0.41	0.55	0.59	0.70	0.00
290	4.83	0.45	0.60	0.65	0.76	0.00
300	5.00	0.49	0.66	0.71	0.83	0.00
310	5.17	0.49	0.66	0.71	0.83	0.00
320	5.33	0.50	0.67	0.72	0.84	0.00
330	5.50	0.50	0.67	0.72	0.85	0.00
340	5.67	0.51	0.68	0.73	0.85	0.00
350	5.83	0.55	0.74	0.79	0.92	0.00
360	6.00	0.60	0.79	0.85	0.99	0.00
370	6.17	0.60	0.80	0.86	1.00	0.00
380	6.33	0.60	0.80	0.86	1.00	0.00
390	6.50	0.61	0.81	0.87	1.01	0.00
400	6.67	0.61	0.81	0.87	1.01	0.00
410	6.83	0.74	0.98	1.05	1.22	0.00
420	7.00	0.87	1.15	1.23	1.43	0.00
430	7.17	0.87	1.15	1.24	1.43	0.00
440	7.33	1.03	1.36	1.46	1.69	0.00
450	7.50	1.19	1.57	1.69	1.95	0.00
460	7.67	1.74	2.29	2.45	2.84	0.00
470	7.83	2.97	3.90	4.18	4.83	0.00
480	8.00	2.76	3.61	3.87	4.47	0.00
490	8.17	1.54	2.02	2.16	2.49	0.00
500	8.33	1.08	1.41	1.51	1.74	0.00
510	8.50	0.92	1.21	1.29	1.49	0.00
520	8.67	0.93	1.21	1.29	1.49	0.00

Pre-Developed Hydrographs							Developed Hydrographs					
Year	=====	2	5	10	25	100	2	5	10	25	100	
Qpeak	cfs =>	2.50	3.45	3.74	4.40	0.00	2.97	3.90	4.18	4.83	0.00	
Volume	cf =>	32,530	44,551	48,192	56,729	-	38,690	51,004	54,712	63,380	-	
Tpeak	min =>	470	470	470	470	10	470	470	470	470	10	
Tpeak	hr =>	7.83	7.83	7.83	7.83	0.17	7.83	7.83	7.83	7.83	0.17	
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100	
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	
530	8.83	0.71	0.95	1.02	1.19	0.00	0.77	1.00	1.07	1.24	0.00	
540	9.00	0.56	0.76	0.82	0.95	0.00	0.61	0.80	0.85	0.98	0.00	
550	9.17	0.56	0.75	0.81	0.94	0.00	0.61	0.80	0.85	0.98	0.00	
560	9.33	0.56	0.75	0.81	0.94	0.00	0.61	0.80	0.85	0.98	0.00	
570	9.50	0.56	0.75	0.81	0.95	0.00	0.61	0.80	0.85	0.98	0.00	
580	9.67	0.56	0.76	0.81	0.95	0.00	0.61	0.80	0.85	0.98	0.00	
590	9.83	0.57	0.76	0.82	0.95	0.00	0.61	0.80	0.86	0.99	0.00	
600	10.00	0.57	0.76	0.82	0.95	0.00	0.61	0.80	0.86	0.99	0.00	
610	10.17	0.57	0.76	0.82	0.95	0.00	0.61	0.80	0.86	0.99	0.00	
620	10.33	0.57	0.76	0.82	0.95	0.00	0.62	0.80	0.86	0.99	0.00	
630	10.50	0.57	0.76	0.82	0.95	0.00	0.62	0.80	0.86	0.99	0.00	
640	10.67	0.57	0.77	0.82	0.96	0.00	0.62	0.80	0.86	0.99	0.00	
650	10.83	0.53	0.70	0.75	0.87	0.00	0.56	0.73	0.78	0.90	0.00	
660	11.00	0.47	0.63	0.68	0.79	0.00	0.50	0.66	0.70	0.81	0.00	
670	11.17	0.47	0.63	0.68	0.78	0.00	0.51	0.66	0.70	0.81	0.00	
680	11.33	0.47	0.63	0.68	0.79	0.00	0.51	0.66	0.70	0.81	0.00	
690	11.50	0.47	0.63	0.68	0.79	0.00	0.51	0.66	0.70	0.81	0.00	
700	11.67	0.48	0.63	0.68	0.79	0.00	0.51	0.66	0.70	0.81	0.00	
710	11.83	0.48	0.63	0.68	0.79	0.00	0.51	0.66	0.70	0.81	0.00	
720	12.00	0.48	0.63	0.68	0.79	0.00	0.51	0.66	0.70	0.81	0.00	
730	12.17	0.48	0.63	0.68	0.79	0.00	0.51	0.66	0.70	0.81	0.00	
740	12.33	0.48	0.63	0.68	0.79	0.00	0.51	0.66	0.71	0.81	0.00	
750	12.50	0.48	0.64	0.68	0.79	0.00	0.51	0.66	0.71	0.81	0.00	
760	12.67	0.48	0.64	0.68	0.79	0.00	0.51	0.66	0.71	0.81	0.00	
770	12.83	0.43	0.57	0.62	0.71	0.00	0.46	0.59	0.63	0.73	0.00	
780	13.00	0.38	0.51	0.54	0.63	0.00	0.40	0.52	0.56	0.64	0.00	
790	13.17	0.38	0.50	0.54	0.63	0.00	0.40	0.52	0.56	0.64	0.00	
800	13.33	0.38	0.51	0.54	0.63	0.00	0.40	0.52	0.56	0.64	0.00	
810	13.50	0.38	0.51	0.54	0.63	0.00	0.40	0.52	0.56	0.64	0.00	
820	13.67	0.38	0.51	0.54	0.63	0.00	0.40	0.52	0.56	0.64	0.00	
830	13.83	0.38	0.51	0.54	0.63	0.00	0.40	0.52	0.56	0.64	0.00	
840	14.00	0.38	0.51	0.54	0.63	0.00	0.40	0.52	0.56	0.64	0.00	
850	14.17	0.38	0.51	0.54	0.63	0.00	0.40	0.52	0.56	0.64	0.00	
860	14.33	0.38	0.51	0.54	0.63	0.00	0.40	0.52	0.56	0.64	0.00	
870	14.50	0.38	0.51	0.54	0.63	0.00	0.40	0.52	0.56	0.64	0.00	
880	14.67	0.38	0.51	0.54	0.63	0.00	0.40	0.52	0.56	0.64	0.00	
890	14.83	0.36	0.48	0.51	0.59	0.00	0.38	0.49	0.53	0.60	0.00	
900	15.00	0.34	0.45	0.48	0.56	0.00	0.35	0.46	0.49	0.57	0.00	
910	15.17	0.34	0.45	0.48	0.55	0.00	0.35	0.46	0.49	0.57	0.00	
920	15.33	0.34	0.45	0.48	0.55	0.00	0.35	0.46	0.49	0.57	0.00	
930	15.50	0.34	0.45	0.48	0.55	0.00	0.35	0.46	0.49	0.57	0.00	
940	15.67	0.34	0.45	0.48	0.55	0.00	0.35	0.46	0.49	0.57	0.00	
950	15.83	0.34	0.45	0.48	0.55	0.00	0.36	0.46	0.49	0.57	0.00	
960	16.00	0.34	0.45	0.48	0.55	0.00	0.36	0.46	0.49	0.57	0.00	
970	16.17	0.34	0.45	0.48	0.55	0.00	0.36	0.46	0.49	0.57	0.00	
980	16.33	0.34	0.45	0.48	0.56	0.00	0.36	0.46	0.49	0.57	0.00	
990	16.50	0.34	0.45	0.48	0.56	0.00	0.36	0.46	0.49	0.57	0.00	
1000	16.67	0.34	0.45	0.48	0.56	0.00	0.36	0.46	0.49	0.57	0.00	
1010	16.83	0.31	0.41	0.44	0.50	0.00	0.32	0.41	0.44	0.51	0.00	
1020	17.00	0.27	0.36	0.39	0.45	0.00	0.28	0.37	0.39	0.45	0.00	
1030	17.17	0.27	0.36	0.39	0.44	0.00	0.28	0.37	0.39	0.45	0.00	
1040	17.33	0.27	0.36	0.39	0.44	0.00	0.28	0.37	0.39	0.45	0.00	
1050	17.50	0.27	0.36	0.39	0.44	0.00	0.28	0.37	0.39	0.45	0.00	
1060	17.67	0.27	0.36	0.39	0.45	0.00	0.28	0.37	0.39	0.45	0.00	
1070	17.83	0.27	0.36	0.39	0.45	0.00	0.28	0.37	0.39	0.45	0.00	
1080	18.00	0.27	0.36	0.39	0.45	0.00	0.28	0.37	0.39	0.45	0.00	
1090	18.17	0.27	0.36	0.39	0.45	0.00	0.28	0.37	0.39	0.45	0.00	
1100	18.33	0.27	0.36	0.39	0.45	0.00	0.28	0.37	0.39	0.45	0.00	
1110	18.50	0.27	0.36	0.39	0.45	0.00	0.28	0.37	0.39	0.45	0.00	
1120	18.67	0.27	0.36	0.39	0.45	0.00	0.29	0.37	0.39	0.45	0.00	
1130	18.83	0.27	0.36	0.39	0.45	0.00	0.29	0.37	0.39	0.45	0.00	
1140	19.00	0.27	0.36	0.39	0.45	0.00	0.29	0.37	0.39	0.45	0.00	
1150	19.17	0.27	0.36	0.39	0.45	0.00	0.29	0.37	0.39	0.45	0.00	
1160	19.33	0.27	0.36	0.39	0.45	0.00	0.29	0.37	0.39	0.45	0.00	
1170	19.50	0.27	0.36	0.39	0.45	0.00	0.29	0.37	0.39	0.45	0.00	
1180	19.67	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.39	0.45	0.00	
1190	19.83	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.39	0.45	0.00	
1200	20.00	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.39	0.45	0.00	
1210	20.17	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00	
1220	20.33	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00	
1230	20.50	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00	

Pre-Developed Hydrographs							Developed Hydrographs				
Year	=====>	2	5	10	25	100	2	5	10	25	100
Qpeak	cfs =>	2.50	3.45	3.74	4.40	0.00	2.97	3.90	4.18	4.83	0.00
Volume	cf =>	32,530	44,551	48,192	56,729	-	38,690	51,004	54,712	63,380	-
Tpeak	min =>	470	470	470	470	10	470	470	470	470	10
Tpeak	hr =>	7.83	7.83	7.83	7.83	0.17	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100	2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)
1240	20.67	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1250	20.83	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1260	21.00	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1270	21.17	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1280	21.33	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1290	21.50	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1300	21.67	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1310	21.83	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1320	22.00	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1330	22.17	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1340	22.33	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1350	22.50	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1360	22.67	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1370	22.83	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1380	23.00	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1390	23.17	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1400	23.33	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1410	23.50	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1420	23.67	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1430	23.83	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1440	24.00	0.28	0.36	0.39	0.45	0.00	0.29	0.37	0.40	0.45	0.00
1450	24.17	0.15	0.19	0.20	0.23	0.00	0.14	0.19	0.20	0.23	0.00
1460	24.33	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
1470	24.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1480	24.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1490	24.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1500	24.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

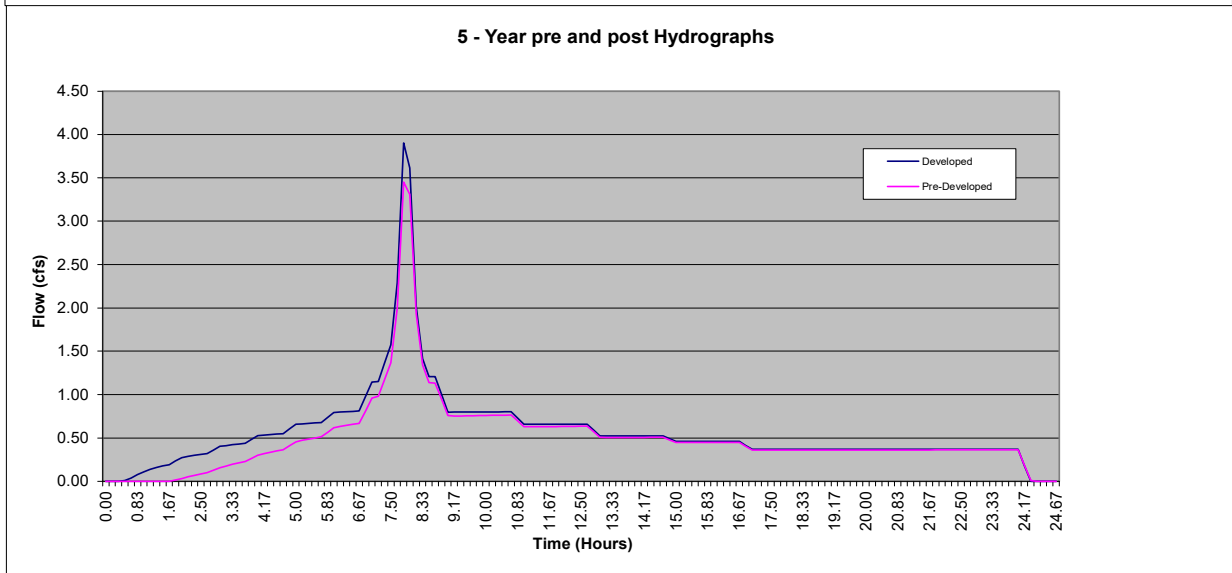
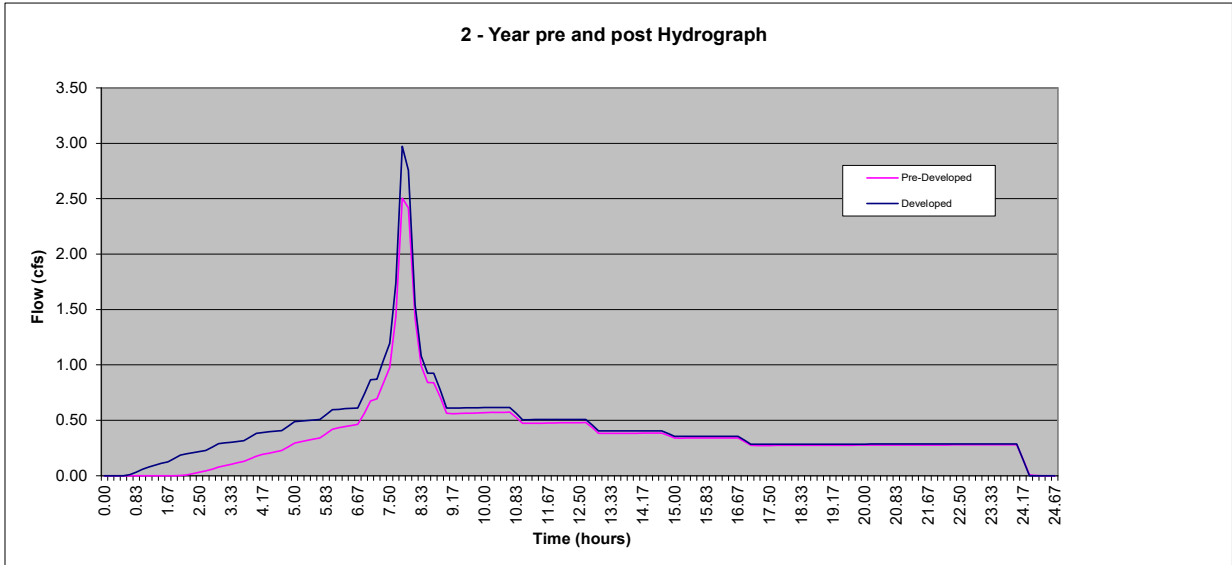
Pre-Developed Hydrographs						
Year	=====	2	5	10	25	100
Qpeak	cfs =>	2.50	3.45	3.74	4.40	0.00
Volume	cf =>	32,530	44,551	48,192	56,729	-
Tpeak	min =>	470	470	470	470	10
Tpeak	hr =>	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	2.97	3.90	4.18	4.83	0.00
Volume	38,690	51,004	54,712	63,380	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



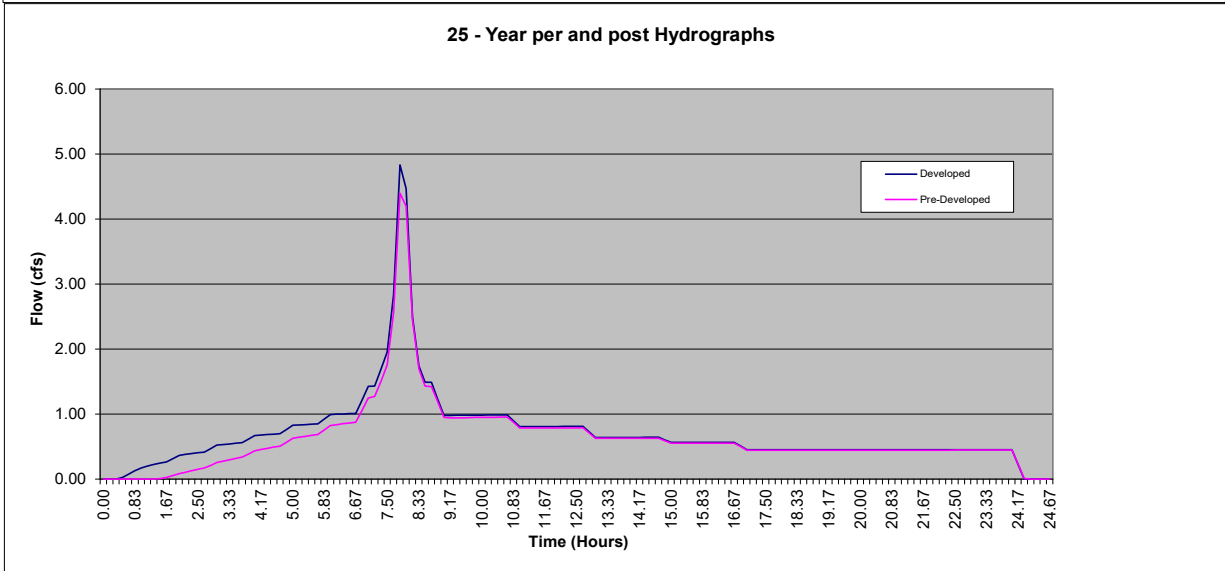
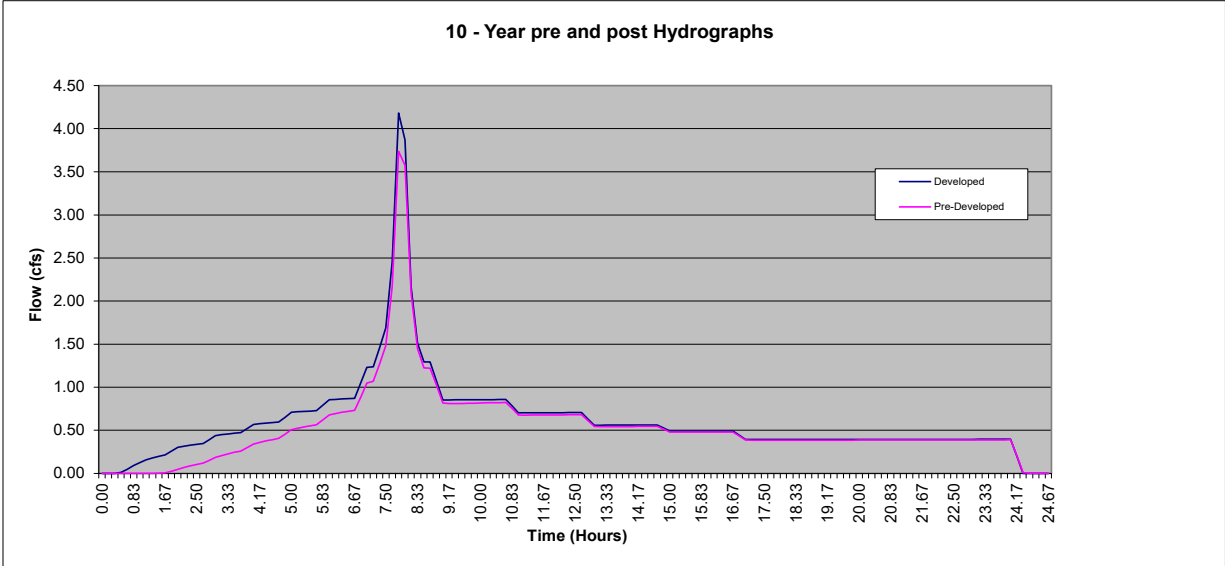
Pre-Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	2.50	3.45	3.74	4.40	0.00
Volume	cf =>	32,530	44,551	48,192	56,729	-
Tpeak	min =>	470	470	470	470	10
Tpeak	hr =>	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
	2.97	3.90	4.18	4.83	0.00
	38,690	51,004	54,712	63,380	-
	470	470	470	470	10
	7.83	7.83	7.83	7.83	0.17
	2	5	10	25	100
	Hyd	Hyd	Hyd	Hyd	Hyd
	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



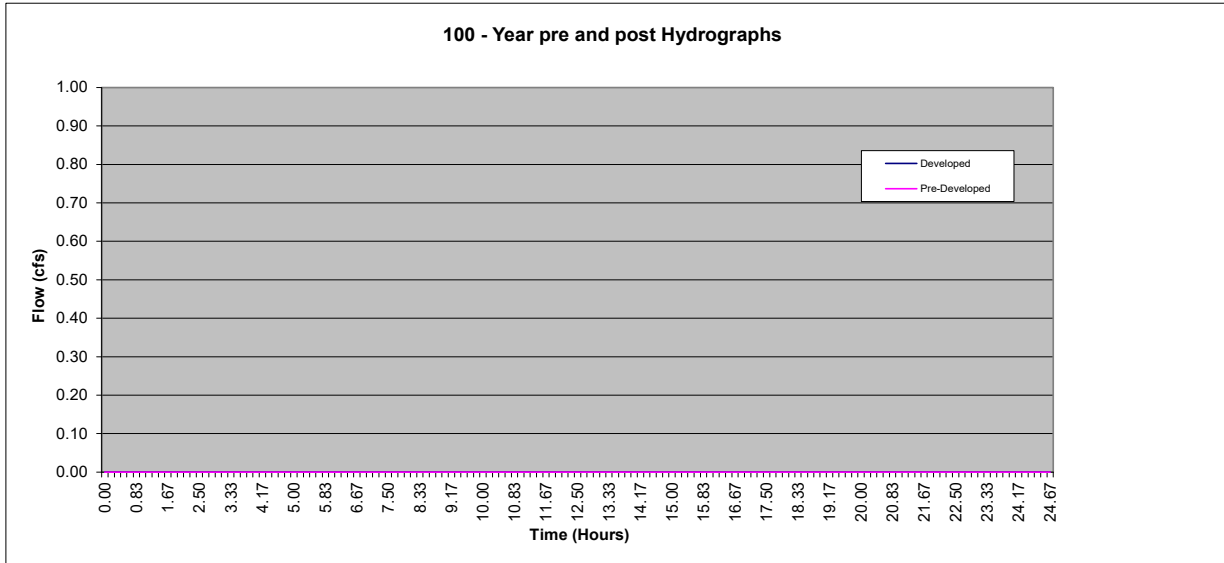
Pre-Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	2.50	3.45	3.74	4.40	0.00
Volume	cf =>	32,530	44,551	48,192	56,729	-
Tpeak	min =>	470	470	470	470	10
Tpeak	hr =>	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

Developed Hydrographs					
	2	5	10	25	100
Qpeak	2.97	3.90	4.18	4.83	0.00
Volume	38,690	51,004	54,712	63,380	-
Tpeak	470	470	470	470	10
Tpeak	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>	2	5	10	25	100
Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



Pre-Developed Hydrographs						
Year	=====>	2	5	10	25	100
Qpeak	cfs =>	2.50	3.45	3.74	4.40	0.00
Volume	cf =>	32,530	44,551	48,192	56,729	-
Tpeak	min =>	470	470	470	470	10
Tpeak	hr =>	7.83	7.83	7.83	7.83	0.17
Hydrograph Name=>		2	5	10	25	100
Time	Time	Hyd	Hyd	Hyd	Hyd	Hyd
(min)	(hr)	(cfs)	(cfs)	(cfs)	(cfs)	(cfs)

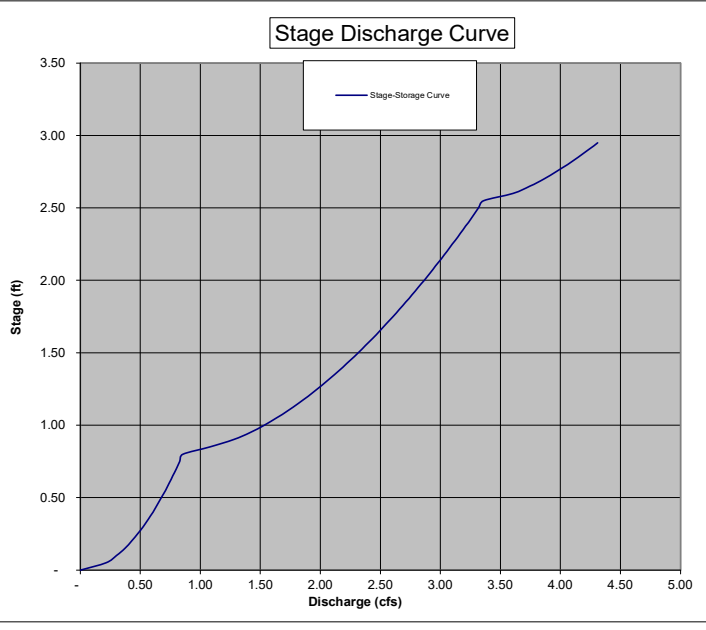
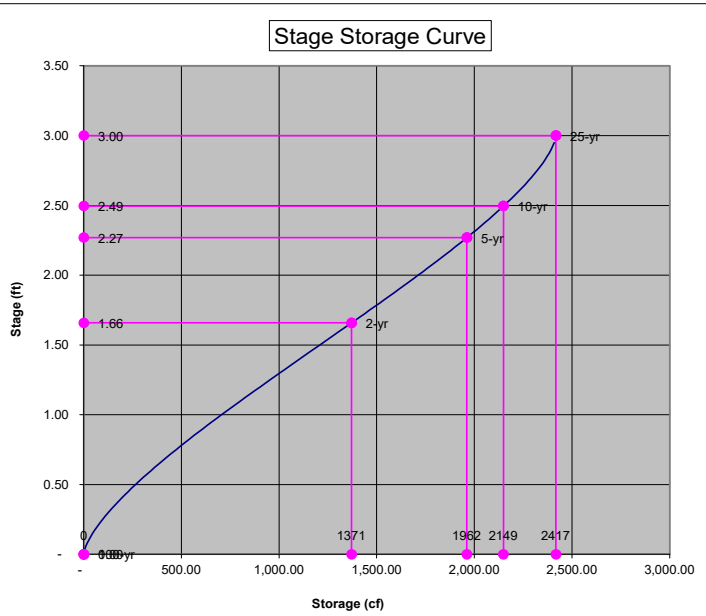
Developed Hydrographs						
		2	5	10	25	100
		2.97	3.90	4.18	4.83	0.00
		38,690	51,004	54,712	63,380	-
		470	470	470	470	10
		7.83	7.83	7.83	7.83	0.17
		2	5	10	25	100
		Hyd	Hyd	Hyd	Hyd	Hyd
		(cfs)	(cfs)	(cfs)	(cfs)	(cfs)



Project Name: Johnson RV
 Stage Storage Summary

Job # 21-375
 Date: 6/14/2022

Stage ft	Storage cf	Discharge cfs
-	-	-
0.05	8.79	0.21
0.10	24.72	0.30
0.15	45.19	0.37
0.20	69.21	0.43
0.25	96.22	0.48
0.30	125.81	0.52
0.35	157.69	0.57
0.40	191.62	0.60
0.45	227.39	0.64
0.50	264.83	0.68
0.55	303.81	0.71
0.60	344.19	0.74
0.65	385.86	0.77
0.70	428.70	0.80
0.75	472.62	0.83
0.80	517.52	0.85
0.85	563.33	1.08
0.90	609.96	1.28
0.95	657.34	1.42
1.00	705.39	1.53
1.05	754.05	1.64
1.10	803.25	1.73
1.15	852.91	1.82
1.20	902.99	1.90
1.25	953.42	1.97
1.30	1,004.14	2.05
1.35	1,055.08	2.12
1.40	1,106.20	2.19
1.45	1,157.44	2.25
1.50	1,208.73	2.31
1.55	1,260.02	2.38
1.60	1,311.25	2.44
1.65	1,362.37	2.49
1.70	1,413.32	2.55
1.75	1,464.04	2.61
1.80	1,514.46	2.66
1.85	1,564.54	2.71
1.90	1,614.21	2.76
1.95	1,663.41	2.81
2.00	1,712.06	2.86
2.05	1,760.12	2.91
2.10	1,807.49	2.96
2.15	1,854.12	3.01
2.20	1,899.93	3.05
2.25	1,944.84	3.10
2.30	1,988.76	3.14
2.35	2,031.60	3.19
2.40	2,073.26	3.23
2.45	2,113.64	3.28
2.50	2,152.62	3.32
2.55	2,190.07	3.36
2.60	2,225.84	3.60
2.65	2,259.76	3.75
2.70	2,291.64	3.86
2.75	2,321.23	3.96
2.80	2,348.24	4.06
2.85	2,372.27	4.15
2.90	2,392.73	4.23
2.95	2,408.67	4.31
2.95	2,408.67	4.31
2.95	2,408.67	4.31
2.95	2,408.67	4.31
2.95	2,408.67	4.31
2.95	2,408.67	4.31
2.95	2,408.67	4.31
2.95	2,408.67	4.31
2.95	2,408.67	4.31
2.95	2,408.67	4.31



Project Name: Johnson RV
Detention System Summary

Job # 21-375
Date: 6/14/2022

Note: The detention system design is based on the King County Model "Facility Design Routine".

1) Detention Facility Design Input:

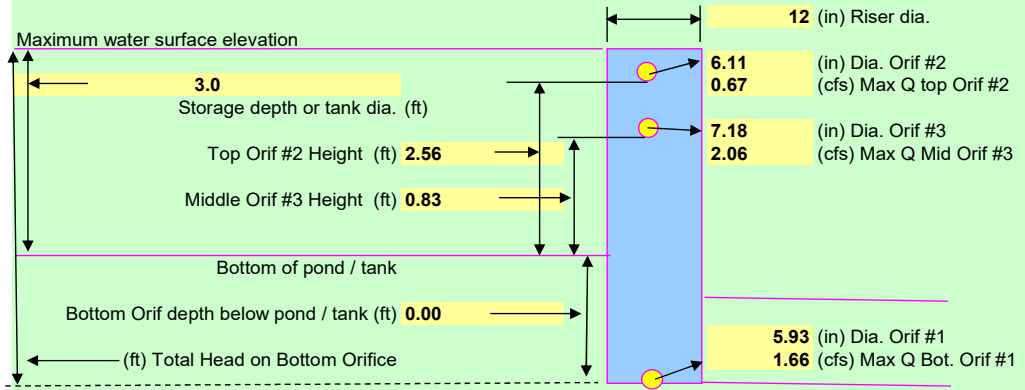
- 2) Type of facility: DETENTION TANK
- 3) Pond side slopes: 3 NA
- 4) Tank Diameter: 3 ft
- 5) Vertical permeability: 0 min/in
- 6) Number of orifices: 3
- 7) Riser dia. => 12 in
- 8) Orifice coefficient: 0.62 (typically 0.62)
- 9) IE - bottom orifice: 0 ft (distance below bottom of pond - Negative #)
- 10) Max Q Bottom Orif. #1: 1.66 cfs
- 11) Top Orif #2 Height = 2.56 ft
- 12) Max Q Mid Orif. #3: 2.06 cfs
- 13) Mid Orif #3 Height = 0.83 ft

Detention Facility Design Results:

Performance year	Developed Inflow cfs	Pre-Developed Outflow cfs	Actual Outflow cfs	Peak Stage ft	Storage cf
100	0	0	0	0	-
25	4.83	4.40	4.39	3.00	2,417
10	4.18	3.74	3.31	2.49	2,149
5	3.90	3.45	3.12	2.27	1,962
2	2.97	2.50	2.50	1.66	1,371
Required Storage =====					2,417

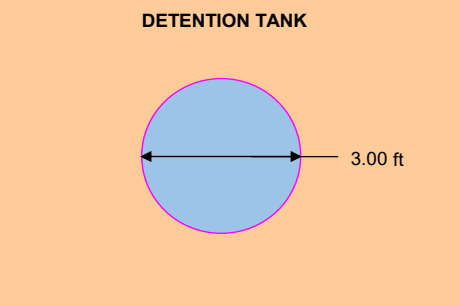
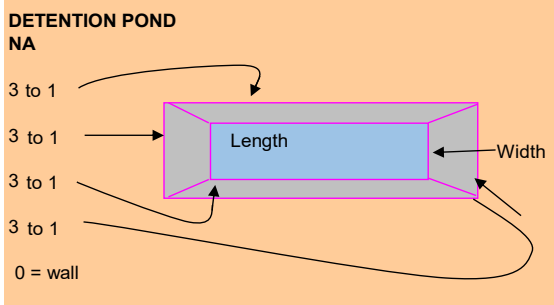
	Bottom Orif.	Middle Orif.	Top Orif.	Optional Weir Design (for top orifice)
Total Q =	1.66	2.06	0.67	0.87 La (ft)
Head (ft) =	3.00	2.17	0.44	99.32 < deg.
Dist. from bottom of pond (ft) =	0.00	0.83	2.56	Must Use Weir
Orif. Dia. (in) =	5.93	7.18	6.11	

FLOW CONTROL STRUCTURE SCHEMATIC



Project Name: Johnson RV
 Detention Facility Type
 Job # 21-375
 Date: 6/14/2022

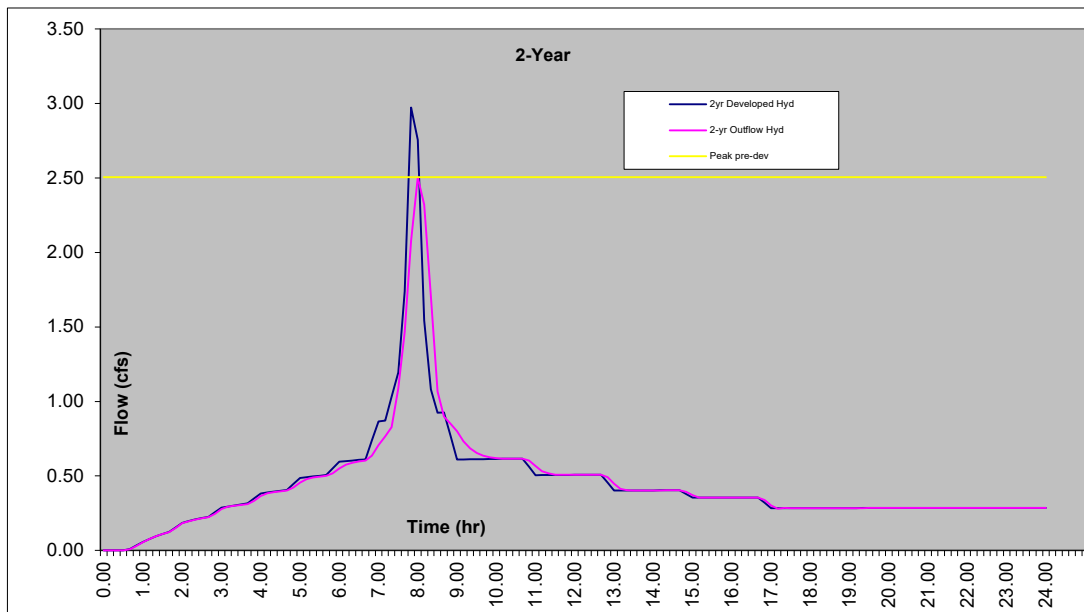
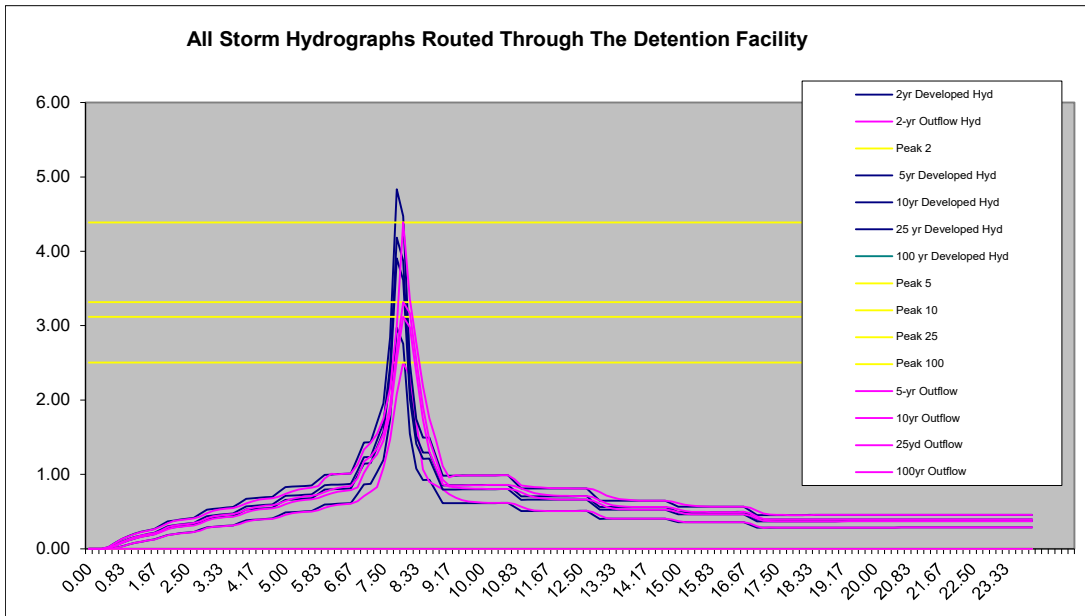
Detention Facility Type:
DETENTION TANK
 L = 342.0 ft
 W = 342.0 ft
 D = 3.0 ft
 Tank Vol. = 2,417 cf

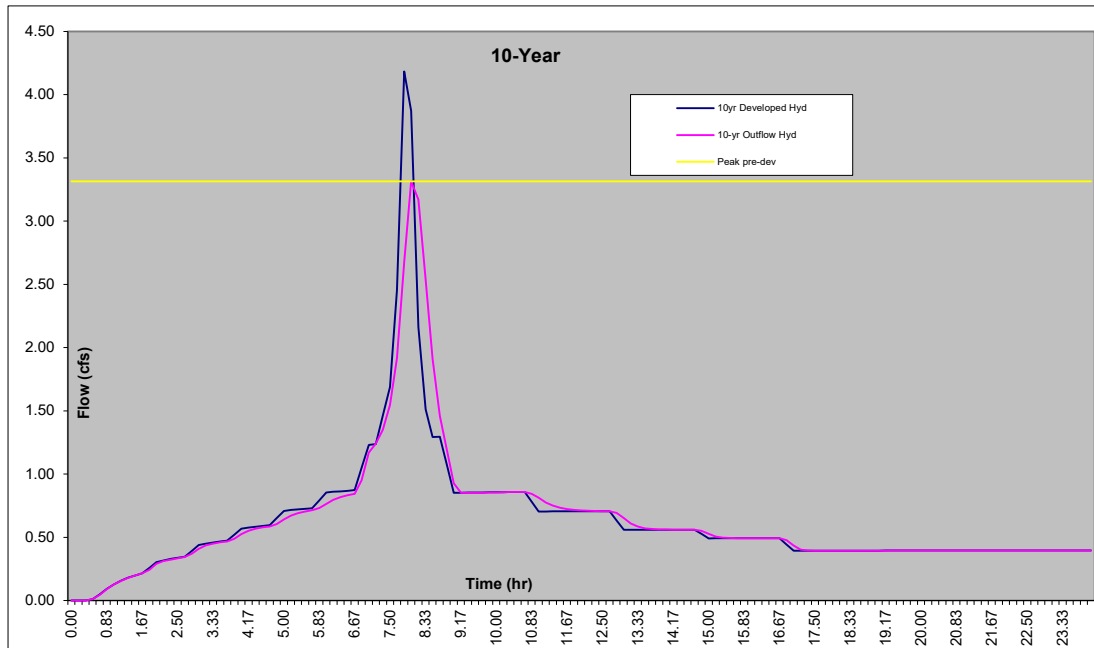
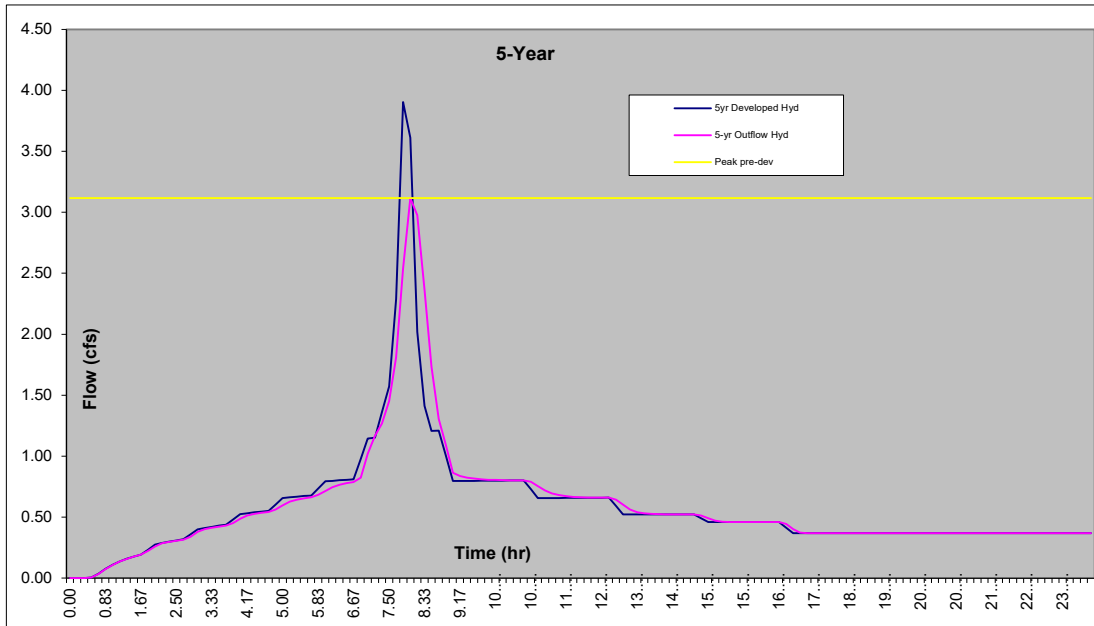


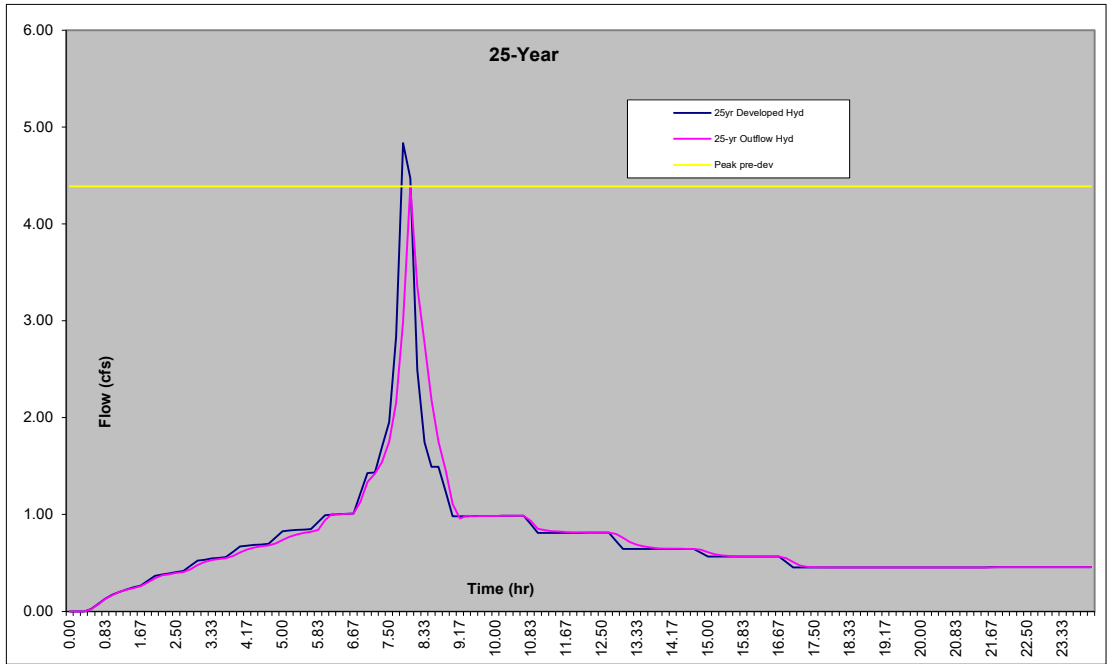
USER DEFINED POND
 NA

Pond Geometry

Stage (ft)	Area (sf)
0	NA
1	NA
2	NA
3	NA
4	NA
5	NA
6	NA
7	NA
8	NA
9	NA
10	NA
11	NA
12	NA
13	NA
14	NA
15	NA







Project Name: Johnson RV
Rectangular, Sharp Crested Weir Calculations

Job # 21-375
 Date: 6/14/2022

Weir Equation: $Q = C(L-0.2H)H^{3/2}$

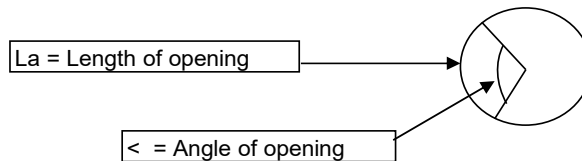
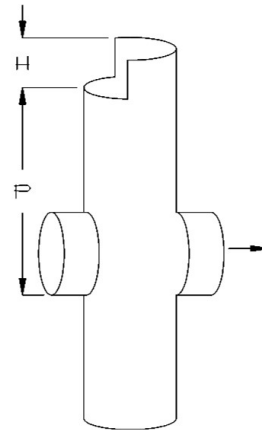
- Q = Flow over weir (cfs)
- C = $3.27 + 0.40 H/P$ (ft)
- L = Adjusted length of weir ($L_a - 0.1H \times 2$) this is to account for side constraints
- La = Actual length of weir along pipes interior circumference (ft)
- H = Distance from bottom of weir to maximum head (ft)
- P = Distance from bottom of weir to outfall invert elevation (ft)
- D = Inside riser pipe diameter (in)
- < = Angle of opening for weir (maximum 180 degrees)

Given:

Q	0.67	cfs
H	0.44	ft
P	2.56	ft
D	12	in

Find:

C	3.34	ft
L	0.78	ft
La	0.87	ft
<	99.32	degrees



CDS2015-4-C DESIGN NOTES

CDS2015-4-C RATED TREATMENT CAPACITY IS 0.7 CFS [19.8 L/s] OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 10.0 CFS [283 L/s]. IF THE SITE CONDITIONS EXCEED 10.0 [283 L/s] CFS, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

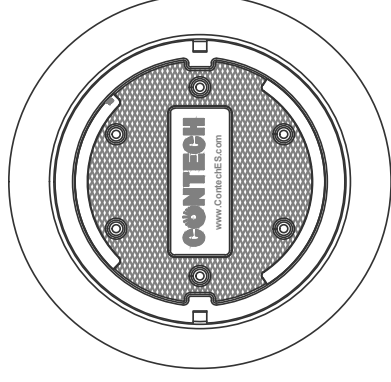
THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION

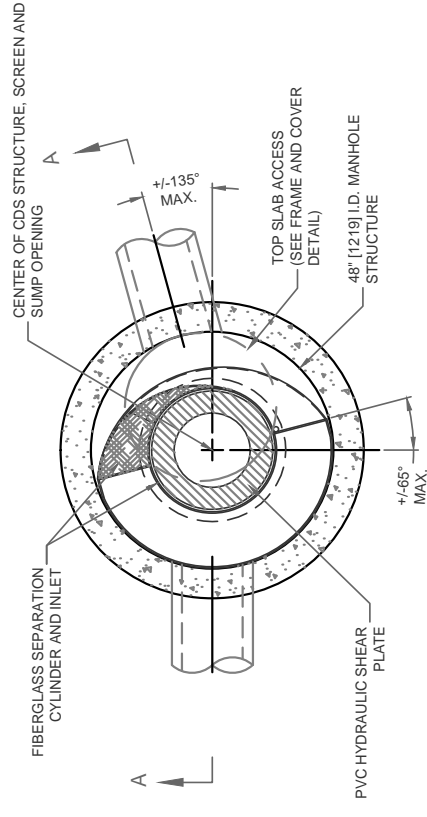
GRADED INLET ONLY (NO INLET PIPE)
GRADED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WEIR FOR NUDEP / NUCAT CONFORMING UNITS

SITE SPECIFIC DATA REQUIREMENTS

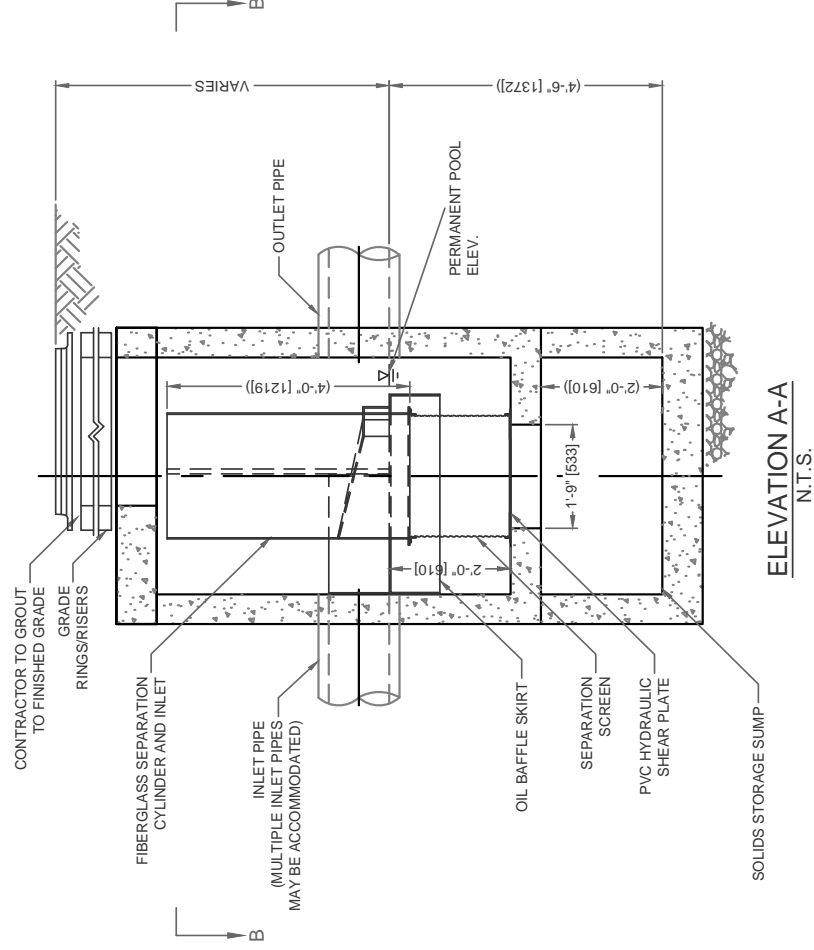
STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	
PEAK FLOW RATE (CFS OR L/s)	
RETURN PERIOD OF PEAK FLOW (YRS)	
SCREEN APERTURE (2400 OR 4700)	
PIPE DATA:	I.E. MATERIAL DIAMETER
INLET PIPE 1	
INLET PIPE 2	
OUTLET PIPE	
RIM ELEVATION	
ANTI-FLOTATION BALLAST	WIDTH HEIGHT
NOTES/SPECIAL REQUIREMENTS:	
* PER ENGINEER OF RECORD	



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.

GENERAL NOTES

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechsolutions.com
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
- PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES

- ANY SUBBASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.



9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7893 FAX



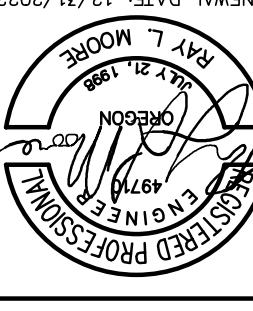
THE ONLY ENGINEERED SOLUTIONS COMPANY OF THE
INTERNATIONAL ASSOCIATION OF ENGINEERS

JOHNSON RV
 ROBERT MURRAY
 3600 SE 362ND AVE.
 SANDY, OR 97055
 503-702-6580

Surveyors & Planners, Inc.
 Surveying, Planning and
 Civil Engineering
 P.O. Box 955 Sandy, OR 97055
 Phone: (503) 668-3151
 Fax: (503) 668-4730

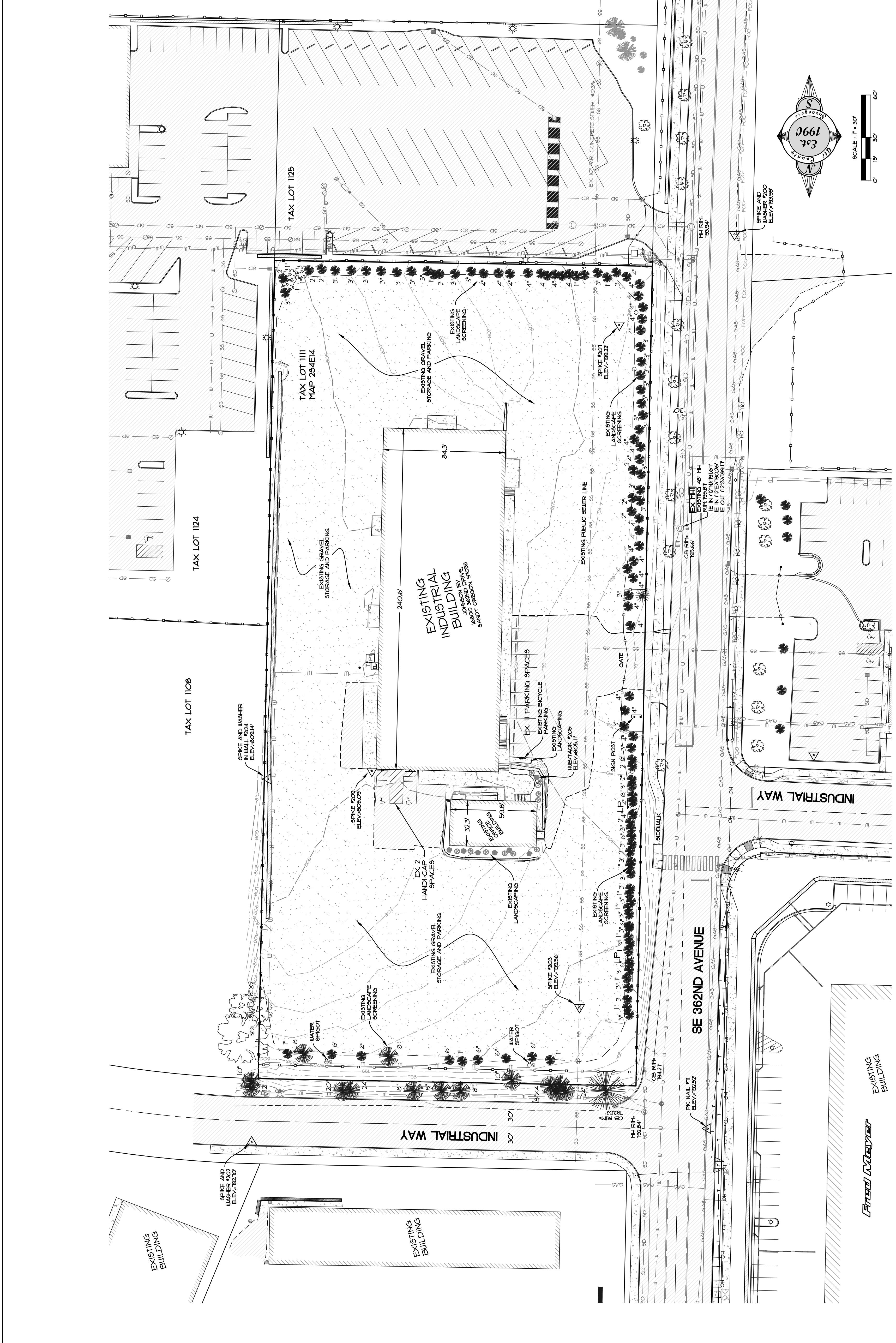
PROJECT: JOHNSON RV
 LOCATION: SE INDUSTRIAL WAY AND SE 362ND, SANDY, OR 97055
 EXISTING CONDITIONS PLAN
 RV STAGING, BUILDING AND UTILITY PLANS

SCALE:	HORIZ: 1"=30'	VERT: N/A
DATE:	07-27-22	FILE: 21-375-PLANNING.dwg
SECTION:	14	LEGAL:
TWP. RANGE:	2S	
RANGE:	4E	



RENEWAL DATE:	12/31/2022
CHECKED:	DLH
DRAWN:	LKF
DESIGNED:	LKF
APPROVED:	RLM

SHEET 2 OF 5



EXISTING CONDITIONS PLAN
 SCALE 1" = 30'

JOHNSON RV
 ROBERT MURRAY
 1600 SE 362ND AVE,
 SANDY, OR 97055
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Surveyors & Planners, Inc.
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 Fax: (503) 668-4730

JOHNSON RV
 RV STAGING, BUILDING AND UTILITY PLANS
 UTILITY PLAN
 SE INDUSTRIAL WAY AND SE 362ND, SANDY, OR 97055

SCALE	HORIZ:	VERT:
	1"=30'	N/A
DATE:	FILE:	SECTION
07-21-22	21-375-PLANNING.dwg	14
DESIGNED:	DRAWN:	CHECKED:
LKF	LKF	DLH
APPROVED:	DATE:	RENEWAL DATE:
RLM	12/2/21	12/2/21

DATE	NO.	REVISION
<p>PROFESSIONAL SEAL STATE OF OREGON CIVIL ENGINEER 1996 066</p>		
<p>PRELIMINARY</p>		
<p>DATE OF PLOT: 07-21-22</p>		

SHEET 4 OF 5

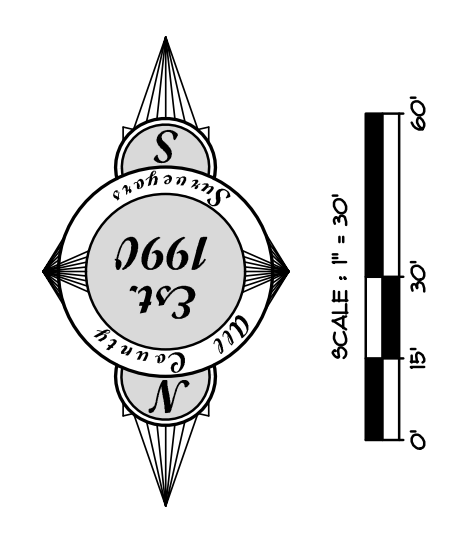
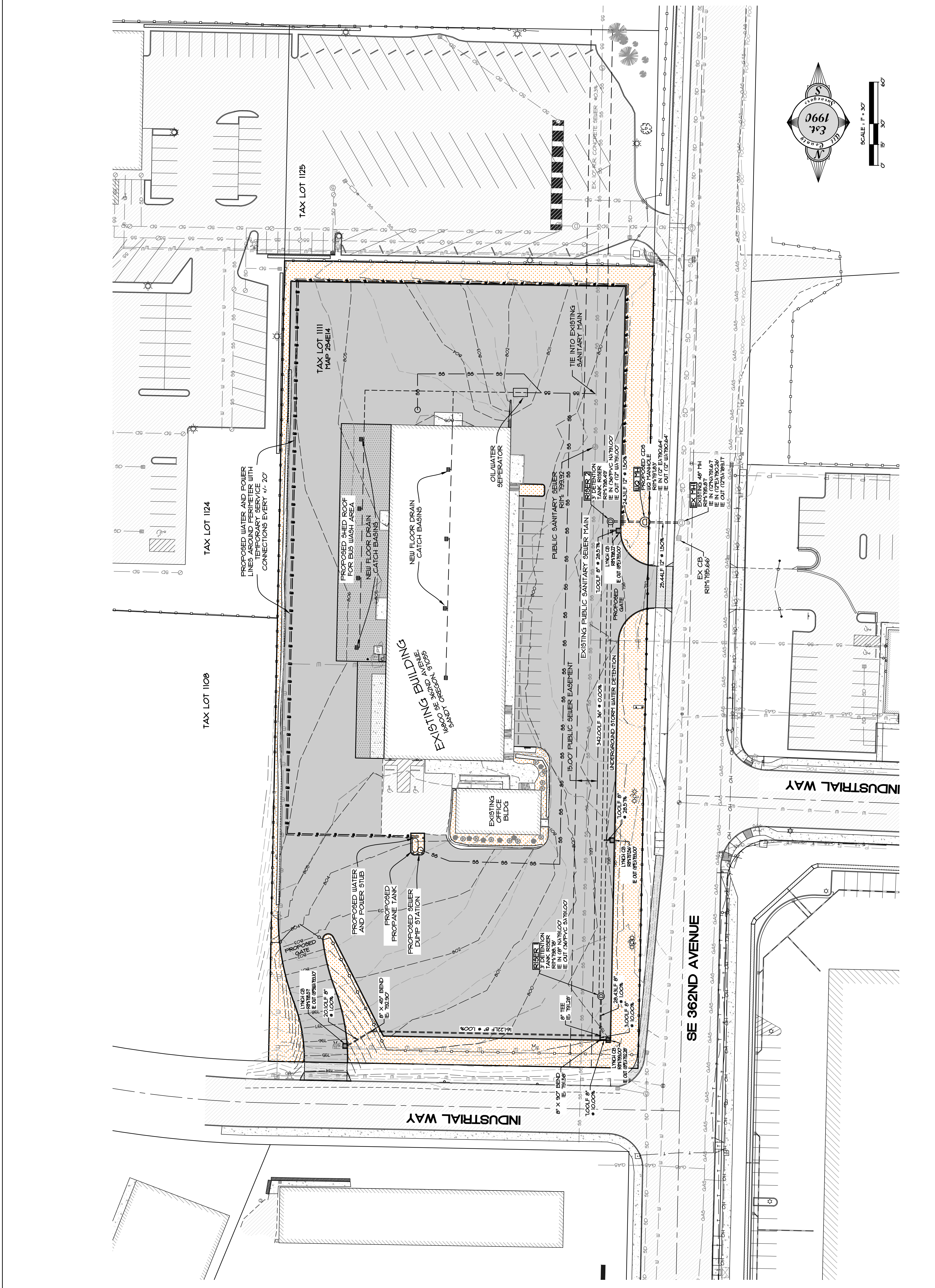
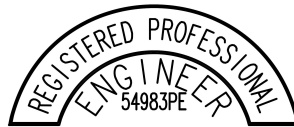


EXHIBIT K



JOHNSON RV TRAFFIC IMPACT STUDY

SANDY, OREGON



RENEWS: 12/31/2023

PREPARED FOR:
Robert Murray – Johnson RV

PREPARED BY:
Michael Ard, PE
Ard Engineering

DATE:
November 10, 2022

21370 SW Langer Farms Parkway, Suite 142, Sherwood, OR 97140 - (503)862-6960



TABLE OF CONTENTS

Executive Summary	3
Project Description & Location	4
Existing Conditions	5
Site Trips.....	11
Future Conditions Analysis	13
Safety Analysis	17
Conclusions	21
Appendix	22



EXECUTIVE SUMMARY

1. A property located on the east side of SE 362nd Avenue immediately south of Industrial Way in Sandy, Oregon is proposed for development with an RV refurbishing business that will be operated by Johnson RV. The site will take access via an existing driveway on SE 362nd Avenue and a proposed new site access driveway on Industrial Way at the northeast corner of the site.
2. Upon completion of the proposed improvements within the subject property, the site is projected to accommodate 18 site trips during the morning peak hour, 22 trips during the evening peak hour, and 108 daily site trips.
3. Based on the operational analysis, the study intersections are currently operating acceptably per City of Sandy and ODOT standards. Under year 2023 traffic conditions the intersections are projected to continue to operate acceptably either with or without the addition of site trips from the proposed use. No operational mitigations are necessary or recommended.
4. Based on the queuing analysis, the projected northbound queues on SE 362nd Avenue are projected to extend beyond the proposed driveway location during a portion of the peak hours. However, average queue lengths even during the peak hours will not obstruct the driveway, and the proposed driveway re-alignment will provide 50 feet of added access spacing as compared to existing conditions, and the driveway will be aligned directly opposite an existing driveway on the west side of SE 362nd Avenue.
5. Based on the crash data, the study intersections are currently operating acceptably with respect to safety. No specific safety improvements are recommended in conjunction with the proposed site use.
6. Based on the warrant analysis, no new turn lanes or traffic signals are recommended in conjunction with the proposed site use.
7. The proposed re-aligned site access on SE 362nd Avenue is projected to have adequate sight distance for safe and efficient operation. The proposed new site access on Industrial Way is projected to have adequate sight distance to the west upon clearing of vegetation within the site frontage allowing a clear line of sight to SE 362nd Avenue. Sight distance to the east is restricted by an existing concrete block which supports a fire department standpipe connection that serves the property immediately east of the Johnson RV site. Although sight lines to the east are restricted, the available intersection sight distance is sufficient for safe operation of the access, and operational impacts associated with the limited sight distance are negligible. Accordingly, the proposed site access on Industrial Way can also operate safely and efficiently.



PROJECT DESCRIPTION & LOCATION

INTRODUCTION

A property located on the east side of SE 362nd Avenue immediately south of Industrial Way is currently developed with two buildings, a 20,000 square foot main building and a two-story 3,850 square foot office building. The site takes access via a driveway on SE 362nd Avenue centered 100 feet south of the west leg of Industrial Way.

Under the proposed development plan, a 7,375 square foot shed roof will be added to cover the bus wash facility within the site. Additionally, a new access driveway intersecting Industrial Way near the northeast corner of the site is proposed.

This report addresses the impacts of the proposed development on the surrounding street system. An operational and safety analysis was conducted for the intersections of:

- Highway 26 at SE 362nd Avenue;
- SE 362nd Avenue at Industrial Way (east);
- SE 362nd Avenue at Industrial Way (west);
- SE 362nd Avenue at Johnson RV Site Access; and
- Industrial Way at the proposed new site access.

The purpose of this analysis is to determine whether the surrounding transportation system is capable of safely and efficiently supporting the proposed use and to identify any necessary improvements and mitigations.

SITE LOCATION AND STUDY AREA DESCRIPTION

The project site has an area of approximately 3.4 acres, and was previously used for trailer and equipment sales, rental, and maintenance. Johnson RV purchased the site to serve as a maintenance facility which supplements their existing sales facility located at 41777 US Highway 26 at the east end of the City of Sandy.

The property is surrounded primarily by commercial and industrial uses, including the Fred Meyer store located immediately to the northwest. There are also residential homes south of the site on the far side of a school bus barn.

US Highway 26 (Mt. Hood Highway) is classified by the Oregon Department of Transportation as a Statewide Highway and a Freight Route. It has two through lanes in each direction and added turn lanes at intersections. It has a posted speed limit of 45 in the vicinity of SE 362nd Avenue. Bike lanes are in place along both sides of the highway in the site vicinity, and sidewalks are in place along the south side of the highway in the vicinity of SE 362nd Avenue.

SE 362nd Avenue generally has one through travel lane for motor vehicles in each direction plus bike lanes and sidewalks on both sides of the roadway. North of Industrial Way it has a center two-way



left-turn lane. It has a posted speed limit of 35 mph and is classified by the City of Sandy as a Minor Arterial.

Industrial Way accommodates one travel lane in each direction with no centerline striping. It has a posted speed limit of 25 mph and has sufficient width for on-street parking (although parking is restricted in the immediate vicinity of SE 362nd Avenue). It is classified by the City of Sandy as a Local Street. Existing sidewalks are in place on both sides of the roadway west of SE 362nd Avenue. Partial sidewalks are in place along the north side of Industrial Way immediately east of SE 362nd Avenue, while none are currently provided along the south side of the roadway east of SE 362nd Avenue.

EXISTING CONDITIONS

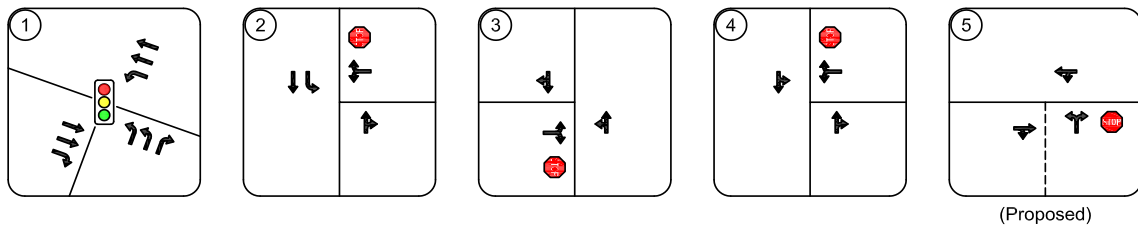
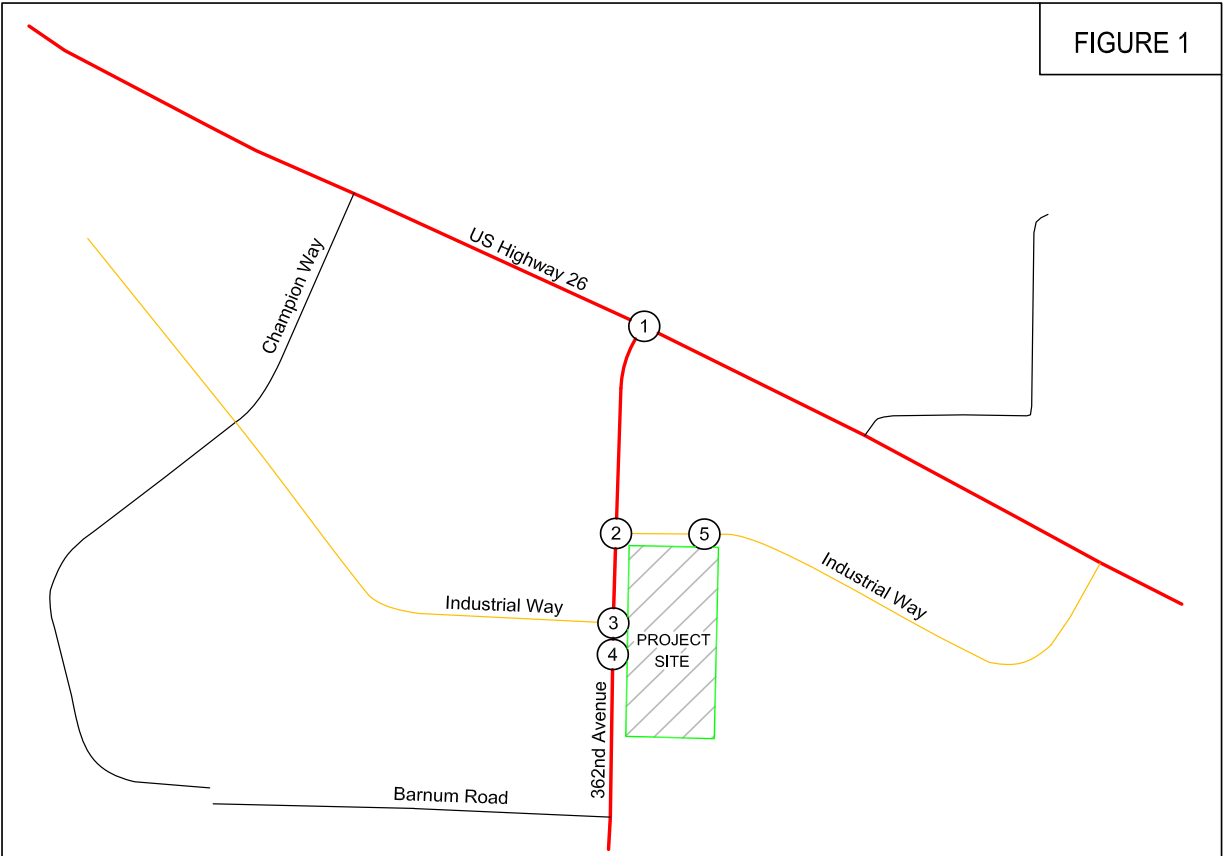
The intersection of US Highway 26 at SE 362nd Avenue is a T-intersection controlled by a traffic signal. The northbound approach has two left-turn lanes, a right-turn lane, and a bike lane to the right of the motor vehicle travel lanes. The westbound approach has a left-turn lane operating with protected signal phasing, two through lanes, and a bike lane to the right of the motor vehicle travel lanes. The eastbound approach has two through lanes, a bike lane, and a right-turn lane on the right side of the bike lane.

The intersection of SE 362nd Avenue at Industrial Way (east) is a T-intersection controlled by a stop sign on the westbound Industrial Way approach. Through traffic traveling along SE 362nd Avenue does not stop. The southbound approach has a left-turn lane and a through lane. The northbound and westbound approaches each have a single shared lane for all turning movements.

The intersection of SE 362nd Avenue at Industrial Way (west) is a T-intersection operating under all-way stop control. Each approach has a single, shared lane for all turning movements.

A vicinity map displaying the project site, vicinity streets, and the study intersections including lane configurations is provided in Figure 1 on page 6.

FIGURE 1



LEGEND

#	Study Intersection #
	Traffic Signal
	Stop Sign



TRAFFIC COUNT DATA

Traffic counts were conducted at the study area intersections on Thursday August 11, 2022 from 7:00 to 9:00 AM and from 4:00 to 6:00 PM. Data was used from the highest-volume hour for each study intersection during each analysis period.

Since the count data was not collected during the peak month of the year, the observed traffic volumes on Highway 26 were adjusted to account for seasonal traffic variations. In accordance with the Oregon Department of Transportation's *Analysis Procedures Manual*, this allows us to analyze operations based on traffic patterns that occur during the 30th-highest hour of the year.

US Highway 26 serves local and commuter traffic as well as trips to and from Mt. Hood and beyond. These trip types would be expected to exhibit vastly different seasonal variations in travel demands over the course of the year, since local and commuter traffic volumes are relatively stable regardless of season, while travel volumes to and from Mt. Hood vary significantly based on the season.

In order to determine the portion of traffic attributable to each of the two primary travel types, data from ODOT's 2017-2021 ATR station trend data was utilized. Specifically, the data used was collected at ODOT's Automatic Count Data station 03-006, located 0.30 miles east of Camp Creek Road in Rhododendron, Oregon. This site is located on Highway 26 approximately 24 miles east of SE 362nd Avenue. Although the distance to the ATR station means the data cannot be used directly, the ATR data provides useful information regarding the variation in traffic volumes traveling to Mt. Hood and beyond during the time of the count data collection as well as during the peak season of the year. Accordingly, this data allows determination of the portion of highway traffic that falls into each of the two seasonal variation categories ("commuter" and "recreational summer/winter"), as well as providing information regarding the most appropriate seasonal adjustment factor for the recreational summer/winter traffic.

Based on the five years of ATR data and excluding the highest and lowest variations (i.e., averaging the three other data points), 13,374 vehicles per day (approximately 1,337 per hour during the peak hour) travel along Highway 26 to and from Mt. Hood at the Rhododendron permanent count station location during the month of August. This volume represents 50.5 percent of the through traffic volumes measured on Highway 26 east of Oregon Highway 211, since the August turning movement counts showed 2,643 vehicles on Highway 26 east of SE 362nd Avenue during the evening peak hour. Accordingly, no more than 50.5 percent of the trips traveling along Highway 26 at that location can be traveling to and from destinations beyond the Rhododendron count station. Since the remaining 49.5 percent of through traffic volumes on Highway 26 at Highway 211 never reach Mt. Hood, it was assumed that these traffic volumes represent more typical commuter and local trips.

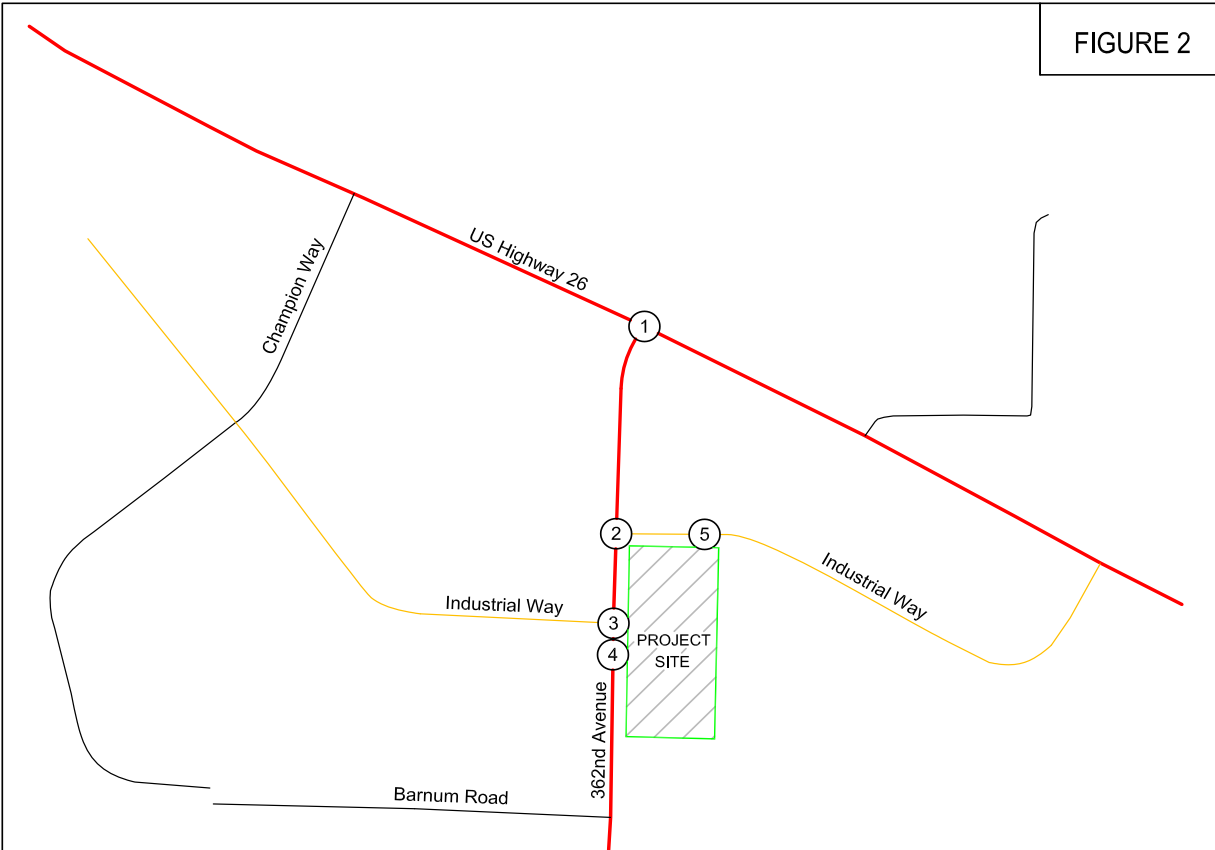
The ODOT data also showed that 13,969 vehicles were measured per day (approximately 1,397 per hour during the peak hour) during the peak-season month of July at the ATR station near Rhododendron. This indicates that the seasonal recreational traffic volumes along the Highway 26 corridor increased by 595 vehicles per day (13,969 vehicles per day in July - 13,374 vehicles per day in August). This equates to roughly 60 additional vehicles per hour during the peak hour of the peak recreational season. Accounting for directionality of trips, this equates to approximately 33 westbound vehicles and 27 eastbound vehicles during the evening peak hour.



In addition to the calculated seasonal adjustment for trips to and from Mt. Hood and beyond, a commuter seasonal adjustment was applied to the traffic volumes that do not reach the ATR station in Rhododendron, Oregon. Based on data from ODOT's Seasonal Trend Table, the seasonal adjustment for commuter traffic was calculated to be 2.2 percent. This adjustment was applied to the portion of the through traffic volumes on Highway 26 that represent commuter and local trips. Accordingly, the total adjustment was calculated to be 84 additional vehicles during the PM peak hour (an increase of 4.0 percent to the through traffic volumes on the highway). This 4.0 percent seasonal adjustment was also applied to the through volumes on Highway 26 for the AM count period.

Figure 2 on page 9 shows the resulting seasonally adjusted existing year 2022 30th-highest hour traffic volumes for the morning and evening peak hours at the study intersections.

FIGURE 2



Location	AM	AM	AM	AM	AM																														
1	<table border="1"> <tr> <td>758</td> <td>132</td> <td>261</td> <td>94</td> <td>935</td> <td>88</td> </tr> </table>	758	132	261	94	935	88	<table border="1"> <tr> <td>121</td> <td>36</td> <td>15</td> <td>26</td> <td>293</td> <td>45</td> </tr> </table>	121	36	15	26	293	45	<table border="1"> <tr> <td>37</td> <td>90</td> <td>58</td> <td>36</td> <td>56</td> <td>293</td> </tr> </table>	37	90	58	36	56	293	<table border="1"> <tr> <td>123</td> <td>3</td> <td>1</td> <td>0</td> <td>348</td> <td>0</td> </tr> </table>	123	3	1	0	348	0	<table border="1"> <tr> <td>41</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	41					
758	132	261	94	935	88																														
121	36	15	26	293	45																														
37	90	58	36	56	293																														
123	3	1	0	348	0																														
41																																			
1	<table border="1"> <tr> <td>1188</td> <td>313</td> <td>251</td> <td>298</td> <td>1014</td> <td>227</td> </tr> </table>	1188	313	251	298	1014	227	<table border="1"> <tr> <td>446</td> <td>23</td> <td>55</td> <td>34</td> <td>346</td> <td>29</td> </tr> </table>	446	23	55	34	346	29	<table border="1"> <tr> <td>33</td> <td>455</td> <td>92</td> <td>129</td> <td>54</td> <td>290</td> </tr> </table>	33	455	92	129	54	290	<table border="1"> <tr> <td>582</td> <td>2</td> <td>3</td> <td>1</td> <td>341</td> <td>0</td> </tr> </table>	582	2	3	1	341	0	<table border="1"> <tr> <td>89</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	89					
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33	455	92	129	54	290																														
582	2	3	1	341	0																														
89																																			
	PM	PM	PM	PM	PM																														



TRAFFIC VOLUMES
 2022 Existing 30th-Highest Hour Conditions
 Morning and Evening Peak Hours



OPERATIONAL ANALYSIS

An operational analysis was conducted for the study intersections using Synchro 10 software, with outputs calculated based on the *HIGHWAY CAPACITY MANUAL, 6th Edition*. The analysis was conducted for the weekday morning and evening peak hours.

The purpose of the existing conditions analysis is to establish how the study area intersections operate currently and allow for calibration of the operational analysis if required.

The results of the operational analysis are reported based on delay, Level of Service (LOS), and volume-to-capacity ratio (v/c). Delays are reported in seconds. Level of service is reported as a letter grade and can range from A to F, with level of service A representing free-flow conditions and level of service F representing high delays and severe congestion. A report of level of service D generally indicates moderately high but tolerable delays, and typically occurs prior to reaching intersection capacity. For unsignalized intersections, the v/c represents the portion of the available intersection capacity that is being utilized on the worst intersection approach. For signalized intersections, it indicates the portion of the overall intersection’s capacity that is being used. A v/c ratio of 1.0 would indicate that the intersection is operating at capacity.

The Oregon Department of Transportation requires that the signalized intersection of Highway 26 at SE 362nd Avenue operate with a v/c ratio of 0.80 or less during the peak hours.

Intersections operating under the jurisdiction of the City of Sandy are required to operate at level of service D or better. This operational standard applies to the intersections of SE 362nd Avenue at the north and south intersections with Industrial Way, as well as the site access intersections.

A summary of the existing conditions operational analysis is provided in Table 1 on the following page. For the unsignalized intersections the reported delays and levels-of-service represent the approach lane which experiences the highest delays. The reported v/c ratios represent the highest ratio for the major-street and minor-street movements. For the signalized intersection of Highway 26 at SE 362nd Avenue, the reported delays, levels-of-service and v/c ratios represent the operation of the overall intersection.

Based on the analysis, the intersections are currently operating acceptably per the respective ODOT and City of Sandy standards. Detailed capacity analysis worksheets are provided in the technical appendix.

Table 1 - Operational Analysis Summary: Year 2022 30th-Highest Hour Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c	Delay	LOS	v/c
Highway 26 at SE 362nd Ave.	13.1	B	0.48	22.6	C	0.68
SE 362nd Ave. at Industrial Way (N)	12.8	B	0.09	15.0	C	0.21
SE 362nd Ave. at Industrial Way (S)	11.5	B	0.48	23.5	C	0.76
SE 362nd Ave. at Existing Site Access	10.8	B	0.01	13.0	B	0.01



SITE TRIPS

PROPOSED DEVELOPMENT

The subject property currently contains an existing 20,000 square foot industrial main building and a two-story 3,850 square foot office building. The proposed redevelopment plan will also include constructing a new 7,375 square foot shed roof to cover the bus wash area within the site. To estimate the number of trips that will be generated at the site trip rates from the *TRIP GENERATION MANUAL, 10th EDITION* were used. Data from land-use code 180, *Specialty Trade Contractor*, were used.

Since the floor area of the existing and proposed facilities is well in excess of the largest comparable facilities within the data set, the trip estimates are based on the number of employees at the site. It is anticipated that 20 to 30 employees will work within the site. To maintain a conservative analysis, the larger estimate of 30 employees was used to assess trip generation for the site.

A summary of the trip generation calculations is provided in Table 2 below. A detailed trip generation worksheet is also included in the technical appendix.

Table 2 - Proposed Development Trip Generation Summary

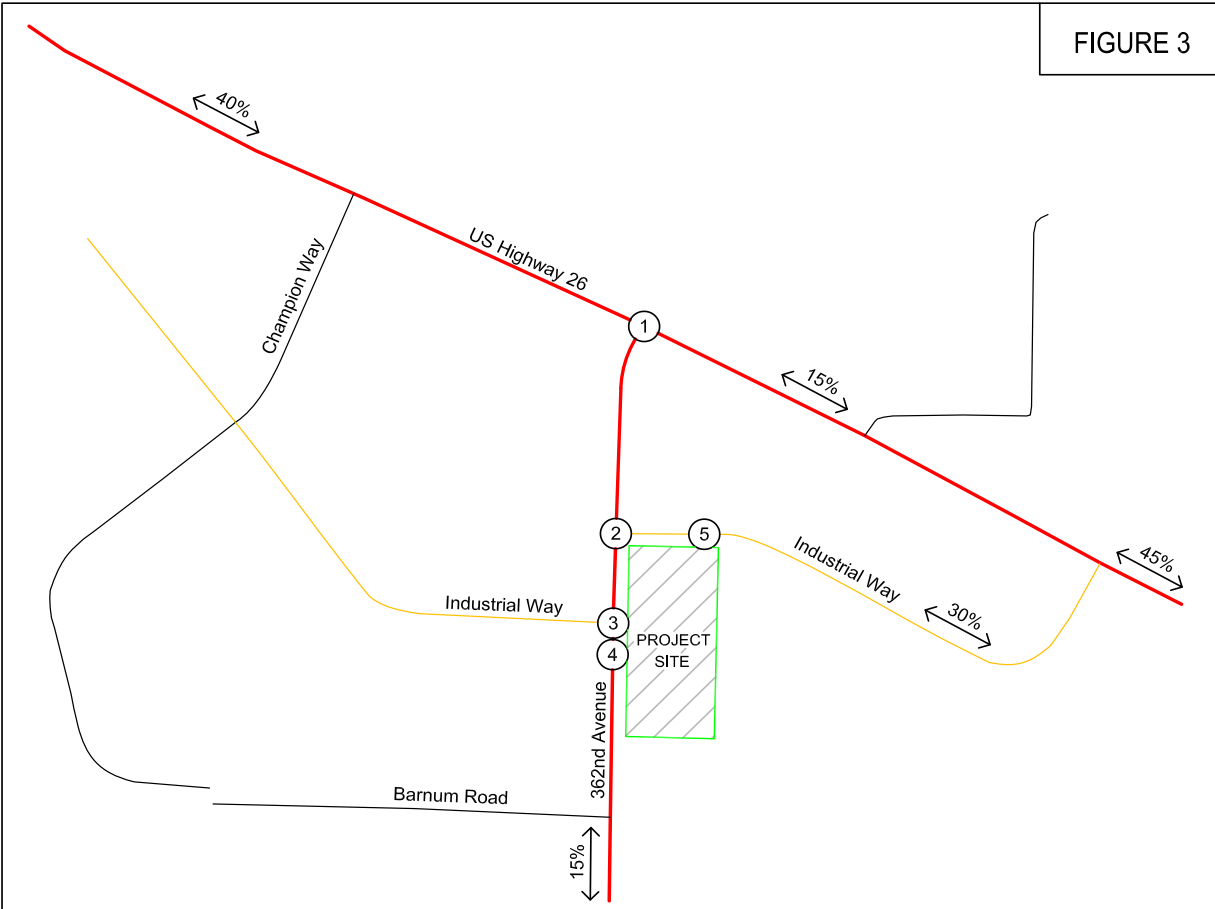
	AM Peak Hour			PM Peak Hour			Daily Total
	In	Out	Total	In	Out	Total	
30 Employee Specialty Contractor	13	5	18	7	15	22	108

TRIP DISTRIBUTION

The directional distribution of site trips to and from the project site was estimated based the existing travel patterns in the site vicinity, as well as the locations of likely trip destinations and major transportation routes. Overall, 40 percent of the anticipated site trips are projected to travel to and from the northwest on Highway 26, 45 percent are projected to travel to and from the southeast on Highway 26, and the remaining 15 percent of site trips are projected to travel to and from the west on Dubarko Road.

The trip distribution percentages and trip assignment for the proposed development are shown in Figure 3 on page 12.

FIGURE 3



1	2	3	4	5
<p>AM</p>	<p>AM</p>	<p>AM</p>	<p>AM</p>	<p>AM</p>
<p>PM</p>	<p>PM</p>	<p>PM</p>	<p>PM</p>	<p>PM</p>



TRAFFIC VOLUMES
 Proposed Development - Site Trips
 Morning and Evening Peak Hours

PAGE
 12



FUTURE CONDITIONS ANALYSIS

BACKGROUND VOLUMES

In order to determine the expected impact of site trips on the study area intersections, it is necessary to compare traffic conditions both with and without the addition of the projected traffic from the proposed development. This comparison is made for future traffic conditions at the time of project completion. It is anticipated that the proposed use will be completed and occupied within one year. Accordingly, the analysis was conducted for year 2023 traffic conditions.

Prior to adding the projected site trips to the study intersections, the existing traffic volumes were adjusted to account for background traffic growth over time. Based on data from ODOT's 2040 Future Volume Table, the growth rate for traffic volumes on Highway 26 in the site vicinity was calculated to be 1.92 percent per year (linear). This growth rate was applied to the through traffic volumes on Highway 26. All other turning movements had a growth factor of 2 percent per year (exponential) applied.

In addition to the background growth, future site trips associated with other anticipated developments within the City of Sandy were added to the background traffic volumes. These projects included the Mt. Hood Senior Living, The Pad, Cedar Heights Views, Shaylee Meadows, Trimble PD, Bornstedt Views, Cascade Creek Multifamily, Tickle Creek Village, Double Creek Condos, Jewelberry Ridge, Jewelberry Meadows, Sandy Plaza Apartments, FreeUp Storage, and a mixed-use development at 38015 Highway 26. The projected site trips for these residential developments are shown in Figure 6 in the attached technical appendix.

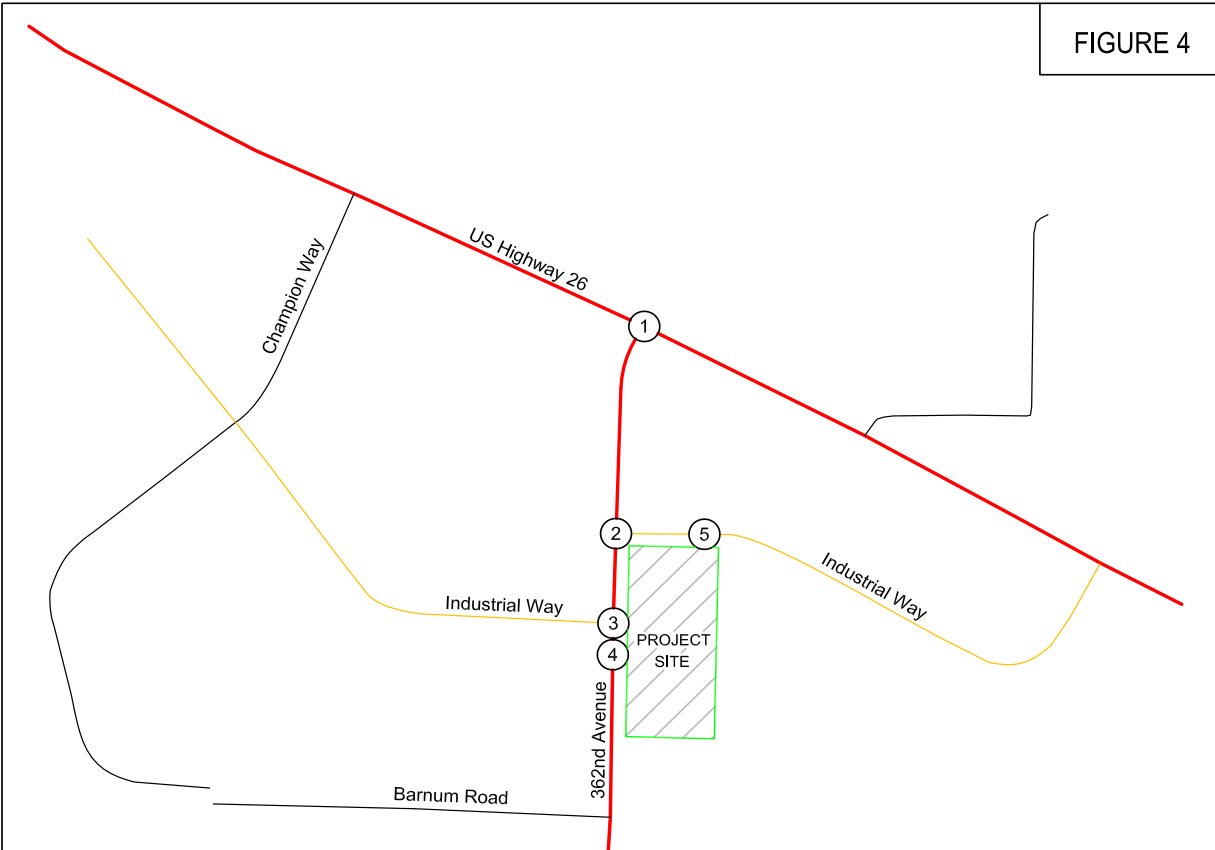
Figure 4 on page 14 shows the projected year 2023 background traffic volumes at the study intersections during the morning and evening peak hours.

BACKGROUND VOLUMES PLUS SITE TRIPS

Peak hour trips calculated to be generated by the proposed development were added to the projected year 2023 background traffic volumes to obtain the year 2023 total traffic volumes following completion of the proposed development.

Figure 5 on page 15 shows the projected year 2023 peak hour volumes including background growth, and site trips from the proposed development for the morning and evening peak hours.

FIGURE 4

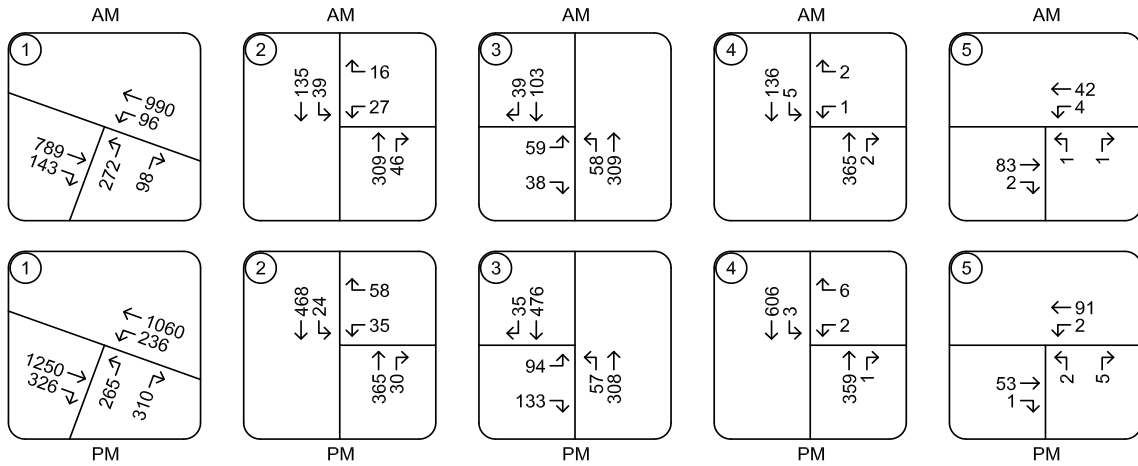
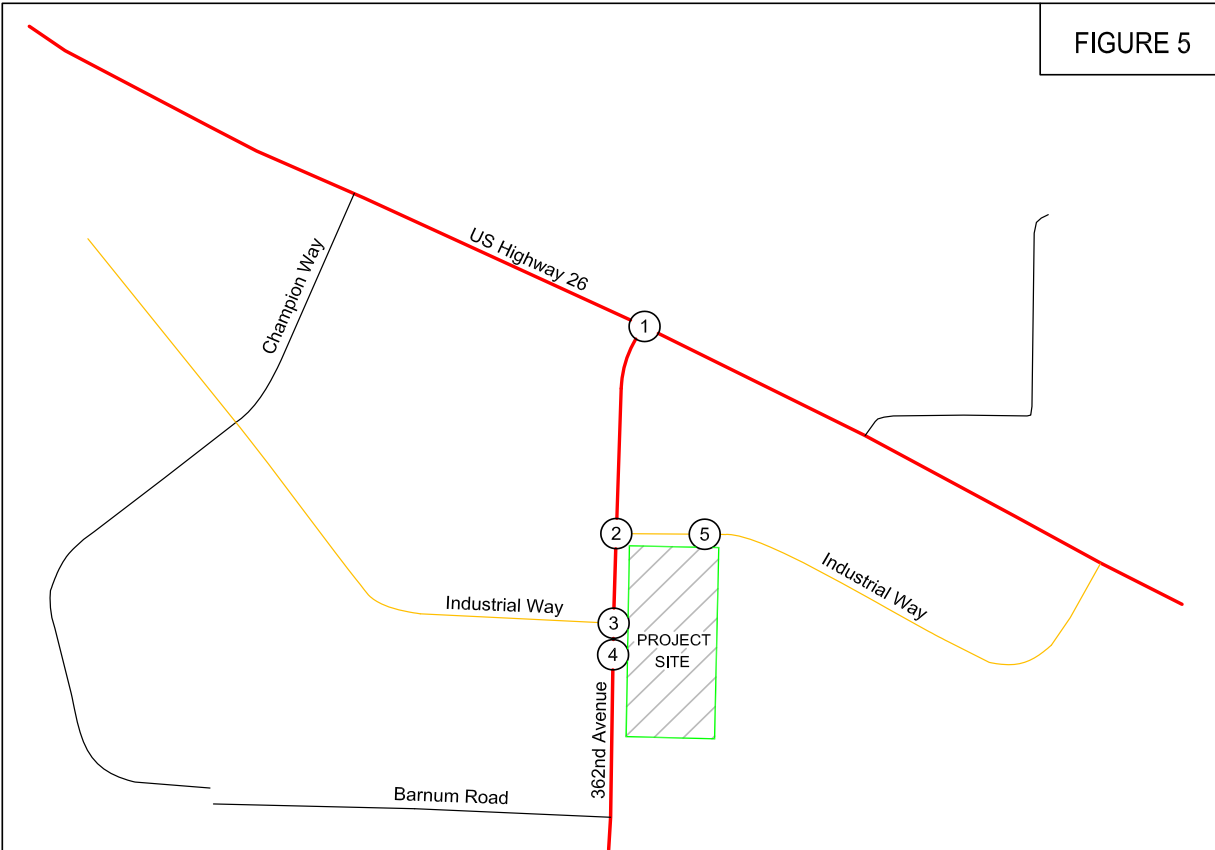


Location	AM	AM	AM	AM	AM
1					
1					
	PM	PM	PM	PM	PM



TRAFFIC VOLUMES
 2023 Background Conditions
 Morning and Evening Peak Hours

FIGURE 5





OPERATIONAL ANALYSIS

The operational analysis for future traffic conditions was again conducted using Synchro analysis software, with outputs based on the analysis methodologies contained in the *HIGHWAY CAPACITY MANUAL*. The analysis was prepared for the intersections’ morning and evening peak hours.

The results of the operational analysis are summarized in Table 4 below. Detailed analysis worksheets are also included in the technical appendix.

Table 4 - Operational Analysis Summary: Year 2023 Future Conditions

Intersection	AM Peak Hour			PM Peak Hour		
	Delay	LOS	v/c	Delay	LOS	v/c
Highway 26 at SE 362nd Ave.						
2023 Background Conditions	13.3	B	0.50	23.3	C	0.72
2023 Background plus Site	13.3	B	0.50	23.4	C	0.72
SE 362nd Ave. at Industrial Way (N)						
2023 Background Conditions	13.1	B	0.10	15.6	C	0.22
2023 Background plus Site	13.2	B	0.10	15.8	C	0.23
SE 362nd Ave. at Industrial Way (S)						
2023 Background Conditions	12.0	B	0.50	27.0	D	0.81
2023 Background plus Site	12.1	B	0.51	27.7	D	0.81
SE 362nd Ave. at Existing Site Access						
2023 Background Conditions	10.9	B	0.01	13.3	B	0.01
2023 Background plus Site	11.7	B	0.01	13.4	B	0.02
Industrial Way at Proposed Site Access						
2023 Background plus Site	9.7	A	0.01	9.4	A	0.01

Upon completion of the proposed development, all study intersections are projected to operate acceptably per the appropriate jurisdictional standards.

QUEUING ANALYSIS

A queuing analysis was conducted using SimTraffic software to determine whether standing queues on the major streets will impact operation of the site access driveways. The SE 362nd Avenue northbound approach toward Industrial Way (South) has projected 95th percentile queue lengths of 103 feet and 115 feet during the morning and evening peak hours, respectively. The existing site access is planned to be moved 50 feet south of its existing alignment in conjunction with the proposed development, resulting in an access spacing of 93 feet between the northbound stop bar and the near side of the driveway. Although the proposed access location is within the 95th percentile queue lengths it is less than the average queue lengths during the peak hours (67 feet and 73 feet during the AM and PM peak hours, respectively) and will align directly opposite an existing driveway on the west side of SE 362nd Avenue. This represents an improvement in access spacing as compared to existing conditions.



SAFETY ANALYSIS

CRASH DATA ANALYSIS

Using data obtained from the Oregon Department of Transportation, a review of the five most recent years of available crash history (from January 2016 through December 2020) was performed for the study intersections. The crash data was evaluated based on the number, type, and severity of collisions, as well as the intersection crash rate. Crash rates allow comparison of relative safety risks at intersections with different lane configurations, volumes, and traffic control devices by accounting for both the number of crashes that occur during the study period and the number of vehicles that traveled through the intersection during that period. Crash rates are calculated using the standard assumption that evening peak hour volumes are approximately 10 percent of the average daily traffic volume at an intersection. The crash rates were compared to statewide crash rates for similar intersection types to identify any locations with crash rates in excess of the 90th percentile.

The intersection of Highway 26 at SE 362nd Avenue had 22 reported collisions during the five-year analysis period. These included 15 rear-end collisions, 6 turning-movement collisions, and one pedestrian collision. The pedestrian collision occurred when a pedestrian crossed Highway 26 without a walk signal in the dark and was struck by a driver making a northbound right turn from SE 362nd Avenue onto Highway 26. The crash resulted in a “possible injury/complaint of pain” from the pedestrian. The crashes resulted in no incapacitating injuries or fatalities, two non-incapacitating injuries, and 18 reports of a “possible injury/complaint of pain”. The crash rate for the intersection was calculated to be 0.362 crashes per million entering vehicles. This is well below the 90th percentile crash rate of 0.509 crashes per million entering vehicles for signalized, three-way urban intersections in Oregon.

The intersections of SE 362nd Avenue at Industrial Way had four total reported collisions during the five-year analysis period. These included three rear-end collisions and one turning-movement collision. The crashes resulted in four reports of a “possible injury/complaint of pain.” No serious injuries or fatalities were reported. Conservatively assuming that all reported crashes occurred at the same intersection, the crash rate for the intersection would be 0.203 crashes per million entering vehicles, which is still below the 90th percentile crash rate of 0.293 crashes per million entering vehicles for stop-controlled, three-way urban intersections in Oregon.

Based on the crash data, the study intersections are currently operating acceptably with respect to safety. No specific safety improvements are recommended for the study area intersections.

TRAFFIC SIGNAL WARRANT ANALYSIS

Traffic signal warrants were examined for the unsignalized study intersections. Based on the projected traffic volumes, traffic signal warrants are not projected to be met for any of the unsignalized study intersections under any of the analysis scenarios.



TURN LANE WARRANT ANALYSIS

Turn lane warrants were also examined for the major-street approaches to the unsignalized study intersections. Left-turn lane warrants are intended to evaluate whether a meaningful safety benefit may be expected if the turning vehicles are provided with a turn lane within the street, allowing left-turning drivers to move out of the through travel lane so that following vehicles may pass without conflicts. Similarly, right-turn lane warrants are intended to evaluate whether a meaningful safety benefit may be expected if a right-turn lane is provided, allowing right-turning vehicles to move out of the through travel lane while decelerating and making turns.

The intersection of SE 362nd Avenue at Industrial Way (North) already has a southbound left-turn lane in place. Right-turn lane warrants are not projected to be met at this intersection.

Turn lane warrants are not directly applicable at the intersection of SE 362nd Avenue and Industrial Way (South), since the intersection operates under all-way stop control. All vehicles must stop prior to entering the intersection and providing a separate turn lane would not allow through vehicles to traverse the intersection without slowing and stopping. The need for turn lanes at all-way stop control intersections is based on operational rather than safety benefits. In this instance, the intersection operates acceptably without the addition of left and right turn lanes. Therefore, no new turn lanes are recommended at this intersection in conjunction with the proposed development.

The intersections of SE 362nd Avenue at the site access and Industrial Way at the proposed site access are not projected to meet turn lane warrants under any analysis scenarios.

INTERSECTION SIGHT DISTANCE ANALYSIS

Intersection sight distance was examined for the proposed re-aligned site access intersections on SE 362nd Avenue and for the proposed new site access on Industrial Way.

SE 362nd Avenue at Re-Aligned Site Access

The existing site access on SE 362nd Avenue is proposed to be re-aligned to a position 50 feet south of the existing driveway alignment. The proposed new alignment increases the access spacing between the driveway and the nearby all-way stop controlled intersection at Industrial Way. It also aligns the proposed access directly opposite another existing driveway on the west side of the roadway.

SE 362nd Avenue has a posted speed limit of 35 mph, typically requiring a minimum of 390 feet of intersection sight distance in each direction. However, the actual 85th percentile approach speeds were used in lieu of the posted speed limit to evaluate sight distance in both directions.

For southbound traffic approaching the proposed re-aligned site access on SE 362nd Avenue, all approaching vehicles must stop prior to entering the intersection. Intersection sight distance was measured to be continuous beyond the stop-controlled intersection at Industrial Way. The effective



approach speed from the intersection is thus zero miles per hour, and adequate intersection sight distance for safe and efficient operation is available.

Intersection sight distance was measured to be 324 feet to the south from the proposed re-aligned site access. For northbound traffic approaching the proposed re-aligned site access on SE 362nd Avenue, the measured 85th percentile speed at the limits of sight distance was 37 mph. For this design speed, a minimum of 410 feet of intersection sight distance would typically be desired. However, this intersection sight distance requirement is predicated on the idea of allowing sufficient sight lines such that through traffic will not need to slow to avoid conflicts at the studied intersection. In this instance, all northbound traffic must slow when approaching the site access since it is in close proximity to the northbound stop bar at Industrial Way, so the assumptions underlying the typical intersection sight distance requirements are not directly applicable.

The required stopping sight distance for an approach speed of 37 mph was calculated to be 270 feet. Since the available intersection sight distance to the south is in excess of 270 feet, northbound vehicles approaching the site access have sufficient sight lines to see vehicles entering the roadway at the proposed site access location and slow or stop to avoid collisions. As such, the site access can operate safely. Since all northbound vehicles must slow (and stop) prior to reaching Industrial Way, the potential induced delays to northbound through traffic are not projected to materially impact operation of SE 362nd Avenue either at the proposed re-aligned site access location or at Industrial Way.

Based on the detailed analysis, sight lines at the proposed re-aligned site access location are sufficient to allow for safe and efficient operation of the site access. Since the proposed re-alignment also results in increased access spacing and direct alignment opposite an existing driveway, the proposed re-aligned access will operate better than the existing site access and is expected to represent the optimal location for the driveway within the site frontage.

Industrial Way at Proposed Site Access

The proposed new site access is centered approximately 40 feet west of the site's east property line on Industrial Way. Industrial Way has a posted speed limit of 25 mph. The desired intersection sight distance for this approach speed is 280 feet in each direction.

Intersection sight distance to the west from the proposed access location on Industrial Way is currently obstructed by vegetation within the site frontage. However, with clearing of the vegetation continuous sight lines to SE 362nd Avenue can be provided to the west. The proposed access will be located 230 feet east of the traveled way on SE 362nd Avenue, indicating that a minimum of 230 feet of intersection sight distance will be provided in this direction. Vehicles approaching from beyond the intersection at SE 362nd Avenue will need to make a 90-degree turn onto Industrial Way. Typical turning speeds are in the range of 9 to 19 mph, while the available intersection sight distance to the west will be sufficient for turning speeds of up to 20 mph. The available intersection sight distance to the west is also projected to provide adequate stopping sight distance for approach speeds up to 33 mph. Based on the analysis, adequate sight lines for safe and efficient operation can be attained to the west of the proposed access location upon clearing of vegetation within the site frontage.



Intersection sight distance to the east from the proposed access location on Industrial Way was measured to be 248 feet, as limited by a large concrete block which provides a fire department standpipe connection that serves the property immediately east of the Johnson RV site.

For westbound traffic approaching the proposed site access on Industrial Way, the measured 85th percentile speed at the limits of sight distance was 33 mph. This design speed requires a minimum of 230 feet of stopping sight distance for safety. Since the available intersection sight distance is in excess of 230 feet, the intersection has adequate sight lines for through vehicles to anticipate and avoid collisions at the site access. However, interruptions to the flow of through traffic along Industrial Way may be expected when vehicles pull out from the proposed access driveway.

In order to assess the anticipated delays which would be induced by operation of the proposed driveway on Industrial Way, a detailed delay analysis was conducted.

For vehicles traveling at speeds of up to 33 mph, the available intersection sight distance of 248 feet accommodates approximately 5.1 seconds of travel time. Typically, intersections are designed to accommodate 7.5 seconds of travel time at the design speed in order to avoid undue delays to through traffic. Accordingly, vehicles entering Industrial Way from the proposed site access have the potential to add as much as 2.4 seconds of additional delay to through traffic per vehicle exiting from the proposed driveway. Assuming random arrivals, the average added delay per affected vehicle would be 1.2 seconds (half the maximum value).

A conservative estimate of the likelihood of conflicts resulting in any induced delay can be calculated based on the volume of westbound traffic traveling on Industrial Way during the highest-volume hour. In this instance, the highest westbound volumes occur during the evening peak hour when 91 westbound through vehicles are projected at the site access. Conservatively assuming that each approaching vehicle has a 2.4-second window during which a vehicle exiting the site would require the westbound driver to slow, each vehicle making a left turn from the site access onto Industrial Way would have a 6 percent chance of experiencing a conflict with westbound through traffic which induces a delay. Since approximately 10 vehicles per day are projected to make this turning movement, the average induced delay was calculated to be 0.72 seconds per day (10 vehicles per day * 6% chance of conflict * 1.2 seconds average delay per conflict). This equates to approximately 4.4 minutes of induced delay per year. The economic impact of these cumulative delays would be \$2.19 per year assuming a time value of \$30 per hour. Based on the minimal economic impact, any meaningful mitigation would result in costs well in excess of the actual impacts of the proposed site access.

Based on the analysis, adequate intersection sight distance is available in each direction for safe operation of the proposed site access on Industrial Way. Since sight lines are limited to the east by a large concrete block which provides a fire department standpipe connection that serves the property immediately east of the Johnson RV site, some induced delays are expected since westbound through vehicles may need to slow or stop to avoid collisions at the site access. The overall impact of these delays is negligible, however. Accordingly, operation of the proposed site access is not projected to result in any significant operational or safety concerns.



CONCLUSIONS

Based on the operational analysis, the study intersections are currently operating acceptably per City of Sandy and ODOT standards. Under year 2023 traffic conditions the intersections are projected to continue to operate acceptably either with or without the addition of site trips from the proposed use. No operational mitigations are necessary or recommended.

Based on the queuing analysis, the projected northbound queues on SE 362nd Avenue are projected to extend beyond the proposed driveway location during a portion of the peak hours. However, average queue lengths even during the peak hours will not obstruct the driveway, and the proposed driveway re-alignment will provide 50 feet of added access spacing as compared to existing conditions, and the driveway will be aligned directly opposite an existing driveway on the west side of SE 362nd Avenue.

Based on the crash data, the study intersections are currently operating acceptably with respect to safety. No specific safety improvements are recommended in conjunction with the proposed site use.

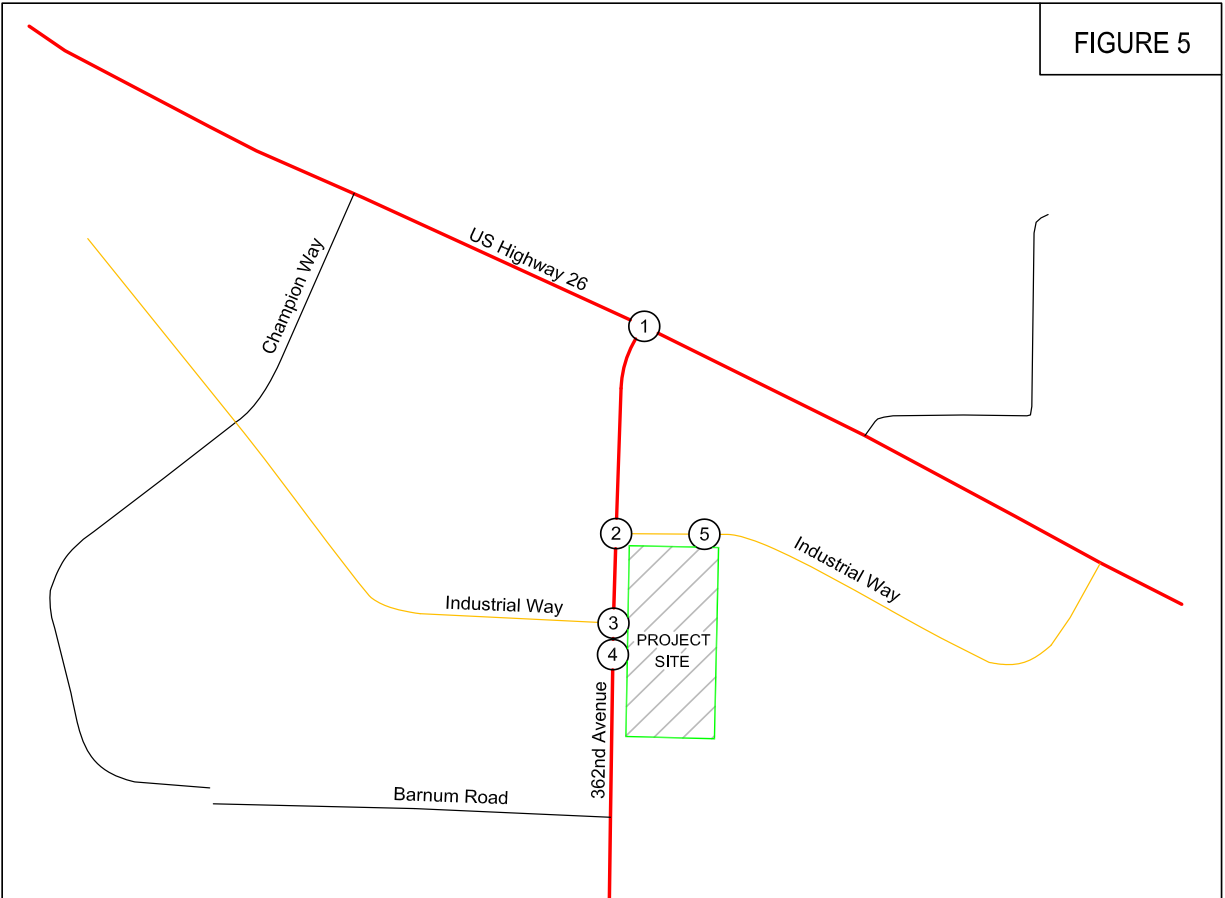
Based on the warrant analysis, no new turn lanes or traffic signals are recommended in conjunction with the proposed site use.

The proposed re-aligned site access on SE 362nd Avenue is projected to have adequate sight distance for safe and efficient operation. The proposed new site access on Industrial Way is projected to have adequate sight distance to the west upon clearing of vegetation within the site frontage allowing a clear line of sight to SE 362nd Avenue. Sight distance to the east is restricted by an existing concrete block which supports a fire department standpipe connection that serves the property immediately east of the Johnson RV site. Although sight lines to the east are restricted, the available intersection sight distance is sufficient for safe operation of the access, and operational impacts associated with the limited sight distance are negligible. Accordingly, the proposed site access on Industrial Way can also operate safely and efficiently.



APPENDIX

FIGURE 5



	AM	AM	AM	AM	AM
1					
1					
	PM	PM	PM	PM	PM



TRAFFIC VOLUMES
 In-Process Development - Site Trips
 Morning and Evening Peak Hours

PAGE
 APP1

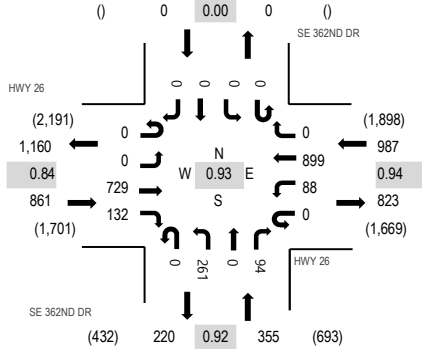


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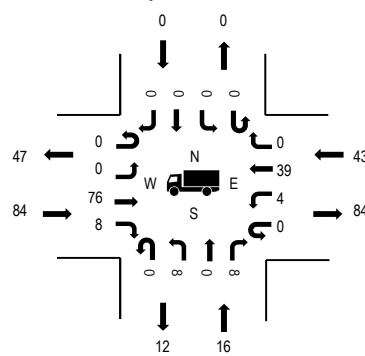
Location: 1 SE 362ND DR & HWY 26 AM
Date: Thursday, August 11, 2022
Peak Hour: 07:15 AM - 08:15 AM
Peak 15-Minutes: 07:50 AM - 08:05 AM

Peak Hour

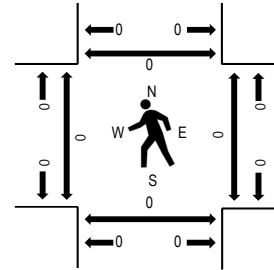
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	9.8%	0.84
WB	4.4%	0.94
NB	4.5%	0.92
SB	0.0%	0.00
All	6.5%	0.93

Traffic Counts - Motorized Vehicles

Interval Start Time	HWY 26 Eastbound				HWY 26 Westbound				SE 362ND DR Northbound			SE 362ND DR Southbound			Total	Rolling Hour		
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left			Thru	Right
7:00 AM	0	0	60	7	0	4	69	0	0	21	0	1	0	0	0	0	162	2,185
7:05 AM	0	0	37	9	0	8	82	0	0	22	0	5	0	0	0	0	163	2,202
7:10 AM	0	0	40	8	0	7	68	0	0	26	0	3	0	0	0	0	152	2,181
7:15 AM	0	0	50	6	0	3	89	0	0	30	0	3	0	0	0	0	181	2,203
7:20 AM	0	0	45	8	0	3	90	0	0	22	0	7	0	0	0	0	175	2,192
7:25 AM	0	0	78	16	0	4	76	0	0	21	0	4	0	0	0	0	199	2,184
7:30 AM	0	0	65	16	0	7	71	0	0	26	0	8	0	0	0	0	193	2,148
7:35 AM	0	0	52	6	0	8	80	0	0	26	0	7	0	0	0	0	179	2,109
7:40 AM	0	0	71	9	0	11	71	0	0	22	0	9	0	0	0	0	193	2,143
7:45 AM	0	0	49	11	0	7	73	0	0	19	0	13	0	0	0	0	172	2,139
7:50 AM	0	0	85	13	0	11	67	0	0	21	0	5	0	0	0	0	202	2,147
7:55 AM	0	0	71	21	0	9	78	0	0	23	0	12	0	0	0	0	214	2,133
8:00 AM	0	0	71	8	0	7	67	0	0	18	0	8	0	0	0	0	179	2,107
8:05 AM	0	0	41	9	0	8	60	0	0	17	0	7	0	0	0	0	142	
8:10 AM	0	0	51	9	0	10	77	0	0	16	0	11	0	0	0	0	174	
8:15 AM	0	0	71	17	0	4	58	0	0	10	0	10	0	0	0	0	170	
8:20 AM	0	0	52	8	0	10	57	0	0	26	0	14	0	0	0	0	167	
8:25 AM	0	0	59	7	0	7	68	0	0	12	0	10	0	0	0	0	163	
8:30 AM	0	0	57	5	0	7	52	0	0	19	0	14	0	0	0	0	154	
8:35 AM	0	0	58	5	0	12	101	0	0	25	0	12	0	0	0	0	213	
8:40 AM	0	0	68	10	0	9	69	0	0	19	0	14	0	0	0	0	189	
8:45 AM	0	0	77	8	0	10	55	0	0	18	0	12	0	0	0	0	180	
8:50 AM	0	0	76	9	0	11	65	0	0	18	0	9	0	0	0	0	188	
8:55 AM	0	0	78	14	0	16	62	0	0	9	0	9	0	0	0	0	188	
Count Total	0	0	1,462	239	0	193	1,705	0	0	486	0	207	0	0	0	0	4,292	
Peak Hour	0	0	729	132	0	88	899	0	0	261	0	94	0	0	0	0	2,203	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	12	0	4	0	16	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	7	0	6	0	13	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	3	2	1	0	6	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	11	2	1	0	14	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	6	0	1	0	7	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	9	0	1	0	10	7:25 AM	0	0	1	0	1	7:25 AM	0	0	0	0	0
7:30 AM	10	2	3	0	15	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	3	1	2	0	6	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	6	0	5	0	11	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	5	1	5	0	11	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	11	1	5	0	17	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	10	4	6	0	20	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	2	1	5	0	8	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	4	0	5	0	9	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	7	4	4	0	15	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	16	1	3	0	20	8:15 AM	0	0	0	0	0	8:15 AM	0	0	1	1	2
8:20 AM	3	3	2	0	8	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	8	2	7	0	17	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	6	1	9	0	16	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	7	2	6	0	15	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	7	1	7	0	15	8:40 AM	0	0	0	0	0	8:40 AM	0	1	0	0	1
8:45 AM	12	2	4	0	18	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	11	1	9	0	21	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	5	1	5	0	11	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	181	32	106	0	319	Count Total	0	0	1	0	1	Count Total	0	1	1	1	3
Peak Hour	84	16	43	0	143	Peak Hour	0	0	1	0	1	Peak Hour	0	0	0	0	0



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Location: 2 SE 362ND DR & INDUSTRIAL WAY EAST

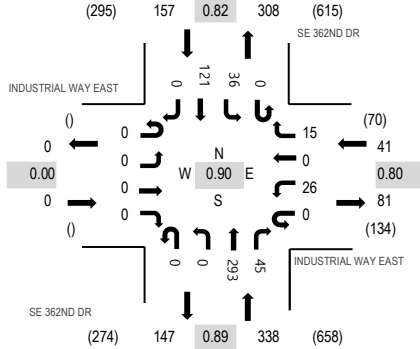
Date: Thursday, August 11, 2022

Peak Hour: 07:20 AM - 08:20 AM

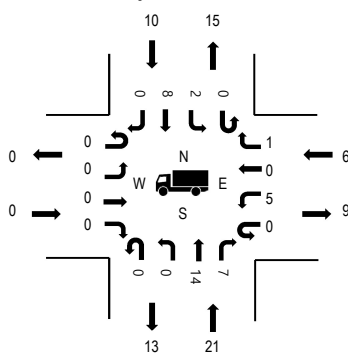
Peak 15-Minutes: 07:20 AM - 07:35 AM

Peak Hour

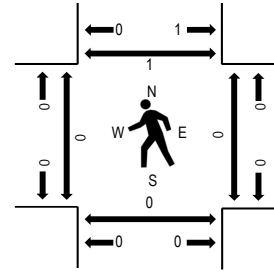
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	14.6%	0.80
NB	6.2%	0.89
SB	6.4%	0.82
All	6.9%	0.90

Traffic Counts - Motorized Vehicles

Interval Start Time	INDUSTRIAL WAY EAST Eastbound				INDUSTRIAL WAY EAST Westbound				SE 362ND DR Northbound				SE 362ND DR Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	0	0	0	0	0	0	0	0	21	3	0	3	4	0	31	520
7:05 AM	0	0	0	0	0	1	0	0	0	0	25	1	0	2	8	0	37	528
7:10 AM	0	0	0	0	0	0	0	0	0	0	29	5	0	5	6	0	45	529
7:15 AM	0	0	0	0	0	0	0	0	0	0	25	2	0	2	6	0	35	521
7:20 AM	0	0	0	0	0	4	0	1	0	0	28	4	0	1	9	0	47	536
7:25 AM	0	0	0	0	0	2	0	1	0	0	24	2	0	5	8	0	42	529
7:30 AM	0	0	0	0	0	0	0	2	0	0	36	5	0	7	10	0	60	523
7:35 AM	0	0	0	0	0	1	0	2	0	0	21	3	0	1	7	0	35	515
7:40 AM	0	0	0	0	0	2	0	2	0	0	26	1	0	2	10	0	43	525
7:45 AM	0	0	0	0	0	1	0	0	0	0	26	3	0	3	18	0	51	527
7:50 AM	0	0	0	0	0	2	0	1	0	0	25	7	0	3	7	0	45	517
7:55 AM	0	0	0	0	0	2	0	1	0	0	24	4	0	3	15	0	49	506
8:00 AM	0	0	0	0	0	5	0	0	0	0	20	7	0	4	3	0	39	503
8:05 AM	0	0	0	0	0	2	0	1	0	0	22	3	0	1	9	0	38	
8:10 AM	0	0	0	0	0	0	0	2	0	0	19	3	0	3	10	0	37	
8:15 AM	0	0	0	0	0	5	0	2	0	0	22	3	0	3	15	0	50	
8:20 AM	0	0	0	0	0	1	0	2	0	0	24	3	0	2	8	0	40	
8:25 AM	0	0	0	0	0	1	0	3	0	0	18	0	0	2	12	0	36	
8:30 AM	0	0	0	0	0	0	0	2	0	0	28	4	0	1	17	0	52	
8:35 AM	0	0	0	0	0	1	0	3	0	0	30	3	0	0	8	0	45	
8:40 AM	0	0	0	0	0	3	0	1	0	0	27	1	0	2	11	0	45	
8:45 AM	0	0	0	0	0	1	0	0	0	0	27	3	0	1	9	0	41	
8:50 AM	0	0	0	0	0	1	0	3	0	0	15	3	0	1	11	0	34	
8:55 AM	0	0	0	0	0	2	0	4	0	0	20	3	0	1	16	0	46	
Count Total	0	0	0	0	0	37	0	33	0	0	582	76	0	58	237	0	1,023	
Peak Hour	0	0	0	0	0	26	0	15	0	0	293	45	0	36	121	0	536	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	1	0	2	3	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	0	2	1	3	6	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	2	0	1	3	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	0	0	0	1	1	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	0	1	0	1	2	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	0	1	0	0	1	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	0	2	0	0	2	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	0	2	0	0	2	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	1	0	2	3	7:45 AM	0	0	0	0	0	7:45 AM	0	0	0	0	0
7:50 AM	0	3	0	1	4	7:50 AM	0	0	0	0	0	7:50 AM	0	0	0	0	0
7:55 AM	0	1	0	2	3	7:55 AM	0	0	0	0	0	7:55 AM	0	0	0	0	0
8:00 AM	0	1	3	0	4	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	0	3	1	0	4	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	0	4	0	1	5	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	1	1
8:15 AM	0	2	2	2	6	8:15 AM	0	0	0	0	0	8:15 AM	0	0	0	0	0
8:20 AM	0	2	0	1	3	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	0	1	0	3	4	8:25 AM	0	0	0	0	0	8:25 AM	0	0	0	0	0
8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	0	3	0	0	3	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	0	0	1	3	4	8:40 AM	0	0	0	0	0	8:40 AM	0	0	0	0	0
8:45 AM	0	1	0	2	3	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	1	0	2	3	8:50 AM	0	0	0	0	0	8:50 AM	0	0	0	0	0
8:55 AM	0	1	1	0	2	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	0	35	9	27	71	Count Total	0	0	0	0	0	Count Total	0	0	0	1	1
Peak Hour	0	21	6	10	37	Peak Hour	0	0	0	0	0	Peak Hour	0	0	0	1	1



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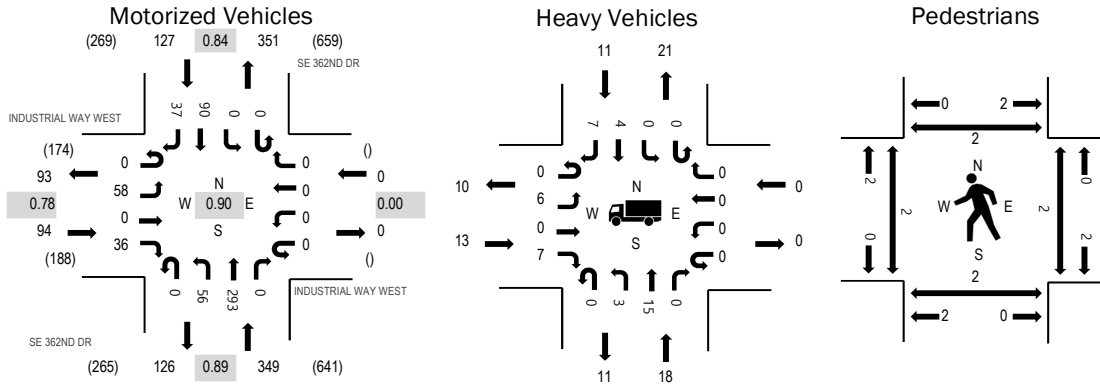
Location: 3 SE 362ND DR & INDUSTRIAL WAY WEST AM

Date: Thursday, August 11, 2022

Peak Hour: 07:10 AM - 08:10 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	13.8%	0.78
WB	0.0%	0.00
NB	5.2%	0.89
SB	8.7%	0.84
All	7.4%	0.90

Traffic Counts - Motorized Vehicles

Interval Start Time	INDUSTRIAL WAY WEST Eastbound			INDUSTRIAL WAY WEST Westbound			SE 362ND DR Northbound			SE 362ND DR Southbound			Total	Rolling Hour				
	U-Turn	Left	Thru	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn			Left	Thru	Right	
7:00 AM	0	5	0	0	0	0	0	0	0	5	21	0	0	0	4	2	37	561
7:05 AM	0	7	0	0	0	0	0	0	0	4	18	0	0	0	4	2	35	565
7:10 AM	0	3	0	4	0	0	0	0	0	2	29	0	0	0	4	3	45	570
7:15 AM	0	3	0	1	0	0	0	0	0	12	26	0	0	0	4	2	48	568
7:20 AM	0	4	0	4	0	0	0	0	0	4	25	0	0	0	5	4	46	558
7:25 AM	0	9	0	3	0	0	0	0	0	5	22	0	0	0	7	4	50	568
7:30 AM	0	6	0	3	0	0	0	0	0	6	23	0	0	0	10	0	48	553
7:35 AM	0	2	0	4	0	0	0	0	0	2	34	0	0	0	8	3	53	558
7:40 AM	0	1	0	3	0	0	0	0	0	5	23	0	0	0	4	4	40	551
7:45 AM	0	4	0	2	0	0	0	0	0	7	21	0	0	0	11	4	49	560
7:50 AM	0	5	0	6	0	0	0	0	0	2	32	0	0	0	10	4	59	564
7:55 AM	0	10	0	3	0	0	0	0	0	1	20	0	0	0	13	4	51	548
8:00 AM	0	8	0	0	0	0	0	0	0	5	16	0	0	0	10	2	41	537
8:05 AM	0	3	0	3	0	0	0	0	0	5	22	0	0	0	4	3	40	
8:10 AM	0	5	0	2	0	0	0	0	0	2	22	0	0	0	8	4	43	
8:15 AM	0	0	0	1	0	0	0	0	0	4	20	0	0	0	11	2	38	
8:20 AM	0	3	0	4	0	0	0	0	0	5	28	0	0	0	9	7	56	
8:25 AM	0	5	0	6	0	0	0	0	0	4	9	0	0	0	9	2	35	
8:30 AM	0	8	0	4	0	0	0	0	0	2	23	0	0	0	12	4	53	
8:35 AM	0	7	0	3	0	0	0	0	0	1	22	0	0	0	10	3	46	
8:40 AM	0	6	0	5	0	0	0	0	0	6	23	0	0	0	8	1	49	
8:45 AM	0	3	0	2	0	0	0	0	0	4	33	0	0	0	7	4	53	
8:50 AM	0	6	0	3	0	0	0	0	0	6	15	0	0	0	12	1	43	
8:55 AM	0	6	0	3	0	0	0	0	0	2	13	0	0	0	12	4	40	
Count Total	0	119	0	69	0	0	0	0	0	101	540	0	0	0	196	73	1,098	
Peak Hour	0	58	0	36	0	0	0	0	0	56	293	0	0	0	90	37	570	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	0	0	2	2	7:00 AM	0	0	0	0	0	7:00 AM	0	0	0	0	0
7:05 AM	1	1	0	3	5	7:05 AM	0	0	0	0	0	7:05 AM	0	0	0	0	0
7:10 AM	0	1	0	1	2	7:10 AM	0	0	0	0	0	7:10 AM	0	0	0	0	0
7:15 AM	1	2	0	0	3	7:15 AM	0	0	0	0	0	7:15 AM	0	0	0	0	0
7:20 AM	3	0	0	1	4	7:20 AM	0	0	0	0	0	7:20 AM	0	0	0	0	0
7:25 AM	1	1	0	2	4	7:25 AM	0	0	0	0	0	7:25 AM	0	0	0	0	0
7:30 AM	1	2	0	0	3	7:30 AM	0	0	0	0	0	7:30 AM	0	0	0	0	0
7:35 AM	2	2	0	0	4	7:35 AM	0	0	0	0	0	7:35 AM	0	0	0	0	0
7:40 AM	0	2	0	0	2	7:40 AM	0	0	0	0	0	7:40 AM	0	0	0	0	0
7:45 AM	0	2	0	1	3	7:45 AM	0	0	0	0	0	7:45 AM	2	2	0	0	4
7:50 AM	2	2	0	2	6	7:50 AM	0	0	0	0	0	7:50 AM	0	0	1	1	2
7:55 AM	2	1	0	1	4	7:55 AM	0	0	0	0	0	7:55 AM	0	0	1	1	2
8:00 AM	0	2	0	3	5	8:00 AM	0	0	0	0	0	8:00 AM	0	0	0	0	0
8:05 AM	1	1	0	0	2	8:05 AM	0	0	0	0	0	8:05 AM	0	0	0	0	0
8:10 AM	4	3	0	2	9	8:10 AM	0	0	0	0	0	8:10 AM	0	0	0	0	0
8:15 AM	1	4	0	3	8	8:15 AM	0	0	0	0	0	8:15 AM	0	0	1	0	1
8:20 AM	1	3	0	2	6	8:20 AM	0	0	0	0	0	8:20 AM	0	0	0	0	0
8:25 AM	1	1	0	1	3	8:25 AM	0	0	0	0	0	8:25 AM	0	0	2	2	4
8:30 AM	1	1	0	2	4	8:30 AM	0	0	0	0	0	8:30 AM	0	0	0	0	0
8:35 AM	1	0	0	0	1	8:35 AM	0	0	0	0	0	8:35 AM	0	0	0	0	0
8:40 AM	1	3	0	2	6	8:40 AM	0	0	0	0	0	8:40 AM	0	0	1	1	2
8:45 AM	1	0	0	2	3	8:45 AM	0	0	0	0	0	8:45 AM	0	0	0	0	0
8:50 AM	0	1	0	3	4	8:50 AM	0	0	0	0	0	8:50 AM	1	1	0	0	2
8:55 AM	0	2	0	1	3	8:55 AM	0	0	0	0	0	8:55 AM	0	0	0	0	0
Count Total	25	37	0	34	96	Count Total	0	0	0	0	0	Count Total	3	3	6	5	17
Peak Hour	13	18	0	11	42	Peak Hour	0	0	0	0	0	Peak Hour	2	2	2	2	8

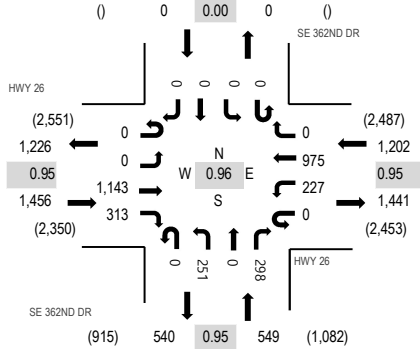


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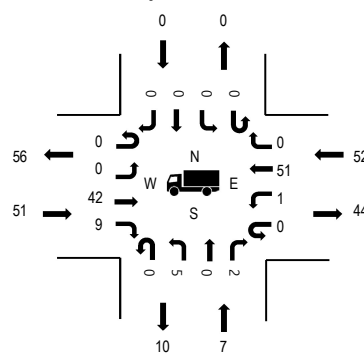
Location: 1 SE 362ND DR & HWY 26 PM
Date: Thursday, August 11, 2022
Peak Hour: 04:50 PM - 05:50 PM
Peak 15-Minutes: 04:55 PM - 05:10 PM

Peak Hour

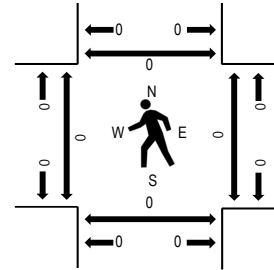
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	3.5%	0.95
WB	4.3%	0.95
NB	1.3%	0.95
SB	0.0%	0.00
All	3.4%	0.96

Traffic Counts - Motorized Vehicles

Interval Start Time	HWY 26 Eastbound				HWY 26 Westbound				SE 362ND DR Northbound			SE 362ND DR Southbound			Total	Rolling Hour		
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left			Thru	Right
4:00 PM	0	0	60	6	0	22	84	0	0	20	0	15	0	0	0	0	207	2,742
4:05 PM	0	0	40	9	0	21	75	0	0	44	0	19	0	0	0	0	208	2,828
4:10 PM	0	0	41	8	0	24	89	0	0	13	0	17	0	0	0	0	192	2,888
4:15 PM	0	0	49	6	0	16	115	0	0	22	0	25	0	0	0	0	233	2,961
4:20 PM	0	0	44	8	0	19	84	0	0	28	0	30	0	0	0	0	213	3,016
4:25 PM	0	0	76	15	0	28	94	0	0	27	0	13	0	0	0	0	253	3,079
4:30 PM	0	0	67	16	0	19	92	0	0	30	0	20	0	0	0	0	244	3,090
4:35 PM	0	0	52	6	0	24	101	0	0	30	0	20	0	0	0	0	233	3,113
4:40 PM	0	0	70	9	0	28	98	0	0	14	0	23	0	0	0	0	242	3,148
4:45 PM	0	0	53	11	0	10	80	0	0	22	0	20	0	0	0	0	196	3,158
4:50 PM	0	0	84	12	0	15	91	0	0	20	0	26	0	0	0	0	248	3,207
4:55 PM	0	0	73	22	0	29	97	0	0	22	0	30	0	0	0	0	273	3,196
5:00 PM	0	0	105	28	0	21	98	0	0	21	0	20	0	0	0	0	293	3,177
5:05 PM	0	0	94	30	0	18	83	0	0	22	0	21	0	0	0	0	268	
5:10 PM	0	0	71	29	0	17	81	0	0	33	0	34	0	0	0	0	265	
5:15 PM	0	0	104	22	0	23	101	0	0	15	0	23	0	0	0	0	288	
5:20 PM	0	0	113	37	0	13	71	0	0	18	0	24	0	0	0	0	276	
5:25 PM	0	0	99	25	0	19	75	0	0	21	0	25	0	0	0	0	264	
5:30 PM	0	0	92	33	0	14	83	0	0	23	0	22	0	0	0	0	267	
5:35 PM	0	0	109	25	0	24	74	0	0	11	0	25	0	0	0	0	268	
5:40 PM	0	0	103	26	0	12	56	0	0	25	0	30	0	0	0	0	252	
5:45 PM	0	0	96	24	0	22	65	0	0	20	0	18	0	0	0	0	245	
5:50 PM	0	0	102	20	0	18	60	0	0	18	0	19	0	0	0	0	237	
5:55 PM	1	0	107	18	0	14	70	0	0	14	0	30	0	0	0	0	254	
Count Total	1	0	1,904	445	0	470	2,017	0	0	533	0	549	0	0	0	0	5,919	
Peak Hour	0	0	1,143	313	0	227	975	0	0	251	0	298	0	0	0	0	3,207	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	11	2	8	0	21	4:00 PM	0	0	0	0	0	4:00 PM	0	0	0	0	0
4:05 PM	7	2	6	0	15	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	4	0	4	0	8	4:10 PM	0	0	0	0	0	4:10 PM	0	0	1	0	1
4:15 PM	10	1	6	0	17	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	6	0	5	0	11	4:20 PM	0	0	0	0	0	4:20 PM	0	0	1	0	1
4:25 PM	9	1	3	0	13	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	10	0	2	0	12	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	3	2	4	0	9	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	8	0	4	0	12	4:40 PM	0	0	1	0	1	4:40 PM	0	0	0	0	0
4:45 PM	7	0	5	0	12	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	10	0	3	0	13	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	7	0	5	0	12	4:55 PM	0	0	1	0	1	4:55 PM	0	0	0	0	0
5:00 PM	5	1	5	0	11	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	3	1	3	0	7	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	4	0	5	0	9	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	5	0	9	0	14	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	2	1	4	0	7	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	4	1	4	0	9	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	4	1	9	0	14	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	2	0	1	0	3	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	2	1	0	0	3	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	3	1	4	0	8	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	7	1	3	0	11	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	1	0	1	0	2	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	134	16	103	0	253	Count Total	0	0	2	0	2	Count Total	0	0	2	0	2
Peak Hour	51	7	52	0	110	Peak Hour	0	0	1	0	1	Peak Hour	0	0	0	0	0



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Location: 2 SE 362ND DR & INDUSTRIAL WAY EAST

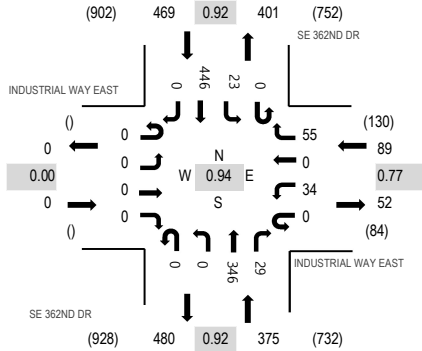
Date: Thursday, August 11, 2022

Peak Hour: 04:00 PM - 05:00 PM

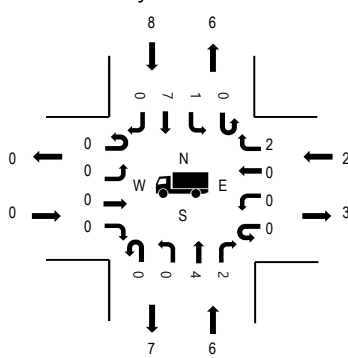
Peak 15-Minutes: 04:30 PM - 04:45 PM

Peak Hour

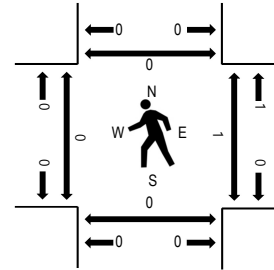
Motorized Vehicles



Heavy Vehicles



Pedestrians



Note: Total study counts contained in parentheses.

	HV%	PHF
EB	0.0%	0.00
WB	2.2%	0.77
NB	1.6%	0.92
SB	1.7%	0.92
All	1.7%	0.94

Traffic Counts - Motorized Vehicles

Interval Start Time	INDUSTRIAL WAY EAST Eastbound				INDUSTRIAL WAY EAST Westbound				SE 362ND DR Northbound				SE 362ND DR Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	0	0	0	0	3	0	7	0	0	42	2	0	1	38	0	93	933
4:05 PM	0	0	0	0	0	2	0	5	0	0	30	2	0	5	30	0	74	929
4:10 PM	0	0	0	0	0	3	0	5	0	0	21	1	0	1	38	0	69	933
4:15 PM	0	0	0	0	0	5	0	5	0	0	35	3	0	2	43	0	93	929
4:20 PM	0	0	0	0	0	0	0	1	0	0	26	4	0	0	41	0	72	898
4:25 PM	0	0	0	0	0	2	0	4	0	0	19	2	0	1	26	0	54	896
4:30 PM	0	0	0	0	0	5	0	11	0	0	34	1	0	2	44	0	97	902
4:35 PM	0	0	0	0	0	2	0	5	0	0	21	6	0	2	45	0	81	876
4:40 PM	0	0	0	0	0	2	0	4	0	0	31	2	0	1	30	0	70	862
4:45 PM	0	0	0	0	0	4	0	5	0	0	34	3	0	5	29	0	80	863
4:50 PM	0	0	0	0	0	5	0	2	0	0	25	0	0	1	36	0	69	854
4:55 PM	0	0	0	0	0	1	0	1	0	0	28	3	0	2	46	0	81	847
5:00 PM	0	0	0	0	0	1	0	4	0	0	44	2	0	0	38	0	89	831
5:05 PM	0	0	0	0	0	1	0	3	0	0	27	3	0	0	44	0	78	
5:10 PM	0	0	0	0	0	1	0	3	0	0	22	1	0	2	36	0	65	
5:15 PM	0	0	0	0	0	1	0	2	0	0	28	2	0	1	28	0	62	
5:20 PM	0	0	0	0	0	2	0	1	0	0	25	1	0	1	40	0	70	
5:25 PM	0	0	0	0	0	2	0	1	0	0	17	1	0	0	39	0	60	
5:30 PM	0	0	0	0	0	2	0	2	0	0	33	1	0	0	33	0	71	
5:35 PM	0	0	0	0	0	5	0	0	0	0	29	2	0	1	30	0	67	
5:40 PM	0	0	0	0	0	3	0	1	0	0	24	2	0	1	40	0	71	
5:45 PM	0	0	0	0	0	3	0	1	0	0	27	2	0	1	37	0	71	
5:50 PM	0	0	0	0	0	0	0	1	0	0	30	3	0	0	28	0	62	
5:55 PM	0	0	0	0	0	1	0	0	0	0	26	5	0	0	33	0	65	
Count Total	0	0	0	0	0	56	0	74	0	0	678	54	0	30	872	0	1,764	
Peak Hour	0	0	0	0	0	34	0	55	0	0	346	29	0	23	446	0	933	

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	3	0	2	5	4:00 PM	0	0	0	0	0	4:00 PM	0	0	1	0	1
4:05 PM	0	1	0	0	1	4:05 PM	0	0	0	0	0	4:05 PM	0	0	0	0	0
4:10 PM	0	1	0	0	1	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	1	0	1	2	4:15 PM	0	0	0	0	0	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	1	1	4:20 PM	0	0	0	0	0	4:20 PM	0	0	0	0	0
4:25 PM	0	0	1	0	1	4:25 PM	0	0	0	0	0	4:25 PM	0	0	0	0	0
4:30 PM	0	0	1	1	2	4:30 PM	0	0	0	0	0	4:30 PM	0	0	0	0	0
4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	2	2	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	0	0	1	1	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0
5:00 PM	0	2	0	0	2	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	0	0	1	1	5:05 PM	0	0	0	0	0	5:05 PM	0	0	0	0	0
5:10 PM	0	0	0	2	2	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0	5:15 PM	0	0	0	0	0
5:20 PM	0	0	1	0	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	1	0	0	1	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	0	0	1	1	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0	5:35 PM	0	0	0	0	0
5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	2	0	0	2	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	0	0	1	1	5:50 PM	0	0	0	0	0	5:50 PM	0	0	0	0	0
5:55 PM	0	1	0	1	2	5:55 PM	0	0	0	0	0	5:55 PM	0	0	0	0	0
Count Total	0	12	3	14	29	Count Total	0	0	0	0	0	Count Total	0	0	1	0	1
Peak Hour	0	6	2	8	16	Peak Hour	0	0	0	0	0	Peak Hour	0	0	1	0	1

Traffic Counts - Heavy Vehicles, Bicycles on Road, and Pedestrians/Bicycles on Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Bicycles on Roadway					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	0	3	0	2	5	4:00 PM	0	0	0	0	0	4:00 PM	0	0	2	0	2
4:05 PM	1	0	0	3	4	4:05 PM	0	0	0	0	0	4:05 PM	0	0	2	1	3
4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0	4:10 PM	0	0	0	0	0
4:15 PM	0	2	0	0	2	4:15 PM	0	1	0	0	1	4:15 PM	0	0	0	0	0
4:20 PM	0	0	0	2	2	4:20 PM	0	0	0	0	0	4:20 PM	0	0	5	0	5
4:25 PM	0	0	0	3	3	4:25 PM	0	0	0	0	0	4:25 PM	0	0	2	0	2
4:30 PM	0	0	0	1	1	4:30 PM	1	0	0	0	1	4:30 PM	0	0	0	0	0
4:35 PM	1	1	0	1	3	4:35 PM	0	0	0	0	0	4:35 PM	0	0	0	0	0
4:40 PM	1	0	0	1	2	4:40 PM	0	0	0	0	0	4:40 PM	0	0	0	0	0
4:45 PM	0	0	0	1	1	4:45 PM	0	0	0	0	0	4:45 PM	0	0	0	0	0
4:50 PM	0	1	0	0	1	4:50 PM	0	0	0	0	0	4:50 PM	0	0	0	0	0
4:55 PM	0	0	0	0	0	4:55 PM	0	0	0	0	0	4:55 PM	0	0	1	0	1
5:00 PM	0	1	0	1	2	5:00 PM	0	0	0	0	0	5:00 PM	0	0	0	0	0
5:05 PM	0	1	0	1	2	5:05 PM	0	0	0	0	0	5:05 PM	0	0	1	0	1
5:10 PM	0	0	0	2	2	5:10 PM	0	0	0	0	0	5:10 PM	0	0	0	0	0
5:15 PM	0	1	0	0	1	5:15 PM	0	0	0	0	0	5:15 PM	0	0	1	0	1
5:20 PM	1	0	0	0	1	5:20 PM	0	0	0	0	0	5:20 PM	0	0	0	0	0
5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0	5:25 PM	0	0	0	0	0
5:30 PM	0	2	0	2	4	5:30 PM	0	0	0	0	0	5:30 PM	0	0	0	0	0
5:35 PM	1	0	0	0	1	5:35 PM	1	0	0	0	1	5:35 PM	0	0	0	0	0
5:40 PM	0	1	0	2	3	5:40 PM	0	0	0	0	0	5:40 PM	0	0	0	0	0
5:45 PM	0	1	0	0	1	5:45 PM	0	0	0	0	0	5:45 PM	0	0	0	0	0
5:50 PM	0	1	0	1	2	5:50 PM	0	0	0	0	0	5:50 PM	0	0	2	0	2
5:55 PM	1	0	0	2	3	5:55 PM	0	0	0	0	0	5:55 PM	0	0	2	0	2
Count Total	6	15	0	25	46	Count Total	2	1	0	0	3	Count Total	0	0	18	1	19
Peak Hour	2	6	0	13	21	Peak Hour	1	1	0	0	2	Peak Hour	0	0	9	0	9

ODOT ADT Volumes at Permanent Count Station 03-006 (Rhododendron)

Year	August	July	Adjust	High/Low
2021	12988	14387	1.107715	High
2020	13411	14166	1.056297	
2019	13497	13605	1.008002	Low
2018	13089	13868	1.059516	
2017	13623	13874	1.018425	
Sum of 3	40123	41908	1.044488	
Average of 3	13374.33	13969.33		

Calculated Adjustment 595 vehicles per day

TREND	SEASONAL TREND TABLE (Updated: 7/20/2021)											Seasonal Trend Peak Period Factor					
	1-Jan	15-Jan	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec	Seasonal Trend Peak Period Factor
INTERSTATE URBANIZED	1.0672	1.0684	0.9615	0.9463	0.9517	0.9571	0.9551	0.9531	0.9674	0.9816	0.9850	0.9884	1.0045	1.0206	1.0322	1.0438	0.9463
INTERSTATE NONURBANIZED	1.2426	1.2863	0.9005	0.8506	0.8322	0.8139	0.8221	0.8302	0.8719	0.9135	0.9441	0.9747	1.0178	1.0608	1.1123	1.1638	0.8139
COMPUTER	1.0850	1.0875	0.9603	0.9355	0.9470	0.9585	0.9509	0.9433	0.9528	0.9623	0.9614	0.9604	0.9938	1.0272	1.0474	1.0676	0.9355
COASTAL DESTINATION	1.1885	1.1712	0.9347	0.8972	0.8612	0.8252	0.8205	0.8159	0.8636	0.9214	0.9669	1.0164	1.0660	1.1156	1.1580	1.2005	0.8159
COASTAL DESTINATION ROUTE	1.3445	1.3248	0.8941	0.8409	0.7820	0.7231	0.7205	0.7205	0.8016	0.8827	0.9669	1.0511	1.1133	1.1754	1.2480	1.3206	0.7205
AGRICULTURE	1.4583	1.4827	0.8579	0.8146	0.8058	0.7970	0.7922	0.7873	0.7772	0.7670	0.8288	0.8905	0.9947	1.0989	1.2462	1.3934	0.7670
RECREATIONAL SUMMER	1.5848	1.6474	0.8256	0.7484	0.7018	0.6552	0.6706	0.6684	0.7393	0.7922	0.8686	0.9674	1.1242	1.2610	1.3965	1.5320	0.6552
RECREATIONAL SUMMER WINTER	0.8736	0.8525	0.9760	0.8821	0.8005	0.7190	0.7305	0.7420	0.8897	1.0374	1.2010	1.3645	1.5212	1.6778	1.3812	1.0847	0.7190
RECREATIONAL WINTER	0.6997	0.6389	1.2832	1.1625	0.9985	0.8344	0.8600	0.8857	1.0560	1.2262	1.4100	1.5937	1.8758	2.1580	1.5328	0.9076	0.6389
SUMMER	1.2151	1.2357	0.8976	0.8615	0.8457	0.8299	0.8354	0.8410	0.8743	0.9077	0.9357	0.9638	1.0273	1.0908	1.1322	1.1737	0.8299
SUMMER < 2500	1.3035	1.3186	0.8720	0.8387	0.8237	0.8086	0.8229	0.8373	0.8616	0.8859	0.9233	0.9607	1.0428	1.1249	1.2016	1.2783	0.8086

* Seasonal Trend Table factors are based on previous year ATR data. The table is updated yearly.

* Grey shading indicates months were seasonal factor is greater than or less than 30%

* February 2019 snow event causing lower seasonal factors

Seasonal Trend Table: The 2020 table is based on 2019 values due to the irregularity caused by the Covid epidemic shutdown during the 2020 count year.

June 15 = 0.9355

Aug 1 = 0.9509

Aug 15 = 0.9433

Aug 11 = 0.956329

-0.00543 (Change per day)

= August 11 value / June 15 peak value

Adjustmen 1.022265

HCM Signalized Intersection Capacity Analysis
 1: 362nd Avenue & US Hwy 26

11/08/2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	758	132	88	935	261	94
Future Volume (vph)	758	132	88	935	261	94
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3023	1352	1599	3197	3072	1417
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3023	1352	1599	3197	3072	1417
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	815	142	95	1005	281	101
RTOR Reduction (vph)	0	54	0	0	0	71
Lane Group Flow (vph)	815	88	95	1005	281	30
Heavy Vehicles (%)	10%	10%	4%	4%	5%	5%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	4	4 1
Permitted Phases		2				
Actuated Green, G (s)	60.5	60.5	11.2	75.7	14.4	30.1
Effective Green, g (s)	61.9	61.9	11.2	77.1	14.9	30.1
Actuated g/C Ratio	0.62	0.62	0.11	0.77	0.15	0.30
Clearance Time (s)	5.4	5.4	4.0	5.4	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1871	836	179	2464	457	426
v/s Ratio Prot	c0.27		c0.06	0.31	c0.09	0.02
v/s Ratio Perm		0.07				
v/c Ratio	0.44	0.11	0.53	0.41	0.61	0.07
Uniform Delay, d1	9.9	7.8	41.9	3.8	39.9	25.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.3	3.0	0.5	2.5	0.1
Delay (s)	10.7	8.0	44.9	4.3	42.3	25.0
Level of Service	B	A	D	A	D	C
Approach Delay (s)	10.3			7.8	37.7	
Approach LOS	B			A	D	
Intersection Summary						
HCM 2000 Control Delay			13.5		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.48			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	12.5
Intersection Capacity Utilization			46.1%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary
 1: 362nd Avenue & US Hwy 26

11/08/2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	↑
Traffic Volume (veh/h)	758	132	88	935	261	94
Future Volume (veh/h)	758	132	88	935	261	94
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1614	1614	1695	1695	1682	1682
Adj Flow Rate, veh/h	815	142	95	1005	281	101
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	10	10	4	4	5	5
Cap, veh/h	2097	935	119	2568	381	272
Arrive On Green	0.68	0.68	0.07	0.80	0.12	0.12
Sat Flow, veh/h	3146	1367	1615	3306	3107	1425
Grp Volume(v), veh/h	815	142	95	1005	281	101
Grp Sat Flow(s),veh/h/ln	1533	1367	1615	1611	1554	1425
Q Serve(g_s), s	11.4	3.7	5.8	9.2	8.7	6.2
Cycle Q Clear(g_c), s	11.4	3.7	5.8	9.2	8.7	6.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2097	935	119	2568	381	272
V/C Ratio(X)	0.39	0.15	0.80	0.39	0.74	0.37
Avail Cap(c_a), veh/h	2097	935	274	2568	715	425
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.8	5.6	45.6	3.0	42.3	35.2
Incr Delay (d2), s/veh	0.5	0.3	11.7	0.4	2.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.9	2.6	1.7	3.4	5.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.4	5.9	57.3	3.4	45.1	36.0
LnGrp LOS	A	A	E	A	D	D
Approach Vol, veh/h	957			1100	382	
Approach Delay, s/veh	7.1			8.1	42.7	
Approach LOS	A			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.3	72.4		16.3		83.7
Change Period (Y+Rc), s	4.0	* 5.4		4.5		* 5.4
Max Green Setting (Gmax), s	17.0	* 47		22.5		* 68
Max Q Clear Time (g_c+I1), s	7.8	13.4		10.7		11.2
Green Ext Time (p_c), s	0.1	6.5		1.0		8.2

Intersection Summary	
HCM 6th Ctrl Delay	13.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
2: 362nd Avenue & Industrial Way

11/08/2022

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y		Y	Y
Traffic Vol, veh/h	26	15	293	45	36	121
Future Vol, veh/h	26	15	293	45	36	121
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	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	15	15	6	6	6	6
Mvmt Flow	29	17	326	50	40	134

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	565	351	0	0	376
Stage 1	351	-	-	-	-
Stage 2	214	-	-	-	-
Critical Hdwy	6.55	6.35	-	-	4.16
Critical Hdwy Stg 1	5.55	-	-	-	-
Critical Hdwy Stg 2	5.55	-	-	-	-
Follow-up Hdwy	3.635	3.435	-	-	2.254
Pot Cap-1 Maneuver	465	664	-	-	1161
Stage 1	685	-	-	-	-
Stage 2	792	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	449	664	-	-	1161
Mov Cap-2 Maneuver	449	-	-	-	-
Stage 1	685	-	-	-	-
Stage 2	765	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	1.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	509	1161
HCM Lane V/C Ratio	-	-	0.09	0.034
HCM Control Delay (s)	-	-	12.8	8.2
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1

HCM 6th AWSC
3: 362nd Avenue & Industrial Way

11/08/2022

Intersection	
Intersection Delay, s/veh	10.5
Intersection LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	58	36	56	293	90	37
Future Vol, veh/h	58	36	56	293	90	37
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	14	14	5	5	9	9
Mvmt Flow	64	40	62	326	100	41
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.2	11.5	8.6
HCM LOS	A	B	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	16%	62%	0%
Vol Thru, %	84%	0%	71%
Vol Right, %	0%	38%	29%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	349	94	127
LT Vol	56	58	0
Through Vol	293	0	90
RT Vol	0	36	37
Lane Flow Rate	388	104	141
Geometry Grp	1	1	1
Degree of Util (X)	0.48	0.151	0.179
Departure Headway (Hd)	4.452	5.219	4.575
Convergence, Y/N	Yes	Yes	Yes
Cap	810	686	783
Service Time	2.476	3.261	2.606
HCM Lane V/C Ratio	0.479	0.152	0.18
HCM Control Delay	11.5	9.2	8.6
HCM Lane LOS	B	A	A
HCM 95th-tile Q	2.6	0.5	0.6

HCM 6th TWSC
4: 362nd Avenue & Site Access

11/08/2022

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T			T
Traffic Vol, veh/h	0	1	348	0	3	123
Future Vol, veh/h	0	1	348	0	3	123
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	20	20	5	5	9	9
Mvmt Flow	0	1	387	0	3	137
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	530	387	0	0	387	
Stage 1	387	-	-	-	-	
Stage 2	143	-	-	-	-	
Critical Hdwy	6.6	6.4	-	-	4.19	
Critical Hdwy Stg 1	5.6	-	-	-	-	
Critical Hdwy Stg 2	5.6	-	-	-	-	
Follow-up Hdwy	3.68	3.48	-	-	2.281	
Pot Cap-1 Maneuver	480	623	-	-	1134	
Stage 1	649	-	-	-	-	
Stage 2	842	-	-	-	-	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	479	623	-	-	1134	
Mov Cap-2 Maneuver	479	-	-	-	-	
Stage 1	649	-	-	-	-	
Stage 2	839	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	10.8	0		0.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	623	1134	-	
HCM Lane V/C Ratio	-	-	0.002	0.003	-	
HCM Control Delay (s)	-	-	10.8	8.2	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

HCM Signalized Intersection Capacity Analysis
 1: 362nd Avenue & US Hwy 26

11/08/2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	1188	313	227	1014	251	298
Future Volume (vph)	1188	313	227	1014	251	298
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3197	1430	1599	3197	3162	1458
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3197	1430	1599	3197	3162	1458
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1238	326	236	1056	261	310
RTOR Reduction (vph)	0	134	0	0	0	28
Lane Group Flow (vph)	1238	192	236	1056	261	282
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	4	4 1
Permitted Phases		2				
Actuated Green, G (s)	73.5	73.5	24.1	101.6	18.5	47.1
Effective Green, g (s)	74.9	74.9	24.1	103.0	19.0	47.1
Actuated g/C Ratio	0.58	0.58	0.19	0.79	0.15	0.36
Clearance Time (s)	5.4	5.4	4.0	5.4	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1841	823	296	2533	462	528
v/s Ratio Prot	c0.39		c0.15	0.33	0.08	c0.19
v/s Ratio Perm		0.13				
v/c Ratio	0.67	0.23	0.80	0.42	0.56	0.53
Uniform Delay, d1	19.1	13.5	50.6	4.2	51.7	32.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.7	13.8	0.5	1.6	1.0
Delay (s)	21.0	14.1	64.4	4.7	53.2	33.8
Level of Service	C	B	E	A	D	C
Approach Delay (s)	19.6			15.6	42.7	
Approach LOS	B			B	D	
Intersection Summary						
HCM 2000 Control Delay			21.9		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.68			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	12.5
Intersection Capacity Utilization			67.1%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary
 1: 362nd Avenue & US Hwy 26

11/08/2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	↑
Traffic Volume (veh/h)	1188	313	227	1014	251	298
Future Volume (veh/h)	1188	313	227	1014	251	298
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1695	1695	1695	1695	1723	1723
Adj Flow Rate, veh/h	1238	326	236	1056	261	310
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	2	2
Cap, veh/h	1918	855	262	2540	477	450
Arrive On Green	0.60	0.60	0.16	0.79	0.15	0.15
Sat Flow, veh/h	3306	1437	1615	3306	3183	1460
Grp Volume(v), veh/h	1238	326	236	1056	261	310
Grp Sat Flow(s),veh/h/ln	1611	1437	1615	1611	1591	1460
Q Serve(g_s), s	32.8	15.4	18.6	13.4	9.9	19.0
Cycle Q Clear(g_c), s	32.8	15.4	18.6	13.4	9.9	19.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1918	855	262	2540	477	450
V/C Ratio(X)	0.65	0.38	0.90	0.42	0.55	0.69
Avail Cap(c_a), veh/h	1918	855	385	2540	477	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	13.8	53.4	4.3	51.2	39.5
Incr Delay (d2), s/veh	1.7	1.3	17.6	0.5	1.3	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.6	5.0	8.7	3.4	4.0	19.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.0	15.1	71.0	4.8	52.5	43.8
LnGrp LOS	B	B	E	A	D	D
Approach Vol, veh/h	1564			1292	571	
Approach Delay, s/veh	18.2			16.9	47.8	
Approach LOS	B			B	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	25.1	81.4		23.5		106.5
Change Period (Y+Rc), s	4.0	* 5.4		4.5		* 5.4
Max Green Setting (Gmax), s	31.0	* 66		19.0		* 1E2
Max Q Clear Time (g_c+I1), s	20.6	34.8		21.0		15.4
Green Ext Time (p_c), s	0.5	11.9		0.0		8.9
Intersection Summary						
HCM 6th Ctrl Delay			22.6			
HCM 6th LOS			C			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

HCM 6th TWSC
2: 362nd Avenue & Industrial Way

11/08/2022

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y		Y	Y
Traffic Vol, veh/h	34	55	346	29	23	446
Future Vol, veh/h	34	55	346	29	23	446
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	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	59	368	31	24	474
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	906	384	0	0	399	
Stage 1	384	-	-	-	-	
Stage 2	522	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	
Critical Hdwy Stg 1	5.42	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	-	2.218	
Pot Cap-1 Maneuver	307	664	-	-	1160	
Stage 1	688	-	-	-	-	
Stage 2	595	-	-	-	-	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	301	664	-	-	1160	
Mov Cap-2 Maneuver	301	-	-	-	-	
Stage 1	688	-	-	-	-	
Stage 2	583	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	15	0		0.4		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	455	1160	-	
HCM Lane V/C Ratio	-	-	0.208	0.021	-	
HCM Control Delay (s)	-	-	15	8.2	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-	

HCM 6th AWSC
3: 362nd Avenue & Industrial Way

11/08/2022

Intersection	
Intersection Delay, s/veh	18.6
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	RT			LT	RT	
Traffic Vol, veh/h	92	129	54	290	455	33
Future Vol, veh/h	92	129	54	290	455	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	100	140	59	315	495	36
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	12.8	15.5	23.5
HCM LOS	B	C	C

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	16%	42%	0%
Vol Thru, %	84%	0%	93%
Vol Right, %	0%	58%	7%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	344	221	488
LT Vol	54	92	0
Through Vol	290	0	455
RT Vol	0	129	33
Lane Flow Rate	374	240	530
Geometry Grp	1	1	1
Degree of Util (X)	0.568	0.395	0.769
Departure Headway (Hd)	5.467	5.919	5.216
Convergence, Y/N	Yes	Yes	Yes
Cap	658	605	695
Service Time	3.515	3.975	3.258
HCM Lane V/C Ratio	0.568	0.397	0.763
HCM Control Delay	15.5	12.8	23.5
HCM Lane LOS	C	B	C
HCM 95th-tile Q	3.6	1.9	7.3

HCM 6th TWSC
4: 362nd Avenue & Site Access

11/08/2022

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	1	3	341	0	2	582
Future Vol, veh/h	1	3	341	0	2	582
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	20	20	2	20	20	3
Mvmt Flow	1	3	371	0	2	633
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1008	371	0	0	371	
Stage 1	371	-	-	-	-	
Stage 2	637	-	-	-	-	
Critical Hdwy	6.6	6.4	-	-	4.3	
Critical Hdwy Stg 1	5.6	-	-	-	-	
Critical Hdwy Stg 2	5.6	-	-	-	-	
Follow-up Hdwy	3.68	3.48	-	-	2.38	
Pot Cap-1 Maneuver	247	637	-	-	1095	
Stage 1	660	-	-	-	-	
Stage 2	494	-	-	-	-	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	246	637	-	-	1095	
Mov Cap-2 Maneuver	246	-	-	-	-	
Stage 1	660	-	-	-	-	
Stage 2	493	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	13	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	456	1095	-	
HCM Lane V/C Ratio	-	-	0.01	0.002	-	
HCM Control Delay (s)	-	-	13	8.3	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

Trip Generation Calculation Worksheet



Land Use Description: Specialty Trade Contractor
 ITE Land Use Code: 180
 Independent Variable: Gross Floor Area
 Quantity: 30 Employees

Summary of ITE Trip Generation Data

AM Peak Hour of Adjacent Street Traffic

Trip Rate: 0.61 trips per ksf
 Directional Distribution: 74% Entering 26% Exiting

PM Peak Hour of Adjacent Street Traffic

Trip Rate: 0.72 trips per ksf
 Directional Distribution: 32% Entering 68% Exiting

Total Weekday Traffic

Trip Rate: 3.63 trips per ksf
 Directional Distribution: 50% Entering 50% Exiting

Site Trip Generation Calculations

30 Employee Specialty Trade Contractor

	Entering	Exiting	Total
AM Peak Hour	13	5	18
PM Peak Hour	7	15	22
Weekday	54	54	108

Data Source: *Trip Generation Manual, 11th Edition*, Institute of Transportation Engineers, 2021

** Future Volume calculated based on 2017-2019 counts due to covid.

Site id	HWY	MP	DIR	HS	Description	2017	2018	2019	2020	2040**	RSQ
26003	026	14.36	1		Southeast of Powell Valley Rd [0.18 mile] {Gresham ATR, Sta. 26-003}		33400			43300	MODEL
1774	026	14.80	1		[0.05 mile]		28500			36500	MODEL
1775	026	18.30	1		Northwest of S.E. Haley Road [0.05 mile]		25600			37600	MODEL
1776	026	19.24	1		Northwest of Clackamas Boring Highway (OR212) [0.30 mile]		25500			37400	MODEL
22590	026	20.60	1		Northwest of S.E. Kelso Road [0.50 mile]		30300			44000	MODEL
1777	026	21.40	1		Southeast of Southeast Kelso Road [0.30 mile]		30300			43000	MODEL
1778	026	22.72	1		Northwest of S.E. 362nd Drive, west city limits Sandy [0.02 mile]		33700			47900	MODEL
1779	026	23.85	1		West of Bluff Road [0.02 mile]		33300			47700	MODEL
1780	026	23.89	1		East of Bluff Road [0.02 mile]		15700			22700	MODEL
1781	026	24.02	1		West of Beers Avenue [0.02 mile]		16200			23500	MODEL
1782	026	24.35	1		West of Meining Ave (OR211) [0.05 mile]		16000			23700	MODEL
1783	026	24.42	1		East of Meining Ave (OR211) [0.02 mile]		12400			17900	MODEL
1784	026	24.59	1		West of Ten Eyck Road [0.02 mile]		12500			18100	MODEL
1785	026	23.89	2		East of Bluff Road [0.02 mile]		16600			23600	MODEL
1786	026	24.04	2		West of Beers Avenue [0.02 mile]		18300			26000	MODEL
1787	026	24.36	2		West of Meining Ave (OR211) [0.02 mile]		15900			23000	MODEL
1788	026	24.40	2		East of Meining Ave (OR211) [0.02 mile]		13700			19400	MODEL
1789	026	24.61	2		West of Ten Eyck Road [0.02 mile]		12600			17900	MODEL
1790	026	25.10	1		West of Langensand Road [0.02 mile]		20700			29600	MODEL
1791	026	25.66	1		East of Vista Loop Drive [0.10 mile]		23500			33300	MODEL
1792	026	26.76	1		West of S.E. Firwood Road [0.10 mile]		19000			26900	MODEL
1793	026	26.93	1		East of S.E. Firwood Road [0.07 mile]		17800			25600	MODEL
1794	026	29.66	1		West of Wagoneer Loop Drive (East Jct.) [0.23 mile]		16500			23700	MODEL
1795	026	34.87	1		West of E. Sleepy Hollow Drive [0.10 mile]		15000			21800	MODEL

HCM Signalized Intersection Capacity Analysis
 1: 362nd Avenue & US Hwy 26

11/08/2022

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	789	138	94	990	270	97
Future Volume (vph)	789	138	94	990	270	97
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3023	1352	1599	3197	3072	1417
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3023	1352	1599	3197	3072	1417
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	848	148	101	1065	290	104
RTOR Reduction (vph)	0	57	0	0	0	72
Lane Group Flow (vph)	848	91	101	1065	290	32
Heavy Vehicles (%)	10%	10%	4%	4%	5%	5%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	4	4 1
Permitted Phases		2				
Actuated Green, G (s)	59.8	59.8	11.6	75.4	14.7	30.8
Effective Green, g (s)	61.2	61.2	11.6	76.8	15.2	30.8
Actuated g/C Ratio	0.61	0.61	0.12	0.77	0.15	0.31
Clearance Time (s)	5.4	5.4	4.0	5.4	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1850	827	185	2455	466	436
v/s Ratio Prot	c0.28		c0.06	0.33	c0.09	0.02
v/s Ratio Perm		0.07				
v/c Ratio	0.46	0.11	0.55	0.43	0.62	0.07
Uniform Delay, d1	10.5	8.1	41.7	4.0	39.7	24.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.3	3.3	0.6	2.6	0.1
Delay (s)	11.3	8.3	45.0	4.6	42.3	24.6
Level of Service	B	A	D	A	D	C
Approach Delay (s)	10.8			8.1	37.6	
Approach LOS	B			A	D	
Intersection Summary						
HCM 2000 Control Delay			13.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	12.5
Intersection Capacity Utilization			47.7%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary
 1: 362nd Avenue & US Hwy 26

11/08/2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	↑
Traffic Volume (veh/h)	789	138	94	990	270	97
Future Volume (veh/h)	789	138	94	990	270	97
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1614	1614	1695	1695	1682	1682
Adj Flow Rate, veh/h	848	148	101	1065	290	104
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	10	10	4	4	5	5
Cap, veh/h	2075	926	126	2560	389	282
Arrive On Green	0.68	0.68	0.08	0.79	0.13	0.12
Sat Flow, veh/h	3146	1367	1615	3306	3107	1425
Grp Volume(v), veh/h	848	148	101	1065	290	104
Grp Sat Flow(s),veh/h/ln	1533	1367	1615	1611	1554	1425
Q Serve(g_s), s	12.4	3.9	6.2	10.1	9.0	6.3
Cycle Q Clear(g_c), s	12.4	3.9	6.2	10.1	9.0	6.3
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2075	926	126	2560	389	282
V/C Ratio(X)	0.41	0.16	0.80	0.42	0.74	0.37
Avail Cap(c_a), veh/h	2075	926	274	2560	684	417
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.2	5.9	45.4	3.1	42.2	34.7
Incr Delay (d2), s/veh	0.6	0.4	11.3	0.5	2.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	1.0	2.8	1.9	3.5	5.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.8	6.2	56.6	3.6	45.0	35.5
LnGrp LOS	A	A	E	A	D	D
Approach Vol, veh/h	996			1166	394	
Approach Delay, s/veh	7.6			8.2	42.5	
Approach LOS	A			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.8	71.7		16.5		83.5
Change Period (Y+Rc), s	4.0	* 5.4		4.5		* 5.4
Max Green Setting (Gmax), s	17.0	* 48		21.5		* 69
Max Q Clear Time (g_c+I1), s	8.2	14.4		11.0		12.1
Green Ext Time (p_c), s	0.1	6.8		1.0		8.9
Intersection Summary						
HCM 6th Ctrl Delay			13.3			
HCM 6th LOS			B			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

HCM 6th TWSC
2: 362nd Avenue & Industrial Way

11/08/2022

Intersection						
Int Delay, s/veh	1.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y		Y	Y
Traffic Vol, veh/h	27	15	307	46	37	130
Future Vol, veh/h	27	15	307	46	37	130
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	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	15	15	6	6	6	6
Mvmt Flow	30	17	341	51	41	144
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	593	367	0	0	392	
Stage 1	367	-	-	-	-	
Stage 2	226	-	-	-	-	
Critical Hdwy	6.55	6.35	-	-	4.16	
Critical Hdwy Stg 1	5.55	-	-	-	-	
Critical Hdwy Stg 2	5.55	-	-	-	-	
Follow-up Hdwy	3.635	3.435	-	-	2.254	
Pot Cap-1 Maneuver	447	650	-	-	1145	
Stage 1	673	-	-	-	-	
Stage 2	782	-	-	-	-	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	431	650	-	-	1145	
Mov Cap-2 Maneuver	431	-	-	-	-	
Stage 1	673	-	-	-	-	
Stage 2	754	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	13.1	0		1.8		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	490	1145	-	
HCM Lane V/C Ratio	-	-	0.095	0.036	-	
HCM Control Delay (s)	-	-	13.1	8.3	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-	

HCM 6th AWSC
3: 362nd Avenue & Industrial Way

11/08/2022

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	59	38	58	307	98	39
Future Vol, veh/h	59	38	58	307	98	39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	14	14	5	5	9	9
Mvmt Flow	66	42	64	341	109	43
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.3	12	8.8
HCM LOS	A	B	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	16%	61%	0%
Vol Thru, %	84%	0%	72%
Vol Right, %	0%	39%	28%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	365	97	137
LT Vol	58	59	0
Through Vol	307	0	98
RT Vol	0	38	39
Lane Flow Rate	406	108	152
Geometry Grp	1	1	1
Degree of Util (X)	0.504	0.158	0.195
Departure Headway (Hd)	4.475	5.277	4.61
Convergence, Y/N	Yes	Yes	Yes
Cap	807	678	776
Service Time	2.504	3.324	2.647
HCM Lane V/C Ratio	0.503	0.159	0.196
HCM Control Delay	12	9.3	8.8
HCM Lane LOS	B	A	A
HCM 95th-tile Q	2.9	0.6	0.7

HCM 6th TWSC
4: 362nd Avenue & Site Access

11/08/2022

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	0	1	364	0	3	133
Future Vol, veh/h	0	1	364	0	3	133
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	20	20	5	5	9	9
Mvmt Flow	0	1	404	0	3	148
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	558	404	0	0	404	
Stage 1	404	-	-	-	-	
Stage 2	154	-	-	-	-	
Critical Hdwy	6.6	6.4	-	-	4.19	
Critical Hdwy Stg 1	5.6	-	-	-	-	
Critical Hdwy Stg 2	5.6	-	-	-	-	
Follow-up Hdwy	3.68	3.48	-	-	2.281	
Pot Cap-1 Maneuver	461	609	-	-	1118	
Stage 1	637	-	-	-	-	
Stage 2	832	-	-	-	-	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	460	609	-	-	1118	
Mov Cap-2 Maneuver	460	-	-	-	-	
Stage 1	637	-	-	-	-	
Stage 2	830	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	10.9	0		0.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	609	1118	-	
HCM Lane V/C Ratio	-	-	0.002	0.003	-	
HCM Control Delay (s)	-	-	10.9	8.2	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

HCM Signalized Intersection Capacity Analysis
 1: 362nd Avenue & US Hwy 26

11/08/2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	↑
Traffic Volume (vph)	1250	323	235	1060	259	308
Future Volume (vph)	1250	323	235	1060	259	308
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3197	1430	1599	3197	3162	1458
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3197	1430	1599	3197	3162	1458
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1302	336	245	1104	270	321
RTOR Reduction (vph)	0	135	0	0	0	25
Lane Group Flow (vph)	1302	201	245	1104	270	296
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	4	4 1
Permitted Phases		2				
Actuated Green, G (s)	73.4	73.4	24.4	101.8	18.3	47.2
Effective Green, g (s)	74.8	74.8	24.4	103.2	18.8	47.2
Actuated g/C Ratio	0.58	0.58	0.19	0.79	0.14	0.36
Clearance Time (s)	5.4	5.4	4.0	5.4	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1839	822	300	2537	457	529
v/s Ratio Prot	c0.41		c0.15	0.35	0.09	c0.20
v/s Ratio Perm		0.14				
v/c Ratio	0.71	0.24	0.82	0.44	0.59	0.56
Uniform Delay, d1	19.8	13.6	50.7	4.2	52.0	33.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.7	15.6	0.5	2.0	1.3
Delay (s)	22.1	14.3	66.3	4.8	54.0	34.4
Level of Service	C	B	E	A	D	C
Approach Delay (s)	20.5			15.9	43.4	
Approach LOS	C			B	D	
Intersection Summary						
HCM 2000 Control Delay			22.6		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	12.5
Intersection Capacity Utilization			69.7%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary
 1: 362nd Avenue & US Hwy 26

11/08/2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↑↑	↑
Traffic Volume (veh/h)	1250	323	235	1060	259	308
Future Volume (veh/h)	1250	323	235	1060	259	308
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1695	1695	1695	1695	1723	1723
Adj Flow Rate, veh/h	1302	336	245	1104	270	321
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	2	2
Cap, veh/h	1913	853	271	2552	465	452
Arrive On Green	0.59	0.59	0.17	0.79	0.15	0.14
Sat Flow, veh/h	3306	1437	1615	3306	3183	1460
Grp Volume(v), veh/h	1302	336	245	1104	270	321
Grp Sat Flow(s),veh/h/ln	1611	1437	1615	1611	1591	1460
Q Serve(g_s), s	35.8	16.1	19.4	14.1	10.3	18.5
Cycle Q Clear(g_c), s	35.8	16.1	19.4	14.1	10.3	18.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1913	853	271	2552	465	452
V/C Ratio(X)	0.68	0.39	0.91	0.43	0.58	0.71
Avail Cap(c_a), veh/h	1913	853	373	2552	465	452
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	14.0	53.1	4.3	51.8	39.7
Incr Delay (d2), s/veh	2.0	1.4	20.0	0.5	1.8	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.7	5.2	9.2	3.5	4.2	20.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.0	15.4	73.1	4.8	53.6	44.8
LnGrp LOS	B	B	E	A	D	D
Approach Vol, veh/h	1638			1349	591	
Approach Delay, s/veh	19.0			17.2	48.8	
Approach LOS	B			B	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	25.8	81.2		23.0		107.0
Change Period (Y+Rc), s	4.0	* 5.4		4.5		* 5.4
Max Green Setting (Gmax), s	30.0	* 68		18.5		* 1E2
Max Q Clear Time (g_c+I1), s	21.4	37.8		20.5		16.1
Green Ext Time (p_c), s	0.4	12.5		0.0		9.6
Intersection Summary						
HCM 6th Ctrl Delay			23.3			
HCM 6th LOS			C			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

HCM 6th TWSC
2: 362nd Avenue & Industrial Way

11/08/2022

Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y		Y	Y
Traffic Vol, veh/h	35	56	359	30	23	465
Future Vol, veh/h	35	56	359	30	23	465
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	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	60	382	32	24	495
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	941	398	0	0	414	
Stage 1	398	-	-	-	-	
Stage 2	543	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	
Critical Hdwy Stg 1	5.42	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	-	2.218	
Pot Cap-1 Maneuver	292	652	-	-	1145	
Stage 1	678	-	-	-	-	
Stage 2	582	-	-	-	-	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	286	652	-	-	1145	
Mov Cap-2 Maneuver	286	-	-	-	-	
Stage 1	678	-	-	-	-	
Stage 2	570	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	15.6	0		0.4		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	437	1145	-	
HCM Lane V/C Ratio	-	-	0.222	0.021	-	
HCM Control Delay (s)	-	-	15.6	8.2	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0.8	0.1	-	

HCM 6th AWSC
3: 362nd Avenue & Industrial Way

11/08/2022

Intersection	
Intersection Delay, s/veh	20.8
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	94	133	57	302	473	35
Future Vol, veh/h	94	133	57	302	473	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	102	145	62	328	514	38
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	13.3	16.7	27
HCM LOS	B	C	D

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	16%	41%	0%
Vol Thru, %	84%	0%	93%
Vol Right, %	0%	59%	7%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	359	227	508
LT Vol	57	94	0
Through Vol	302	0	473
RT Vol	0	133	35
Lane Flow Rate	390	247	552
Geometry Grp	1	1	1
Degree of Util (X)	0.601	0.413	0.81
Departure Headway (Hd)	5.542	6.019	5.28
Convergence, Y/N	Yes	Yes	Yes
Cap	648	595	685
Service Time	3.598	4.083	3.331
HCM Lane V/C Ratio	0.602	0.415	0.806
HCM Control Delay	16.7	13.3	27
HCM Lane LOS	C	B	D
HCM 95th-tile Q	4	2	8.4

HCM 6th TWSC
4: 362nd Avenue & Site Access

11/08/2022

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	1	3	356	0	2	604
Future Vol, veh/h	1	3	356	0	2	604
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	20	20	2	20	20	3
Mvmt Flow	1	3	387	0	2	657
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1048	387	0	0	387	
Stage 1	387	-	-	-	-	
Stage 2	661	-	-	-	-	
Critical Hdwy	6.6	6.4	-	-	4.3	
Critical Hdwy Stg 1	5.6	-	-	-	-	
Critical Hdwy Stg 2	5.6	-	-	-	-	
Follow-up Hdwy	3.68	3.48	-	-	2.38	
Pot Cap-1 Maneuver	233	623	-	-	1080	
Stage 1	649	-	-	-	-	
Stage 2	481	-	-	-	-	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	232	623	-	-	1080	
Mov Cap-2 Maneuver	232	-	-	-	-	
Stage 1	649	-	-	-	-	
Stage 2	480	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	13.3	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	438	1080	-	
HCM Lane V/C Ratio	-	-	0.01	0.002	-	
HCM Control Delay (s)	-	-	13.3	8.3	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

HCM Signalized Intersection Capacity Analysis
 1: 362nd Avenue & US Hwy 26

11/08/2022

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (vph)	789	143	96	990	272	98
Future Volume (vph)	789	143	96	990	272	98
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Fr _t	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3023	1352	1599	3197	3072	1417
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3023	1352	1599	3197	3072	1417
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	848	154	103	1065	292	105
RTOR Reduction (vph)	0	60	0	0	0	73
Lane Group Flow (vph)	848	94	103	1065	292	32
Heavy Vehicles (%)	10%	10%	4%	4%	5%	5%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	4	4 1
Permitted Phases		2				
Actuated Green, G (s)	59.7	59.7	11.7	75.4	14.7	30.9
Effective Green, g (s)	61.1	61.1	11.7	76.8	15.2	30.9
Actuated g/C Ratio	0.61	0.61	0.12	0.77	0.15	0.31
Clearance Time (s)	5.4	5.4	4.0	5.4	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1847	826	187	2455	466	437
v/s Ratio Prot	c0.28		c0.06	0.33	c0.10	0.02
v/s Ratio Perm		0.07				
v/c Ratio	0.46	0.11	0.55	0.43	0.63	0.07
Uniform Delay, d1	10.5	8.1	41.7	4.0	39.7	24.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.3	3.5	0.6	2.6	0.1
Delay (s)	11.3	8.4	45.2	4.6	42.4	24.5
Level of Service	B	A	D	A	D	C
Approach Delay (s)	10.9			8.2	37.6	
Approach LOS	B			A	D	
Intersection Summary						
HCM 2000 Control Delay			13.8		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.50			
Actuated Cycle Length (s)			100.0		Sum of lost time (s)	12.5
Intersection Capacity Utilization			47.9%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary
 1: 362nd Avenue & US Hwy 26

11/08/2022

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘	↑↑	↘	↗
Traffic Volume (veh/h)	789	143	96	990	272	98
Future Volume (veh/h)	789	143	96	990	272	98
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1614	1614	1695	1695	1682	1682
Adj Flow Rate, veh/h	848	154	103	1065	292	105
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	10	10	4	4	5	5
Cap, veh/h	2069	923	128	2558	391	285
Arrive On Green	0.67	0.67	0.08	0.79	0.13	0.12
Sat Flow, veh/h	3146	1367	1615	3306	3107	1425
Grp Volume(v), veh/h	848	154	103	1065	292	105
Grp Sat Flow(s),veh/h/ln	1533	1367	1615	1611	1554	1425
Q Serve(g_s), s	12.4	4.1	6.3	10.2	9.1	6.4
Cycle Q Clear(g_c), s	12.4	4.1	6.3	10.2	9.1	6.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	2069	923	128	2558	391	285
V/C Ratio(X)	0.41	0.17	0.81	0.42	0.75	0.37
Avail Cap(c_a), veh/h	2069	923	274	2558	684	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.3	6.0	45.3	3.2	42.2	34.5
Incr Delay (d2), s/veh	0.6	0.4	11.1	0.5	2.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	1.0	2.8	1.9	3.6	5.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.9	6.3	56.4	3.7	45.0	35.3
LnGrp LOS	A	A	E	A	D	D
Approach Vol, veh/h	1002			1168	397	
Approach Delay, s/veh	7.7			8.3	42.4	
Approach LOS	A			A	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	11.9	71.5		16.6		83.4
Change Period (Y+Rc), s	4.0	* 5.4		4.5		* 5.4
Max Green Setting (Gmax), s	17.0	* 48		21.5		* 69
Max Q Clear Time (g_c+I1), s	8.3	14.4		11.1		12.2
Green Ext Time (p_c), s	0.1	6.8		1.0		8.9
Intersection Summary						
HCM 6th Ctrl Delay			13.3			
HCM 6th LOS			B			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

HCM 6th TWSC
2: 362nd Avenue & Industrial Way

11/08/2022

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y		Y	Y
Traffic Vol, veh/h	27	16	309	46	39	135
Future Vol, veh/h	27	16	309	46	39	135
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	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	15	15	6	6	6	6
Mvmt Flow	30	18	343	51	43	150
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	605	369	0	0	394	
Stage 1	369	-	-	-	-	
Stage 2	236	-	-	-	-	
Critical Hdwy	6.55	6.35	-	-	4.16	
Critical Hdwy Stg 1	5.55	-	-	-	-	
Critical Hdwy Stg 2	5.55	-	-	-	-	
Follow-up Hdwy	3.635	3.435	-	-	2.254	
Pot Cap-1 Maneuver	440	649	-	-	1143	
Stage 1	672	-	-	-	-	
Stage 2	774	-	-	-	-	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	423	649	-	-	1143	
Mov Cap-2 Maneuver	423	-	-	-	-	
Stage 1	672	-	-	-	-	
Stage 2	745	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	13.2	0		1.9		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	486	1143	-	
HCM Lane V/C Ratio	-	-	0.098	0.038	-	
HCM Control Delay (s)	-	-	13.2	8.3	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-	

HCM 6th AWSC
3: 362nd Avenue & Industrial Way

11/08/2022

Intersection	
Intersection Delay, s/veh	10.9
Intersection LOS	B

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	59	38	58	309	103	39
Future Vol, veh/h	59	38	58	309	103	39
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	14	14	5	5	9	9
Mvmt Flow	66	42	64	343	114	43
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.4	12.1	8.8
HCM LOS	A	B	A

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	16%	61%	0%
Vol Thru, %	84%	0%	73%
Vol Right, %	0%	39%	27%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	367	97	142
LT Vol	58	59	0
Through Vol	309	0	103
RT Vol	0	38	39
Lane Flow Rate	408	108	158
Geometry Grp	1	1	1
Degree of Util (X)	0.508	0.159	0.203
Departure Headway (Hd)	4.484	5.295	4.621
Convergence, Y/N	Yes	Yes	Yes
Cap	803	676	775
Service Time	2.514	3.344	2.659
HCM Lane V/C Ratio	0.508	0.16	0.204
HCM Control Delay	12.1	9.4	8.8
HCM Lane LOS	B	A	A
HCM 95th-tile Q	2.9	0.6	0.8

HCM 6th TWSC
4: 362nd Avenue & Site Access

11/08/2022

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	
Traffic Vol, veh/h	1	2	365	2	5	136
Future Vol, veh/h	1	2	365	2	5	136
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	20	20	5	5	9	9
Mvmt Flow	1	2	406	2	6	151
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	570	407	0	0	408	0
Stage 1	407	-	-	-	-	-
Stage 2	163	-	-	-	-	-
Critical Hdwy	6.6	6.4	-	-	4.19	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.48	-	-	2.281	-
Pot Cap-1 Maneuver	454	607	-	-	1114	-
Stage 1	635	-	-	-	-	-
Stage 2	824	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	451	607	-	-	1114	-
Mov Cap-2 Maneuver	451	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.7	0		0.3		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	544	1114	-	
HCM Lane V/C Ratio	-	-	0.006	0.005	-	
HCM Control Delay (s)	-	-	11.7	8.2	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0	0	-	

HCM 6th TWSC
5: Proposed Access & Industrial Way

11/08/2022

Intersection						
Int Delay, s/veh	0.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Vol, veh/h	83	2	4	42	1	1
Future Vol, veh/h	83	2	4	42	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	6	6	15	15	50	50
Mvmt Flow	104	3	5	53	1	1
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	107	0	169	106
Stage 1	-	-	-	-	106	-
Stage 2	-	-	-	-	63	-
Critical Hdwy	-	-	4.25	-	6.9	6.7
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.335	-	3.95	3.75
Pot Cap-1 Maneuver	-	-	1406	-	722	832
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	851	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1406	-	719	832
Mov Cap-2 Maneuver	-	-	-	-	719	-
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	848	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.7	9.7			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	771	-	-	1406	-	
HCM Lane V/C Ratio	0.003	-	-	0.004	-	
HCM Control Delay (s)	9.7	-	-	7.6	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

HCM Signalized Intersection Capacity Analysis
 1: 362nd Avenue & US Hwy 26

11/08/2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	1250	326	236	1060	265	310
Future Volume (vph)	1250	326	236	1060	265	310
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.5
Lane Util. Factor	0.95	1.00	1.00	0.95	0.97	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3197	1430	1599	3197	3162	1458
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3197	1430	1599	3197	3162	1458
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1302	340	246	1104	276	323
RTOR Reduction (vph)	0	137	0	0	0	25
Lane Group Flow (vph)	1302	203	246	1104	276	298
Heavy Vehicles (%)	4%	4%	4%	4%	2%	2%
Turn Type	NA	Perm	Prot	NA	Prot	pt+ov
Protected Phases	2		1	6	4	4 1
Permitted Phases		2				
Actuated Green, G (s)	73.4	73.4	24.4	101.8	18.3	47.2
Effective Green, g (s)	74.8	74.8	24.4	103.2	18.8	47.2
Actuated g/C Ratio	0.58	0.58	0.19	0.79	0.14	0.36
Clearance Time (s)	5.4	5.4	4.0	5.4	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	1839	822	300	2537	457	529
v/s Ratio Prot	c0.41		c0.15	0.35	0.09	c0.20
v/s Ratio Perm		0.14				
v/c Ratio	0.71	0.25	0.82	0.44	0.60	0.56
Uniform Delay, d1	19.8	13.7	50.7	4.2	52.1	33.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.7	15.9	0.5	2.3	1.4
Delay (s)	22.1	14.4	66.6	4.8	54.4	34.5
Level of Service	C	B	E	A	D	C
Approach Delay (s)	20.5			16.0	43.7	
Approach LOS	C			B	D	
Intersection Summary						
HCM 2000 Control Delay			22.7		HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			130.0		Sum of lost time (s)	12.5
Intersection Capacity Utilization			69.9%		ICU Level of Service	C
Analysis Period (min)			15			
c Critical Lane Group						

HCM 6th Signalized Intersection Summary
 1: 362nd Avenue & US Hwy 26

11/08/2022

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↓	↑↑	↑↑	↑
Traffic Volume (veh/h)	1250	326	236	1060	265	310
Future Volume (veh/h)	1250	326	236	1060	265	310
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1695	1695	1695	1695	1723	1723
Adj Flow Rate, veh/h	1302	340	246	1104	276	323
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	2	2
Cap, veh/h	1911	852	272	2552	465	453
Arrive On Green	0.59	0.59	0.17	0.79	0.15	0.14
Sat Flow, veh/h	3306	1437	1615	3306	3183	1460
Grp Volume(v), veh/h	1302	340	246	1104	276	323
Grp Sat Flow(s),veh/h/ln	1611	1437	1615	1611	1591	1460
Q Serve(g_s), s	35.9	16.4	19.4	14.1	10.5	18.5
Cycle Q Clear(g_c), s	35.9	16.4	19.4	14.1	10.5	18.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1911	852	272	2552	465	453
V/C Ratio(X)	0.68	0.40	0.91	0.43	0.59	0.71
Avail Cap(c_a), veh/h	1911	852	373	2552	465	453
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	14.1	53.1	4.3	51.9	39.7
Incr Delay (d2), s/veh	2.0	1.4	20.2	0.5	2.0	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.7	5.3	9.2	3.5	4.4	20.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.0	15.5	73.2	4.8	53.9	44.9
LnGrp LOS	C	B	E	A	D	D
Approach Vol, veh/h	1642			1350	599	
Approach Delay, s/veh	19.1			17.3	49.0	
Approach LOS	B			B	D	
Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	25.9	81.1		23.0		107.0
Change Period (Y+Rc), s	4.0	* 5.4		4.5		* 5.4
Max Green Setting (Gmax), s	30.0	* 68		18.5		* 1E2
Max Q Clear Time (g_c+I1), s	21.4	37.9		20.5		16.1
Green Ext Time (p_c), s	0.4	12.5		0.0		9.6
Intersection Summary						
HCM 6th Ctrl Delay			23.4			
HCM 6th LOS			C			
Notes						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

HCM 6th TWSC
2: 362nd Avenue & Industrial Way

11/08/2022

Intersection						
Int Delay, s/veh	1.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y		Y	Y
Traffic Vol, veh/h	35	58	365	30	24	468
Future Vol, veh/h	35	58	365	30	24	468
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	-	-	-	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	62	388	32	26	498
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	954	404	0	0	420	
Stage 1	404	-	-	-	-	
Stage 2	550	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	
Critical Hdwy Stg 1	5.42	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	-	2.218	
Pot Cap-1 Maneuver	287	647	-	-	1139	
Stage 1	674	-	-	-	-	
Stage 2	578	-	-	-	-	
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	280	647	-	-	1139	
Mov Cap-2 Maneuver	280	-	-	-	-	
Stage 1	674	-	-	-	-	
Stage 2	565	-	-	-	-	
Approach	WB	NB		SB		
HCM Control Delay, s	15.8	0		0.4		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	433	1139	-	
HCM Lane V/C Ratio	-	-	0.228	0.022	-	
HCM Control Delay (s)	-	-	15.8	8.2	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0.9	0.1	-	

HCM 6th AWSC
3: 362nd Avenue & Industrial Way

11/08/2022

Intersection	
Intersection Delay, s/veh	21.2
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	94	133	57	308	476	35
Future Vol, veh/h	94	133	57	308	476	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	102	145	62	335	517	38
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	13.4	17	27.7
HCM LOS	B	C	D

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	16%	41%	0%
Vol Thru, %	84%	0%	93%
Vol Right, %	0%	59%	7%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	365	227	511
LT Vol	57	94	0
Through Vol	308	0	476
RT Vol	0	133	35
Lane Flow Rate	397	247	555
Geometry Grp	1	1	1
Degree of Util (X)	0.612	0.414	0.817
Departure Headway (Hd)	5.553	6.046	5.296
Convergence, Y/N	Yes	Yes	Yes
Cap	647	592	683
Service Time	3.607	4.109	3.344
HCM Lane V/C Ratio	0.614	0.417	0.813
HCM Control Delay	17	13.4	27.7
HCM Lane LOS	C	B	D
HCM 95th-tile Q	4.2	2	8.6

HCM 6th TWSC
4: 362nd Avenue & Site Access

11/08/2022

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		T		T	
Traffic Vol, veh/h	2	6	359	1	3	606
Future Vol, veh/h	2	6	359	1	3	606
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	20	20	2	20	20	3
Mvmt Flow	2	7	390	1	3	659
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1056	391	0	0	391	0
Stage 1	391	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Critical Hdwy	6.6	6.4	-	-	4.3	-
Critical Hdwy Stg 1	5.6	-	-	-	-	-
Critical Hdwy Stg 2	5.6	-	-	-	-	-
Follow-up Hdwy	3.68	3.48	-	-	2.38	-
Pot Cap-1 Maneuver	231	620	-	-	1076	-
Stage 1	646	-	-	-	-	-
Stage 2	479	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	230	620	-	-	1076	-
Mov Cap-2 Maneuver	230	-	-	-	-	-
Stage 1	646	-	-	-	-	-
Stage 2	477	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.4	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	435	1076	-	
HCM Lane V/C Ratio	-	-	0.02	0.003	-	
HCM Control Delay (s)	-	-	13.4	8.4	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

HCM 6th TWSC
5: Proposed Access & Industrial Way

11/08/2022

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Vol, veh/h	53	1	2	91	2	5
Future Vol, veh/h	53	1	2	91	2	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	2	2	2	2	50	50
Mvmt Flow	66	1	3	114	3	6
Major/Minor	Major1	Major2	Minor1			
Conflicting Flow All	0	0	67	0	187	67
Stage 1	-	-	-	-	67	-
Stage 2	-	-	-	-	120	-
Critical Hdwy	-	-	4.12	-	6.9	6.7
Critical Hdwy Stg 1	-	-	-	-	5.9	-
Critical Hdwy Stg 2	-	-	-	-	5.9	-
Follow-up Hdwy	-	-	2.218	-	3.95	3.75
Pot Cap-1 Maneuver	-	-	1535	-	704	877
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	799	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1535	-	703	877
Mov Cap-2 Maneuver	-	-	-	-	703	-
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	797	-
Approach	EB	WB	NB			
HCM Control Delay, s	0	0.2	9.4			
HCM LOS			A			
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	819	-	-	1535	-	
HCM Lane V/C Ratio	0.011	-	-	0.002	-	
HCM Control Delay (s)	9.4	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Queuing and Blocking Report
 2023 Bkgd plus Site AM Peak Hour

11/08/2022

Intersection: 1: 362nd Avenue & US Hwy 26

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	L	T	T	L	L	R
Maximum Queue (ft)	262	246	85	157	174	174	140	274	140
Average Queue (ft)	148	96	31	78	88	70	78	118	66
95th Queue (ft)	248	199	65	146	154	138	141	215	137
Link Distance (ft)	890	890			1768	1768		648	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			250	500			115		115
Storage Blk Time (%)		0					1	7	1
Queuing Penalty (veh)		0					3	16	3

Intersection: 2: 362nd Avenue & Industrial Way

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	80	5	57
Average Queue (ft)	30	0	15
95th Queue (ft)	62	4	45
Link Distance (ft)	373	164	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			150
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: 362nd Avenue & Industrial Way

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	89	120	89
Average Queue (ft)	44	67	44
95th Queue (ft)	71	103	71
Link Distance (ft)	443	551	164
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
2023 Bkgd plus Site AM Peak Hour

11/08/2022

Intersection: 4: 362nd Avenue & Site Access

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	35	20
Average Queue (ft)	3	1
95th Queue (ft)	19	10
Link Distance (ft)	365	551
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Proposed Access & Industrial Way

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	23	67
Average Queue (ft)	1	4
95th Queue (ft)	10	30
Link Distance (ft)	306	173
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 22

Queuing and Blocking Report
 2023 Bkgd plus Site PM Peak Hour

11/08/2022

Intersection: 1: 362nd Avenue & US Hwy 26

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	R	L	T	T	L	L	R
Maximum Queue (ft)	513	502	275	323	180	184	140	556	140
Average Queue (ft)	330	288	133	196	95	79	108	343	134
95th Queue (ft)	474	452	280	310	161	151	162	573	161
Link Distance (ft)	890	890			1768	1768		648	
Upstream Blk Time (%)								0	
Queuing Penalty (veh)								1	
Storage Bay Dist (ft)			250	500			115		115
Storage Blk Time (%)		6	0				6	29	22
Queuing Penalty (veh)		19	3				27	127	59

Intersection: 2: 362nd Avenue & Industrial Way

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	180	26	63	189
Average Queue (ft)	58	1	9	27
95th Queue (ft)	128	20	41	106
Link Distance (ft)	373	164		648
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			150	
Storage Blk Time (%)				1
Queuing Penalty (veh)				0

Intersection: 3: 362nd Avenue & Industrial Way

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	121	129	176
Average Queue (ft)	61	73	126
95th Queue (ft)	99	115	186
Link Distance (ft)	443	551	164
Upstream Blk Time (%)			2
Queuing Penalty (veh)			9
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
2023 Bkgd plus Site PM Peak Hour

11/08/2022

Intersection: 4: 362nd Avenue & Site Access

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (ft)	57	20
Average Queue (ft)	9	1
95th Queue (ft)	36	12
Link Distance (ft)	365	551
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Proposed Access & Industrial Way

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	7	71
Average Queue (ft)	0	10
95th Queue (ft)	5	46
Link Distance (ft)	306	173
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 245

OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING
362ND DR at MT HOOD HY, City of Sandy, Clackamas County, 01/01/2016 to 12/31/2020

1 - 4 of 22 Crash records shown.

SER#	P	R	J	S	M	D	C	CLASS	CITY STREET	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE		
INVEST	E	A	I	C	O	D	AY	DIST	FIRST STREET	(MEDIAN)	TRF SIGNAL	N	DRY	REAR	PRVTE	SE-NW	01	DRVR	INJB	63	F	OR-Y	OR<25		
RD DPT	E	L	G	N	H	R	TIME	FROM	SECOND STREET	LEGS	TRAF-	RNDFT	SURF	COLL	OWNER	FROM	PRTC	INJ	G	E	L	I	C		
UNLOC2	D	C	S	V	L	K	LAT	LONG	MT HOOD HY	(LANES)	CONTL	DRVTY	LIGHT	SVRTY	V# TYPE	TO	PH TYPE	SVRTY	E	X	RES	LOC	ERROR		
03855	N	N	N	N	N	N	08/23/2016	14	MT HOOD HY	3-LEG	N	N	CLR	S-1STOP	0	STRGHT	01	NONE	0				29		
CITY	TU								362ND DR	TRF SIGNAL	N	DRY	REAR	PRVTE	SE-NW	01	DRVR	INJB	63	F	OR-Y	OR<25	000	00	
N	3P						45 24 17.19 -122.17	26.69	002600100800	0		N	DAY	INJ	FSNGR CAR	SE-NW	01	DRVR	INJB	63	F	OR-Y	OR<25	026	000
N										02 NONE					STOP									011	00
										PRVTE					SE-NW									000	00
										FSNGR CAR					FSNGR CAR									011	00
										02 NONE					STOP									000	00
										PRVTE					SE-NW									011	00
										FSNGR CAR					FSNGR CAR									000	00
05491	N	N	N	N	N	N	11/25/2016	14	MT HOOD HY	3-LEG	N	N	RAIN	PED									110	02,119	
CITY	FR								362ND DR	TRF SIGNAL	N	WET	PED												
N	7P						45 24 17.19 -122.17	26.69	002600100800	0		N	DARK	INJ										035	110
										01 NONE					STOP									000	00
										PRVTE					TURN-R									000	00
										FSNGR CAR					S-SE									000	00
										01 NONE					FSNGR CAR									000	00
										01 NONE					FSNGR CAR									000	00
03153	N	N	N	N	N	N	07/12/2016	14	MT HOOD HY	3-LEG	N	N	CLR	S-1STOP	9	STRGHT	01	NONE	9				29		
CITY	TU								362ND DR	TRF SIGNAL	N	DRY	REAR	N/A	SE-NW									000	00
N	4P						45 24 17.19 -122.17	26.69	002600100800	0		N	DAY	PDO	FSNGR CAR								000	00	
										02 NONE					STOP									011	00
										N/A					SE-NW									000	00
										FSNGR CAR					FSNGR CAR									000	00
04441	N	N	N	N	N	N	09/26/2016	14	MT HOOD HY	3-LEG	N	N	CLR	S-1STOP	9	STRGHT	01	NONE	9				29		
CITY	NO								362ND DR	TRF SIGNAL	N	DRY	REAR	N/A	NP-SE									000	00
N	4P						45 24 17.19 -122.17	26.69	002600100800	0		N	DAY	PDO	FSNGR CAR								000	00	
										02 NONE					STOP									011	00
										N/A					NP-SE									000	00
										FSNGR CAR					FSNGR CAR									000	00
00521	Y	N	N	N	N	N	02/05/2017	14	MT HOOD HY	3-LEG	N	N	RAIN	S-1STOP	0	STRGHT	01	NONE	0				013	01,29	
CITY	WE								362ND DR	TRF SIGNAL	N	WET	REAR	PRVTE	SE-NW									000	00
N	8A						45 24 17.19 -122.17	26.69	002600100800	0		N	DAY	INJ	FSNGR CAR								047,026	000	
										01 NONE					STOP									011	00
										N/A					NP-SE									000	00
										FSNGR CAR					FSNGR CAR									000	00

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CDS360 09/01/2022 OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING
362ND DR at MT HOOD HY, City of Sandy, Clackamas County, 01/01/2016 to 12/31/2020
 13- 16 of 22 Crash records shown.

SER#	P E R I O D	S D M	CITY OF SANDY, CLACKAMAS COUNTY	CLASS	CITY STREET	RD CHAR	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPCL USE	MOVE	A S	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE
INVEST	E A I C O DAY	DIST	FIRST STREET	FROM	SECOND STREET	DIRECT	LEGS	TRAF-	RNDFT	SURF	COLL	OWNER	FROM	INJ	G E LICNS	FED					
UNLOC?	D C S V L K LAT	LONG	LS			LOCIN	(LANES)	CONTL	DRVTY	LIGHT	SVRTY	V# TYPE	TO	PH TYPE	SVRTY	E X RES	LOC	ERROR	ACT EVENT	CAUSE	
01286	N N N	03/18/2016	16	MT HOOD HY	INTER	INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE	9	STRGHT	01 DRIVER	INJC	58 M	OR-Y	OR<25	000	00
NONE		FR	0	362ND DR	S	S		TRF SIGNAL	N	DRY	REAR	N/A	S -N							000	00
N		4P	45-24 17.19 -122.17			06	0		N	DAY	FDO	FSNGR CAR	01 DRIVER	NONE	00	Unk	Unk	000	000	000	00
N			26.69									02 NONE	9	STOP						011	00
												N/A	S -N							000	00
												FSNGR CAR	01 DRIVER	NONE	00	Unk	Unk	000	000	000	00
02803	N N N	06/22/2016	14	MT HOOD HY	INTER	INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE	0	STRGHT	01 DRIVER	INJC	26 M	SUSP	OR<25	013	29,32
CITY		WE		362ND DR	NW	NW		TRF SIGNAL	N	DRY	REAR	PRVTE	NW-SE							000	00
N		9A	45-24 17.19 -122.17			06	0		N	DAY	INJ	FSNGR CAR	01 DRIVER	NONE	26 M	SUSP	OR<25	026,052	000	000	29,32
N			26.69									02 NONE	0	STOP						011	013
												PRVTE	NW-SE							000	00
												FSNGR CAR	01 DRIVER	INJC	79 F	OR-Y	OR<25	000	000	000	00
												02 NONE	0	STOP						011	013
												PRVTE	NW-SE							000	00
												FSNGR CAR	02 PSNG	INJC	86 M					011	013
												03 NONE	0	TURN-L						000	00
												PRVTE	S -NW							022	00
												FSNGR CAR	01 DRIVER	INJC	40 F	OR-Y	OR<25	000	000	000	00
86016	N N N	12/22/2016	14	MT HOOD HY	INTER	INTER	3-LEG	N	N	UNK	S-1STOP	01 NONE	9	STRGHT	01 DRIVER	INJC	40 F	OR-Y	OR<25	000	29
NONE		TH		362ND DR	NW	NW		TRF SIGNAL	N	UNK	REAR	N/A	NW-SE							000	00
N		12P	45-24 17.19 -122.17			06	0		N	DAY	FDO	FSNGR CAR	01 DRIVER	NONE	00	Unk	Unk	000	000	000	00
N			26.69									02 NONE	9	STOP						011	00
												N/A	NW-SE							000	00
												FSNGR CAR	01 DRIVER	NONE	00	Unk	Unk	000	000	000	00
00589	N N N	02/13/2017	14	MT HOOD HY	INTER	INTER	3-LEG	N	N	CLR	S-1STOP	01 NONE	0	STRGHT	01 DRIVER	INJC	26 M	OFF-Y	N-RES	013,084	29
CITY		MO		362ND DR	NW	NW		TRF SIGNAL	N	DRY	REAR	PRVTE	NW-SE							000	00
N		7A	45-24 17.19 -122.17			06	0		N	DAY	INJ	FSNGR CAR	01 DRIVER	INJC	26 M	OFF-Y	N-RES	026	026	084	29
N			26.69									02 NONE	9	STOP						011	00

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OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING
362ND DR at MT HOOD HW, City of Sandy, Clackamas County, 01/01/2016 to 12/31/2020
 22 - 22 of 22 Crash records shown.

CDS380
 09/01/2022
 CITY OF SANDY, CLACKAMAS COUNTY

SER#	P E R M I T	S E R I A L	D A T E	C L A S S	C I T Y	S T R E E T	R D	C H A R	I N T - T Y P E	I N T - R E L	O F F R D	W T H R	C R A S H	S P C L	U S E	M O V E	A	S	C A U S E									
INVEST	E A I C O D A Y	D I S T	F I R S T	S T R E E T	F I R S T	S T R E E T	D I R E C T	R D	(M E D I A N)	I N T - R E L	R N D B T	S U R F	C O L L	T R L R	Q T Y	F R O M	E	L I C E N S										
UNLOC?	D C S V L K L A T	L O N G	L E S	L E S	L E S	L E S	L O C T N	I N T E R	(# L A N E S)	C O N T L	D R V Y	L I G H T	S V R T Y	V #	T Y P E	T O	P #	T Y P E	S V R T Y	E X	R E S	L O C	E R R O R	A C T	E V E N T	C A U S E		
00488	N N N	02/05/2017	14	MT HOOD HW	362ND DR	002600100800	01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
NONE	SU	45:24	17:19	-122.17	26.69																							
N																												
N																												

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CDS360 09/01/2022 OREGON... DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
 URBAN NON-SYSTEM CRASH LISTING
362ND DR at INDUSTRIAL WAY, City of Sandy, Clackamas County, 01/01/2016 to 12/31/2020

1 - 4 of 4 Crash records shown.

SER#	P E R J S W DATE	CLASS	CITY STREET	INT-TYPE	INT-REL	OFFRD	WTHR	CRASH	SPLC USE	MOVE	A S	CAUSE
NONE	WE	0	362ND DR	3-LEG	UNKNOWN	N	WET	REAR	N/A	S -N	01 DRVR	00 UNK
N	45 24 7.79	-122.17		0		N	DLIT	PDO	FSNGR CAR		00 UNK	00
N	45 24 7.79	27.78				N			02 NONE 9	STRGHT	00 UNK	00
									N/A	S -N	00 UNK	00
									FSNGR CAR		00 UNK	00
02898	N N N N 08/19/2018	16	INDUSTRIAL WAY	3-LEG	N	N	CLR	S-1STOP	01 NONE	STRGHT	093	27,03,07
CITY	SU	0	362ND DR		STOP SIGN	N	DRY	REAR	PRVTE	S -N	000	00
N	45 24 7.8	-122.17		0		N	DAY	INJ	FSNGR CAR		021,043,026	038 093
N	45 24 7.8	27.79				N			02 NONE 0	STOP	000	00
									PRVTE	S -N	000	00
									FSNGR CAR		011	00
									02 NONE 0	STOP	000	00
									PRVTE	S -N	011	00
									FSNGR CAR		000	00
01438	N N N N 06/07/2020	16	INDUSTRIAL WAY	3-LEG	N	N	RAIN	S-1STOP	01 NONE	STRGHT		29
CITY	SU	0	362ND DR		STOP SIGN	N	WET	REAR	PRVTE	S -N	000	00
N	45 24 7.78	-122.17		0		N	DAY	INJ	FSNGR CAR		026	29
N	45 24 7.78	27.81				N			02 NONE 0	STOP	000	00
									PRVTE	S -N	011	00
									FSNGR CAR		000	00
04077	N N N N 11/07/2018	16	INDUSTRIAL WAY	3-LEG	N	N	CLR	ANGL-OTH	01 NONE	STRGHT		02
CITY	WE	0	362ND DR		STOP SIGN	N	DRY	TURN	PRVTE	N -S	000	00
N	45 24 10	-122.17		0		N	DUSK	INJ	FSNGR CAR		000	00
N	45 24 10	27.77				N			02 NONE 0	TURN-L	015	00
									PRVTE	E -S	000	02
									FSNGR CAR		028	00

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Preliminary Traffic Signal Warrant Analysis



Project Name: Johnson RV

Intersection: 362nd at Industrial (North)

Scenario: 2023 Background plus Site Trips

Number of Major Street Lanes: 1

PM Peak Hour Volume 887 (sum of both approaches)

Number of Minor Street Lanes 1

PM Peak Hour Volume 35 (highest-volume approach)^a

Posted or 85th percentile speed > 40 mph: No

Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Analysis Calculations

	8th Highest Hour ^b	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	501	500	
Minor Street Volume	20	150	No
Condition B - Interruption of Continuous Traffic			
Major Street Volume	501	750	
Minor Street Volume	20	75	No
Combination Warrant^c			
Major Street Volume	501	600	
Minor Street Volume	20	120	No

^a Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.

^b Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.

^c This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Preliminary Traffic Signal Warrant Analysis



Project Name: Johnson RV

Intersection: 362nd at Industrial (South)

Scenario: 2023 Background plus Site Trips

Number of Major Street Lanes: 1

PM Peak Hour Volume 876 (sum of both approaches)

Number of Minor Street Lanes 1

PM Peak Hour Volume 94 (highest-volume approach)^a

Posted or 85th percentile speed > 40 mph: No

Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Analysis Calculations

	8th Highest Hour ^b	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	495	500	
Minor Street Volume	53	150	No
Condition B - Interruption of Continuous Traffic			
Major Street Volume	495	750	
Minor Street Volume	53	75	No
Combination Warrant^c			
Major Street Volume	495	600	
Minor Street Volume	53	120	No

^a Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.

^b Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.

^c This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Preliminary Traffic Signal Warrant Analysis



Project Name: Johnson RV

Intersection: 362nd at Site Access

Scenario: 2023 Background plus Site Trips

Number of Major Street Lanes: 1

PM Peak Hour Volume 969 (sum of both approaches)

Number of Minor Street Lanes 1

PM Peak Hour Volume 2 (highest-volume approach)^a

Posted or 85th percentile speed > 40 mph: No

Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Analysis Calculations

	8th Highest Hour ^b	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	547	500	
Minor Street Volume	1	150	No
Condition B - Interruption of Continuous Traffic			
Major Street Volume	547	750	
Minor Street Volume	1	75	No
Combination Warrant^c			
Major Street Volume	547	600	
Minor Street Volume	1	120	No

^a Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.

^b Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.

^c This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Preliminary Traffic Signal Warrant Analysis



Project Name: Johnson RV

Intersection: Industrial at Proposed Site Access

Scenario: 2023 Background plus Site Trips

Number of Major Street Lanes: 1

PM Peak Hour Volume 147 (sum of both approaches)

Number of Minor Street Lanes 1

PM Peak Hour Volume 2 (highest-volume approach)^a

Posted or 85th percentile speed > 40 mph: No

Isolated Population Less than 10,000: No

Warrant 1, Eight-Hour Vehicular Volume

Condition A - Minimum Vehicular Volume

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B - Interruption of Continuous Traffic

Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on minor street (total of both approaches)			
Major Street	Minor Street	100%	80%	70%	56%	100%	80%	70%	56%
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

Warrant Analysis Calculations

	8th Highest Hour ^b	Minimum Volume	Warrant Satisfied?
Condition A - Minimum Vehicular Volume			
Major Street Volume	83	500	
Minor Street Volume	1	150	No
Condition B - Interruption of Continuous Traffic			
Major Street Volume	83	750	
Minor Street Volume	1	75	No
Combination Warrant^c			
Major Street Volume	83	600	
Minor Street Volume	1	120	No

^a Minor-Street right turn volumes are reduced to account for the impact of right-turns on red.

^b Eighth-highest hour volumes are calculated as 5.65 percent of the expected daily traffic volume.

^c This warrant should be used only after adequate trial of other alternatives has failed to solve traffic problems.

Left-Turn Lane Warrant Analysis (ODOT Methodology)

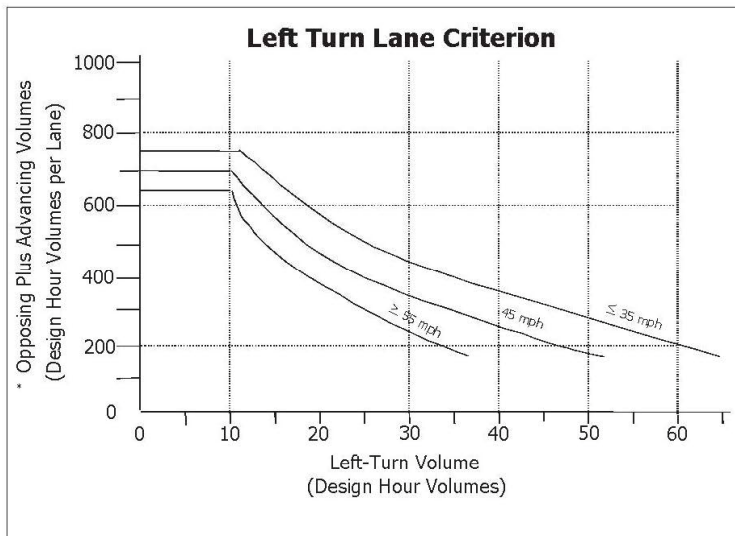


Project Name: Johnson RV
 Approach: Northbound 362nd Avenue at Industrial (South)
 Scenario: 2022 Existing Conditions

Number of Advancing Lanes: 1
 Number of Opposing Lanes: 1
 Major-Street Design Speed: 35 mph

	AM Volume	PM Volume
Advancing Volume for Design Hour:	349	344
Opposing Volume for Design Hour:	127	488
Design Hour Volume Per Lane:	476	832
Number of Left Turns per Hour:	56	54
Left-turn lane warrants satisfied?	YES	YES

Exhibit 7-1 Left Turn Lane Criterion (TTI)



* (Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)

Left-Turn Lane Warrant Analysis (ODOT Methodology)

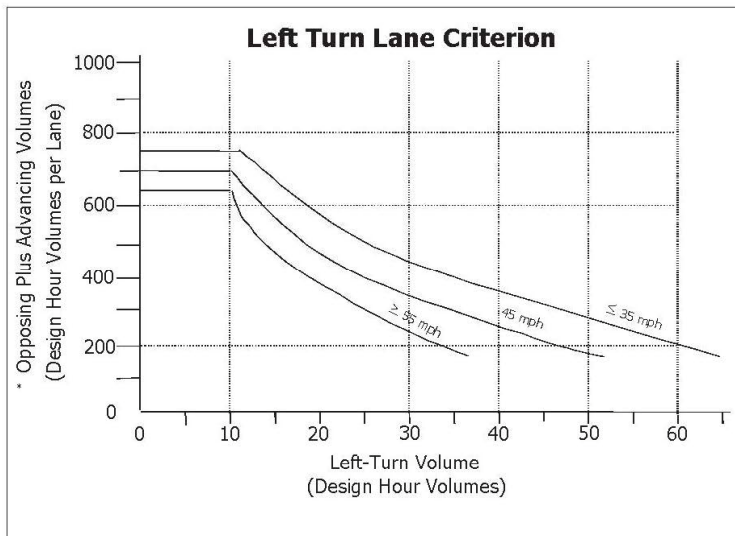


Project Name: Johnson RV
 Approach: Southbound 362nd Avenue at Site Access
 Scenario: 2023 Background plus Site Trips

Number of Advancing Lanes: 1
 Number of Opposing Lanes: 1
 Major-Street Design Speed: 35 mph

	AM Volume	PM Volume
Advancing Volume for Design Hour:	141	609
Opposing Volume for Design Hour:	367	360
Design Hour Volume Per Lane:	508	969
Number of Left Turns per Hour:	5	3
Left-turn lane warrants satisfied?	NO	NO

Exhibit 7-1 Left Turn Lane Criterion (TTI)



* (Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)

Left-Turn Lane Warrant Analysis (ODOT Methodology)



Project Name: Johnson RV

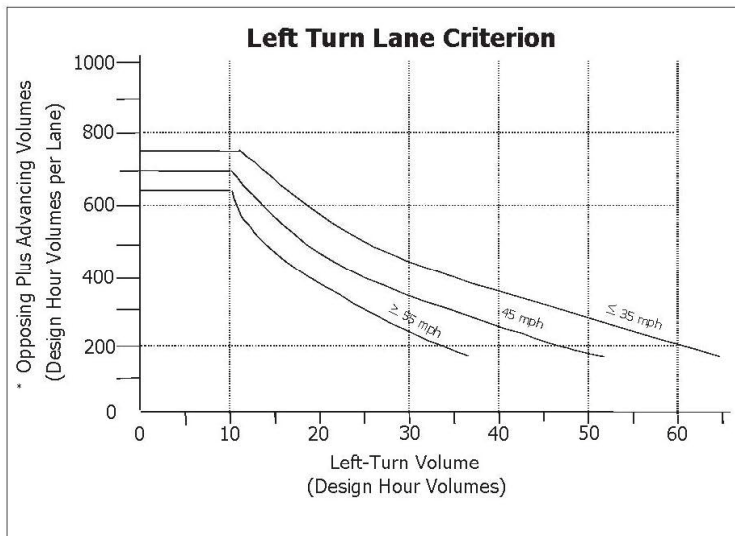
Approach: Westbound Industrial at Proposed Site Access

Scenario: 2023 Background plus Site Trips

Number of Advancing Lanes: 1
 Number of Opposing Lanes: 1
 Major-Street Design Speed: 25 mph

	AM Volume	PM Volume
Advancing Volume for Design Hour:	44	93
Opposing Volume for Design Hour:	85	54
Design Hour Volume Per Lane:	129	147
Number of Left Turns per Hour:	4	2
Left-turn lane warrants satisfied?	NO	NO

Exhibit 7-1 Left Turn Lane Criterion (TTI)



* (Advancing Volume/Number of Advancing Through Lanes) + (Opposing Volume/Number of Opposing Through Lanes)

Right-Turn Lane Warrant Analysis (ODOT Methodology)



Project Name: Johnson RV
 Approach: Northbound 362nd at Industrial (North)
 Scenario: 2023 Background plus Site Trips

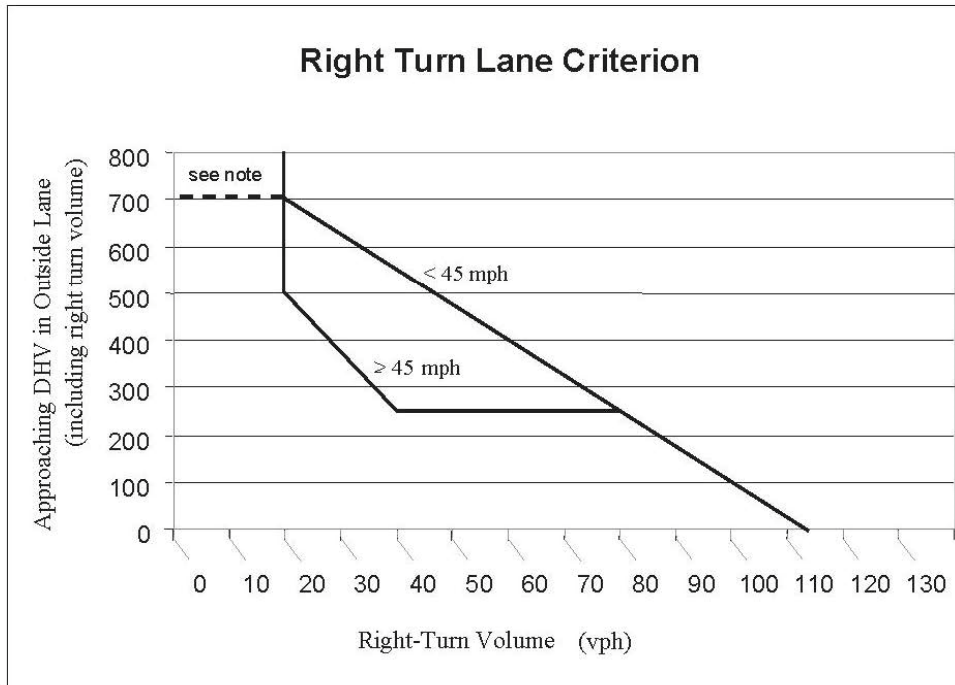
Major-Street Design Speed: 35 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	46	30
Approaching DVH in Outside Lane:	355	395
Calculated Turn Volume Threshold:	66	61
Right Turn Volume Exceeds Threshold?	NO	NO

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane. The vehicular volume criteria are determined using the curve in Exhibit 7-2.

Exhibit 7-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

Right-Turn Lane Warrant Analysis (ODOT Methodology)



Project Name: Johnson RV
 Approach: Southbound 362nd at Industrial (South)
 Scenario: 2023 Background plus Site Trips

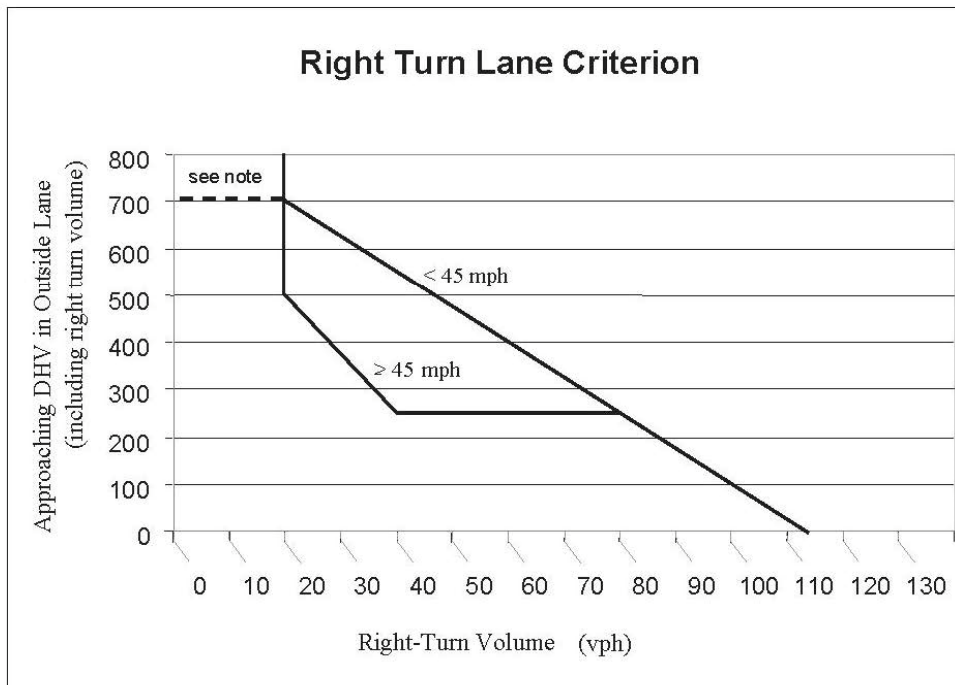
Major-Street Design Speed: 35 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	39	35
Approaching DVH in Outside Lane:	142	511
Calculated Turn Volume Threshold:	94	45
Right Turn Volume Exceeds Threshold?	NO	NO

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane. The vehicular volume criteria are determined using the curve in Exhibit 7-2.

Exhibit 7-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

Right-Turn Lane Warrant Analysis (ODOT Methodology)



Project Name: Johnson RV
 Approach: Northbound 362nd at Site Access
 Scenario: 2023 Background plus Site Trips

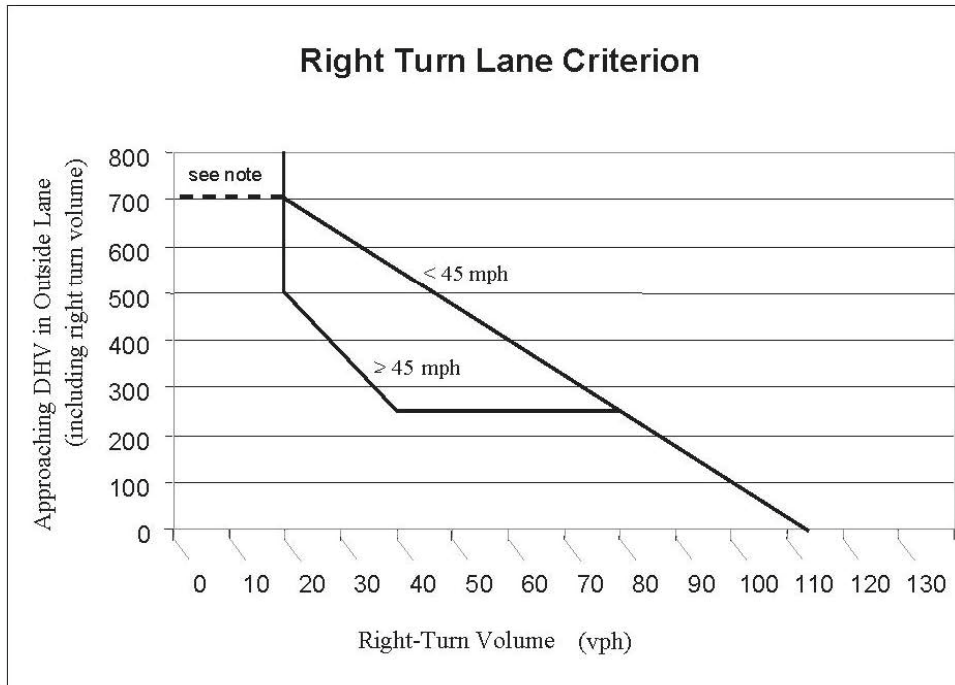
Major-Street Design Speed: 35 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	2	1
Approaching DVH in Outside Lane:	367	360
Calculated Turn Volume Threshold:	64	65
Right Turn Volume Exceeds Threshold?	NO	NO

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane. The vehicular volume criteria are determined using the curve in Exhibit 7-2.

Exhibit 7-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

Right-Turn Lane Warrant Analysis (ODOT Methodology)



Project Name: Johnson RV
 Approach: Eastbound Industrial at Proposed Site Access
 Scenario: 2023 Background plus Site Trips

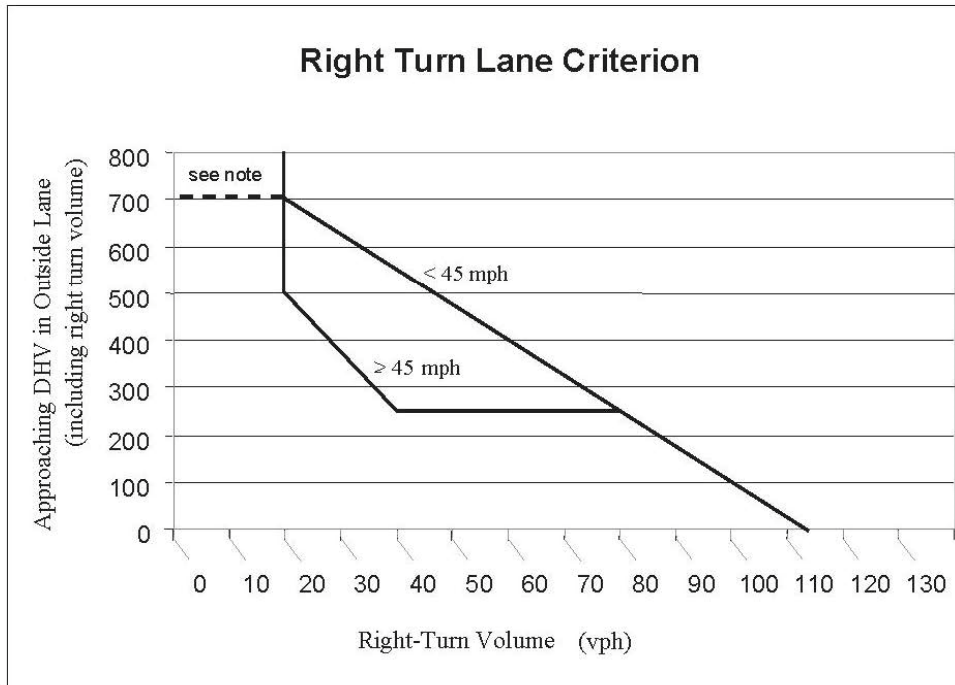
Major-Street Design Speed: 35 mph

	AM Volume	PM Volume
Number of Right Turns per Hour:	2	1
Approaching DVH in Outside Lane:	85	54
Calculated Turn Volume Threshold:	102	106
Right Turn Volume Exceeds Threshold?	NO	NO

Criterion 1: Vehicular Volume

The vehicular volume criterion is intended for application where the volume of intersecting traffic is the principal reason for considering installation of a right turn lane. The vehicular volume criteria are determined using the curve in Exhibit 7-2.

Exhibit 7-2 Right Turn Lane Criterion



Note: If there is no right turn lane, a shoulder needs to be provided. If this intersection is in a rural area and is a connection to a public street, a right turn lane is needed.

Speed Study Summary - Radar Data



Location: SE 362nd Avenue

Direction: Northbound

Date: August 31, 2022

Time: 3:00 PM

Weather: Clear/Dry

Notes: Occasional queues back up and impact through travel speeds. Data collection was stopped during these incidents to capture free-flow speeds.

85th Percentile Speed 37 mph

Average Speed: 33 mph

Recorded Speeds:*

1 mph ----- 0	26 mph ----- 2	51 mph ----- 0
2 mph ----- 0	27 mph ----- 3	52 mph ----- 0
3 mph ----- 0	28 mph ----- 4	53 mph ----- 0
4 mph ----- 0	29 mph ----- 3	54 mph ----- 0
5 mph ----- 0	30 mph ----- 5	55 mph ----- 0
6 mph ----- 0	31 mph ----- 14	56 mph ----- 0
7 mph ----- 0	32 mph ----- 13	57 mph ----- 0
8 mph ----- 0	33 mph ----- 8	58 mph ----- 0
9 mph ----- 0	34 mph ----- 12	59 mph ----- 0
10 mph ----- 0	35 mph ----- 7	60 mph ----- 0
11 mph ----- 0	36 mph ----- 10	61 mph ----- 0
12 mph ----- 0	37 mph ----- 5	62 mph ----- 0
13 mph ----- 0	38 mph ----- 4	63 mph ----- 0
14 mph ----- 0	39 mph ----- 2	64 mph ----- 0
15 mph ----- 0	40 mph ----- 1	65 mph ----- 0
16 mph ----- 0	41 mph ----- 0	66 mph ----- 0
17 mph ----- 0	42 mph ----- 2	67 mph ----- 0
18 mph ----- 0	43 mph ----- 0	68 mph ----- 0
19 mph ----- 0	44 mph ----- 1	69 mph ----- 0
20 mph ----- 0	45 mph ----- 0	70 mph ----- 0
21 mph ----- 0	46 mph ----- 0	71 mph ----- 0
22 mph ----- 0	47 mph ----- 0	72 mph ----- 0
23 mph ----- 1	48 mph ----- 0	73 mph ----- 0
24 mph ----- 1	49 mph ----- 1	74 mph ----- 0
25 mph ----- 1	50 mph ----- 0	75+ mph ----- 0

* Speed data observations include free-flowing traffic only (i.e. no following vehicles)

Speed Study Summary - Radar Data



Location: Industrial Way (North)
 Direction: Westbound
 Date: 11/7/2022
 Time: 2:00 PM
 Weather: Overcast, showers
 Notes: None

85th Percentile Speed: 33 mph
 Average Speed: 29 mph

Recorded Speeds:*

1 mph -----	0	26 mph -----	6	51 mph -----	0
2 mph -----	0	27 mph -----	9	52 mph -----	0
3 mph -----	0	28 mph -----	10	53 mph -----	0
4 mph -----	0	29 mph -----	10	54 mph -----	0
5 mph -----	0	30 mph -----	4	55 mph -----	0
6 mph -----	0	31 mph -----	8	56 mph -----	0
7 mph -----	0	32 mph -----	7	57 mph -----	0
8 mph -----	0	33 mph -----	10	58 mph -----	0
9 mph -----	0	34 mph -----	2	59 mph -----	0
10 mph -----	0	35 mph -----	2	60 mph -----	0
11 mph -----	0	36 mph -----	0	61 mph -----	0
12 mph -----	0	37 mph -----	3	62 mph -----	0
13 mph -----	0	38 mph -----	1	63 mph -----	0
14 mph -----	0	39 mph -----	0	64 mph -----	0
15 mph -----	0	40 mph -----	1	65 mph -----	0
16 mph -----	0	41 mph -----	1	66 mph -----	0
17 mph -----	1	42 mph -----	0	67 mph -----	0
18 mph -----	1	43 mph -----	0	68 mph -----	0
19 mph -----	0	44 mph -----	1	69 mph -----	0
20 mph -----	2	45 mph -----	0	70 mph -----	0
21 mph -----	3	46 mph -----	0	71 mph -----	0
22 mph -----	4	47 mph -----	0	72 mph -----	0
23 mph -----	1	48 mph -----	0	73 mph -----	0
24 mph -----	7	49 mph -----	0	74 mph -----	0
25 mph -----	6	50 mph -----	0	75+ mph -----	0

* Speed data observations include free-flowing traffic only (i.e. no following vehicles)

EXHIBIT L



Shelley Denison <sdenison@ci.sandy.or.us>

Re: Johnson RV Transmittal ~File No. 22-037 DR/VAR

2 messages

Gary Boyles <fmboyles.sandyfire@gmail.com>
To: Planning <planning@ci.sandy.or.us>

Fri, Dec 2,

The Fire District has no comments regarding the canopy variance.

Thank you,

Gary Boyles
Fire Marshal
Sandy Fire District No. 72
PO Box 518
17460 SE Bruns Ave.
Sandy, Oregon 97055

Business line: 503-668-8093
Cell number: 503-891-7042

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On Mon, Nov 21, 2022 at 1:31 PM Rebecca Markham <rmarkham@ci.sandy.or.us> wrote:

Good afternoon Gary, please see the attached "Transmittal Notice" for Johnson RV. It looks like Shelley needs comments back by December 7th if possible.

Happy Holidays!!

--

Rebecca Markham
Executive Assistant

City of Sandy
Development Services Department / Public Works

39250 Pioneer Blvd
Sandy, OR 97055
503-489-2160 (Direct)
rcasey@ci.sandy.or.us

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Rebecca Markham <rmarkham@ci.sandy.or.us>
To: Gary Boyles <fmboyles.sandyfire@gmail.com>
Cc: Planning <planning@ci.sandy.or.us>

Fri, Dec 2, 2022 at 10:42 AM

Received, thank you Gary.
[Quoted text hidden]

EXHIBIT M

December 5, 2022

CURRAN-McLEOD, INC.
CONSULTING ENGINEERS
6655 S.W. HAMPTON STREET, SUITE 210
PORTLAND, OREGON 97223

Ms. Shelly Denison
City of Sandy
39250 Pioneer Boulevard
Sandy, OR 97055

**RE: CITY OF SANDY
JOHN SON RV SITE DEVELOPMENT**

Dear Shelly:

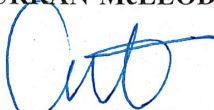
We have reviewed the Johnson RV site improvements at 362nd Drive and Industrial Way and have the following comments:

1. The application indicates they will be adding a septage receiving station. The City needs to review the sewer use ordinance to determine the allowable loading and whether additional SDC charges are due if this results in excess loading. A sampling manhole should be required downstream of the grease separator.
2. In that there are no sidewalks on the south side of Industrial Way, waiving that sidewalk requirement is reasonable. The City may require a fee in lieu of the Industrial Way sidewalk if the City ultimately intends to add sidewalks on the south side.
3. The new curb-tight sidewalk shown on 362nd Drive is acceptable. An ADA compliant ramp needs to be installed at the corner of 362nd and Industrial Way.
4. The stormwater plan is acceptable.

Let me know if you have questions.

Very truly yours,

CURRAN-McLEOD, INC.



Curt McLeod, P.E.

PHONE: (503) 684-3478

E-MAIL: cmi@curran-mcleod.com

FAX: (503) 624-8247

EXHIBIT N

January 20, 2023

CURRAN-McLEOD, INC.
CONSULTING ENGINEERS
6655 S.W. HAMPTON STREET, SUITE 210
PORTLAND, OREGON 97223

Ms. Shelley Denison
City of Sandy
39250 Pioneer Boulevard
Sandy, OR 97055

**RE: CITY OF SANDY
JOHNSON RV SITE DEVELOPMENT**

Dear Shelley:

Regarding the proposal from Johnson RV to construct an additional driveway access from Industrial Way, we see no concerns and recommend approval.


The Johnson RV site is in a light industrial zone and per the SMC 17.90.130.A.5. is permitted to have a second access if the frontage is greater than 150 feet wide. The site frontage on Industrial Way, a collector street, is 257.71 feet and the frontage on SE 362nd Drive, minor arterial, is 577.47 feet.

Additionally, the Sandy Transportation System Plan requires driveway spacing on collector streets to be a minimum of 150 feet. The nearest driveway on Industrial Way would be over 220 feet east of the proposed Johnson RV driveway.

Let me know if you have questions.

Very truly yours,

CURRAN-McLEOD, INC.



Curt McLeod, P.E.

EXHIBIT O



720 SW WASHINGTON STREET, SUITE 500, PORTLAND, OR 97205 • 503.243.3500 • DKSASSOCIATES.COM

DATE: December 7, 2022

REQUEST: Johnson RV Canopy Cover, Transportation Review

FILE NO: 22-037 DR/VAR

REVIEWER: Dock Rosenthal, PE, DKS Associates

DKS Associates has reviewed the traffic impact analysis¹ and site plan for the Johnson RV. The proposed development application includes a new 7,375 square foot covered wash facility in addition to the existing 20,000 square foot main building and two-story 3,850 square foot office building. The project site is located on the southeast corner of 362nd Drive and Industrial Way.

The general comments and listing of recommended conditions of approval are based on a review of the impact study and site plan.

DEVELOPMENT TRANSPORTATION IMPACT REVIEW

Key comments and issues related to the proposed development's transportation impact analysis include:

Existing

- Study Intersections
 - US 26 at SE 362nd Drive
 - SE 362nd Drive at Industrial Way (east)
 - SE 362nd Drive at Industrial Way (west)
 - SE 362nd Drive at Johnson RV site access
 - Industrial Way at Johnson RV site access
- All study intersections operate at an acceptable mobility standard during the 2022 AM and PM peak hours
- Crash data from January 2016 to December 2020 was analyzed, no systemic safety issues were identified. A review of the Oregon Traffic Safety Data Explorer (OTSDE) found 37 "Intersection Related" crashes along US 26 near 362nd Drive compared to the 22 reported in the Johnson RV

¹ Johnson RV Traffic Impact Study, Ard Engineering, November 10, 2022.

analysis. 37 crashes at the intersection does exceed the 90th percentile crash rate. While there is a discrepancy between the numbers reported in the analysis and the OTSDE the nature of the collisions, primarily rear-end collisions and turning collisions, indicate driver error and no additional mitigation is recommended for the development.

Future (2023) Background Condition

- A linear growth rate of 1.92 percent per year was applied to the existing 2022 volumes along US 26. An exponential growth rate of 2.0 percent per year was applied to other volumes to account for background growth.
- 14 approved in process developments included in the background volumes:
 - Mt Hood Senior Living
 - The Pad
 - Cedar Heights Views
 - Shaylee Meadows
 - Trimble PD
 - Bornstedt Views
 - Cascade Creek Multifamily
 - Tickle Creek Village
 - Double Creek Condos
 - Jewelberry Ridge
 - Jewelberry Meadows
 - Sandy Plaza Apartments
 - FreeUp Storage
 - 38015 US 26 mixed-use development
- Study intersections operate at an acceptable mobility standard during the 2023 AM and PM peak hours

Future (2023) Project Condition

- Specialty Trade Contractor (ITE Trip Generation code 180) was used to estimate trips generated at the site.
- The proposed project would result in additional vehicle trips: 18 (13 in/5 out) AM peak hour vehicle trips, 22 (7 in/15 out) PM peak hour vehicle trips and 108 weekday trips.
- 2023 Total Traffic Conditions - All study intersections would operate at an acceptable volume to capacity ratios with the addition of vehicle trips from the proposed project.
- Traffic queues from the intersection of 362nd Drive and Industrial Way (west) were evaluated. The 95th percentile queues were found to extend past the proposed driveway, including the additional space created by the realignment 50 feet to the south along 362nd Drive. The average traffic queues do not exceed the available storage.
- An evaluation of traffic signal warrants at the unsignalized intersections found that they were not met.
- Sight distance was evaluated at the two site access driveways. At the site access driveway along SE 362nd Drive the northbound intersection site distance is 410 feet based on an 85th percentile speed of 37 miles per hour. There is 324 feet of sight distance available to the south from the

intersection, less than the intersection site distance. The required stopping site distance is 270 feet which is less than the available sight distance. Since the site access location is in an urbanized area and stopping site distance is met, no mitigations are recommended to meet the intersection site distance. The site distance at the site access driveway along Industrial Way is met with the clearing of vegetation along the site frontage along Industrial Way.

- The 2011 Transportation System Plan includes a project to realign Industrial Way (east) to meet Industrial Way (west) which would require right-of-way acquisition through the development parcel. At this time the project is only planned and no further action is required.

RECOMMENDED CONDITIONS OF APPROVAL

The following conditions of approval are recommended based on a review of the traffic impact study and site plan:

1. Page 10 states that HCM 6th edition was used. The volume – capacity ratio at the intersection of US 26 and 362nd Drive is based on HCM 2000 results. This is not expected to change the findings but the report shall be updated to reflect the appropriate HCM methodology used.
2. Page 11 states that the 10th edition of the Trip Generation Manual was used to estimate trip generation while the report in the appendix shows the 11th edition was used. The report shall be updated to reflect the appropriate Trip Generation edition used.
3. The development shall contribute System Development Charges toward citywide impacts.
4. The development shall pay a fee in-lieu of sidewalk improvements along the Industrial Way frontage.
5. The development shall clear vegetation as appropriate to maintain the intersection site distance from the site access along Industrial Way.
6. Minimum sight distance requirements shall be met at all site driveways. Sight distances should be re-verified in the final engineering/construction stages of development.

EXHIBIT P



Shelley Denison <sdenison@ci.sandy.or.us>

Question about land use application

3 messages

Shelley Denison <sdenison@ci.sandy.or.us>
To: Dock Rosenthal <dock.rosenthal@dksassociates.com>

Wed, Jan 4, 2023 at 10:48 AM

Hi Dock,

I wanted to follow up on an application you recently provided comments on.

The application file is 22-037: Johnson RV Canopy Cover.

On the site plans (attached), you'll see that they're proposing to move the driveway access to 362nd further south so it aligns with the driveway across the street. Based on a rough measurement (using a ruler and the scale bar), it looks like the new driveway is about 105 feet from the intersection of 362nd and Industrial Way.

According to 17.98.80, driveways need to be at least 150 feet from arterial or collector streets (which Industrial Way is) unless an exception is granted by the City Engineer.

Kelly and I agree that it makes sense to align the new driveway with the existing driveway, even if that means being short of that 150 foot distance. Would you agree with that?

--

Shelley Denison, AICP
Associate Planner

City of Sandy
Development Services Department
39250 Pioneer Blvd
Sandy, OR 97055
503-783-2587
sdenison@ci.sandy.or.us

"Cities have the capability of providing something for everybody, only because, and only when, they are created by everybody." - Jane Jacobs

 **RV Staging, Building and Utility Planning - PLANS (rcvd August 31, 2022).pdf**
3477K

Dock Rosenthal <dock.rosenthal@dksassociates.com>
To: Shelley Denison <sdenison@ci.sandy.or.us>
Cc: Reah Flisakowski <rfl@dksassociates.com>

Wed, Jan 4, 2023 at 11:21 AM

Hi Shelley.

Yes I agree, by moving the driveway they are improving an existing deficiency. The new driveway on Industrial Way should improve internal site circulation and provide some redundancy in the highest traffic volume periods.

-Dock

Dock Rosenthal, PE | Transportation Engineer/Planner
Direct: 503.972.1244 | Cell: 208.755.5361 | dock.rosenthal@dksassociates.com



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Shelley Denison <sdenison@ci.sandy.or.us>
To: Dock Rosenthal <dock.rosenthal@dksassociates.com>
Cc: Reah Flisakowski <rfl@dksassociates.com>

Wed, Jan 4, 2023 at 11:22 AM

Got it. Thanks!

[Quoted text hidden]

Memorandum

To: Shelly Denison, Associate Planner

From: AJ Thorne, Assistant Public Works Director

Re: Johnson RV Building addition 22-037

January 9, 2023

Public Works Comments

Stormwater

The proposed building addition will be placed on existing surface. There is no increase in impervious area. No comments from PW.

Water/wastewater

There are no added fixtures shown in the attached documents. If there are additional floor drains included in the structure, their connection to the sewer system will need to be reviewed.

Transportation

Public works has no comments.

Sincerely,

AJ Thorne, PE
Assistant Public Works Director
City of Sandy
503-489-2162



Date: January 26, 2023
To: Sandy Planning Commission
From: Tracy Brown Planning Consultants, LLC
RE: Staff Recommended Condition D.3, File No. 22-037 Johnson RV

After reviewing the January 24, 2023 Staff Report for this application, the applicant is concerned Finding 29 and Condition D.3 could be misinterpreted to prohibit use of the property as it is intended.

Existing Finding 29:

29. Per Section 17.90.130(J), the exterior storage of merchandise and/or materials, except as specifically authorized as a permitted accessory use, is prohibited. The applicant is requesting approval to redevelop the site as a recreational vehicle repair and service center, not as a sales lot for recreational vehicles. **The applicant shall not use the outdoor portion of the property as storage for merchandise and/or related materials unless authorized.**

Existing Condition D.3:

3. The applicant shall not use the outdoor portion of the property as storage for merchandise and/or related materials unless authorized.

The applicant's purpose for developing the property is to use the structures on the site to repair and service recreational vehicles and to store recreational vehicles on the site waiting for repair. The concern we have with the existing language in Finding 29 and Condition D.3 is the use of the words "storage for merchandise" as used in this condition could be misinterpreted to apply to vehicles parked awaiting repair. For this reason, the applicant requests Finding 29 and Condition D.3 be modified to clarify the intent of the Condition.

Proposed Language to Condition D.3:

The applicant shall not use the outdoor portion of the property ~~to as storage~~ **store or display for recreational vehicles** merchandise **for sale** and/or related materials unless authorized.